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A Paradigmatic examination of Peirce's Philosophy

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1 Introduction

This thesis aims to contribute to the consolidation of the metamodern paradigm in philosophy, by providing an overview of various projects therein and indicating how they relate to each other. It attempts to show that certain foundational patterns can be identified, that work as a generator function for a qualitatively different cluster of philosophical ideas. Furthermore, it aspires to introduce a historical component to the discussion of metamodernism that that begins before the inception of its naming and can be traced back to, among others, Charles Sanders Peirce. By doing so it attempts to critique the tendency to quantify and temporalise paradigms that are of a fundamentally qualitative nature. Additionally, it seeks to showcase the strengths of a paradigmatic approach in interpreting complex and broad thinkers like Charles Sanders Peirce.

Attempts have been made to capture central elements of large scale paradigms like modernity or metamodernity. This has in many cases led to a limited focus on temporal epochs or a fixed number of qualitative characteristics. As both of these approaches have problematic implications that will be further explored, this thesis aims to avoid these by looking at the *familienähnlichkeit* ("family resemblance") of various ideas that are not necessarily limited to a specific epoch (Wittgenstein, 1977). The work of Peirce will be interpreted through the paradigm of pragmatic and metamodern philosophy and certain ideas, of high centrality to his thinking, will be most prominently featured as they allow for an understanding of his work without explicitly going through the many areas of his thought.

The main body of the thesis has a threefold structure. The first part titled "On Metamodern Philosophy", will begin by a brief exploration on the qualitative categories of pre-modernity, modernity and postmodernity. This is done to both, introduce the relevant thinkers and literature in this field, as well as contextualise the concept of metamodernism to the unacquainted reader. Problems of placing these categories at precise historical moments will be discussed and big-data driven approaches to an understanding of them will be introduced. The first part ends with a discussion on

paradigms - a term used throughout the thesis to refer to these categories, and a brief introduction to the metamodern philosophical paradigm.

The second part titled "The Philosophy of Charles Sanders Peirce" will begin with the introduction of a new methodology, called the paradigmatic approach, which is chosen in this thesis, to talk about the work of Peirce. Next, his foundational categories will be introduced and their multivalent character, and method of justification, will be examined. Thereafter, his categories will be interpreted as a fractal generator function for much of his work including his architectonic system, which attempts to structure all knowledge by its natural relation. This is followed by a discussion on the processual nature of his work at large and some context regarding its origin and novelty will be given.

The last section will then look at the intersection of metamodernism and the philosophical system developed by Peirce, to indicate certain parallels present between them. First, a specific understanding regarding the relationship between subject and object will be considered. Second, architectonic structures will be reviewed. Third, the processual models underlying them will be indicated.

2 On Metamodern Philosophy

2.1 Pre-Modernity, Modernity and Post-Modernity

Discussing metamodernism, is best done against the background of pre-modernism, modernism and postmodernism[1]. There are many places to begin this exploration, but for the purpose of this thesis the discussion will begin with one of the first theorists who discussed distinct aesthetic, cultural and philosophical phases as part of a history that attempted to avoid historicists views like those pioneered by Hegel, and relativistic accounts, like those of Foucault (Little, 2020). This thinker is Karl Jaspers, who developed the theory of the Axial Age to describe a grand view of history of pre-modern or traditional times, that accounts for the synchronous developments of the major religions and philosophies of the Abrahamic Tradition, ancient Greece, early Buddhism, Confucianism and Zoroastrianism (Jaspers and Salamun, 2017). According to Jaspers, similar developments occurred in the Middle Eastern, Indian and Chinese regions between the years 800 and 200 BCE. Jaspers saw in these developments the deepest cut in world history; these developments represent the axis around which history and philosophy up until today, revolves. This does not mean that prior and later developments loose their import all together. They still remain significant, although they are being outshone by the purity and depth of the Axial Age.

At this point it is relevant to note, that Jasper's project oscillates between a classical modern progress narrative and a postmodern critique thereof[2]. On the one hand there is a *before* and *after* the Axial Age, as well as societies that are *closer* or *more distant* to from certain developments of the Axial Ages. On the other hand, there are pluralistic elements present, that do not only view the Western world as the "goal" of history, but underscore different developmental phenomena in different cultures. These are seen

[1]Describing these different paradigms as pre-modernity, modernity, and postmodernity is done here as a matter of convention. There is no intention to indicate any kind of value judgment via this particular naming.

[2]This oscillation will later on be used as a characteristic of metamodern philosophy - in the case of Jaspers however, similar to Peirce, talking about metamodern philosophy is a bit difficult due to the fact, that both built their philosophies before the postmodern paradigm was instantiated. In this sense they are both proto-metamodern.

as progress that does not move in a predefined direction but finds its unique cultural expression. The question that arises for Jaspers is something like, how can these two elements be connected? The answer he gives is a developmental model that allows for a "before and after" but does not concretise the detailed forms of development. Additionally not one developmental step is postulated as the most important one or deepest[3]. Such developmental models can be found in various disciplines by different thinkers from Eisenstadt (2000), to Habermas (2019), Adorno and Jephcott (1978), Piaget and Gruber (1995), Kohlberg (Brenner, 2001), Commons (2008) and Gilligan et al. (1993), among others.

To avoid getting lost in the detailed debates which specific elements exactly constitute a certain paradigm like the one of the Axial Age, here the focus will lie on the commonly agreed upon characteristics, that show up in various thinkers. Along the lines of Wittgenstein's concept of *familienähnlichkeit*, this thesis argues, that a word, idea or paradigm is not defined through a collectively exhaustive and mutually exclusive list of specific properties, but rather, through concepts that are adjacent to each other and share certain overlapping similarities (Wittgenstein, 1977). The example given by Wittgenstein is that the concept of a game cannot be satisfactorily described by specific properties, since we can always think of games that do not share these properties, but can still be considered games. Yet, we find that any game will share a certain family resemblance with some other games. Similarly, the paradigms we will be investigating in the coming paragraphs cannot be defined exhaustively, their family resemblance can however be indicated.

There are two ideas that pervade various ideas of historical development accounts mentioned above that are especially important in the context of this thesis. First, there is a certain logic regarding which developments can occur earlier and which can occur later. For example, deconstructive philosophies can only exist if there is something to deconstruct, or, coordinating the abstract variables of god and money, can only

[3]Hence it can be argued, that Jaspers is not fully true to this dictum, as he postulates the transformation from the Mythical Age to the Axial Age as the deepest and most important. He does however indicate the possibility of a second Axial Age, that arguably shares certain characteristics with the paradigm of Metamodernism, which in some sense relativises the importance of the Axial Age - if only to a limited extent

be done after the capability for society-wide abstraction has been gained and these variables have been constituted. Hence, there is a kind of inherent ordering of these paradigms[4]. Second, these paradigms are constituted through paralleled sociogenetic and ontogenetic developments, meaning that there are correlations between the development of the individual and that of society and, that both seem to influence one another[5].

2.2 On Metamodernism

First, a few notes on the name and history of metamodernism. The concept of metamodernism, similar to pre-modernity, modernity and postmodernity aims to capture a cluster of qualitative developments that find their expression in aesthetics, culture, politics, philosophy and the sciences. The general question, that metamodernism attempts to answer is, what comes after modernism and postmodernism[6]. One of the earliest direct investigations into this question was done by the architect Tom Turner in his book *"City as Landscape: A Post-postmodern View of Design and Planning"*. He simply used the term post-postmodernism to allude to a new sensibility that emerges after postmodernism, which is called metamodernism in this thesis. He argued that there are valuable elements in the modernist focus on function in design, as well as the multivalent design of postmodernism, but that something after these sensibilities must come, that reintroduces organic pattern languages and "seeks to temper reason with

[4]It should be noted that this ordering does not directly imply any normative judgments. Just because one expression of a certain paradigm occurred earlier it is not necessarily better or worse. There are some indications that on average certain normative claims can be made, however this discussion goes beyond this thesis. For further information the following starting points are recommended: (Gilligan et al., 1993; Brenner, 2001).

[5]Again, it is important to reiterate that there is a difference between a historicist account of history, like Fukuyama's, and the one presented here. Whilst both state that the concept of development, plays a relevant part in the description of society and the individual, the historicist idea is inherently very modern. It is the narrative of progress towards a certain goal or state, that is in most cases, "by coincidence", similar to that of the society the thinker currently lives in. The narrative presented here also states that there is an inherent logic to development (it is no coincidence that for example, no pre-modern society has ever developed Quantum Mechanics) but the expressions thereof are not pre-given. Additionally, no endpoint or final goal is defined towards which development occurs.

[6]Some scholars have differentiated between metamodernism and metamodernity (Andersen, 2019). For the purpose of this work these terms will refer to the same concept.

faith" (Turner, 1996, p. 9)[7]. Turner himself was however not content with the name of this new sensibility he was describing as post-postmodernism. He wrote; *"embrace post-Postmodernism – and pray for a better name"*[8] (Turner, 1996, p. 10).

The term *metamodernism* appeared as early as 1975 to describe certain shifts in aesthetic sensibility (Zavarzadeh, 1975). However. it only became more widely used after two dutch art scholars, Timotheus Vermeulen and Robin van den Akker, re-introduced the term in their article *"Notes on Metamodernism"* to describe a sensibility that comes after postmodernism (Vermeulen and van den Akker, 2010). Interestingly, their use of the prefix *"meta"*, is not primarily referring to the meaning of "after" or "beyond", but to Plato's concept of "metaxy" which describes something that is "in-between" (Woodruff and Nehamas, 1965). In this sense, metamodernism is not only defined as being that which comes after postmodernism, but also as something that oscillates between modern modes of expressions like sincerity, knowingness and truth, and the postmodern moments of irony, naivety and relativism, or in the words of the performance artist Luke Turner in the Metamodern Manifesto:

We propose a pragmatic romanticism unhindered by ideological anchorage. Thus, metamodernism shall be defined as the mercurial condition between and beyond irony and sincerity, naivety and knowingness, relativism and truth, optimism and doubt, in pursuit of a plurality of disparate and elusive horizons. We must go forth and oscillate! (Turner, 2011, para. 8)

[7]Much can be said about Turners work, what is interesting to observe however is, that a lot of his analysis is similar to that of thinkers like Christopher Alexander who have been more or less criticising postmodern aesthetics, and have argued for a move beyond, more than 15 years prior. Alexander is also citepd as one of the major influences of Turner (Alexander et al., 1977). Yet, a clearer notion of the paradigm that Alexander's work operates in needed to emerged before it became clearer how his work links to others with a related message. Similarly in philosophy and culture; many examples can be found, where early and proto-metamodern thinkers explicate certain concepts and qualities, that will become concretised as part of a larger paradigm much later on - this thesis argues, that just this is the case for Charles Sanders Peirce.

[8]Many names built around *modernism* have been suggested, examples include: *cosmodernism, neomodernism, remodernism, automodernism, trans-postmodernism, pseudo-modernism, digimodernism, altermodernism, hypermodernism, supermodernism* - the list of names that do not include *modernism*, but allude to something similar that comes after postmodernism is even longer.

This synthesising move, of extracting valuable elements from both modernism and postmodernism and oscillating between them, constitutes a central theme in most descriptions of metamodernism [9]. There are however, different focal points of various scholars who stress certain aspects of metamodernism over others. The Canadian sociologist Brent Cooper has identified two main strands of metamodern thought, emerging at its beginning, the Dutch and Nordic school (Cooper, 2021). The former clusters around the work of Timotheus Vermeulen and Robin van den Akker and is interested in the cultural and aesthetic description of the newly emerging structure of feeling associated with metamodernism. The Nordic School centres around Daniel Görtz and Emil Friis who write under the pen name Hanzi Freinacht, and are more focused on the political and philosophical prescriptive elements associated with metamodernism[10].

Thus, the span of areas investigated in light of metamodernism is quite extensive, which is one of the main reasons for adopting the particular word in this thesis. As mentioned in the beginning, like with other large-scale paradigms, there are different aspects of aesthetic, cultural and philosophical expression central to metamodernism. Beyond that, more fine-grained differentiations of various aspects can be found and analytically employed. Daniel Görtz for example suggests six dimensions of metamodernism; as a cultural phase, a societal developmental stage, a meta-meme (similar to a kind of meta-narrative), a stage of personal development, as a philosophical paradigm and as a broader movement or project (Görtz, 2021). Without going into any detail of these specific dimensions, it is important to highlight the inherent multidimensionality of any given paradigm. There is no singular perspective that encapsulates the others, the paradigm is constituted by its multidimensionality.

[9] There has been some debate over the right organising principle of modernity and postmodernity from the perspective of metamodernity (Rowson, 2021). Synthesis, oscillation and superposition are some of the more regularly used principles. While having this discussion is relevant, for the purpose of this thesis a pluralist position will be held, where all concepts that refer to a non-arbitrary ordering of modernity and postmodernity that lead to a higher-order concept of metamodernity are used.

[10] A list containing about 250 entries of works that engage with metamodernism has been published by the Canadian thinker Brent Cooper, it is good starting place for a more in-depth engagement with metamodernism and can be found under the link: `https://docs.google.com/spreadsheets/d/e/2PACX-1vS7fyFHmjdDAo5eofTk6d67DDtWZGKnyW1pZhAQVDYcPTq2400ykgkScdnAox0UHeSLyhCliqrCPf6g/pubhtml`

Additionally, any attempt that aims to reduce these paradigms to singular aspects to achieve a specific temporal placement is problematic. This has been demonstrated in detail by the big-data driven "Seshat: Global History Databank" project[11] (Turchin et al., 2015a). It is one of the largest databases that collects and organises data-points on the political and social organisation of humans from the neolithic period till early modern times. One of its aims is to test scientific hypotheses, like those provided by some scholars who have written on the Axial Age and have argued for specific times when "axial" characteristics fist emerged (Turchin et al., 2015b). This big-data driven approach demonstrated that the exact temporal and geographic placement of nearly all scholars writing on the Axial Age was not exact. The "axial" qualities they described sometimes appeared hundreds or even thousand years prior to the various proposed Axial Ages. Hence, talking about something like the Axial *Age* is not sensible, talking about certain "axial" qualities does however make sense. The interdisciplinary research of the Seshat-project revealed, that certain "axial" traits do co-emerge in the organisation of more and more complex civilisations [12] (Hoyer et al., 2019). Thus, talking about certain qualitative developments can be helpful. The attempt to place them at a specific temporal moment is however problematic. Hence, this thesis will be talking about the qualitative aspects of metamodernity and not attempt to place them in a specific temporal context.

Society clearly is never at equilibrium, but dynamic steady states around attractors can be seen as some kind of equilibrium, that is more or less stable over a certain time and in certain places

While many traits do co-emerge, they need not necessarily do so. An example of this could arguably be found, when looking at the aesthetic expression of postmodern art. While a more comprehensive formulation of postmodernism as a paradigm can only

[11] Link to the project: http://seshatdatabank.info/

[12] While some traits do co-emerge, it is difficult to see a pattern regarding to which traits do co-emerge and which traits follow others. The diversity of historical accounts show various permutations of the sequence in which these traits emerged. For this thesis this question will not be looked at in more detail. The position held will be that complex systems (e.g. a society) can come to critical thresholds (e.g. threshold before a new large-scale paradigm emerges) induced by various stressors or self-organising properties (e.g. the threshold before in pre-modernity, many more people moving to cities), that eventually move the system from one steady state around a certain attractor that has been disrupted, to a new steady state of another attractor.

be found in the second half of the 20^{th} century, artistic expression of this paradigm can already be found in the "readymades" by Marcel Duchamp, most famously his exhibition of a urinal as a sculpture titled "Fountain", as early as 1917. Another example could be found in Japan, where many of the pre-modern or axial traits did not emerge up until modernity. This has even led some scholars to argue for the seemingly contradictory position that Japan was pre-axial up until modernity (Eisenstadt and Aizenshtadt, 1996). However that may be, specific traits that some authors interpret as clear expressions of the Axial Age, are present much earlier. The classical theory of the Axial Age has problems explaining such temporally disparate events (Hoyer et al., 2019). It is therefore important to distinguish various aspects or dimensions of these large-scale paradigms, to not view the world in all too simple categories. Some aspects of these large-scale paradigms are shared across borders and time, however many elements only occur in specific cultures [13].

It takes the observation of multiple singular instances to detect a pattern. Similarly, it takes time until the coherence of a large-scale paradigm emerges, which requires developments in various disciplines like literature, arts, philosophy and so on. As these need not necessarily co-emerge but can occur at various places and times, it is possible to look at early instantiations of soon-to-be paradigms, and analyse them retrospectively in terms of the future paradigm. Thus we can investigate metamodernism as a philosophical paradigm and find precursors and early expressions thereof already with thinkers that lived during the 19th century, like Charles Sanders Peirce. The reasons for doing so will be further explored in the third part of this work; what can be said in this context is that, when attempting to present the thought of any thinker who has developed a new philosophical and metaphysical paradigm, understanding it can be aided by interpreting it as part of a larger development that finds expressions in areas like aesthetics, culture and other philosophical ideas.

[13] Naturally, the question arises, why it might be helpful to talk about these large-scale paradigms if they are to be analytically differentiated later on. The reason for this is, that the internal coherence of different expressions of these paradigms can arguably be much better demonstrated, if the movement is from the large to the small. Also, since the understanding of any abstract idea or paradigms relies on looking at various expressions of itself, pointing towards other instantiations in areas like aesthetics and culture can be helpful to see the family resemblances between them. It is for this reason that I place the philosophy of Charles Sanders Peirce as a precursor to the qualitative paradigm of metamodern philosophy and metaphysics.

2.3 On Paradigms

A few, more formal considerations about paradigms will be required, as this concepts has been quite extensively employed in the previous paragraphs, without properly defining it. There are two main sources of inspiration for the use of "paradigm" in this thesis. These come through the work of Kuhn on paradigm shifts in the sciences, and the work on cognitive development and paradigmatic thought by Commons (Kuhn, 1962; Commons, 2008). First, some introductory notes: in terms of ethymology the word paradigm derives from the Greek *paradeigma* and comes close in meaning to words like "pattern, example, sample". The first of these three translations is closest to the way the word is used in this thesis. In one way, a paradigm can be understood as a complex pattern or pattern-of-patterns that has an internal coherence and co-emerges and resonates with similar aspects of itself. As such it has some underlying generator functions that co-emerge from the dynamics of a complex system, of which the pattern itself is an instantiation. Importantly, the following section on paradigms does not aim to contribute to the extensive discussion on what exactly constitutes a paradigms, it does also not aim to present a definite definition of a paradigm, rather, it introduces the angle from which the complex hyperobject of the paradigm is looked at in this text (Morton, 2013).

The most prominent analysis of paradigms, as provided by Thomas Kuhn, produces valuable insights into the nature of paradigms (Kuhn, 1962). He argued, that there are two main modes of doing science, one is what he called *normal science* which is the work done within a given paradigm and the other is *extraordinary research* which is conducted after sufficient inconsistencies of a given paradigm have become obvious and a new paradigm is required, this will lead to a paradigm shift - the move from one paradigm to the next. Similarly to the adoption of new forms of governance, this is accompanied by a kind of *revolution*, where the competing forces of the old and new paradigm are fighting for institutional adoption. Kuhn uses the concept of the paradigm in different ways throughout his work. Two of the main ones are described by Giorgio Agambend who writes:

"In the first one, "paradigm" designates what the members of a certain scientific community have in common, that is to say, the whole of techniques, patents and values shared by the members of the community. In the second sense, the paradigm is a single element of a whole, say for instance Newton's Principia, which, acting as a common model or an example... stands for the explicit rules and thus defines a coherent tradition of investigation. Thus the question is for Kuhn to investigate by means of the paradigm what makes possible the constitution of what he calls "normal science". That is to say, the science which can decide if a certain problem will be considered scientific or not. Normal science does not mean at all a science guided by a coherent system of rules, on the contrary, the rules can be derived from the paradigms, but the paradigms can guide the investigation also in the absence of rules. This is precisely the second meaning of the term "paradigm", which Kuhn considered the most new and profound, though it is in truth the oldest." (Agamben, 2009, p. 2)

While the theory of paradigm shifts might appear like a discrete function where one "hops" from paradigm to paradigm, change is not sudden, but happens gradually. Kuhn writes that the transformation from one paradigm to the next is a sign of an overripe science, indicating that a science approaches the limits of a given paradigm and becomes unstable by phenomenon that cannot yet be integrated into the theory. At this point, extraordinary research can produces a new paradigm into which the science will eventually transform (Kuhn and Hacking, 2012). The relativist implication of his analysis is that, since we move from paradigm to paradigm, we can never conclusively come to the *Truth*. Therefore all kinds of sciences as belief systems are to be equated. Kuhn argues against this by stating that the new paradigm is better than the old one, not only different, because it is able to encompass more phenomena [14].

In his analysis, Kuhn only focused on paradigm shifts in physics. These provide clear, illustrative examples of both paradigms and paradigm shifts, like the movement

[14] As already indicated in a previous footnote 4 making judgements on which paradigm is *better* is a difficult thing to do. For the sciences, it can be argued that if its goal is the description of as many natural phenomena as possible, it follows that the paradigm that is able to do so, is better. An example of this would be the transition from Newtonian Physics to Relativity theory. For the large-scale paradigms described in the previous chapters this is a more complex argument to be made, but it can be made, for example, by using a model like the Circle of Caring (Singer, 2011).

from e.g. the paradigm of a geocentric world to the paradigm of heliocentric world. Looking at other fields like the social sciences, technology, literature, aesthetics and philosophy, the idea of the paradigm has been employed extensively, though in some cases their use is distant far from Kuhn's original definitions (Harvey, 1982). The difficulty of talking about paradigms in the "softer" sciences, is in part due to the fact that often multiple paradigms co-exist, that differentiating between "normal work" and "extraordinary research" is difficult and that new experiments in many cases cannot demonstrate anomalies in an mature paradigm as clearly, as is possible in the "harder" sciences. Nonetheless, the concept of the paradigm, remains helpful to describe thought patterns, beliefs and common practices within a given domain. As mentioned early, this section does not aim to present a definite definition of a what a paradigm, rather, it introduces the angle from the concept is looked at in this thesis. As such, Kuhn's understanding of the paradigm and the accompanying paradigm shift provide a good starting point that will be further generalised in the next paragraphs. In short, the use of "paradigm" here is not only pertaining to the structure of scientific revolution, but can be understood as a more general form of revolution and evolution of thought patterns where a paradigm can be both, a collection of values and ideas within a community as well as a single element of a whole, acting as a model to guide thinking and inquiry.

The Model of Hierarchical Complexity (MHC) developed by Michael Commons indirectly provides one of the clearest definitions of what constitutes a paradigm (Commons, 2008). The theory was originally formulated as a mathematical model and proved to be very successful in classifying behaviour and has extensively been empirically tested in a variety of different domains (Commons et al., 2007). It organises the complexity of a given cognitive task based on mathematical principles used in information science (Commons, 2008). The model consists of 16 levels describing the complexity of behaviour from single-celled organisms to adult humans. A detailed discussion of the MHC would exceed the scope of this thesis. For the purpose of this text, the MHC will be outlined in very broad terms. A higher stage is defined by having the ability to order the actions of the next lower stage in a non-arbitrary way. An example would be, that the action of uttering a grammatically correct sentences is one stage more complex, than uttering a singular word. This is because a sentence

needs to organise words in a non-arbitrary way. If a sentence with, for example, 10 words is uttered, there are more than three million ways to arrange these words, while there will only be a handful of ways that are grammatically correct.

Leaving the lower levels of complexity aside and taking examples that are helpful for the purpose of this thesis, we can move up the hierarchy from sentences, to paragraphs, to groups of paragraphs, to coherent stories, to abstracting variables derived from these stories, to coordinating multiple variables, to systems of variables, to relating systems to each other, to paradigms. According to this definition, a paradigm coordinates various collections of systems or practices (Commons, 2008). As an example from the natural sciences, we could look at the work of thinkers that have come to develop new paradigms in their respective disciplines, like Copernicus, Newton, Einstein and find that the insights produced by these thinker are qualitatively different to those who later applied these theories to develop novel insights. This is because thinkers operating at the paradigmatic stage will produce theories that can be applied at various scales and help solve very different problems across disciplines. From this understanding we can see that a paradigm is the coordination of various groups of systems in a relatively coherent way.

From the perspective of the Model of Hierarchical Complexity we can further address a difficulty that naturally arises when the concept of "paradigm" is generalised. Namely the question, whether paradigms can overlap or exist within other paradigms. Kuhn argued that paradigms shifts are incommensurate, meaning that they occur in a holistic manner. The problems of the old paradigm vanishes and are replaced by new ones. The can lead to the so-called "Kuhn loss" where the solutions to certain problems that were central to an older paradigm can disappear, become unscientific or obsolete (Oberheim and Hoyningen-Huene, 2018). Likewise, novel problems become meaningful or trivialities of the old paradigm take centre-stage (Kuhn, 1962). This siloed description of paradigms and their shifts is important to stress the discontinuous evolution of the sciences. However, at the point where various paradigms intersect to create novel ones this narrative is no longer satisfactory. As an example, one could look at the paradigm of computation and find that it altered the collection of practices in nearly all the sciences over the last decades and created various new fields. Hence,

this thesis argues that paradigms can intersect and influence one another and that paradigms can be nested within one another. From the perspective of the MHC this makes sense as paradigms are no longer defined in Kuhn's way, but by their vertical complexity.

Importantly, the large-scale paradigms of pre-modernity, modernity, postmodernity and metamodernity, talked about in the previous chapters, are themselves collections of paradigms. They could be further divided into different categories or modes of expression like the arts, ethics and science, or even further subdivided into particular paradigms like complexity theory, non-linear mechanics and self-organisation, for example present in the sciences. Hence, they have often been referred to as large-scale paradigms since they are a collection of many paradigms in the way used by Kuhn [15].

Let me summarise and reiterate some of the insights from this chapter and the last ones, before I discuss the paradigm of metamodern philosophy. A paradigm is the coordination of various groups of systems into a relatively coherent way. In a more concrete way, a paradigm is both, the techniques and values shared by a given community, as well as well as specific "paradigmatic" models that provide the basis for exploration and understanding. A paradigm can be replaced by a new one. This can happen once enough problems of the old paradigm become visible and a paradigm shift is stimulated by the formation of a new paradigm through extraordinary research, but also thought the interaction with other paradigms. Some kinds of ideas and paradigms are developmentally dependent on each other - quantum physics does not arise in any tribal civilisation nor does behavioural economics or Freudian psychoanalysis. Furthermore, certain paradigms cluster together with one another - quantum physics is

[15]It could therefore also be argued, that the paradigms of pre-modernity, modernity, postmodernity and metamodernity are of a higher stage of complexity as they order lower stage paradigms in a non-arbitrary way. This might seem so at first glance, however this need not necessarily be the case. It is possible to, for example, consider systems that are embedded within other systems, where both have similar complexity. The differentiating factor is not how *general* something is, rather at which level of complexity someone can understand something. Another important insight here is that one has to differentiate between the thinker who develops a given theory - operating at a certain stage like paradigmatic - and the theory itself. The theory of paradigms and paradigm shifts itself, or the development of these clusters of paradigms here called pre-modernity, modernity, postmodernity and metamodernity requires paradigmatic thinkers or thinkers of higher complexity. However, what has been discussed up until this point requires no paradigmatic thinking to understand and use.

more likely to emerge in a society whose worldview is not mainly dictated by transcendental religious values but by one that focuses more on immanent worldly processes. Hence, it is possible to observe clusterings of paradigms and four such clusterings have been suggested up until this point, named, pre-modernity, modernity, postmodernity and metamodernity[16].

2.4 On Metamodern Philosophy

Each of the large-scale paradigms that have been investigated, have their accompanying cluster of philosophies, theologies and schools of thought. These are both functioning as justifications for the world view present in a given paradigm and come to constitute certain parts of it. Examples of these for pre-modernity could be the theologies of the major world religions and the philosophies of ancient Grece. For modernity, the schools of empiricism, rationalism and positivism are central, as are thinkers like Descartes, Kant, Locke and Hume. In postmodernity schools of poststructuralism, deconstructionism and critical theory, among many other theories, are shaping much of the philosophical discourse.

Importantly, these clusters of philosophies have their commonalities. The possibility to talk about large-scale paradigms, was in part dependent on certain family-resemblances, between certain expressions of large-scale paradigms in various fields like the arts, religion and the sciences. Similarly, certain family-resemblances can be found in the clusterings of these philosophical paradigms. As an example, we could

[16]A thinker worth mentioning, who has started to formulate how the concept of paradigm (and similar categories) can be understood in a metamodern context is the philosopher Jason Ānanda Josephson-Storm. He has formulated a theory of *social kinds* that responds to the deconstructive moves postmodernity has made against many kinds of fixed categories. Such static and reified categories make for simple targets by various forms of deconstructive analysis as they will ultimately fail in their ambition to capture static essences. Josephson-Storm therefore proposes that social kinds (or most categories (including paradigms)) are best understood as "temporary zones of stability", that are "1) socially constructed 2) dynamic clusters of powers, 3) which are demarcated by the causal processes that anchor the relevant clusters" (Storm, 2021, p.283). Additionally, the property of interactioin and intersection of social kinds is highlighted in his work. As such, the understanding of paradigm put forth in this section shares many similarities with Josephson-Storm's social kinds. His work will be briefly mentioned in section 4.

look at the development of modern philosophies and find that in many cases, these focus on theories of knowledge, perspectives on the scientific method, and ways of logical reasoning. However, this is not the case for all philosophies that are clustered around the modern paradigm. Thus, Wittgenstein's family-resemblance is invoked to look at the commonalities, even though one might find certain aspects of philosophies, that are in many other ways distant from each other. As an example, empiricism and rationalism are in many ways quite distant, since they attempt to answer a question in a fundamentally different way. However, the presuppositions made to come to that particular question, are embedded in modern thought. Running the risk of oversimplifying, we could argue that, pre-modern thought was not as centrally concerned with a theory of knowledge based on rationality, the senses and intersubjective verification, as *Truth* was given by God or revealed itself through access to the transcendental world. Modern thought however, needed a sound theory of knowledge to justify the relevance of the scientific method. Hence, it was the job of various theories in the modern philosophical paradigm, to consider epistemological questions that centre around man and how he comes to knowledge - theories like empiricism and rationalism. Postmodernity critiqued the possibility an absolute *Truth*, and is therefore also not as much involved in the question how we come to certain knowledge. Rather it is concerned with demonstrating the multitude of biases and power relations shaping the way we understand the world.

If it is sensible to talk about the various developments in the aforementioned philosophical paradigms, it is likely also sensible to talk about metamodern philosophies. Hence, this section will attempt to provide an overview of the paradigm of metamodern philosophy. In what follows, I will examine the way philosophies express themselves in the bigger cluster of metamodernity. To provide a broad overview of the theories pertaining to metamodern paradigm, an extensive quote is taken from a recent essay by Daniel Görtz, an scholar active in the Nordic School of Metamodernism. He writes that one dimension of metamodernity can be seen,

"As a certain paradigm, with its own philosophy with accompanying theologies (which includes a family of ideas concerning ontology, epistemology, aesthetics and ethics - such as Karen Barad's (2007) agential realism and onto-epistemology, Quentin Meil-

lassoux's (2008) speculative realism, perspective-participatory views of reality and 'entanglement', belief in potential rather than actuality as the ground of reality, developmental views of emergence, chaos, complexity and cybernetics, multi-perpectivalism, the revisiting of process philosophy in Whitehead and Peirce (see Stanford Encyclopaedia, 2017), critiques of anthropocentrism and humanism, holistic views that put spirituality and studies first-person phenomenological or experiential perspectives at the centre, developmental semiotics and cybersemiotics (Brier, 2007), synthetic theologies (Bard and Söderqvist, 2014), transdisciplinary studies and meta-theories which map out non-arbitrary relations between different injunctions into reality, fractal perspectives of reality and phenomenological experience in which for instance the relations between natural and social sciences are viewed as contained within one another in fractal patterns, relationally as an ontological basis, deconstructive critiques of the naive experience of the self as a discrete object, transpersonal perspectives that try to go beyond ideas of 'the individual' and 'the collective', critiques of linear statistical inference in favour of the study of emergent patterns, a holistic view of information theory, and an embrace of both-and thinking and a self-critical embrace of paradox and the brokenness of reality's self-organisation; these abstractly interrelated strands represent different versions of neo-Hegelianism and post-Kantianism, tending towards 'non-dual' spirituality and a distancing from Cartesian dualism in its various, often subtle forms). Obviously, the interconnecting links between all of these philosophical projects are far from evident; rather, I hold there is a profound structure to the metamodern mind, to contours of which can thus far only be vaguely sketched, an much work remains to be done in terms of formulating the key principles underlying the metamodern philosophy proper, as well as within the sociology of knowledge from which social contexts such ideas emerge;"(Görtz, 2021, p. 139-140)

While postmodernity heavily rested on the moment of critiquing modernity, this move is less prevalent in metamodern ideas. Many of the above philosophical doctrines and ideas, are still to some extent a critique of modernity, postmodernity or both. However a central theme found throughout them is a more constructive approach towards discourse and theorising. The way many of these projects are approached, differs from the way modern theories and philosophical systems were formed. The stasis and universalising tendencies of much of modern philosophy is less present in the

metamodern systems constructed. They often integrate evolutionary, process-oriented and relational perspectives.

Apart from the tonal difference to postmodern and modern discourse, philosophical systems are more explicit about their constructive purpose. Theory is no longer seen as separate from practice, both are understood to be mutually influential - the way we understand ourselves and our place in the world directly relates to the way we act and pursue our goals. It is in this sense that the philosophical and metaphysical assumptions - explicitly or implicitly - shape our place in the world. The lack of deliberative metaphysical discourse that has been present in modern and postmodern societies and academic circles, has further intensified a meaning crisis that expresses itself in emptiness, alienation and fatigue, on individual and collective levels (Fleming, 2021; Vervaeke, 2019b). This is something often directly expressed in the purpose of the philosophical systems that are present within the metamodern paradigm. By being aware of the constructive nature of theory they bind themselves to a particular context, strive to conduct constructive work and by doing so, move beyond the modern ideal of the *ultimate* metaphysical system, as well as the postmodern critique thereof.

Having set the metamodern stage, we will turn to Pierce's philosophy and metaphysics in the next section, and evaluate it against currents in contemporary metamodern thought in the subsequent and final chapter of this thesis. First, I will introduce a new methodology that guides my interpretation of Pierce. Then, I will discuss his categories in some detail to illustrate their centrality to his work. Finally. I will outline his architectonic structure and understanding of process. Chapter 3 ends with a discussion of the historical and social context from which his philosophy originated.

3 The Philosophy of Charles Sanders Peirce

3.1 A Paradigmatic Approach

Attempting to present the thought of Charles Sanders Peirce in a systematised and coherent way is a nearly impossible undertaking (Burch, 2021). The reasons for this are manifold. First, his thought underwent substantial changes throughout his lifetime, which leads to contradictions when looking at work from different life-phases. Second, some ideas that are central to the internal coherence of his work, like elements of his semiotics, were never fully developed. Third, the body of work produced by Peirce is so vast and - even today - difficult to access, that an engagement with its entirety is very laborious and time consuming. Finally, his ability to discover new things and produce new insights was arguably slightly greater than his effort to systematise these.

The difficulties of pursuing Pierce scholarship are evident in the quickly growing literature from the past 50 years that engages with Pierce's work. Most of it focuses on one (or a few) of the many areas Pierce wrote about. The breadth of his work further adds to the difficulty of systematising his thought. As detailed by Burch, his writing extended over an extremely wide range of topics including *"mathematics, mathematical logic, physics, geodesy, spectroscopy, and astronomy, on the one hand (that of mathematics and the physical sciences), to psychology, anthropology, history, and economics, on the other (that of the humanities and the social sciences)"* (Burch, 2021).

Since the days of the polymath geniuses like Leibniz are long gone, due to the exponential growth of knowledge, one cannot be expected to be an expert in different fields like spectroscopy, anthropology, and economics at the same time. Therefore, most reconstructions of Peirce's thought that aim to paint a big-picture view, follow one of two paths. In some cases, a chronological approach is taken where the focus lies on the development of Peirce's work throughout his life, and his thought is explained via the contextualisation in different life-phase and historical epochs[17]. Another path taken is

[17]Some notable thinkers in this category include: Apel (1975)Brent (1998)Peirce and Ketner (1998)

the exploration of a central idea or topic, that shows up in various places throughout Peirce's writing, and has high centrality and explanatory power in his philosophy[18].

Both these approaches can yield valuable insights about Peirce's system of philosophy and help us understand certain elements in his theories. However, like any perspectives on a given topic, they also have their inherent limitations. The chronological approach, for example, often leads to the over-emphasis of differences in thought, to tell a story of growth and maturing over someone's life, while the topic-centered approach can, by limiting itself to certain ideas, paint a distorted picture of the internal coherence of a given system of thought. This second problem is especially noticeable with Peirce, where topic-centered reconstructions of his thought often only look at either his semiotics, logic, phenomenology, or philosophy of mathematics, thus missing important aspects of his work that appear in all these places, and are therefore of central import to the internal structure and coherence of his work.

This thesis attempts to showcase the usefulness and value of a novel approach that differs from the aforementioned ones: the paradigmatic approach[19]. I will interpret Pierce as an early precursor to an emerging paradigm in philosophy, aesthetics, and culture for which the term "metamodernism" is used in this thesis. This approach, by looking at Peirce's thought through the lens of a philosophical, aesthetic and cultural paradigm attempts to capture certain reoccurring consistent themes in his ideas that range over the broad span of topics he has written on, and looks at the continued influence they assert on contemporary philosophical debates. Thereby, this perspective aims to avoid some of the shortcomings of the chronological, and topic-centred approach. Of course, the attempt to avoid some of these limitations introduces some new constraints of a different nature. One of the limitations this paradigm-centred approach has is the unavoidable tradeoff between breadth and depth. Due to the extent of Peirce's opus, there is a need to generalise. Another potential bias is my focus on elements that are featured prominently in the paradigm of metamodernism. A further, more subtle limitation occurs within the hermeneutic process of viewing Peirce as a

[18]See, for example: Mayorga (2007)Eisele and Martin (1979)Thayer (1968)

[19]The paradigmatic approach taken here should not be confused with paradigmatic analysis, a style of literary criticism. Though there are similarities, this work is much less text-focused as it is paradigm-focused.

proto-metamodern thinker, thereby running the danger of distorting the boundaries of the paradigm itself.

At this point it is relevant to stress that the paradigmatic approach introduced in this thesis, is not a form of anachronistic analysis. As discussed in Section 2, the paradigm of metamodernism has instantiations in various domains like aesthetics, culture, and philosophy. Its cultural element only show up if a critical mass of people adopts certain elements of this paradigm. The philosophical and aesthetic ideas, however, can precociously manifest themselves far in advance, which makes it possible for exceptional individuals to engage with them sometimes hundred years before a cultural epoch concretises. Thus, it can be said that this thesis simply uses a category that has only recently been described, to talk about the precursors of that very category. For this reason, it is not an anachronism to interpret Pierce in light of metamodern philosophy. Moreover, it is important to emphasise that I interpret Pierce as a precursor to this paradigm, not a direct expression of it.

The following sections will introduce Peirce's doctrine of categories. I will examine their origin, historical background, derivation, and function to indicate what role they play in his philosophy in general, and to show how his categories relate to his work on architectonics.

3.2 On Peirce's Categories

If we attempt to understand the system of thought Charles Sanders Peirce developed, his theory of categories provides one of the best entry points (Peirce, 1975, 1.33). However, due to difference in functionality and abstractness of these categories, any introduction will have a difficult time to account for the staggering amount of intricacies and details subsumed under them[20]. Peirce himself often stressed this, at one point remarking that the categories *"must grow up in the mind, under the hot sun-*

[20]One of the most concise, yet informatory introductions given to the categories of Peirce has been published by Vincent Colapietro, who talks about the categories from the perspectives of *"articulation (or expression), definition, number, names, function, application, origin, status, derivation, and justification"* (Colapietro, 2008).

shine of hard thought, daily bright, well-focused, and well-aimed thought" (Peirce et al., 1997, 1.521). The hermeneutic risk of starting with the most abstract and proceeding to the more concrete has also been noted, since this approach increases the possibility of a fundamental misinterpretation if problematic interpretations of abstract classes inform the formation of more concrete ones (Colapietro, 2008). Nonetheless, the centrality of Peirce's categories for his writing and the explanatory power derived from them, demand our engagement. In respect to the importance of categories, Peirce is similar to thinkers like Aristotle, Hegel and Kant who played an important role in the formation of his fundamental categories (Whitehead, 1929).

In 1867, at the age of 27, Pierce presented paper titled "On a New list of Categories" before the American Academy of Arts and Sciences (Burch, 2021). This paper was the first attempt to formulate three universal categories that would influence all of Peirce's philosophy. His interest in categories, together with that in logic, can be found from some of his earliest philosophical musings, up to the last works ever written by him (Esposito, 1980). A starting point for his triplicate system was his study of Schiller's *"Über die Ästhetische Erziehung des Menschen in einer Reihe von Briefen"* at the age of 16 years. In these letters, Schiller differentiates between the fundamental human drives of *Spieltrieb, Stofftrieb und Formtrieb* that would become Peirce's man of practical affairs, scientific affairs and aesthetic affairs (Schiller, 2019). However, attempting to derive the categories in a genealogical manner is a difficult and somewhat misleading undertaking. There is no doubt that similarities between his categories and those of German idealists (especially Schelling) can be found. These were noticed by Pierce himself in his later writing (Peirce et al., 1997, 6.605). In actuality, however, he developed his categories more in objection to Kant's, rather than through them, or any other system of categories (Peirce et al., 1997, 5.525).

According to Peirce, his use of the term *category* is similar to that of most other philosophers (Peirce et al., 1997, 5.43). Categories can be understood as abstractions that help order different kinds of elements into various groupings. Hence, categories can differ depending on their horizontal complexity, i.e. how they order different elements in relation to each other. Categories can also differ in their vertical complexity, i.e. how general or abstract the category is, meaning, how many elements they sub-

sume[21]. The categories of interest to most philosophers have been those, with the highest vertical complexity. These are the most general or universal categories that can be applied to the greatest number of specific instances and subsume the greatest number of specific elements under them. Pierce attempted to find such categories, applicable to any kind of phenomenon. He regarded this as the process by which manifold sensuous impressions come into unity, and the necessity of the categories *"consist[s] in the impossibility of reducing the content of consciousness to unity without the[ir] introduction"*(Peirce et al., 1997, 1.545). The categories as an idea are therefore the most abstract concepts that can be talked and thought about, before reducing everything into unity. For Peirce they present themselves naturally if one inquires into the most fundamental aspects of phenomena. Thus, Peirce can be placed in a rich tradition of defining universal categories, originating with Aristotle and Plato, flourishing in Neoplatonic circles, continued by scholastic traditions as well as Kant and the German idealists (Studtmann, 2021).

The universal categories defined by Peirce are expressed by many different names - in their most abstract form they are called "firstness", "secondness" and "thirdness".

Before continuing to discuss additional abstract aspects of the categories, let me give some examples to give them more concrete meaning. It should be noted that these categories were called by very different names throughout Peirce's writing (Freeman, 1934). The names used, range from abstract ones like firstness, secondness and thirdness to seemingly familiar ones like quality, reaction and representation. Throughout Peirce's writings one finds many musings on the categories and how they are to be understood, yet at no place can a concrete definition of them be found[22]. This of course, directly follows from any attempt to capture universal categories which, by their nature, cannot be explained by overarching concepts. They can only be pointed

[21]These terms are borrowed from complexity science to illustrate what Peirce endeavoured to do with his universal categories. For a more detailed description of the concepts of horizontal and vertical complexity, I recommend Michael Commons Lamport's work on hierarchical complexity (Commons, 2008).

[22]The closest to a definition appears in the original paper "On a New List of Categories" from 1867 where firstness references a ground, secondness a correlate and thirdness the interpretant (Peirce et al., 1997, 1.551). However, looking at Peirce's work over his lifetime, these cannot really be thought of as definitions but rather as general expressions of firstness, secondness and thirdness.

towards by certain concepts they subsume and defined by a description at their own level - hence, the ultimate abstractness of firstness, secondness and thirdness are in some sense necessary for universal categories.

One example often used to illustrate Pierce's categories is the phenomenology of colour perception (Peirce et al., 1997, 1.551). In this example, the singular moment of perception, where a subject sees the colour "red" relates to firstness. In this case, firstness is the pure and singular moment of perception, that entails nothing but the very moment of perceiving something. The moment in which redness is concretised, happens in *contrast* to, e.g. the blue of the sky. Redness in and of itself has the quality of firstness. Differentiating it from anything else is already the mode of secondness. In this mode, redness becomes an another, an "ob-ject" by being thrown against something else. The question that remains is, how the concept of "redness" can be constituted by the moment of observation and it's contrast. For Peirce this happens through the repeated observation of a firstness, that concretises via another, a secondness. If this process is repeated often enough, a pattern or habit emerges, which could be the social practice of calling objects which reflect a specific wave-length of light "red". This repetition, which creates pattern or habit, is called thirdness.

Another way to help understand Pierce's categories is to consider firstness, secondness, and thirdness as levels of concreteness and specificity. In this example firstness relates to "some" or an undefined vagueness, secondness relates to the concretised singularity a "this", and thirdness becomes a form of generality or continuity (Peirce et al., 1997, 2.87). The triple can also be understood as a class of experiences where firstness relates to potential, possibility or idea, secondness relates to facts and actuality, and thirdness relates to general laws or necessary habits. Another relatively intuitive correspondence can be found between the basic pronouns of: "I, Thou and It" and the categories. In this example firstness corresponds to the pronoun I, to the subjective experience related to a self. Secondness, the moment of contrast, is related to the other, to a Thou and that which becomes pattern or law is in some sense situated outside the self, therefore becoming an It. This fundamental triple of pronouns has been influential in the development of semiotics and was featured heavily in Baldwin's *opus magnus* "Thought and Things" (Baldwin, 2000). It is also a central anchor from which

Habermas' and Popper's triplicate world theories take their origin (Habermas et al., 1993; Popper, 1968).

There is a subtle yet helpful distinction that can be made between firstness, secondness and thirdness thirdness themselves, and the categories of "firstness", "secondness" and "thirdness" (Colapietro, 2008). The modes of expression of firstness, secondness and thirdness are universal qualities of any given phenomenon, while the categories are formal descriptions of these qualities. In this sense, the modes of expression are immanent to a phenomenon, while the category is the abstraction from the immanent occurrence towards the general. It should be noted that this distinction does not invite any nominalist positions, rather it attempts to counter them. The categories, as universal abstractions, have their direct correspondences as well as their ontological basis in reality.

The categories are not solely mental abstractions that lead to a dualistic picture of a world that consists of either, Descartes' *res extensa* and *res cogitans* or Kant's *transcendental subject* and the *"Ding an sich"*. The categories attempt to bridge this dualistic picture by attributing the modal expressions of the categories to both mental and physical aspects of reality. As an example, firstness can be attributed to both a merely mental phenomenon, as well as any physical phenomenon. In this sense, any instance that would for Descartes fall into either *res extensa* or *res cogitans*, expresses the modes of firstness, secondness and thirdness, blurring the line drawn between them. In this sense, the categories of Peirce also differ fundamentally from those of Kant, whose categories were descriptions of properties of the subjective. The categories of Peirce go beyond both the subjective and the objective by being expressed in both the subjective and the objective. This means that any expression of both the subjective and the objective will have aspects of all the categories. For Peirce, that which is real is therefore not confined to either the mental or the physical, rather reality is grounded in the relationship between the subjective and the objective. The categories are therefore expressions, inherent to any aspect of reality[23].

[23]This in part motivates the chapter on the fractal properties of the categories. For Peirce, the categories are inherent to any aspect of reality (which is neither confined to subject nor object but is the relation of both). Hence, they have a fractal-like quality where they can be found at any scale-level and nested inside any category one again finds all three.

Underlying Pierce's categories is therefore the concept of "foundational triplication", i.e. that any occurrence or phenomenon can be divided to no less than three foundational aspects and the idea of an structural isomorphism, i.e. that these three essential aspects of any given phenomenon have a correspondence to the aspects of any other given phenomenon (Landry, 2002). This implies that when talking about any phenomenon three fundamental categories of firstness, secondness and thirdness will order aspects of this phenomenon and can, more or less directly, be related to any other kind of phenomenon.

The descriptions of the categories given above illuminates the statement by Peirce that the categories are *"ideas so broad that they may be looked upon rather as moods or tones of thought, than as definite [or determinate] notions, but which have great significance for all that"* (Peirce et al., 1997, 1.355). This statement indicates that the Peircean categories go beyond the merely taxonomic-, and classification-focused category systems like those of Kant and Aristotle. This is due to the fact, that they do not only attempt to order and sort, they are in some sense phenomenologically present in any moment of experience, and as such, expressions of experience itself.

3.3 Justification for the Categories

The literature on Pierce has not yet reached a consensus regarding the justification of Pierce's general triplicate system and its ubiquitous use. While some scholars have found great merit in Peirce's categories and understand them to be quite natural, others have critiqued Peirce's use of his categories as being obtrusive and somewhat unnatural:

"Merely to say that Peirce was extremely fond of placing things into groups of three, of trichotomies, and of triadic relations, would fail miserably to do justice to the overwhelming obtrusiveness in his philosophy of the number three."(Burch, 2021)

Peirce himself even commented on his proclivity for triples, by somewhat ironically stating that he himself was afflicted with a special kind of madness - *triadomania* (Peirce et al., 1997, 1.568).

Pierce provided two main arguments for the justification of his categories. The first argument relies on "phaneroscopy", a form of study that became known as "phenomenology" after Husserl. According to this line of argument the reality of categories can be verified by anyone simply by observing phenomena and noticing the modes of firstness, secondness and thirdness—similar to the examples of colour observation in the above section. There are however, a few subtle differences between Husserl's and Pierce's understanding of phenomenology. According to the pragmatist view, phenomenology cannot tell us anything about the "structure of essences" (Wesensstruktur) or "relations of essence" (Wesenszusammenhänge) in the way Husserl used them, since this would bear similar to knowledge about the Kantian *"Ding an sich"*. Peirce avoids the transcendentally subjective turn found in Husserl's work (Krausser, 1977). Still, similar to Husserl, insights into the phenomenological aspects of the world, are a central part of any philosophical inquiry for Pierce. Thus, any phenomenological investigation should, according to Peirce, lead to the observation of the categories. Therefore, the validity of the categories can be verified by anyone upon observation of phenomena. This phenomenological method was the one he relied on most, especially in his later writings.

Pierce, however, employs another method that has garnered some attention at the end of the 20^{th} century, and the beginning of the 21^{st}. It is a logical derivation of the categories. For Peirce, this does not constitute an independent method, since the logical derivation is formally phenomenological and the phenomenological method relies on logic.

For an overview of this derivation, it is helpful to note that the valence of firstness is monadic, for secondness dyadic, and for thirdness triadic. In this sense, n^{th}-ness relates to any property that has n-adic relations. Peirce's Reduction Thesis then claims that, (1) having three categories is necessary, since triadic relations cannot be analysed through dyadic or monadic relations, and (2) that any polyadic relations, higher

than three, can be reduced to triadic, dyadic and monadic relations (Peirce et al., 1997, 3.483). Three categories are therefore necessary and sufficient to represent any n-adic relation. he Reduction Thesis has been investigated by various logicians, who have offered formal proofs (Burch, 1991; Anellis, 1993; Correia and Pöschel, 2006). It is however impossible to speak of a consensus regarding this proof of the Reduction Thesis. Alternative arguments have been provided, for example, arguing that n-adic relations can be reducted to dyadic ones (Ackermann, 1957), or to tetradic ones (Burgess, 1988).

Regardless of how the categories are arrived at—either phenomenological or logical—their justification must ultimately happen according to the pragmatic dictum of truth. If the model of the world that the categories provide, can be justified by experience and experiment, then they can be understood as being true. This implies that the justification of the categories depends on their ability to function as useful tools that inform our experience and our practices. Therefore, they serve a heuristic function in guiding philosophical inquiry (and inquiry in general).

3.4 Fractal properties of the Categories

The triadic properties of the categories are akin to a thread that runs through all of Peirce's work. Ranging from his work in logic to that in phenomenology, scientific metaphysics, and mathematics, traces of the three categories are ubiquitous. Due to their central importance in Peirce's work, this section uses the concept of the fractal to elucidate the three categories. As the word "fractal" was only coined in 1975, using it to talk about Peirce's categories is an anachronism (Mandelbrot, 1975). Nonetheless, the concept of the fractal, and the possibility of its visual representations, can be helpful to better understand the categories and how Peirce used them in various areas.

There are multiple place to begin exploring applications of Peirce's categories. However, they can arguably be found nowhere clearer, than in his work on semiotics. Without going into details about Peirce's work in semiotics, I will introduce some

central aspects of this part of his work to illustrate another important domain of application for his categories, and to discuss their fractal properties.

Peirce called his theory of signs "semeiotics" (Peirce et al., 1997, 1.551). It is the work he is best known for, and that most scholarship centres around. He started to develop it in parallel with his work on the universal categories. Compared to his European counterpart, Ferdinand de Saussure, we find that Peirce's semiotics go beyond the confines of the philosophy of language (de Saussure et al., 1985). They are a general form of logic, that can help to explicate the boundary conditions of the subject of Logic itself (Scholz et al., 2020). Logic is not based on semiotics, for Peirce, but semiotics can be seen as a very general tool, that can be applied to logic and beyond[24] (Romanini and Fernández, 2014).

The influence of Western analytical metaphysics can be felt in the work of de Sassure whose semiotics is built on the dyadic relationship between a signifier and a signified, denoting a "sound-image" and the "concept" it denotes (Berger, 2005). This corresponds to the relationship of the objective to the subjective, a central theme in analytic metaphysics: *"signified pertains to the 'plane of content,' while signifier is the 'plane of expression'"*(Meen, 2015).

Peirce's categories provide the basis for his triadic semiotics, based on a sign, an object, and an interpretant, relating to firstness, secondness and thirdness. Generally speaking, the act of interpretation mediates the relation between any given sign and an object. Or in the obfuscated words of Peirce: *"[A] sign is something, A, which brings something, B, its interpretant sign determined or created by it, into the same sort of correspondence with something, C, its object, as that in which itself stands to C."*(Peirce and Eisele, 1976, 4.20-4.21). Pierce draws most of the examples he uses to illustrate this process from fields like psychology and linguistics. Hence, Peirce's semiotics is often associated with the process by which humans relate to signs. While this is certainly a part of his semiotics, Pierce's semiotic processes go beyond the human into the biological and physical world:

[24]Here logic is used in the way Peirce defined logic in his architectonic system, which will be discussed in the next chapter.

Thought is not necessarily connected with a brain. It appears in the work of bees, of crystals, and throughout the purely physical world; and one can no more deny that it is really there, than that the colors, the shapes, etc., of objects are really there. Consistently adhere to that unwarrantable denial, and you will be driven to some form of idealistic nominalism akin to Fichte's. Not only is thought in the organic world, but it develops there. But as there cannot be a General without Instances embodying it, so there cannot be thought without Signs. We must here give "Sign" a very wide sense, no doubt, but not too wide a sense to come within our definition. Admitting that connected Signs must have a Quasi-mind, it may further be declared that there can be no isolated sign. Moreover, signs require at least two Quasi-minds; a Quasi-utterer and a Quasi-interpreter; and although these two are at one (i.e., are one mind) in the sign itself, they must nevertheless be distinct. In the Sign they are, so to say, welded. Accordingly, it is not merely a fact of human Psychology, but a necessity of Logic, that every logical evolution of thought should be dialogic. (Peirce et al., 1997, 4.530)

The above paragraph illustrates the generality of Peirce's semiotics. The processes happening at the level of the mind are structurally similar to those in a *quasi*-mind. This move, of not fundamentally differentiating between mental and non-mental processes, solves problems any metaphysics based on a strict differentiation between the subjective and objective has to face [25]. Beyond that, it highlights the self-similarity of semiosis on different scales[26]. This means that the processes and structure of semiosis can be found not only at the scale of human brain, but also in animals and other parts of the world. According to Peirce, the semiotic process at the level of the brain will therefore, in many ways be similar to the process that can be observed in a process like the work of bees. As such, the process of semiosis has a certain self-similarity across different scales.

The scale-invariance of the semiosis process is not the only way in which Peirce further refined his semiotics. Before we looked at how one can find similar properties across different scales, like in brains and bees. However, one can also look closer at the semiotic process itself and investigate each element on its own. These three elements

[25]For a discussion of some of these problems, the following serves as an introduction: (Calef, 2021)

[26]This is a move often found in Peirce's work. I will elaborate it some more in section 3.6 on tychism below.

of sign, object and interpretant can independently be further looked at to find a more fine-grained structure. It comes as no surprise that for Peirce these more detailed structures came in triads that could be related to his three categories. The below table illustrates a more fine-grained picture Peirce developed, as he looked at his semiotics.

	1st Trichotomy	2nd Trichotomy	3rd Trichotomy
Monadic relation	Qualisign in itself, the sign is of the nature of appearance.	Icon a sign which refers to the object merely by virtue of characters of its own	Rheme a sign which, for its Interpretant, is a Sign of possibility
Dyadic relation	Sinsign in itself, the sign is of the nature of an individual object or fact.	Index a sign which refers to the object by virtue of some existential relation.	Dicent a sign which, for its Interpretant, is a Sign of actual existence.
Triadic relation	Legisign in itself, the sign is of the nature of a general type.	Symbol a sign which refers to the object by virtue of some kind of convention.	Argument a sign which, for its Interpretant, is a Sign of law.

Table 1: Three kinds of relation and three trichotomies (see (Peirce et al., 1997; Queiroz, 2012, 2.243)

While the details of the table go beyond the scope of this work it is worthwhile to look at the pattern of how they are generated. We already saw that Peirce applied his three categories to the study of semiosis to come to his triple of sign, object, and interpretant. He then argued that the process of semiosis does not only hold for meaning making and communication in humans, but extends beyond that—the semiotic process can be found at many different scales from brains to bees. That this is the case follows from the universality of his categories. As they can be applied to any phenomenon the semiotic process is not limited to a particular class of phenomena. Hence, an observation that holds for a particular phenomenon, which follows from the categories, will have similarities at different scales.

Beyond that, Peirce used the categories to further refine the concepts used in his semiotics. He did this by applying the categories to themselves. In this manner the above table was generated. In the above example he looked at a sign and found further triples contained within it. He did this along two axis to further differentiate the sign into nine different kinds of signs. The above table is only one of those further classifications. Throughout his life he developed multiple versions of differing detail with up to 66 classes of signs (Atkin, 2013; Romanini, 2006).

Generally speaking, Peirce has two different patterns in how he applies his categories. The first pattern is that he applies the triples of his categories (or something he derived from them, like the semiotic process) to various phenomena at different scales. With the assumption that the categories are universal and expressed in every phenomenon, it seems logical to expect fundamental patterns to be present at various scales. The second pattern is that he applies the categories onto themselves. In the case of his semiotics, the sign is one part of a triple, comprised of sign, object and interpretant. He then looks at the sign in more detail and further separates it into a more detailed triple. Thus we find a certain kind of self-similarity and scale-invariance of the categories.

These properties of self-similarity and general scale-invariance are central to fractals (Jin et al., 2017). "Zooming in" on any element leads to a further devisions into triadic relationships - ad infinitum [27]. These triples are ultimately instantiations of categories, or in other words, are an expression of the modalities of firstness, secondness and thirdness intrinsic to any phenomenon. The fractal properties occur in two directions in Peirce's semiotics. First, looking at any phenomenon in the universe, ranging from the physical, to the biological and ultimately to the mental, will consist of looking at a sign, an object and an interpretant[28]. Thus the process of semiosis can not exclusively be found at a specific level, but serves as a fundamental description of sign, processing and the production of meaning. Second, zooming in on any specific part of the semiotic process itself, like the sign, object or interpretant, will lead to

[27]It should be added that self-similarity eventually breaks down in any observation in the real world. Self-similarity is always confined to a certain range of scales and always approximate.

[28]There is no specific reason for choosing physical, biological and mental. The point is that fractal properties can be found at any integrative level (this concept will be further discussed in section 3.2) or level of organisation Eronen and Brooks (2018).

a more fine-grained picture where new triple properties can be seen across levels of organisation[29].

Examples of the fractal nature of Peirce's thinking and philosophical system are by no means limited to his work of semiotics. Examples of a recursive application of the categories onto themselves can be found in many places. One other illustrative example might be looking at the category of thirdness as a process of articulation, of mediating that which has become a pattern. For Peirce, an instance of a thirdness in its firstness would be the expression of art. Art is the the process of articulation (a thirdness) in which a creation can express something particular of a singular moment (a firstness). Hence, an artistic expression can be the firstness in a thirdness. The cultural and practical realm in which this moment is communicated, in which it finds another, becomes an instance of a thirdness in its secondness. Once this process has repeated and a certain pattern emerges that can be observed as pattern or habit, it becomes an expression of a thirdness in a thirdness (Peirce et al., 1997, 1.43).

Thus far, the triplicate fractal nature of Peirce's categories, was highlighted. Their properties of scale-invariance and self-similarity were discussed and I indicated how Peirce considered his categories to be nested within one another. In the following section, I will not only discuss these fractal properties as qualities of specific phenomena, but will also explore their ontological status as generative functions for Pierce's architectonic system. Specifically, I will argue that the categories provide a fractal basis for the Piercean model of architectonics. [30].

[29]This can also be visually represented by drawing the triple relationship of sign, object and interpretant as a triangle. Then, inside the triangle we can draw an inverted triangle. This leads to a structure similar to the Sierpiński triangle. In the section 3.2, a short discussion will follow that explains why using monofractal systems like the Sierpiński triangle, the Koch Snowflake or even the Mandelbrot Set are not the ideal metaphors for describing the results produced by an fractal application of the categories. For some visual examples of Piercean semiotics (represented in diagrams for his 10, 28, and 66 classes of signs), I recommend Farias and Queiroz (2003)

[30]The link between the categories and architectonics has been indicated by others who have presented big-picture views on Peirce's system of thought, most notably (Apel, 1975)

3.5 The Architectonics of Peirce

"[I intend] to make a philosophy like that of Aristotle, that is to say, to outline a theory so comprehensive that, for a long time to come, the entire work of human reason, in philosophy of every school and kind, in mathematics, in psychology, in physical science, in history, in sociology and in whatever other department there may be, shall appear as the filling up of its details."(Peirce et al., 1997, 1.1)

Idea and name of Peirce's architectonic structure are strongly influenced by thinkers like Aristotle and Kant (Atkin, 2021). Especially Kant, who devised a similar system, also termed architectonic, held similar views regarding foundational properties of his system of thought (Kant and Hartenstein, 1868). The motivation to arrange various elements of a given philosophy in a systematised fashion, akin to the arrangement of certain patterns in architecture, was clearly present in both thinkers. Kant and Peirce held the position, that certain insightful thoughts can come to the "lucky philosopher", but they are not the cornerstones that constitute the comprehensive philosophical systems they set out to develop. Furthermore, these "lucky" insights may make for an entertaining read, where the mind can jump from one pleasant insight to the next, however, without their proper relation to other ideas, they can be compared to a random arrangement of doors, windows, walls and roofs, but not a house that one might want to inhabit (Peirce et al., 1997, 6.7). Furthermore, both thinkers agreed that the aim of their philosophical system was to construct intellectual edifices that can house and shelter everybody, not merely the technical-minded philosopher (Mora, 1955). While we can seriously doubt that they actually achieved this ambitious aim, the motivation to build coherent systems of thought is clearly present in both Kant and Pierce.

Analogies between real-world architecture and philosophical theory are a theme that is often present in Peirce's writing. His metaphorical language goes as far as bringing up images of buildings made of *papier-mâché*, which might look interesting but are akin to systems constructed of fragile ideas, and houses built of granite, able to withstand harsh weather, which stand for systems constructed of sound arguments with high internal coherence. These analogies are taken to extremes when Peirce interprets periods

with particular ways of thinking in the Middle Ages in parallel to their predominant styles of building (Mora, 1955). In any case, it is evident that Pierce endeavoured to construct a system in which the parts of his philosophy are carefully arranged with regard to each other and their use in various scientific disciplines (and other forms of inquiry).

For Peirce, the term "science" meant any organisation of human knowledge. In this sense, fields like history, art criticism and philosophy are also considered science. The overall structure of the architectonic system is based on the generality of the domain of a given science. Peirce devised a hierarchy that structures the sciences from most, to least general. In this system, it is the more general science that provides the tools and methods for the more specific disciplines. This flow of information from the general to the particular, is countered by a second flow of information from the particular to the general. It stems from insights and experimental data that a more specific scientific discipline produces. Therefore, the flow of information moves in both directions, from the more general to the more specific and vice versa. An example of this bidirectional information flow might be the discipline of philosophy, which can give valuable insights to any specific domain of inquiry, concerning something like the notion of "process". In return, the philosophical investigation of the concept of "process" can be supported by specific findings from particular disciplines, like that of physics and their description of thermodynamic processes. In the following statement, Pierce describes his method for classifying the sciences:

"This classification, which aims to base itself on the principal affinities of the objects classified, is concerned not with all possible sciences, nor with so many branches of knowledge, but with sciences in their present condition, as so many businesses of groups of living men. It borrows its idea from Comte's classification; namely, the idea that one science depends upon another for fundamental principles, but does not furnish such principles to that other. It turns out that in most cases the divisions are trichotomic; the First of the three members relating to universal elements or laws, the Second arranging classes of forms and seeking to bring them under universal laws, the Third going into the utmost detail, describing individual phenomena and endeavoring

to explain them. But not all the divisions are of this character....”(Peirce et al., 1997, 1.180)

It is important to note that Pierce not only describes a cybernetic information system, where the information of one nodes influences all other nodes. He also advocates a strong anti-foundationalist position. The findings and concepts from one scientific discipline will influence all the other sciences according to Peirce. Therefore no singular discipline is *above* or *below* all the other ones. The generality of any given domain does not make one discipline more foundational than other ones. Just because logic is relevant in every domain, it is not the foundation on which everything else is built. Thus, we can never arrive at the most fundamental discipline and derive the rest of human knowledge from it, as some physicists and logical positivists have been inclined to think (Feynman et al., 1965; Creath, 2021).

Beyond that, Pierce left epistemology's traditional notion of an abstract knowing subject behind, to replace it with the *construction* of knowledge by a group of thinkers (Stein, 2018). In doing so, he was one of the first philosophers to talk about various aspects of the economics of research. This this included a discussion on strategies to obtain scientific results quicker and at lower cost, as well as a discussion on the communal aspects of the practice of science. For this, he used the phrase ”community of inquiry”, which referred to both, a community of researchers as well as a set of communal aspects of the practice of doing science. Pierce's radical departure from Kantian philosophy—and from most modern endeavours in epistemology, present until this day—becomes clear. The knowing subject is no longer the lone individual producing insight over insight. She is embedded in a community of inquirers, which in turn is embedded in a social world or collective imaginary (Taylor et al., 2007). Habermas sees at this point, with the work of Peirce and his fellow pragmatists, the turn to a new kind of metaphysics, which he called postmetaphysical thinking (Habermas, 2012). Not only the inward flow of information (perception and reflection) is required, but science also demands expression and construction of theory. The Kantian transcendental subject is no longer separate from a world that can never be known, separate from the *'Ding an sich'*. The new decentralised subject is itself a part of the world,

part of an ongoing evolutionary process, embedded in groups and cultures of scientific inquiry (Stein, 2018).

Another concept worth mentioning in the context of knowledge production in the sciences is "fallibilism". Peirce coined the term to describe the position that *"people cannot attain absolute certainty concerning questions of fact."*(Peirce et al., 1997, 1.51). This strongly connects to the above mentioned turn away from the fixed transcendental subject, by being an expression of the processual and embedded nature of the subject within a world and a changing social context. While fallibilism has led to the justification of relativistic ideas, pragmatic ideas about truth oppose this. A relativistic interpretation of fallibilism will emphasise the impossibility of obtaining certain knowledge in general. The pragmatic interpretation will however argue that despite the inability to ascertain certain knowledge, truth can be approached or converged towards. Therefore, fallibilism is not so much an expression of the impossibility of certainty per se, but might better be understood in the context of the processual nature of knowledge production, of evolution and of thirdness. Both, certainty and evolution, are never final.

After these introductory remarks on the process of scientific knowledge production, we can now return to the hierarchical ordering of the individual sciences. Peirce provided slightly different classifications of the sciences (see (Peirce et al., 1997, 1.180-202) and (Peirce et al., 1997, 1.203-283)). The overall structure of the classifications in a threefold manner remained the same. Below, a brief overview of some parts of Peirce's architectonic and its structure are given:

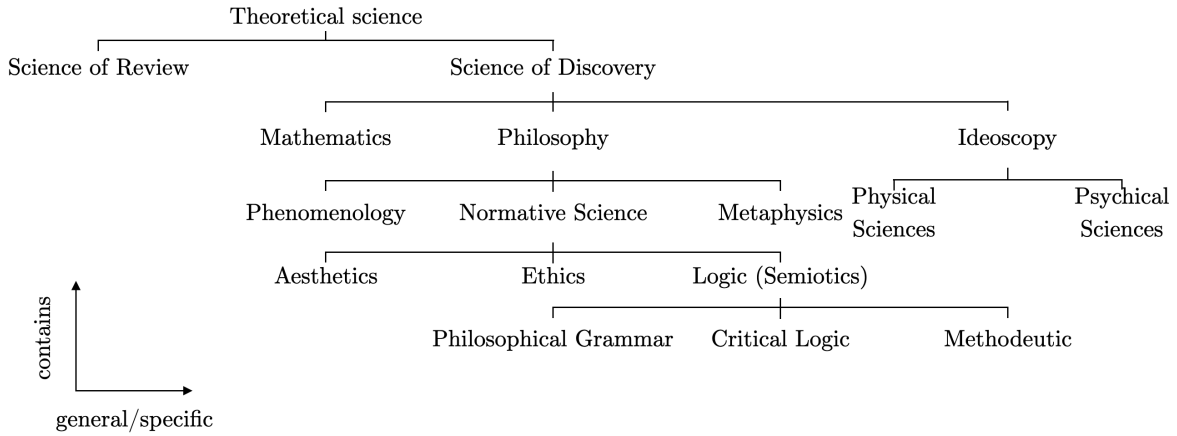

Figure 1: Overview of Peirce's architectonic system (Peirce et al., 1997, 1.2)

The above diagram is looking at Peirce's architectonic system of the sciences[31].For the following paragraphs we will be focusing on what Peirce called the "Science of Discovery". This was contrasted with the "Science of Review", which is concerned with the arrangement of results obtained from the Science of Discovery (in his 1903 there was also the "Practical Science", which is concerned with sciences like book binding, glass blowing and pedagogics (Peirce et al., 1997, 1.203-283)).The above diagram shows which sciences contain other sciences along the y-axis. The sciences placed at a higher position on the vertical axis contain the sciences placed below them, if they are linked. How general or specific a given science is depends on the placement of a given science along the x-axis, in respect to its neighbours (the two or one other science it is connected with at the same horizontal height). The more general sciences are placed on the left, the more specific sciences of the right.

The "Science of Discovery" is concerned with general truths. It is interested in knowledge itself, without any practical applications in mind. The first major differentiation is into the fields of mathematics, philosophy and Ideoscopy (or the physical and psychical sciences), where mathematics is the most general. Philosophy employs the tools of mathematics, which in turn influences the way the physical and psychical sciences conduct their experimental processes. Moving in the other direction, we find that

[31]The structure of the diagram is inspired by AltExploit (2017)

Ideoscopy leads to particular insights while endeavouring to explain certain phenomena. These insights are arranged under universal laws in the discipline of philosophy, which can be described in their most abstracted form through mathematics which is concerned with drawing necessary conclusions about hypothetical objects (Grattan-Guinness and Walsh, 2013).

This relation of mathematics being super-ordinate to philosophy, and philosophy being super-ordinate to Ideoscopy does not imply, that the more specific sciences are a branch of the more general disciplines Philosophy is not a branch of mathematics. The focus is, as mentioned before, on the the principles and tools a more general science can provide to a more specific one (Atkin, 2021). Peirce divided mathematics into the areas of formal logic, mathematics of the infinite and discrete mathematics. These fields help to reason about the most abstract and therefore hypothetical objects, and the necessary relations that guid their interactions. Since these are abstractions, drawn from the more concrete special sciences and philosophy, the necessary relations between these hypothetical objects can provide insights into the relation between the less abstract objects, that philosophy and the special sciences are concerned with.

The study of philosophy can be subdivided into the three areas of phenomenology, the normative sciences, and metaphysics. Phenomenology deals with the appearance of phenomena, normative philosophy is concerned with what ought to be done, and metaphysics is the study of that which is real. Following the general outline above, phenomenology employs principles of mathematics in its observation of the phenomenal world, the normative sciences then use these insights to talk about how one ought to act, and metaphysics looks at that which is real.

When taking a closer look at phenomenology, the discussion returns to the previous sections on the categories, and the observation of firstness, secondness and thirdness in their most abstract forms. This is because phenomenology is the study of appearances and phenomena which always express aspects of firstness, secondness and thirdness to varying degrees. This provides a link to mathematics, and explains why Peirce places mathematics above phenomenology. According to his Reduction Thesis, all relations expressed in mathematics can be reduced to triadic, dyadic and monadic

relations. This logical reasoning is the basis for his focus on triples. Hence, the study of phenomenology, which leads to these three categories and the ubiquitous observation of their expression, comes after mathematics. We find firstness expressed in terms such as the relational predicate "x is red", secondness in predicates such as "x looks at y", and thirdness in the predicate of "x looks at y through z" (Atkin, 2021).

If the study of phenomenology deals with the different qualities of experience, then the normative sciences are looking at the principles that guide how we interact with the world. For Peirce, the normative sciences can be divided into aesthetics, ethics and logic (Peirce et al., 1997, 1.2). Again, the movement is from most abstract to least abstract. Aesthetics provides the basis on which ethics builds its investigation of right conduct, and logic looks at the concrete examples of reasoning and its validity. The fields of aesthetics and ethics are not well developed in Peirce's architectonic. Still, as some have pointed out, they provide the basis for an exact classification of logic (Atkin, 2021). Somewhat surprisingly, the only aesthetic principle that Pierce mentions is the "ultimate ideal" of "growth of concrete reasonableness", which he construes as an increase in our grasp upon reality—a principle that seems somewhat distant from what is generally considered the subject of aesthetics [32](Hellberg, 2018).

Peirce's investigation of the normative sciences focuses most on logic. Since logic deals with signs and their relation, Peirce also called his study of logic, semiotics, or the logic of formal semiotics (Peirce et al., 1997, 5.484). He divides it into the parts of philosophical grammar, critical logic, and methodeutic. In this hierarchy it is philosophical grammar that deals with the investigation of signs and their triadic nature, while critical logic examines different kinds of. We find both induction and deduction, as well as Pierce's own addition, abduction, as important subjects of this science. Finally, we come to methodeutic, which is concerned with the pragmatic maxim of truth. Pierce defines this maxim as follows: we move closer, by following

[32]However, as with many other topics that Peirce wrote about, there is some ongoing debate as to how his conception of aesthetics is related to a more mainstream conception of art. One way to look at the relation is by interpreting the investigation of aesthetics as the investigation of possible goals that can be aimed at, and looking at ethics as the way in which these can be reached. For a more extensive discussion on this topic, see Lefebvre (2007)

the aesthetic ideal through reducing doubt and achieving a kind of equilibrium state in which our truths about the world result in the intended actions (Burch, 2021).

Let us look now at the final part of Pierce's classification of philosophy: metaphysics. As some aspects of Peirce's metaphysics will be discussed in the following sections, it will suffice to say here, that metaphysics, as placed in the hierarchy of the architectonics, is an attempt to talk about the reality of the categories explored by phenomenology, and the reality of the methods of the normative sciences (Peirce et al., 1992, p. 160). His metaphysics, directly relates to phenomenology and the normative sciences, and appears as a distinctly hands-on affair (Atkin, 2021). To differentiate it from what was commonly called metaphysics throughout the history of philosophy, it is sometimes called "scientific metaphysics" (Reynolds, 2002). For Peirce, many traditional metaphysical endeavours are in some sense meaningless, since they do not follow the pragmatist maxim. These systems are not based on the practical meanings and implications of the concepts they employ, hence they do not align themselves with the pragmatic maxim of truth. In other words, if metaphysics does not attempt to bridge the gap between theory and practice by focusing on both, but is only concerned with the former, it becomes meaningless for a pragmatist. While this argument can be taken to dismiss the possibility of traditional metaphysics per se, Peirce still sees the necessity of metaphysics. It must, however, be done in a scientific and pragmatic way (Peirce et al., 1992, p. 259).

Throughout his system of architectonic, Pierce places disciplines according to their abstractedness or generality. These are placed in triples ranging from areas of study that look at some particular phenomenon, areas that look at the coordination of various particular phenomenon, and areas that look at the systemic interrelation between those locally coordinated phenomena. This triplicate ordering of fields of study, according to their generality, can be seen as an expression of firstness, secondness and thirdness, respectively. Firstness is the observation of the particular phenomenon in itself, secondness looks at the relation between various phenomena and thirdness abstracts rules and habits from the interrelation of a multitude of phenomena of firstness and secondness. The most general fields of study are those most closely related with thirdness, with pattern and habit, whereas the most specific sciences, investigating

singular and particular occurrences of phenomena are most closely related to firstness. This does not mean that, for instance, the study of mathematics excludes the category of firstness. Aspects of all three categories are always present in each field of study, they can be present to varying degrees and with different degrees of emphases.

The hierarchical ordering of the sciences within the architectonic model is consistent with the categories. Looking at Peirce's work in general, it is very plausible that the development of the architectonic model came about via re-application of the categories to different fields of study, and the idea to structure them according to their generality. Of course, this does not imply that the only structuring consistent with the categories is the one Peirce gave—his structuring was heavily dependent on his sometimes idiosyncratic understanding of these various fields of study as well as the specific idea to use generality as the dominant metric. Still, the categories in their heuristic function (see section 3.3) are the tools that allow Peirce to order the architectonic. In this sense, the categories can be considered a fractal basis for the development of the architectonic system.

It is relevant to mention here, that the hierarchical structuring of the architectonic system, is arguably better represented by a *multi*fractal, rather than a *mono*fractal system. Without going too much into the mathematical details, the difference between *mono-* and *multi*fractal systems is, that the former rely on one global scaling rule, whereas the latter have a spectrum of exponents (the singularity spectrum) that describes their various scaling rules (Harte, 2001). Monofractals are the kinds of fractals known from popular illustration, like the Sierpiński triangle or the Koch snowflake whereas multi-fractals systems are different fractals combined into a system.

Using the metaphor of the fractal to investigate Pierce's philosophical system, we find that the categories taken in their purest form, are an attempt to describe a kind of mono-fractal structure, which emphasises self-similar modes across all levels of phenomena. However, the moment the fractals are applied to form a complex hierarchical structure like the one of his architectonic or semiotic system, it becomes evident that Pierce is describing fractal structures across different scales with different properties. As an example we can see that the study of Ideoscopy is divided into

two different parts, the physical sciences and the psychical sciences. This shows that Peirce did not blindly divide everything into three parts but in some cases found other devisions that are not congruent with the original fractal patter of the three categories. Pierce's architectonic system is therefore much more akin to a multifractal structure than a monofractal one. This somewhat subtle point is accentuated here, to underline the scale-variant nature of Peirce's architectonic, as interpreted from a fractal basis.

It can also be argued, that the scale-variants of a multifractal system is required to avoid the kind of foundationalism Peirce set out to resist. The subtleties of his multidimensional architectonic model set it apart from a simple layer cake model of the sciences that relies on one foundational discipline. The multifractal description also sets it apart from a monofractal system that only relies on one singular generator function. If a coherent philosophical system can rely on singular generator function its study can be seen as the new foundational discipline. This would however contradict Peirce's evolutionary inclinations, as well as his fallabilsim and theory of thirdness as habit generation, concepts that will be explored in the following section.

3.6 An evolving System

In this section, we will come as close as it gets in this thesis to a discussion of topics in classical metaphysics. I will outline Pierce's evolutionary cosmology (Hookway, 1997), in order to indicate several of its most original elements that introduce a new way of doing metaphysics based on a deep understanding of evolutionary process. As mentioned in the previous section, Peirce considered the discipline of metaphysics a distinctly hands-on affair. This kind of practice-oriented approach extends beyond his metaphysics. It is important to remember, that Peirce was a practicing scientist and therefore very engaged in the scientific process of experimenting and making measurements (Apel, 1975). This deep link between theory and practices is a central theme in much of pragmatism in general, and is present throughout Pierce's work. Below, I will investigate this link further, but for now it will suffice to say, that linking practical insights gained as a scientist, to his philosophy and metaphysics, was deeply important

to Peirce, and arguably differentiates him from many other philosophers, especially those central to the Enlightenment era.

This strong differentiation is probably best captured by looking at his position on determinism. While strong currents of determinism were present at his time, Peirce saw little evidence to follow these. Compelled by the precision of the scientific method, and the predictive power of theories that could be derived from it, many thinkers throughout the 17^{th} and 18^{th} century saw nature as determined in some way (Hacking, 1983). This position of causal determinism held that all things at a given time are directly caused by all the previous causes. Laplace's daemon captures one of the implications of this worldview: if an *"intellect which at a certain moment would know all forces that set nature in motion, and all positions of all items of which nature is composed, if this intellect were also vast enough to submit these data to analysis, it would embrace in a single formula the movements of the greatest bodies of the universe and those of the tiniest atom; for such an intellect nothing would be uncertain and the future just like the past would be present before its eyes."*(de Laplace et al., 1902)

This position is tempting for any thinker dedicated to the power of the classical scientific method, and according to Charles Hartshorne (2011), Peirce subscribed to this position up until the age of roughly forty. Later, however, Peirce came to view this topic differently. The reasons for this were, according to Peirce himself (see Turley (1969)), that the experiences of growth, variety, regularity and consciousness are hard to account for, in a purely deterministic world. According to Peirce, his opposition to purely deterministic accounts of the world was influenced by the experience of conducting experiments and observing the natural world in a laboratory Turley (1969). As any experimental scientist will know, collecting data-points in the process of an experiment and fitting them onto some particular function, will never work perfectly. Even if only one experiment is repeated often enough, and measured with sufficient precision, the data will not neatly fit on one singular point, but will cluster around some estimate of the 'true' value, which becomes increasingly accurate as more data points are gathered. This is well known in the sciences of psychology or sociology, but it also holds for physics and chemistry. In other words, what the practical scientist does to determine the position of a data point is to repeat an experiment often enough

until she gets a probability distribution, which lets her predict the probability with which a new measurement is expected to yield a certain result. If enough of these data points have been measured, they can be fitted onto a particular function, sometimes one predicted by a certain model. However, measured data points hardly ever fit exactly to a function, so that the function remains an approximation to the date.

The above account does not give any conclusive evidence that determinism can be ruled out - the variation in data can always be attributed to a measurement error or other inaccuracies. The variation in data does however not get smaller as one looks closer, they become relatively greater. Some scientific findings that came after Peirce, especially in the fields of quantum physics have further underscored this; the Heisenberg uncertainty principle states that the measurements needed for a Laplacian Daemon cannot even be made in principle. Therefore his views on determinism have stood the test of time. Of course, modern physics and quantum theory have not ruled out deterministic accounts of the world. They have, however, made the argument more difficult to make.

Pierce interprets the variation in empirical data as an indication that deterministic law cannot be found in the universe, only certain degrees of habit or regularity (Peirce et al., 1997, 6.7–34). For him, there is no evidence that would support a deterministic world. Not even the physical sciences that often champion such a view, provide data supporting it. Only if one moves to the most abstract and general sciences, those of mathematics, can quasi-deterministic relations be made. But mathematics, for Pierce, concerns reasoning about hypothetical objects, not real ones (Atkin, 2021). Notably, Peirce distinguishes different degrees of habit throughout the various sciences. When looking at the physical sciences, one finds the nearly perfectly predictable habits of larger physical objects like an asteriod. Looking at human society, mind, or dreams, behavior seems to be closer to pure chance and complete indeterminacy (Peirce et al., 1997, 6.7–34).

This argumentative move is similar to the one explored in section 3.4, on the fractal nature of the categories. There, Peirce argued with regard to his theory of semiotics, that it is impossible to find a foundational level of complexity at which semiotic processes

begin. Therefore, these processes are fundamentally present throughout the universe, even in crystals and bees. Similarly, in our present context of determinism, Pierce sees habits as present throughout the universe (Peirce, 1998). This argumentative move falls for Peirce in the category of "synechism" or thirdness, indicating that phenomena in the universe have a certain degree of continuity with each other, and that there is no clear cut between any two phenomena - a concept, which will be further investigated in the following paragraphs. Therefore, the physicalist assumption that there is one level at which particles behave according to absolute law, would either require the drawing of a line between phenomena that behave according to law and those that don't, or require a purely deterministic worldview that must be able to account for novelty and chance. This leads Pierce to argue that no evidence of perfect determination can be found in principle. General observable phenomena in the world include growth and increase in complexity, as well as regularities and law-like behaviour, indicating that a theory of habits that are present throughout the universe provides the most coherent theory (Peirce et al., 1992).

According to Peirce's thinking, habits that have existed for a longer time exhibit more regularities. Using statistical analysis in non-Bernoullian trials (trails where the probability of an outcome are not independent on early trials), he attempted to show that a tendency towards more lawful habits can be seen in the long run of conducting experiments (Burch, 2021). He reasoned, therefore, that certain habits that can now be predicted with near lawfulness (like the gravitational constant, for example) must have varied to a higher degree in the past than they do now, and that they may still be subject to change [33]. Here, the evolutionary influence on his metaphysics can be clearly seen. As with animals, humans and culture at large, Peirce posits that natural habits are part of an evolutionary process that comprises the whole universe.

[33]In the physics community there is only limited debate going on about this topic, since it directly attacks foundational assumptions of modern physics. Noether's theorems, which sits at the root of physics would require rethinking, or a new force would need to be introduced. Paul Dirac, is one of the significant exceptions who has dealt with this topic (Dirac, 1938). Interestingly, this question seems like one that could potentially be answered in the not-too-distant future. Some indications have also been given that the variation in G measured up until today may be a sign that constant are time-variant (Lopez-Honorez et al., 2020). This, of course, does not directly imply that natural habits may become solidified over time. It does, however, indicate that the perspective of cosmic habits, rather than laws and constants, may be a useful one.

Hence, chance is inherent to every phenomenon, and Pierce named his doctrine that chance has a fundamental status in the world "tychism," from the Greek word for "chance" (Peirce et al., 1997, 6.35). It is a central part of his mature work on evolutionary metaphysics. By describing the world as an evolving process—fundamentally unpredictable, and always open for new habit formation—he went beyond much of modern metaphysics, which—based on a Cartesian and Newtonian understanding of the universe as a clockwork, a machine—postulated a world that is fundamentally determined. For Pierce, beyond being a critique of much of Enlightenment thinking, this was necessary to think about growth and increasing complexity in the universe, its diversity as well as its regularity grounded in habits (Reynolds, 2002).

Pierces' work on tychism also strongly connects to his theory of fallibilism. Many of the more recent accounts of fallibilism tend to focus on the scientific method itself, by arguing that certainty can never be reached since there can always be an outlier event, and that all the scientific method can do is falsify (Popper, 2002a). In addition, Pierce argued that natural laws can never be determined with absolute precision, because they are only concretised habits, not fixed in an absolute sense, and are able to vary over different time-scales. Thus, fallibilism is not only based on the fact that no hypothesis can survive all attempts at falsification. It is more fundamentally a part of his cosmology as an element of chance. "Tychism" is a basic ingredient of the universe. These views are clearly expressed in an unpublished paper written in 1897:

"The infallibilist naturally thinks that everything always was substantially as it is now. Laws at any rate being absolute could not grow. They either always were, or they sprang instantaneously into being by a sudden fiat like the drill of a company of soldiers. This makes the laws of nature absolutely blind and inexplicable. Their why and wherefore can't be asked. This absolutely blocks the road of inquiry. The fallibilist won't do this. He asks may these forces of nature not be somehow amenable to reason? May they not have naturally grown up? After all, there is no reason to think they are absolute. If all things are continuous, the universe must be undergoing a continuous growth from nonexistence to existence. There is no difficulty in conceiving existence as a matter of degree. The reality of things consists in their persistent forcing themselves upon our recognition. If a thing has no such persistence, it is a mere dream. Reality, then, is

persistence, is regularity. In the original chaos, where there was no regularity, there was no existence. It was all a confused dream. This we may suppose was in the infinitely distant past. But as things are getting more regular, more persistent, they are getting less dreamy and more real. (Peirce et al., 1997, 1.175)

As Peirce's work is saturated with triadic conceptual schemes, it comes as no surprise that his concept of "tychism" is complemented with two other that are directly related, namely "anancism" and "agapism" (Peirce, 1998). Before introducing these, we must briefly discuss another concept that is deeply connected to Peirce's understanding of process and evolution. It is the concept of "synechism," which we have already briefly encountered above (Peirce et al., 1997, 6.169–173). Synechism functions as a meta-regulative principle in Peirce's logic. It is a presupposition for much work in the physical sciences.

The concept of synechism is deeply influential in Peirce's metaphysics and has been described as its keystone (Esposito, 2005).The name of "synechism" is taken from the Greek synechismos or syneches meaning "continuous". Like other aspects of his metaphysics, it has an abstract theoretical component, as well as more practical methodological aspects. As a central idea in his metaphysics, synechism describes the fundamental continuity of the universe and its parts, alluding to the semiotic process by which the universe is moving towards increasing complexity and interconnectedness. It is the description of a momentum by which seemingly disparate parts of the substrate of the universe become continuous and connected. For Peirce, the concept refers to both, the more mathematical notion of he infinite divisibility of "things", as well as the connectedness of everything throughout the universe via semiotic processes and a third that mediates them (Locke, 2000).

As a research method, synechism attempts to find continuity and mediation where there is seemingly none. Where there are only dyadic relations it attempts to find their connection - thus making them triadic (Burch, 2021). This for Peirce is necessary for the possibility of understanding itself, which again rests on the possibility of relating one thing to another. In other words, connecting two things (a dyad) via a third (triadic relationship). Furthermore, synechism functions as an argumentative

strategy. Since all things are continuous, and can in principle be related to one another, drawing a "clear lines" to differentiate between distinct aspects of reality goes against synechism. Peirce's pansemiotic view of reality is an example of this. By attributing the ability to partake in semiotic processes not only to human minds, but also to quasi-minds, he avoids the problem of drawing a clear line between human and non-human minds.

Synechism can be understood as the metaphysical and methodological principle of Peirce's category of thirdness, which is the category of continuity, growth, intelligence, mediation and regularity. Or in the words of Peirce: *"[b]y the third, I mean the medium or connecting bond between the absolute first and last. The beginning is first, the end second, the middle third. The end is second, the means third. The thread of life is a third; the fate that snips it, its second. A fork in a road is a third, it supposes three ways; a straight road, considered merely as a connection between two places is second, but so far as it implies passing through intermediate places it is third. Position is first, velocity or the relation of two successive positions second, acceleration or the relation of three successive positions third. But velocity in so far as it is continuous also involves a third. Continuity represents thirdness almost to perfection."* (Peirce et al., 1997, 1.337) The explanation of any feature of synechism therefore requires a reference to the category of thirdness.

Beyond that, synechism has profound implications in the fields of mathematics and physics. One of Pierce's main areas of engagement in modern science, was that of continuity (Peirce et al., 1997, 1.41). These aspects are clearly present in the scientific investigation of space, time, feeling and perception. Peirce's mathematical definition of continuity relied on concepts he termed "Kanticity" and "Aristotelicity"[34] (Peirce et al., 1997, 6.166). Kanticity means that for any two points on a continuum C, there exists a point that lies between those - the property of infinite divisibility. Aristotelicity means that for any subset of C, any higher or lower bound of that very subset, will lie within C. Pierce's investigation of synechism, or the continuum, through mathematics becomes understandable in the context of his architectonic system (section 3.5), which

[34]In modern mathematics the closest relatives to these concepts are, arguably, the set-theoretical notions of 'density' and 'closedness'.

places mathematics at the top of all other fields of inquiry, by being the discipline that draws necessary conclusions for the others (Peirce et al., 1997, 1.180–202).

It is this systematic aim that distinguishes Pierce from more famous contemporary mathematicians working on similar issues, such as Dedekind and Cantor (Burch, 2021). He develops a position where a continuum is not being made up of definite points that collectively come to define a line. Instead, the continuum is made up of *infinitesimals*, a set of points that is not finite[35]. Both Peirce and Cantor independently came to argue, that such a continuum can be represented by the real numbers - an innovation Cantor is credited with finding despite both of them arriving at it independently (Locke, 2000).

With his understanding of the continuum, Peirce also came to argue against various strands of atomism. Since atomism holds that an atom is an irreducible building-block of the universe that consist of no other parts, it is inconsistent with the doctrine of synechism. Additionally, atoms require the impossibility of occupying the same space, creating definite boundaries that do not allow for continuous flow. Peirce writes: *"Unless we are to give up the theory of energy, finite positional attractions and repulsions between molecules must be admitted. Absolute impenetrability would amount to an infinite repulsion at a certain distance. No analogy of known phenomena exists to excuse such a wanton violation of the principle of continuity as such a hypothesis is. In short, we are logically bound to adopt the Boscovichian idea that an atom is simply a distribution of component potential energy throughout space (this distribution being absolutely rigid) combined with inertia."* ((Peirce et al., 1997) 6.242). Without going into the details of the Boscovichian conception of the atom[36], it is interesting to observe, that many of the developments in particle physics in the 20^{th} century are closer to Pierce's understanding of a particle than that of classical atomistic interpretations [37].

[35]This was necessary since the devision of any line, consisting of a finite set of points, via a Dedekind cut will result in one point lying on one of the lines whereas the other one doesn't, hence the line is not continuous in the sense imagined by Peirce. If a line is however filled with infinitesimally this problem vanishes.

[36]For a more in-depth study of Boscovich's understanding of physics and its reception, see Olson (1969)

[37]Examples of Piercean-like views in physics include the relation between matter and energy as formulated by Einstein (1905), the problems problems with Dalton's and Bohr's model of the atom, much of quantum mechanics, and, of course, the fact that the atom has been split into many more

In his attempt to formulate a process of evolution that is logically derived from the notion of synechism, Pierce found that customary logic was not fit for the task (Peirce et al., 1997, 3.342). The central problem he encountered was that potential, meaning possibilities that have not yet been actualised, could not be represented in any logical formalism existing at his time. He therefore developed his own logic of relatives that included his understanding of general categories, including their potential[38]. This meant that the set of all barbers, not only includes all exsiting babers, but must also formally include all barbers that do not yet exist (Locke, 2000). In his words:

The great difference between the logic of relatives and ordinary logic is that the former regards the form of relation in all its generality and in its different possible species while the latter is tied down to the matter of the single special relation of similarity. The result is that every doctrine and conception of logic is wonderfully generalised, enriched, beautified, and completed in the logic of relatives. (Peirce et al., 1997, 4.5)

The problematic relationship between most of standard logic and potentiality is further illuminated by Peirce's dealings with the law of the excluded middle (Lane, 1997). Its earliest formulations go back to Aristotle who argues that it is not possible for something to be and not to be the same thing. In other words, any proposition can either be true or false but not be both at the same time. For individuals, Peirce contends, this holds (Paolucci, 2018). By an individual he means any subject that is fully determined or whole. In the following passage Peirce uses the analogy of chemical radicals to illustrate the meaning of relatives in his logic:

[Relatives are] shadows combining together to form a substance! They are things that do not exist. [...] They have no existence in the universe of quantity. But joined together in sets, they do. They are just like chemical radicals, each having a certain number of unsatisfied wants. When each of these is satisfiee by union with another, the completely satured whole has an existence in the universe of quantity [...] The

fundamental components, resulting in the standard model of particle physics (Hartcup and Allibone, 1984).

[38]Interestingly, some have indicated the similarity between Peirce's logic of relatives and implications of Gödel's incompleteness theorem. Peirce writes: *"Things that are indeterminate in themselves have the function to determine each other,"*, which implies an understanding of the bootstrap principle and the necessity of open-ended categories, based on a certain incompleteness. (Roberts, 1973).

application of this idea to logic gives the exact logic of relatives. (Peirce et al., 1997, 4.151)

In other words, he means that any individual that is in no relation to something else and as such no longer relevant for his logic of relatives. As soon as this individual changes, the principle of the excluded middle will no longer apply, since the subject will change and no longer be in a fixed state. Pierce summarises his view on many ideas related to synechism in the following passage::

There is a famous saying of Parmenides (esti gar einai, méden d' ouk einai), "being is, and not-being is nothing." This sounds plausible; yet synechism flatly denies it, declaring that being is a matter of more or less, so as to merge insensibly into nothing. How this can be appears when we consider that to say that a thing is is to say that in the upshot of intellectual progress it will attain a permanent status in the realm of ideas. Now, as no experiential question can be answered with absolute certainty, so we never can have reason to think that any given idea will either become unshakably established or be forever exploded. But to say that neither of these two events will come to pass definitively is to say that the object has an imperfect and qualified existence. Surely, no reader will suppose that this principle is intended to apply only to some phenomena and not to others, - only, for instance, to the little province of matter and not to the rest of the great empire of ideas. Nor must it be understood only of phenomena to the exclusion of their underlying substrates. Synechism certainly has no concern with any incognizable; but it will not admit a sharp sundering of phenomena from substrates. That which underlies a phenomenon and determines it, thereby is, itself, in a measure, a phenomenon. (Peirce et al., 1997, 7.569)

Peirce's investigation into the mathematics of the continuum and the logic of relatives led him to develop a position, where all of reality, is in principle relatable. However, the way be which all aspects of reality are connected is in no way predetermined, but consists mainly of un-actualised potential. This foundational principle of synechism allows for the possibility of a comparison between all separate instances that are not yet connected via a thirdness. This does not mean that a limited single human being or a collection thereof, can possibly relate all aspects of reality to one another. However,

in principle any two aspects of the universe could be connected. The evolutionary process of habit formation is therefore directly linked to the continuum of infinitesimal points, in its pure form of potentiality. Here the tychist conception of chance shows up by underscoring the variability and indeterminacy of connection via thirdness (Peirce et al., 1997, 6.35-65). While the possibility of relating any- thing to anything other via a semiotic process is consistent with Pierce's notion of the continuum (synechism), the precise way in which this is done is up to chance (tychism). As such, the process of attempting to understand any phenomenon in the world will not result in fixed laws or first principles that govern all aspects of reality. Instead, the Piercean process of investigation is defined by its variability and potentiality (Peirce et al., 1997, 6.35-65).

This strongly disagrees with nominalist positions that view generalities as mere abstractions. It is a realist position that stands against the reduction of reality to foundational principles or a unique "real" level of reality, upon which others are built. While his three categories can be interpreted in various ways, they certainly do not aim to give reality a foundational grounding. They are heuristic in nature and act like a fractal triple that has no ultimate beginning or end, but serves in a synechist way, connecting disparate parts of reality, thereby moving from un-actualised potential firstness to habitual, actual thirdness, and back (Peirce et al., 1997, 8.329).

Having outlined the regulative functions of synechism within Peirce's philosophy, we can now return to his understanding of evolution. Peirce summarises his view of evolution and its three different modes succinctly:

"Three modes of evolution have thus been brought before us: evolution by fortuitous variation, evolution by mechanical necessity, and evolution by creative love. We may term them tychastic evolution, or tychasm, anancastic evolution, or anancasm, and agapastic evolution, or agapasm. The doctrines which represent these as severally of principal importance we may term tychasticism, anancasticism, and agapasticism. On the other hand the mere propositions that absolute chance, mechanical necessity, and the law of love are severally operative in the cosmos may receive the names of tychism, anancism, and agapism." (Peirce et al., 1997, 6.28)

We have already explored tychism and its fundamentally indeterminate nature. In contrast, Pierce posits the mode of anancastic evolution, the mechanical element of necessary evolution. He considers Hegel's historicist understanding of evolution—its direction predetermined—as anancastic evolution. Such mechanistic evolution, by itself, does not leave space for novelty or the idea of free will, according to (Peirce et al., 1997, 6.287-317).

Agapism, sometimes called evolutionary love, refers to the third mode of evolution. According to Pierce, it is the most fundamental one the three modes (Peirce et al., 1997, 6.287-317). Agapism connects the mechanistic (anancastic) and the serendipitous (tychist) parts of evolution under a drive towards increasing complexity. It represents the process by which habits become more and more concrete, and by which we gain understanding of the world. Any of these evolutionary modes considered on their own are insufficient to account for the evolutionary process (Peirce et al., 1997, 6.287-317). Thus, a proper explanation of evolution must always involve the entire triple.In his article on "Evolutionary Love" he writes regarding the development of ideas:

The agapastic development of thought is the adoption of certain mental tendencies, not altogether heedlessly, as in tychasm, nor quite blindly by the mere force of circumstances or of logic, as in anancasm, but by an immediate attraction for the idea itself, whose nature is divined before the mind possesses it, by the power of sympathy, that is, by virtue of the continuity of mind. (Peirce et al., 1997, 6.307)

Peirce's theory of evolution goes beyond mere criticism of the Social Darwinist tendencies of his time. It provides a comprehensive framework of different modes that drive evolutionary dynamics (Peirce et al., 1997, 6.287-317). Both Darwinian aspects of evolution—including chance via random variation—as well as the more anancastic views of Lamarckian evolution—where changes are driven by logical, mechanistic tendencies towards adaptation—are present. Additionally, with agapism, Pierce posits an evolutionary mode contributing to the increase in complexity and reason. It is his answer to the question what opposes the second law of thermodynamics under certain circumstance, where a decrease of entropy or negentropy can be found—as in living organisms. It is important to note that his theory of evolution transcends the realm

of the biological science. It is presented as a fundamental dynamic present throughout the universe, which drives the movement of habit formation (Peirce et al., 1997, 6.287-317). In this way, his metaphysical system construes our universe as a process, as far as it can currently be perceived. As such, process is not just part of the universe, the universe only comes to be through process.

4 Peirce and Metamodernism

In this chapter, I will argue that certain aspects of Peirce's philosophy and scientific metaphysics (see section 3) share close proximity with with many of the ideas that have been clustering around the paradigm of metamodern philosophy and metaphysics. This is done to argue, that a serious engagement with metaphysical questions is still possible, sensible, urgent, and timely, even after Kant, analytic metaphysics, and the postmodern critique of metaphysics (or any kind of grand narrative). The first three sections look at central metaphysical themes within the metamodern paradigm, while the last section briefly outlines a number of philosophical ideas that emerged through their combination. Overall, the following sections intend to outline some of the foundational structures of the metamodern philosophical paradigm.

4.1 Subject and Object

The first complex of ideas that is relevant for this discussion provides a novel interpretation of the relationship between the subjective and the objective. This relationship is of fundamental importance for our capability of conducting any metaphysical inquiry in the first place, and will profoundly influence the philosophical systems built on theses base assumptions. The starting point of our discussion are the ideas developed in Kant's Critiques (Kant and Hartenstein, 1868; Kant, 2012). These works have been interpreted in two very different ways when it come to metaphysics. First, Kant can be understood as providing a solid fundament for the natural sciences, while rejecting traditional metaphysics at large. Second, Kant can be seen as establishing a new kind of metaphysics, different from what had been understood as metaphysics until then (Ando, 1974; Aylesworth, 2015). Here, I will side with the latter interpretation, and argue that, even after Kant, doing metaphysics is possible, although fundamentally different from traditional metaphysics.

According to French physicist and transdisciplinary philosopher Basarab Nicolescu (2010), we can model the relationship between subject and object in the modern philo-

sophical paradigm as two completely separated spheres, where the subjective stands independently of the objective. This interpretation of the relationship between subjective and objective gives rise to the idea that the objective can be perfectly modelled. The modern philosophical paradigm implicitly holds that the scientific method allows for an exhaustive understanding of the objective though conducting experiments and clear reasoning (Nicolescu, 2010). This changed with Kant's *Copernican turn*, which shifts the modern focus on the objective towards an inquiry of the subjective. Kant's philosophy argues that the objective reality-in-itself is ultimately unknowable, therefore philosophy should focus on knowable things, like the innate structures of the mind—the subjective (Rohlf, 2020; Aylesworth, 2015; Ghate, 2003). Kant's turn towards the subjective is one of the earliest and clearest points that establishes the metaphysics of a postmodern philosophical paradigm by viewing the object as an emanation of the subject[39] (Hicks, 2019). While postmodernity has sometimes defined itself through the abandonment of grand narratives like those of classical metaphysics, it is impossible to do away all metaphysical assumptions (Lyotard, 1984). The discourse of postmodernity is significantly shaped by assumptions of the relationship between subjective and objective. The object, separate from the subject, is individual or social construct, and nothing meaningful can be said about it. It is in this sense that traditional and modern metaphysics was declared dead by postmodern philosophers. To revive the discussion about metaphysics, thinkers adjacent to the metamodern paradigm of philosophy had to separate the spheres of the subjective and objective again, while binding them by a "hidden third"—a necessary interrelation between these spheres (Nicolescu, 2010)[40].

[39]It is relevant to note that this is true for Kant but not all post-Kantian philosophers. Especially German Idealists like Schelling and Hegel, who critiqued Kant on multiple occasions (Bowie, 2020; Redding, 2020) as well as each other (Reardon, 1984) are much closer to Peirce than Kant (Franks, 2015; Esposito, 1977). Hence, scholars have differentiated between two major strands of German idealism. First, transcendental idealism, associated with Kant and Fichte that argue for the impossibility of accessing things in themselves, and second, absolute idealists, associated with Hegel and Schelling that claim that being is accessible as an all-inclusive whole (Dunham et al., 2014).

[40]This shift in the interpretation of subject and object can be seen in various disciplinary contexts. An interesting example where this difference is relevant, is in the context of modelling. Traditionally, the epistemic role of models has been seen as representation—subjective models "tracking" objective reality in some way. This view is being challenged from various angles, one of them an artifactual account where models are understood as erotetic vehicles, tools to interrogate the world in the context of specific scientific question (Knuuttila, 2021). This view is explicitly based on a triadic model-world

In this spirit, let us compare how Pierce treats the subject-object relation with thinkers contributing to the metamodern paradigm today. As discussed in section 3.2, the triadic relation between object, subject, and a connecting third is implicit in Pierce's use of the categories (Peirce et al., 1997, 8.329). His mode of firstness can be related to the subjective, to the quality of feeling, an initial moment of perception. The mode of secondness is the reaction or resistance to this firstness. It is the quality of feeling or perception of a colour against a background, against something that objects it. As such it relates most closely to the objective. The mode of thirdness mediates and expresses habituation. Nicolescu's hidden third is based on this mode and it accounts for the novel relation between the subjective and objective found in metamodernism (Nicolescu, 2010). A relationship that is no longer based on a dual opposition of subjective and objective. Unlike the categories of Kant, Pierce's are not exclusively confined to the subjective, but are present in expressions of both the subjective and the objective (Thomasson, 2019). Hence, when Pierce models subject and object using his categories, the subject embodies firstness, the object secondness, and thirdness can be understood as the mediating mode between them—bridging the seemingly unbridgeable gap between subject and object.

Structurally similar arguments have been gaining traction in current philosophical debates. One of the most recent and famous examples is speculative realism (Brassier et al., 2007). It is united by the motivation to overcome the anthropocentric ideas of "philosophies of access" and "correlationism" (Mackay, 2007). Philosophies of access are those that prioritise the human over other entities. Correlationism is the Kantian idea that we can never access the objective directly, but can only do so via the correlations between the subjective and objective (Meillassoux and Brassier, 2009). Speculative realists aim to establish a new form of realism in objection to the prevailing forms of idealism in Continental traditions[41]. One of the four founders of speculative realism, Graham Harman (2018a), has gained international recognition for developing

relationship that includes the modeller and their motivations as a third. We will revisit this topic when discussing processual models in section 4.3.

[41]It is important to note that certain aspects of the metamodern philosophies mentioned in this paper are incompatible with each other—similar to rationalism and empiricism within the modern paradigm. However, certain unifying themes are also present in these metamodern works that set them apart from modern approaches as a qualitatively different way of theorising, built on fundamentally different principles. See discussion in the main text for details.

object-oriented ontology, a theory very similar to speculative realism that explicitly stresses the ontic reality of objects separately from human beings, and holds that the object is not exhausted by its relation to a subject (correlationism). Pointing to the exact differences between these movements is difficult for two reasons. First, they overlap in a lot of ways and offer no uniform critique of the other. Second—similar to much metamodern philosophy—the spaces in which these ideas are discussed and developed is no longer primarily the academic conference, but the blogosphere, online video platforms, and various internet forums. Hence, the movements are less homogenous and harder to pin down [42].

Three other schools of thought—aligned with metamodernism and speculative realism—are worth mentioning: critical, agential and multiperspectival realism. Critical realism was first introduced and established by philosopher and sociologist Roy Bhaskar (1997b) and further developed over the subsequent decades. It opposes positivistic interpretations of the scientific method and critiques postmodern and poststructuralist philosophies by arguing for the ontic reality of the objective. This position of ontological realism, central to much of critical realism, holds, that reality does exist independent of our subjective experience of it. This is expressed in structural realism's opposition to the "epistemic fallacy", which according to Bhaskar (1997a), reduces the real to that which we can know about the real. Thus, critical realism (like speculative realism above) replaces constructivist views with an independent notion of the objective, which is interrelated to the subjective. Again, we find contours of a triplicate structure that does not collapse the objective sphere into the subjective, rather it demands their independence. The motivations for these triplicate structures varies between speculative realism and object-oriented-ontology and critical realism. The former two are direct responses to much of Kantian metaphysics and predominating trends in contemporary continental philosophy (Harman, 2018b). Critical realism on the other hand, was developed as a framework for research in the social sciences (Collier, 1994).

At this point, agential realism becomes important, a view proposed by Karen Barad (2007), feminist, physicist, and philsopher, as it shares many elements with the above

[42] As such they more closely embody the structure of social kinds discussed in footnote 16.

mentioned theories and their understanding of an objective reality. Her neo-Bohrian interpretation of quantum mechanics and quantum field theory stresses the inseparability of any interaction. This interpretation follows Bohr's understanding of quantum physics according to which, the modern conception of the strict separation between a subject conducting an experiment, and an object being experimented on, is no longer possible (of Physics et al., 2002). This debate arose in the field of quantum theory especially because of the double-slit experiment—an experimental setup that showed that light can display the behaviour of both waves, and particles. Importantly, the behaviour of light depends on its interaction with an apparatus or measurement device. Barad (2007) therefore focuses on interaction and its generative function in determining phenomena in general. She coins the neologism "intra-action", to stress that objects come to be through their intra-action. We come to see a tree only because light reflected off its surface hit our retinas. In this sense, all phenomena are born through their intra-action (Barad, 2007). Parallel to Bhaskar, Barad also argues that epistemology is not the only modality relevant for the sciences and knowledge production. Ontological questions are of equal importance and cannot be separated from epistemological ones Barad (2007). The spheres of the subjective and objective are not separated (like in modernity) or collapsed into one (postmodernity), rather they are intra-acting (connected via a hidden third).

The last realism worth mentioning at this point is multiperspectival realism developed by Giere (2010) and Wimsatt (2007). Inspired by, among others, Charles Sanders Peirce, it holds that the starting point of any scientific inquiry is the subjective human perspective (Callebaut, 2012). Combining multiple human perspectives, allows for the "triangulation" of objects and common phenomena (Wimsatt, 2007, p. 43). The reliability of scientific observations can be increased, by looking at objects from various perspectives to determine their characteristics. This feature of multiple determination is called *robustness*, which functions as a criterion for the reality of objects (Wimsatt, 2007). Connecting this to our triplicate structure discussed above we find that human perspectives correspond to the subjective or a firstness, robustness refers to a repeated observation (thirdness, or hidden third) of something that is real or has a high degree reality (secondness, an object).

While the above mentioned realisms have arguably been more implicit about the relationship between subject, object and a third, some key thinkers of the metamodern philosophical paradigm have explicitly build central parts of their works on this triplicate structure[43]. Looking at the two books published by Hanzi Freinacht we see that both heavily rely on this pattern. In first book, "The Listening Society", Freinacht (2017) lays out theory of developmental psychology that looks at subjective states (relating to the subjective) cognitive and cultural development (relating to the objective) as well as "depth" (relating to a third[44]). The second book published by Freinacht (2019) describes a political political philosophy, based on six different, interacting forms of politics. Similar to above, the master pattern behind these six forms of politics is a version of the triplicate structure. In this case it is based on the personal pronouns of I, We, and It and six different ways in which they can be connected.

Another theme that can be found in the works of Freinacht (2017) and Storm (2021), two thinkers that describe themselves as metamodern, is the relation between the real and imaginary, or fact and fiction. How these are interconnected, directly describes how the relationship between the objective and subjective is implicitly understood. Strom argues, in parallel to this section: *"If realism is paradigmatically modern and antirealism is paradigmatically postmodern, then we can transcend both in the name of the metamodern"* (Storm, 2021, p. 43-44). Similarly, Freinacht declares in poetic terms that reality cannot be reduced to either fact (objective) or fiction (subjective) but lives at the intersection of these (a third). He writes: *"Reality is much more than*

[43]Or a slight moderation of this triplicate structure. One often used moderation of this triplicate structure was most clearly formulated by the philosopher Ken Wilber (2001) in his "four quadrants" model. Four quadrants are created by dividing along the two parameters of *internal/ external* and *individual/ collective*. The internal and individual quadrant refers to the subjective of a self, to the perception of firstness. Both external quadrants (individual and collective) refer to singular organisms and things (individual) and systems and networks (collective). As such they are most closely related to Peirce's secondness and the objective. Finally the quadrant of internal collective is most closely related to that which connects both object and subject via a third (Wilber, 2000).

[44]While the connection of subjective states to the subjective, and cognitive and cultural development to the objective is relatively straight forward, "depth" is a bit more difficult. Depth is defined as "a person's intimate, embodied acquaintance with subjective states" (Freinacht, 2017, chapter 14). As such it describes how a subject can relate to subjective states. This means that the subjective states it relates to are no longer its present subjective states (firstness), rather they become an object (secondness) to which it relates. Therefore depth connects the subjective with the objective and can be related to a thirdness.

the facts of the matter. The real reality resides at the crossroads of fact and fiction. It is born precisely at the point where our imaginations, the stories we tell ourselves, meet the facts of the world and put them into context" (Freinacht, 2017, Prologue).

Two other thinkers that have not been working under the banner of metamodernism, but have developed philosophies that are remarkably similar to Peirce's work, are worth mentioning here. The first is Forrest Landry (2002), who has written the "Immanent Metaphysics". It is built around three modalities, called "transcendent", "immanent", and "omniscient" that directly correspond to Peirce's modalities of firstness, thirdness, and secondness, respectively. The similarities to Peirce are however not limited to the triplicate structure, but extend beyond that. Other similarities include an evolutionary perspective, a theory of fallabillism, similarities in the justification of the categories, and what has been described as fractal properties of them (see section 3.4)[45]. The second thinker whose philosophy is remarkably similar to both Peirce and Landry is David Cory Barker (2013). For brevity's sake it shall suffice to say that he uses the terms of "subject", "object", and "transject" (among others), to refer to the triplicate structure we have explored in this section.

Some other noteworthy works that propose novel interpretations of the relation between the subjective and the objective, in philosophy and other fields of inquiry, include Habermas et al. (1993), Holbraad and Pedersen (2017), McGilchrist (2021), Henriques (2021), Maturana et al. (1992), Vervaeke (2019a), and von Foerster (2003). In these cases, the pattern that defines the relation of the subjective to the objective is congruent with the triplicate structure we have explored in this section. More or less implicitly, all of them argue that both, the subjective and objective constitute different spheres or phenomenon that can be bridged by connecting them via a third. Furthermore, these citations range from anthropology to biology and psychology (the works of Landry (2002) and Barker (2013) are predominantly situated in the fields of computer science, mathematics and knowledge organisation). This demonstrates that overarching patterns of the subject-object relation hold across disciplines, which is a prerequisite for something that is described as a paradigm.

[45]Interestingly, these overlaps would indicate a direct influence of Peirce on Landry's work. According to him that is however not the case, and his philosophy was developed independently (Landry, personal communication).

While the above mentioned philosophical currents are relatively marginal in contemporary debates (with the possible exceptions of speculative realism and object-oriented-ontology), we come to see that they constitute a new approach to doing metaphysics. In this section I have shown that said approach is based on differentiating the subjective from the objective, and connecting them via a third. This pattern is already clearly present in Peirce's categories and their interrelation (see section 3.2). The mode of firstness represents the subjective, which is opposed by a secondness that represents the objective. The mode of thirdness connects them, to not reduce either to the other. By doing so, the three are not collapsed into one, but remain separated—yet dependent on each other.

The next three sections are a closer look at each part of the triple. I will look at processual and architectonic models, and the combination of them, as expressed in the metamodern philosophical paradigm. This relates to the above discussed triple in the following way: processual models describe continuity, growth, and evolution, as such they most closely relate to the mode of firstness or the subjective perspective. Architectural models are arrangements of knowledge and cognition and most closely related to the mode of secondness or the objective perspective. The interrelation of processual and architectonic models accounts for the more specific habits and representations of the metamodern philosophical paradigm (see (Peirce et al., 1997, 8.329) for characterisations of the categories) [46].

4.2 Architectonic Models

Within the postmodern philosophical paradigm, architectonic super-structures that organise various elements in non-arbitrary ways are commonly criticised and deconstructed, since they justify grand narratives that are seen as oppressive, cementing existing power relations (Willatt, 2010; Morgan, 2002). These structures often take the forms of nested hierarchies which were further critiqued for their rigid structures,

[46]The triple of architecture, process, and computation (the combination of architecture and process) was used by (Barker, personal communication) and has inspired the naming of processual and architectural models.

their often teleological implications, their notion of exclusivity, the domination of certain classes over others, and their being based on on Aristotelean logic built on disjointed classes with an excluded middle (Olson, 1999). These criticisms led to the development of new structures—panarchical, heterarchical, tree- or rhizome-like (Gunderson and Holling, 2002; Crumley, 2015; Deleuze et al., 1977)—which were proposed to counter the rigidity of hierarchies through an emphasis on connectedness and family resemblance of the phenomena to be classified. In this section I will (1) show that metamodern architectonic systems are inspired by (or in many ways similar to) Pierce's architectonics, (2) show that the ordering process of such systems is not arbitrary, but attempts to capture certain natural relations between elements and aim to show how more complex patterns integrate elements of less complex patterns, and (3) argue that there is a unified generator function underlying these regularities.

The classification systems investigated in this section, attempted to overcome the problematic effects of rigid hierarchies by building pluralist systems that can account for various elements without the often problematic ordering and dominating superstructure. It is important to remark that while these newer structures are more inclusive and pluralistic, they are nonetheless hierarchical. As any kind of structure that has any layering inherent to it can be interpreted as a hierarchy, I argue that certain kinds of hierarchies, those built around centralised, rigid and ordered principles, are overcome in the metamodern philosophical paradigm.

Therefore, when investigating the architectonic structures present within the metamodern philosophical paradigm, a strong critique of rigid categories based on Aristotelean logic should be found, as these cannot account for the complexities of the world and easily lead to dominating relationships and simplified teleological narratives of the world that justify an often unjust status quo. Metamodernists must therefore also criticise postmodern propositions to do away with all kinds of hierarchies, since this position has the reverse problem that it is unable to justify itself, and has difficulties explaining any natural hierarchies present in the world (Freinacht, 2017). The structures of metamodern architectonics should therefore avoid the problems of both modern or postmodern approaches.

In chapter 3, we have looked at two architectonic systems in the work of Pierce. First and foremost, we have looked at his Architectonic model that attempts to organise human knowledge at large in a systematised fashion (see section 3.5), and, second, we have looked in more depth at the part of his architectonic system relevant to semiotics—Pierce's architectonics of signs (section 3.4).

Before moving on, I will introduce a concept that helps differentiate between modern, rigid categories and metamodern ones—the differentiation between "dominator" and "growth" hierarchies (Wilber, 2007). While this simple differentiation does certainly not capture all the sublte differences between various kinds of hierarchies and structures, it works well as an orienteering generalisation. When any of a hierarchy "attempts to dominate the whole, then you get a pathological or dominator hierarchy—a cancerous cell dominates the body, or a fascist dictator dominates the social system, or a repressive ego dominates the organism, and so on" (Wilber, 2007, p. 40). This is contrasted with a growth hierarchy that represents natural stages of development.

Some aspects make Peirce's architectonic look like a simple dominator hierarchy, since it structures the sciences from most to least general and thereby provides something very similar to a classical hierarchy. However, there are a few differences that indicate a distinct way of constructing and structuring systems. First, there is an explicitly bidirectional flow of information. In Pierce's system, it is the more general science that provides the tools and methods for the more specific, less general, sciences, but this is countered by insights and experimental data that flow from the more specific science to the more general one. As such, a broadcast-like structure similar to a dominator hierarchy is opposed by a model similar to the hermeneutic circle, where whole and part interact in both directions (Mcluhan et al., 1996). Second, Pierce's architectonic, like the rest of his philosophy, is suffused by an anti-foundationalist position where no single part of a structure can be considered the most fundamental or important one. This implies that we can never arrive at the most fundamental discipline and derive the rest of human knowledge from it. Third, it is relevant to add that the inspiration for his architectonic system came in part from architecture, the discipline that is focused on finding harmonious relations between different construction elements at various scales (Alexander, 1964). Architecture is not focused on ordering a door and window by their

respective size, but it deals with finding a balanced relation between these two, all the other parts of the building and its natural surroundings. Fourth, his understanding of categories in general (not just his three categories, but also the more specific categories present within the architectonic system) was influenced by his work in mathematics and the logic of relatives (Peirce et al., 1997, 3.45-3.46). A category as understood by Peirce is therefore in some sense open, as the category of "chair" does not only include all chairs present in this world, but also all that are yet to come. Seen from his evolutionary metaphysical point of view, the boundaries of the categories themselves can be seen as less rigid and stiff, since they—like the membrane of a cell—are part of an adaptive evolutionary process (Peirce et al., 1997, 1.353). Fifth, Peirce uses a fractal mode of derivation for his architectonics from his three categories (see section 3.4). This implies that the architectonic system has consistent distances between its levels, and remains extendable if further categories need to be added. These criteria differentiate the Peircean architectonic system from a classical dominator hierarchy and foreshadows elements that are present in metamodern architectonic systems.

When looking at architectonic systems that express properties with Wittgenstein's family resemblance to that of Peirce, we can find some of those presented in the discipline of philosophy, like those of Barker (2019a), Apel (1978), Habermas (1979), and Wilber (2001).However, since these growth hierarchies tend to structure certain elements of nature, mind, the physical universe or a combination of these the are also present in various scientific disciplines, as seen in the works of Commons (2008), Jantsch and Ryan (1980), Freinacht (2017), Bellah (2011), and Esbjorn-Hargens and Zimmerman (2011). We will thus look at the discipline of knowledge organisation, as it includes both philosophical as well as scientific architectonic systems.

Knowledge organisation is the discipline that is concerned with tasks such as indexing and classification, the representation of knowledge and general principles that organise knowledge (Hjørland, 2008). It is used for organising knowledge in databases, dictionaries, libraries and the Internet at large[47]. It employs many architectonic structures, some based on alphabetisation, temporal classification, thesaurus-like or hypertext linkages, reader-interest classification, or what are called integrative levels on which

[47]For a concise but exhaustive introduction to knowledge organisation, see Kleineberg (2017).

we will focus here. Integrative levels are closest to Pierce's architectonics: they align various elements of knowledge according to various dimensions of complexity. This stresses the natural relations between those elements, in contrast to more arbitrary classification schemes, e.g. based on alphabetisation. One definition of integrative levels is given by Douglas Foskett:

"The theory of integrative levels is that the world of things evolves from the simple towards the complex by an accumulation of properties, and that, at a succession of levels, these aggregations reach new degrees of complexity and become new wholes, with individual and unique identities. (Foskett D., 1962)

To illustrate how such integrative levels can look, and along which trajectories or dimensions of complexity they order elements, we will look at a few examples. The first one is provided by Nolan and Lenski (2010). They provide a hierarchy of integrative levels with a particular focus on macro-sociology:

1. Subatomic particles
2. Atoms
3. Molecules
4. Cells
5. Multicellular organisms
6. Societies
7. Species
8. Ecological communities
9. The global ecosystem

The integrative levels they provide start at the smallest level of organisation currently known in standard model of particle physics (Weinberg et al., 2003). Combining these

subatomic particles gives rise to the next level of organisation, namely atoms. Atoms combined can make up molecules, and so on—until we reach the level of the global ecosystem. As mentioned by Foskett D. (1962), moving up the levels of organisation we find that the complexity of the levels increase. The new whole that emerges out of its parts, has properties that are not confined to the individual parts. This can clearly be seen when e.g. comparing cells with multicellular organisms. The properties of a multicellular organism like a human, are far greater than those of unicellular bacteria. It is also interesting to note, that each level of organisation can by itself be considered a whole, or an individual.

Other examples of integrative levels can be found in psychology and the development of cognition. The most prominent example was given by Jean Piaget and Gruber (1995) with his four stages of developments from birth to adulthood:

1. Sensorimotor
2. Preoperational
3. Concrete operational
4. Formal operational

It might not be directly obvious how this example relates to the one given by Nolan and Lenski (2010), as the former describes levels of organisation present in the natural or objective world, and Piaget talks about the stages of children growing up. Linking them are certain patterns that hold for integrative levels in general. In both cases, do the latter levels include the former ones. Molecules include atoms, and having passed through sensorimotor stages is a prerequesit for preoperational ones. Furthermore, the latter levels are more complex, or can be attributed with a greater range of properties. A child a concrete operational will be able to solve problems a child at preoperational won't. Additionally can the individual levels be seen as *wholes*(Foskett D., 1962). This is directly evident for e.g. societies, but is in a more metaphoric way also true for children at e.g. formal operational—meaning that these wholes have a certain kind of stability.

In some cases, knowledge categorisation even defines its sequence of integrative levels in explicitly Peircean terms, using his three fundamental categories. An example of this is the work by Danish philosopher and semiotician Søren Brier, who established the field of cybersemiotics. It aims to unite biosemiotics with information theory in order to provide a new paradigm for understanding in both living and non-living entities (Brier, 2008a). Brier developes an architectonic model of integrative levels aimed at uniting physical matter and phenomenological qualities (qualia), which is structured in the following way (Brier, 2003):

1. Quantum vacuum fields (Peirce's Firstness)
2. Physical (Peirce's Secondness)
3. Informational-chemical (Peirce's Thirdness)
4. Biological-semiotic (sign games)
5. Social-linguistic (language games)

The above framework aims to define integrative levels for information theory (Brier's cybersemiotics). Each of these levels is proposed to have different characteristics in regards to the type of information being processed (Brier, 2003). At the level of quantum vacuum fields we find an entangled form of causality that is related to spontaneity and chance as expressed in Peirce's mode of firstness. The physical level describes energy exchanges in the area of physics and is related to Peirce's secondness, to fact, and actuality. Dissipative structures and cybernetic machines organise the informatoinal-chemical layer. Semiotic processes regulate the biological-semantic level and linguistic communities and their language games define thee social-linguistic level. While the details of this particular integrate level framework go beyond the scope of this thesis, this example illustrates one way in which Peirce's categories can be used to organise architectonic systems. Overall, the integrative levels discussed, imply an understanding of architectonic systems somewhat similar to Peirce. His classification of the science relies on a fundamental pattern of specificity vs. generality (more complexity), where each science is considered as a distinct whole, with a unique identity (Peirce et al.,

1997, 1.180-1.202). Additionally, as argued in section 3.5, Peirce's architectonic system relies on his categories, which themselves reepreesent the pattern of specificity vs. generality.

The important takeaway from the architectonic systems of integrative levels given above is not their precise content, rather the pattern of using architectural meta-structures to organise various elements that influence a given research paradigm. In the above examples this has been done for macro-sociology, cognitive development and different kinds of information, in a manner that is similar to Peirce and his architectonic theory classifying the sciences. After a postmodern critique of dominator hierarchies, integrative levels can be seen as part of a turn towards growth hierarchies. This turn is achieved by explicating the boundaries of a given element, as well as its relations to others. The ordering process itself is not arbitrary but attempts to capture certain natural relations between these elements and aims to show how more complex patterns integrate elements of less complex patterns.

At this point it is relevant to stress that the pattern of integrative levels cannot only be found in specific domains, rather it can be found across all kinds of domains. I hold that this indicates a kind of meta-pattern with regards to how various elements can be arranged in a systematised way. Such a claim can supported by, either providing examples of integrative levels across various domains, or pointing towards a generator-function that accounts for this pattern. Since the former has already been done (Kleineberg, 2017, 2021), I want to briefly outline what the deeper reason for the emergence of integrative levels within the metamodern philosophical paradigm might be. To do so, I will use Commons (2008) Model of Hierarchical Complexity, that has been briefly introduced in section 2.3. Here, I present stages 10-13 (note, these stages themselves are integrative levels):

1. Abstract
2. Formal
3. Systematic
4. Metasystematic

As argued elsewhere (see section 2.1), certain parallels between sociogenetic and ontogenetic development can be found (Fahr et al., 2000; Habermas, 2019; Freinacht, 2017). We have seen (also see section 2.1) that the paradigm of pre-modernity was shaped by the ability to form abstract variables, like god and money—the ability to coordinate them was however not present. This parallels stage 10 - abstract, which can form single variables, can however not coordinate them (Commons, 2008). Stage 11 - formal, gains the ability to coordinate multiple variables, and as such mirrors certain developments in the modern paradigm. Organising variables in multivariate systems, and the ability to consider relationships in contexts, are central characteristic of stage 12 - systematic. This stage roughly corresponds to what has been described as the postmodern philosophical paradigm. Lastly (though there are three further stages described by Commons (2008)), stage 13 - metasystematic organises multiple systems in non-arbitrary ways. This pattern of organising various systems, runs parallel to many of the ideas expressed in the metamodern philosophical paradigm.

What the above helps to explain, is that the structure of thought found at stage 13 - metasystematic, shapes many elements of the metamodern paradigm and its accompanying philosophies. As such it is not surprising that the structure of integrative levels appears in various domains and constitutes a kind of meta-pattern, which helps organise the various systems that are being studied. In the case of macro-sociology and the levels of Nolan and Lenski (2010), we see that various systems (from atoms, to organisms, to societies) are coordinated in a non-arbitrary way that tracks their natural relations. Similarly, the stages of complexity described by Commons (2008) organise various systems of thinking in an ordered way, where the latter stage is dependent on the former[48]. The generator function for the meta-pattern of integrative levels, can therefore be seen as the ability, to organise multiple systems. This is clearly visible when looking at various ontogenetic development trajectories like those of Commons (2008) or Fischer and Bidell (2007).

[48]This is at least what happens if we look at the Model of Hierarchal Complexity from a perspective of stage 13. Looking at the model from higher or lower stages will change the way it is interpreted. This is also the case for all other models of integrative levels, for the purpose of this thesis we want to interpreted it from the perspective of stage 13, as this illustrates how multiple systems are non-arbitrarily coordinated.

While integrative levels are one kind of structure that is gaining more attention in academic discourses, they represent only one kind of architectonic system, while others are also being developed. These include various pattern languages that have been devised, especially prominent in the fields of architecture and design (Alexander et al., 1977; Fincher, 1999; Cloutier and Verma, 2007; Schuler, 2008; Jacke and Toensmeier, 2005). These languages are often structured along the description of various patterns ranging from the micro to the macro and an interrelation of them via hyperlinks (similar to a wiki-structure). The patterns that are organised in a language specify problems and multidimensional approaches to finding solutions. They have been devised for the architecture of houses, towns, pedagogy, permaculture, communication, as well as computer-programs.

Another example of an architectonic system is the stratification of models provided by Bhaskar and other critical realists to talk about ontology with the three domains of the empirical, the actual and the real (Bhaskar, 1997b). In Bhaskar's model the empirical refers to experienced phenomena, the actual to the phenomena themselves, and the real to to mechanisms that create these events (Chouliaraki et al., 1999). While a more detailed description of this goes beyond the scope of this thesis, it is important to remark that Bhaskar attempts to develop an exhaustive ontology that can order various aspects of reality. As such they share much similarity with four quadrant ontologies (see 43), independently developed by various thinkers, that differentiate between internal and external perspectives, as well as singular and collective ones (Wilber, 2001; Ritzer, 1991; Brier, 2008a)[49].

Another increasingly popular area, where architectonic systems linking various domains of knowledge are important, consists of the research paradigms of multi-, inter-,

[49] An argument can be made that when looking at much of the architectural structures being developed in computer science, aided by cryptographic principles, a similar pattern can be found. Namely, flat network structure that defined much of the early information processing of the internet are being replaced by structures that allow for the non-arbitrary structuring of data like blockchain technologies, git architectures, IPFS (Interplanetary Filesystem) and DHT (Distributed Hash Table). These structures are more flexible in the specific way they organise data, while ensuring the integrity of the relations (especially when built on cryptographic principles).

and transdisciplinarity[50]. Multidisciplinarity employs researchers from different disciplines, who all do work within their own domain of expertise (Van Dijk, 1998). Interdisciplinarity goes further than that, studying the relations between disciplines, to coordinate research efforts in an integrated and synergistic fashion (Jones, 2010). Transdisciplinarity goes even beyond that in its aim to tightly integrate different domains of expertise into a coherent overarching framework (Max-Neef, 2005). In this way, transdisciplinarity shares some similarity with Pierce's notion of an architectonic system. Nicolescu (2012) has advocated three methodological postulates or axioms as the foundation for transdisciplinary studies. These include (1) levels of reality[51], (2) the principle of a hidden third[52], and (3) complexity.

Architectonic structures, that organise various elements or systems of knowledge in non-arbitrary ways, are a defining characteristic of the metamodern philosophical paradigm. Peirce's architectonic system, as well as its derivation from his categories indicate a different way of organising knowledge by tracking natural hierarchies better, by being less rigid, and more evolutionary, than traditional ways to subdivide knowledge and the world. This is done in accordance to principles that repeat on various scale levels, principles that work as a generator function for structure that differs from dominator hierarchies by providing justification for their ranking.

4.3 Processual Models

A focus on process, time, and evolution is a central part to the metamodern philosophical paradigm (Freinacht, 2017, Appendix). As we have seen in section 3.6, Pierce's complex account of evolution—with his abstract notion of interrelating triadic processes (tychism, anancasm, and agapism), combined with synechism, and thirdness—

[50]There has even been a call for an approach beyond transdisciplinarity, which studies transdisciplinary studies to identify and classify the patterns and mechanisms that hold them together. Barker (2019b) suggests to call this meta-approach "arch-disciplinarity".

[51]The notion of levels of reality is largely congruent with the notion of integrative levels (as discussed above).

[52]The notion of a hidden third is directly inspired by Pierce's thirdness. As mentioned in section 4.1, this implies a novel interpretation of the subject-object relationship, including a kind of interpretant, which mediates the interactions between the two.

aims to account primarily for the wide variety of evolutionary processes that have been observed across different fields of study. This is not confined to biological evolution, but also includes cultural, technological, and epistemological evolutionary processes in philosophy and the social sciences (Peirce et al., 1997, 6.7–34). Pierce's whole system of philosophy is set in an evolutionary context that does not merely describe evolution from an outside perspective, but uses inbuilt evolutionary approaches like his logic of relatives of the dialectical function of thirdness to give his system the quality of dynamics and open-endedness required for the description of process as such (Barker, 2013).

Before continuing our discussion on process in the metamodern paradigm, it is relevant to briefly discuss the relationship between architectural models and processual models within large scale philosophical paradigms. Unlike the architectural components discussed in the previous section, the processual elements are arguably not a key differentiating factor between the postmodern and metamodern philosophical paradigm, but are to some extent shared by both of them. Both postmodernism and metamodernism are processually oriented, while modernity is not.

One relevant element in structuring these developmental trajectories will be mentioned here, that helps clarify the position, why processual models don't differentiate postmodernity from meta-modernity, but why they differentiate both, post-, and metamodernity, from modernity. When looking at ontogenetic developmental models, an often found patter, that is clearly shown in the skill theory of Kurt Fischer and Bidell (2007),is that there is dynamic movement from "single", to "mappings", to "systems" that structures the progression from one stage to the next. This triple can be directly correlated to Peirce's categories (Peirce et al., 1997, 1.300-354). A single would correspond to firstness, a mapping to secondness and system to thirdness. The key idea is that when for example dealing with abstract variables, one moves from the ability to deal with a single one (single), to mapping more than one to each other (mappings), to the ability to coordinate multiple ones as a new system (system). This new system in turn becomes a new single[53]. This dynamic was already indicated in the

[53]This relates to the above discussion on integrative levels and how multiple singular instances can become a new whole (see section 4.2).

various paradigms explored in the second chapter. Pre-modernity gained to ability to deal with a single abstract variable (single), modernity learned to coordinate multiple ones (mappings), post-modernity could think in systems (systems, and new single of higher complexity) and meta-modernity again learned to coordinate multiple systems (mappings) [54].

There is a basic rhythm, where a novel, most abstract element is introduced (e.g. variable or system) and forms new patterns that comes to constitute the specific expressions of a given paradigm. Thereafter, the most abstract element is coordinated with more elements of the same complexity, which in turn allows for the emergence of new patterns. These come to constitute the expressions of the next large-scale paradigm. According to this rhythm there are two fundamentally different kinds of paradigms. One, built around the emergence of a novel most complex element, and one, built around the coordination of multiple elements. If multiple ones are coordinated, the architectonic models will be the key differentiating factor between an older and a newer paradigm. This is because architectonic models help build structures that order multiple elements in non-arbitrary ways. If a new most complex element is introduced, the processual models will be the key differentiating factor between an older and a newer paradigm. This is because processual models (understood in their broadest sense) describe the behaviour of a most complex element.

This can be illustrated when looking at the transition from pre-modernity to modernity, as well as postmodernity to metamodernity. Architectonic models are in both cases defining for the emergence of the new paradigm. The transition to modernity, brought with it the ability to coordinate multiple variables—something that was not possible in pre-modernity. In section 2.1 this was discussed in the context of money and god. Pre-modernity could not tolerate the peaceful coexistence of both, rather, one had to be chosen over the other. Modernity on the other hand coordinated both in a more complex fashion. In parallel to this we saw that postmodern analysis is

[54]This does not perfectly correlate to the progression of developmental stages as laid out by Fischer, since the progression from mapping to system is not well differentiated in the instantiation of cultural paradigms—the overall pattern however, holds. One hypothesis why this is the case, is that a single is qualitatively more different from both a mapping and a system as both of these involve the coordination of various elements. This might be one of the main factors, why the cultural expression mainly differentiate between the single and the multiple (mappings, system).

often confined to a singular system. The different architectonic models discussed (see section 4.2), indicate how metamodernity attempts to coordinate multiple systems.

Looking at the transition from modernity to post-modernity we find the introduction of a new most complex element[55]. In this particular case one moves from a use of variables (multiple ones) as the most complex element, to the use of systems (only a single one). Processual models—those that define the behaviour of this new most complex element—will be defining for the new paradigm.

This is why metamodern philosophers do not stand out for their novel process philosophies. They often built on the processual models that have already been developed in the postmodern philosophical paradigm. Their central contribution is in many cases the coordination of multiple systems (through architectonic models) while incorporating the evolutionary and processual aspects. Hence, in the remaining part of the section I will show that within the postmodern and metamodern paradigm, process can no longer be regarded as exterior to the description of systems. Addiotnally, in the metamodern philosophical paradigm, space and time or architecture and process must be thought of together.

To do so I want to mention four fields of inquiry that are close to ideas developed by Pierce. These are complexity science, information science, cybernetics and semiotics. These disciplines are relevant in the context of process, as they spearheaded a deeper understanding of time, causation and entropy in the sciences.

Information theory, complex systems science, and semiotics, rather than precisely defined fields of inquiry, can be seen as collections of methods, practices, and ideas that differ qualitatively from those of other sciences in their understanding of process (among other things). Looking at the interdisciplinary and transdisciplinary study of complex systems, this becomes evident, as the unit of analysis used to describe certain aspects of reality, shifts from the level of single variables to that of the system—a

[55]The same pattern is also clearly visible when looking at a shift from a pre-pre-modern paradigm to the pre-modern one. For description of these transition dynamics, expressed in the cultural instantiations of the paradigm, see Habermas (2019); Jaspers and Salamun (2017); Bellah (2011); Freinacht (2017)

collection of interrelated and interdependent variables coordinated in a non-arbitrary way (Mitchell, 2009). These complex interactions between interrelating parts generate types of behaviour that cannot be accounted for simply by the study of the behaviour of isolated systems components in isolation. This is sometimes described as synergetic, self-organising, or emergent behaviour (Jantsch and Ryan, 1980; Gibb et al., 2019).

Descriptions of systems can be given with or without explicating the factor of time, the idea of process and time-evolution are part of the description of most of these systems implicit in the synchronisation and self organisation patterns observed. This is in contrast to Newtonian sciences, which regard time as an independent variable that can be added to the description of a given phenomenon to capture its trajectory through configuration space—something no longer possible in complex systems (Thurner et al., 2018). Overall, the progress of complexity science is strongly driven by the study of evolutionary processes in biology, neuroscience, and the social sciences, which motivate a turn away from linear equilibrium models towards non-linear, far-from-equilibrium dynamics (Jaeger and Monk, 2015; Scheffer, 2009; Gunderson and Holling, 2002).

The notion of "process" is also central to the related fields of information science, cybernetics and semiotics. Classical formulations of information theory and cybernetics, such as those of Claude Shannon (2001) or Norbert Wiener (1950) are based on the mathematical description of information flow or cybernetic feedback, respectively. The early formulations of both, centre around an objective concept of information (Brier, 2008a). Information theory, concerned with the the transmission and storage of digital information is deeply connected to the description of macroscopic processes in physical systems, as given in thermodynamics (Landauer, 1996). As a research program it is centred around logical and arithmetic descriptions of information processes. It is mostly applied to fields of computer sciences, information engineering and electrical engineering (Csiszár and Körner, 2011). Communication and data transmission process have especially been influenced by the theoretic work in information theory.

Cybernetics is concerned with regulatory systems and the study of circular causality or feedback (Ashby, 1961). It goes beyond the description of these processes in machines by arguing that cybernetic feedback-systems are central to both Animals and Machines

(Wiener, 2019). In many ways, cybernetics is an attempt to expand the study of information and feedback processes into the domains of cognition and communication. The natural extension of this paradigm was given through second-order cybernetics, arguing for the fundamental impossibility to remove the epistemological position of an observer Bateson (2000). The feedback loops necessary to understand any system, were no longer merely those of the system, but also the feedback between observer and system. This lead Maturana et al. (1992) to develop their notion "structural couplings" between various systems, to indicate the interdependence between observer and observed. The broader theoretical groundworks for this paradigm was arguably best articulated by Von Foerster (2003).

What the above paradigms often have difficult with, is the description and modelling of the semantic aspects of language, cognition and perception (Brier, 2008a). This is where various semiotic theories come to play, as they explicitly address the symbolic-processing layer in computation and cognition. Peirce of course, was the first to formulate a comprehensive theory of semiotics (see section 3.4) that has, and continues to inspire, many thinkers in this field. Examples include Thomas Sebeok et al. (1992) biosemiotics and the cybersemiotic framework developed by Brier (2008a). The latter is especially interesting, as it attempts to integrate the objective description of information, implications of second-order cybernetics, and the ethological insights from biosemiotics into a coherent framework, based on the Peircean categories (Brier, 2015).

What the above paradigms all come to show, is that process can no longer be regarded as exterior to the description of complex systems but that space and time or architecture and process must be thought of together. Thinkers that show an awareness of the interdependence of structure and time include Alfred North Whitehead with his elaborate metaphysical system laid out in "Process and Reality". It shares proximity with many thinkers in this category. His metaphysics based on *actual entities*, which are processes or extended events across space and time, are the foundation on which he builds his work (Whitehead, 1929). By doing so, Whitehead strongly criticises the Cartesian notion of a reality where static atoms exist independent from each other. According to him, all primary events are interdependent and share a fundamentally processual nature. Karen Barad (2007) (see section 4.1) with her focus on intra-action

which both indicates the connected nature of things, as well as the temporal element of interaction, that comes to constitute them, is a thinker also deeply focused on process. Another scientist with a strong focus on process and its irreversibility is the Nobel Price laureate Ilya Prigogine. His pioneering work in non-equilibrium thermodynamics, and his investigations of dissipative structures is key to the characterisation of emergent behaviour in nature and the irreversibility of the temporal arrow (Prigogine and Stengers, 1997).

Overall, the interdependence of structure and time is a central theme in the postmodern and metamodern philosophical paradigm. For example, it is central to the thinking of proto-metamodernist Jean (Gebser, 1949), for his integration of process into mathematics, physics, biology, psychology, philosophy, jurisprudence, sociology and economics, music, architecture, painting and poetry (Gebser, 1949). His analysis details the wide-ranging implications of an alternative conceptualisation of process that shifts the understanding of all the aforementioned disciplines. It leas Gebser to postulate a novel paradigm, which he calls 'integral' (in many ways similar to metamodernism). Interestingly, his discussion not only focuses on temporal aspects, but also on architectonic themes like a fourth dimension that links space and time, systemic interpretations of the world, and mediation between the two poles of dualistic world-views

The integration of process is a central theme in many parts of the metamodern paradigm of philosophy. In particular, process features as an evolutionary perspective in these thinkers, who place both the subjective as well as parts of the objective realm in an evolutionary context in which irreversibility, unpredictability, and openendedness can no longer be disregarded. For Peirce, both of these influences can be seen and the wide interest in Peirce's metaphysics can in part be attributed to its integration of process.

4.4 Combination of Architectonic and Processual Models

In the last section, we have established a fundamental connection between structure and time. Here, we will briefly review a number of thinkers whose thinking and models combine both architectonic and processual aspects. Themes that will be touched upon in this section include (1) the interaction of theory and practice, (2) the coordination of science and religion, (3) and anti-essentialist positions.

The aim of this section is to indicate that combining the architectonic and processual models discussed above can generate certain clusters of patterns or ideas that between them have a certain family resemblance[56] (Wittgenstein, 1977). This links the more metaphysical aspects to the broader metamodern philosophical paradigm and its various expressions in other fields. As such this section is less about metaphysics, rather about connecting metaphysical themes to practical aspects that manifest in other fields.

As already mentioned in section 3.6, Pierce was both a working scientist—conducting experiments in various scientific disciplines—as well as a philosopher. For this reason, he had a keen awareness of the influence of scientific practice on theoretical ideas, and vice versa. It is therefore not surprising that his architectonic system, which structures the various sciences from most specific to most general, always considered the less general science providing data and insight via practice to the more general science. The more general discipline then organises these insights through theory, which in turn provides directionality to the research performed in the less general one. Beyond that he often conducted experiments to directly validate the theories he was building. Additionally, his shift away from purely theoretical and idealistic positions towards more pragmatic oriented ideas of truth, are a further indication of him rethinking the relationship between theory and practice[57].

[56] Although not explicitly mentioned in this section, the relationship between subject and object can also be subdivided into architectonic and processual modes. Architectural aspects are, e.g., the triplicate structure of subject, object, and the third that relates. Processual aspects are, e.g., the move from firstness to secondness to thirdness.

[57] As with most of the points discussed in this section, this can be more or less directly derived from the understanding of the intimate connection between architecture and process discussed in the previous section. In this case, the architectonic relationship between subject, object and a mediating

Parallels to this kind of thinking can be found in various fields adjacent to philosophy of mind, for example in the paradigm of 4E cognition (embodied, embedded, enactive, and extended), which looks at the interrelation of physical and social environments with both body and brain (Newen et al., 2018). Another example, from the philosophy of science, could be the turn away from understanding models as representations of reality, towards an artifactual approach that better accounts for the modal aspects of modelling (Knuuttila, 2021). In architecture and design studies, concepts like "ontological design" are gaining traction that are directly focusing on the feedback loops that govern how the contexts that surround us come to shape us (Willis, 2006; Escobar, 2018). A further example can be found in the work on Non-Philosophy by Laruelle and Adkins (2016) that also builds on a reintegration of theory and practice. Additionally, the political ambitions of the nordic school of metamodernism could be cited, who argue that action-oriented theorising is an integral part of their work (Freinacht, 2017; Andersen, 2019; Andersen and Björkman, 2017).

Peirce shared with his pragmatic contemporaries an avid interest in religion and spiritual experiences. His three categories, are the most general distinctions that can be made, before our experience and the world turn into primordial oneness (Peirce et al., 1997, 5.82-5.92). As Brier (2008b) puts it, *"Peirce seems to be a panentheist. It seems fair to characterise him as a mystic whose path to enlightenment is science as a social activity."*.

It is not surprising that one of the editors of the *Collected Papers of Charles Sanders Peirce*, Charles Hartshorne (Peirce et al., 1997), came to develop process theology, combining Whitehead's process philosophy and much of Peirce's thought with theological studies (Viney, 2020). The contemporary religious movement of syntehism draws inspiration from these process theologies (Bard et al., 2014). It attempts to recreate certain communal aspects of traditional religions for people with an atheist or pantheist mindset. It's practitioners attempt to recreate the feelings of awe and community without the confine of traditional religious intuitions and norms. The

third is parallel to a novel relation (third) between theory (that which is more heavily based in the subjective) and practice (that which is more heavily based in the objective) (Peirce et al., 1997, 1.616-1.648).

movement has gained support from speculative realist like Quentin Meillassoux and Brassier (2009), among others.

The third theme that will be briefly discussed here are various anti-essentialist positions central to the metamodern paradigm. Peirce himself was a strong critic of any kind of epistemological foundationalism through his work in semiotics (see section 3.4). He further argued against ontological foundationalism and held a fallibilist position. This is directly linked to his understanding of *tychism* or chance and the evolution of habit.

Many thinkers that have been cited throughout this thesis hold similar beliefs, among them Freinacht (2017), Bhaskar (1997b) and Landry (2002). While these anti-essentialist or anti-foundationalist positions are central to metaphysical inquiry they often have more specific expressions if various disciplines. One example is Popper's anti-historicism, which holds that history is not converging towards a single point (Popper, 2002b). As discussed in section 2.1, modernity is not the end of history and its expressions can vary from culture to culture. Anti-anthropocentrism is another example, hinted at in Pierce's pansemiotics, where the centrality of humans and the human mind is criticised and contextualised within a broader view on evolution and the recognition of other sentient animals (Steiner, 2005).

The above mentioned themes are only a small selection of those that could be mentioned. They serve the purpose of illustrating that a novel understanding of the relationship between subject and object within architectonic and processual models leads to a qualitatively different philosophical paradigm that itself has a certain consistency or completeness.

5 Conclusion

Throughout this thesis I have indicated how a metamodern philosophical paradigm can be understood, how the work of Charles Sanders Peirce foreshadows various ideas found therein and what certain foundational and metaphysical components of such a paradigm might be.

This has been done by discussing the context of the metamodern paradigm in regards to to its precursors, pre-modernity, modernity and post-modernity. The emergence of metamodernism was briefly indicated and it was argued that like its precursors, metamodernity ought to be understood as a qualitative not quantitative category. Next, the concept of the paradigm was examined to specify its use in this thesis. Moreover, it was argued that further differentiation of these large-scale paradigms is crucial and that this thesis will focus on the philosophical expression of the metamodern paradigm.

The next part of the thesis discussed the philosophy of Charles Sanders Peirce and introduced the methodological framework that was utilised, named the paradigmatic approach. The complexity as well as inaccessibility of Peirce's work was acknowledged, hence his categories, a concept of high centrality to his work, were discussed first. These were interpreted as a fractal generator function from which many other parts of his work spring. Next, his architectonic system of the sciences was described and its relation to the categories was demonstrated to indicate a novel understanding of structure. The processual and evolutionary components central to his work were pointed out in the following section to show that his philosophy placed both subject and object in an evolving context and fundamentally connected them to each other via a third, that was often an expression of his pan-semiotic theory of signs. The final section in this part of the thesis explored the context in which much of pragmatic philosophy was born, to allude to common elements in this philosophical trend. This served three functions, first, indicate the accelerating and rapidly changing world of the 1870s, second, allude to the internal coherence of ideas formed in contrast to certain external conditions, third, mention certain philosophical elements that would also show up in the expression of the metamodern philosophical paradigm.

The third part of this thesis is roughly parallel in structure to the second part. A generalisation of Peirce's categories is discussed, via a novel understanding of the relation between subject and object as found in the metamodern paradigm of philosophy. These two are no longer separated, unified or not yet differentiated, but seen as distinct and inseparable and connected through a mediating third. Thereafter, architectonic structures are discussed to point towards a new perception regarding the arrangement and interaction of various elements in a given philosophical framework. The processual and evolutionary components present in metamodern philosophies are further mentioned as central aspects thereof. It is argued that these three elements, the relation between subject and object, structure as well as process are the centrepieces of the metaphysics within the metamodern philosophical paradigm. The part ends with a brief discussion on more concrete philosophical ideas found in Peirce and the metamodern philosophical paradigm at large, that follow from a novel understanding of subject and object, structure and process.

On the whole, this thesis demonstrated that an analysis of the metamodern paradigm in philosophy can be made sensibly given a focus on qualitative aspects. Various elements present within this paradigm are discussed and arranged via the identification of three central elements that connect these, namely, a new interpretation of the relation between the subject and object, a renewed and qualitative different focus on structure and architecture as well as a deep consideration and integration of evolutionary and processual themes. Furthermore, the thesis establishes that the work of Charles Sanders Peirce can be interpreted as proto-metamodern and that a paradigmatic interpretation of complex and large-scale thinkers can have its merits.

Due to its length many relevant discussion were kept to a bare minimum and should be further explored. These include a more extensive discussion on the various qualitative aspects of the metamodern paradigm along with the correlation of various developmental trajectories to paint a more cohesive picture. Peirce's work could be examined in much greater detail due to its sheer extent, especially his work on semiotics and logic could be examined more closely as many recent developments in these field build upon these insights or rediscover them. Another worthwhile examination could be a more comprehensive comparison of the sociological and cultural factors that influenced both

pragmatic and metamodern philosophies. Additionally, a more extensive mapping of various philosophies onto the framework given in the last part of the thesis might yield valuable insight regarding its proposed generality. Lastly, the paradigmatic approach begs for the interpretation of more large-scale thinkers in the context of their operating paradigm, to further concretise these and thereby strengthen this very methodology.

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Abstract

Modern and postmodern discourses give little room for metaphysical inquiry. While the former reject premodern metaphysical systems, the latter critique the possibility of metaphysical truths per se. Yet, metaphysical assumptions—explicitly or implicitly—shape the foundations of many current debates, in academic philosophy and society at large. The lack of any deliberative metaphysical discourse in modern and postmodern societies has led to a meaning crisis that results in a sense of emptiness and fatigue. The exploration of abstract yet fundamental metaphysical truths an essential prerequisite for any robust and sustainable collective meaning-making processes.

While the topic of metaphysics currently remains at the fringes in philosophical discussions, it is slowly gaining momentum with the emerging schools of object-oriented ontology, speculative realism, agential realism and the works of Roy Bhaskar, Zak Stein and Stuart Kauffman, among others who share an evolutionary, process-oriented and relational view of the world. My project aims to show that a post-Kantian way of doing metaphysics was introduced by Charles Sanders Peirce, which takes the insights of Darwin seriously and formulates an intricate model of thought that foreshadowed many of the more recent developments in this field. I plan to closely examine Peirce's work to indicate how the study of metaphysics can happen in a world after Kant and Darwin. Specifically, I will take a detailed look at Pierce's system of triplicate metaphysics, and his understanding of evolution, arguing for a metaphysics that need not confine itself to either process or substance, but finds a way to bridge them.

Abstrakt

Moderne und postmoderne Diskurse bieten wenig Raum für metaphysische Fragestellungen. Während erstere vor-moderne, metaphysische Systeme per se ablehnen, kritisieren letztere die Möglichkeit einer metaphysischen Wahrheit an sich. Dennoch bilden metaphysische Annahmen—explizit oder implizit—die Grundlage vieler gegenwärtiger Debatten. Das Fehlen eines deliberativen, metaphysischen Diskurses hat in modernen und postmodernen Gesellschaften zu einem Zustand der Leere und Anomie geführt.

Während die Metaphysik in der gegenwärtigen philosophischen Diskussion lediglich am Rande vorkommt, gewinnt sie mit den aufkommenden Strömungen der Object-Oriented Ontology, des spekulativen Realismus und des Agential Realism langsam an Bedeutung. Dazu gehören die Arbeiten von Roy Bhaskar, Zak Stein und Stuart Kauffman u. a., welche eine evolutionäre, prozessorientierte und relationale Sicht der Welt vertreten. Diese Arbeit untersucht die Philosophie von Charles Sanders Peirce, um zu zeigen, dass Metaphysik auch heute noch betrieben werden kann. Insbesondere werde ich einen detaillierten Blick auf das Peircesche System der dreifach gegliederten Metaphysik, sowie sein Verständnis der Evolution werfen und für eine Metaphysik plädieren, die sich weder auf Prozess noch Substanz beschränkt, sondern einen Weg findet, beide zu verbinden.