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Published by the Athens Institute

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The current issue is the second of the fifth volume of the *Athens Journal of Philosophy* (AJPHIL), by the published by the Philosophy Unit of ATINER

Gregory T. Papanikos
President
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- Acceptance of Abstract: **4 Weeks after Submission**
- Submission of Paper: **27 April 2027**

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- Social Dinner
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- Abstract Submission: **27 October 2026**
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- Delphi Visit
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The Complex Theory of Hope

*By Dimitrios Dentsoras**

The essay offers an account of hope that conceptualizes and analyzes hope' complexity. The Complex Theory of Hope, which the essay presents and defends, incorporates different competing theories of hope by placing them within a single framework. This is achieved by drawing a parallel between hope and complex systems, such as those studied by social and biological sciences. The resulting picture presents hope as a state that emerges from the interactions between a set of beliefs, desires, and other future-oriented cognitive and affective processes. The essay begins with a sketch of the different strategies philosophers and psychologists have employed in providing a definition of hope and with a discussion of their shortcomings. Following that, it presents the Complex Theory of Hope, which provides a general framework for combining the different attributes of hope brought up in philosophical and psychological literature. The goal is to provide a way of conceiving hope as a complex psychological state, while emphasizing its link to cognition, affect, and agency.

Keywords: *hope, optimism, emotions, moral psychology, complex systems.*

Introduction

We all have a notion of what it means to hope for something, of what it is like to lose hope, and of the factors that affect our hopeful or hopeless attitudes. We also have an idea about the wide range that hope-related attitudes can occupy, from specific events to more general assessments of our lives. Things become thornier when we try to move past such general observations. On the one hand, it seems difficult, if not impossible, to provide a definition of hope that covers all the conditions under which people report its experience. On the other, it is often difficult, if not impossible, to distinguish between the underlying psychological factors that lead to hopeful attitudes, the factors that constitute hope proper, and those that result from hope. The first set of problems is apparent in the philosophical literature on hope, where the various proposed definitions of hope fall victims to counterexamples or fail to capture some important aspect of hope. The second set of issues can be seen in psychological analyses of hope that focus on hope's measurement. Research has revealed a large number of correlations between a subjects' reported hopefulness and a predefined set of conditions, but it is often unclear if the correlated psychological states are causes or constituents of hope.

Our intuitions and common descriptions of hope indicate that hope is a complex state that cannot be reduced to a set of beliefs or desires. This is why it is possible for people who share the same beliefs and desires about an outcome to develop very different hope-related attitudes towards it. The complexity of hope is also suggested by the fact that we often maintain hope, when all reasons point

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towards abandoning it, and we sometimes abandon a long-held hope, even through the relevant circumstances and our beliefs about them have not changed. Such reactions only make sense if hope involves more than just an assessment of the probability that a desired outcome comes about.

The essay's goal is to give an account of hope that focuses on the complexity of its experience. In order to conceptualize and analyze this complexity, it will present and defend a *Complex Theory of Hope*. The theory maintains that hope is a psychological state that emerges from the complex interaction between related cognitive, conative, and affective elements. Rather than trying to identify hope with any set of such elements, as recent philosophical accounts of hope often do, the Complex Theory considers hope a state that crucially depends on the *structure* and the *relations* between the beliefs and desires that give rise to it, and not merely on their presence. This is why people who have the same beliefs and desires about a certain outcome might exhibit different hope-related attitudes. The resulting view of hope is that of a positive attitude towards future events that is grounded on the combined effects of states such as being able to imagine success in one's goals, conceiving of pathways to success, and maintaining confidence in one's agency.

The following section will give a sketch of the different strategies that philosophers and psychologists have employed in providing a definition of hope and will highlight some of their limitations. Section Three will present the Complex Theory of Hope, which provides a general framework for combining the different attributes of hope brought up in philosophical and psychological literature. The last section will examine how the Complex Theory of Hope can avoid some shortcoming of previous theories and will draw practical lessons regarding hope's assessment and enhancement.

Recent Accounts of Hope

Hope has historically been treated by philosophers ranging from Aristotle and Aquinas to Descartes and Hume as an emotion along desire, joy, and fear (Cartwright 2004, Day 1969). During the twentieth century, philosophical and psychological accounts of hope have mainly focused on the evaluative cognitive aspects of hope, in providing a definition of the phenomenon. J. P. Day (1969) provides a paradigmatic definition of hope (henceforth the *Standard Theory*) that has been used for the better part of the twentieth century: "'A hopes that P' is true if and only if 'A wishes that P, and A thinks that P has some degree of probability, however small' is true." Robert Downie (1963) expresses a similar thought, when he tries to establish a set of necessary conditions for hope: "The criteria for 'hope that' - which I shall call the minimum conditions, for all genuine hope - are desire for the object of hope and belief that its attainment lies within a range of probabilities which includes what we ordinarily call improbable."

While intuitively part of our common sense understanding of hope, the minimal conditions presented by Day and Downie are rather loose, allowing attitudes different from hope, such as expectation, to count as hope, and, in some cases, even failing to distinguish hope from opposing states, such as despair (Meirav 2009, Kwong 2019,

Palmqvist 2021). Numerous examples in the hope literature show that the Standard Theory fails to provide sufficient conditions for hope. Moreover, the Standard Theory seems to leave out many features of hope that are paradigmatic or representative of hope, even if they do not appear in every case of hope and, therefore, do not constitute necessary conditions. To address and rectify these shortcomings, philosophers have often employed a strategy of *augmenting* the Standard Theory (Chignell 2022). This usually consists in adding further characteristics of hope and in specifying the kinds of desires that are involved in hope, the beliefs that accompany hope, or the objects that hope is directed towards.

Much of the philosophical literature on hope contains an ever-increasing list of hope's cognitive, conative, and affective aspects. Features of hope that have been presented in philosophical literature include, among others: the cognitive resolve to pursue a course of action leading to the desired outcome (Petit 2004); evaluating factors that go beyond the hoped for prospect (Meirav 2009); "seconding" one's commitments and sustaining practical pursuits (Martin 2013); mental activities, such as imaging and fantasising about the desired outcome (Bovens 1999, Walker 2006, McGeer 2004); being able to envision some pathways in which the desire outcome can come about (Kwong 2017); "a phenomenological idea of the determinate future whose content includes success" (Calhoun 2018). All these augmentations point towards the same direction: the Standard Theory that sought to define hope through a restricted set of necessary conditions does not account for the complexity of hope and does not explain why hope can be beneficial and desirable, especially in cases of hardship and doubt.

In general, the augmentations of the Standard Theory aim at two goals. The first is to address the problem of correctly identifying cases that intuitively qualify as hopeful, and to resolve some of the counterexamples to the early orthodox definitions; the second is to explain what makes hope special and different from other similar attitudes. The different features of hope-related attitudes that the various augmentations of the Standard Theory propose seem to be prima facie plausible and largely compatible with one another (Webb 2007). So, in principle, there is no reason why we could not adopt multiple augmentations of the Standard Theory. In fact, some of the theories, such as the incorporation model adopted by Martin 2013, seem to do exactly that.

In her criticism of the Standard Theory, Martin notes that the mere presence of a belief about the possibility of an event and a desire for it are not sufficiently for distinguishing adequately between cases of hopefulness and hopelessness. In many cases some further mental state is required (such as fantasising about an outcome or showing resolve to working towards it). More importantly, though, these additional mental states need to be somehow incorporated into one's motivational process and their actions. Martin thinks this is achieved by providing reasons to act in a way that takes a favourable outcome as possible and achievable.[1] According to Martin, this looking at a possible and desirable outcome

[1]Martin 2013, 24: "The key difference between the characters in the challenge cases is that the hopeful people stand ready to justify dedicating certain kinds of attention and thought to the outcome, as well as hedged reliance on the outcome in their plans; moreover, they stand ready to appeal to the outcome's probability as part of their justification for these activities."

as justification for planning one's actions is an *additional* aspect of hope, besides the agent's desires and beliefs about an event.[2]

Calhoun 2018 also adds a motivational aspect to what she calls "substantial practical hope", which she describes as a "phenomenological idea" of a future that includes success. Calhoun's reason for the addition is that beliefs and desires alone are often not enough for motivating someone the way hope paradigmatically does. What exactly is involved in developing a hopeful motivational orientation from one's preferences and assessments of probability is left rather vague by Calhoun. The looseness seems intentional, and justifiable, since it reflects common self-ascriptions of hope. For example, hopeful people sometimes report being able to envision pathways to success, or a high level of resolve in pursuing it. But this is not always the case, especially when success involves a lot of external factors.

Psychological studies have also expanded their emphasis from the simple measurement of hope-related beliefs and desires of the Standard Theory to other equally important, and in some cases more representative, aspects of hope, such as the perception of agency and available pathways to success, the ability to envision a successful future, positive readiness and expectancy, and the ability to give meaning to one's continued existence (Pleeging 2022). As these studies show, the variance in hopeful and hopeless attitudes is not only, or even primarily, due to the canonical belief and desire couplet of the Standard Theory, but due to other factors that include a sense of agency and control and the ability to envision a successful outcome and pathways through which it can be achieved.

Despite its improvements, the augmentation approach is not without challenges and causes for concern. One evident pitfall has to do with features that might appear in some instances of hope but do not seem to be necessary, or even characteristic, conditions of hope.[3] A more concerning complaint against the augmenting strategy has to do with the strategy in general, rather than any particular augmentation. The worry is that augmenting the Standard Theory complicates the picture unnecessarily, by adopting a piecemeal process that can balloon if we are to respond to counterexamples by adding new features, every time we need to make a distinction between different hope-related attitudes.

This leads to a new challenge for the augmentation strategy. Since the features of hope in the literature are often compatible with each other and seem to reveal salient aspects of the phenomenological experience of hope, it would seem reasonable to combine the different augmenting theories. But how are we to do so? The two most straight-forward ways, conjunctively or disjunctively, seem both

[2]Martin 2013, 36: ""Hope," using the term perhaps a bit loosely, is a mental state composed of other mental states: desire, probability assignment, the representation of the probability in a licensing way, the representation of the desire as a practical reason."

[3]For example, the requirement that hope involve the belief that the desired outcome is improbable, even though possible (Miceli and Castelfranchi 2010) and the requirement that hope be accompanied by the belief that the outcome is to some extent dependent on factors outside one's control (McGeer 2004) seem unduly restrictive. Something similar can be seen in more recent psychology research on hope. Rustøen 2018 suggests that many factors used to evaluate and measure hopeful attitudes in the earlier Herth Hope Index can be left out without statistically affecting the results. Pleeging 2022 goes further by validating shorter versions of *four* hope instruments, leaving out a whole set of features that presumably relate to hopeful attitudes.

problematic. If we were to try and combine the amplifications of the Standard Theory conjunctively, we would run the risk of making the analysis of hope susceptible to counterexamples, since not all cases of hope demonstrate the various features of the augmenting accounts. If we were to join them disjunctively, we would lose the explanatory character of the proposed description of hope. In this case, it is not clear why attitudes that share different features, such as showing cognitive resolve or being able to fantasize about the desired outcome, belong under the same description of being instances of hope.

An alternative approach adopted by recent philosophical work on hope goes in the opposite direction and tries to *revise* the Standard Theory by clarifying the kinds of beliefs and desires that constitute hope. This sometimes involves a further specification of the belief that a desired outcome is possible, for example by viewing it as a "live possibility" that passes a certain threshold (Palmqvist 2021), or a reworking of the connection between hopeful beliefs and desires, for example the idea that one can only experience hope if their desire for something is "directly causally influenced by the belief that fulfilling the desire still possible" (Milona 2019).

Revisionist accounts manage to address some of the most obvious counterexamples to the Standard Theory. But this is not always the case.[4] More importantly, it is often hard to see what separates cases of hope and despair without introducing some extra feature of their psychological state. Why would someone who assigns the same probability to an equally desired outcome with a hopeful person, fail to see the outcome as a live probability, as Palmqvist 2021 requires, or fail to causally link his desire with the belief about the outcome's probability, as Milona 2019 wants? If we try to give an answer based on their cognitive and emotional state, then we should include these further features to the description of hope. But then we would end up with yet another augmentation of the Standard Theory.

The increasing amount of psychological research and philosophical analysis seeking to either augment or revise the original Standard Theory only helps to reinforce the idea that hope is a complex phenomenon that resists any set of necessary and sufficient conditions. This has led some to *abandon* the Standard Theory and the pursuit of defining hope more generally, and to settle instead for a functional account of hope and a description of hope as a primitive/irreducible mental state and of its particular instances as cases that share a family resemblance (Segal and Textor 2015, Blöser 2018). There are two principal motivations behind holding such a position. The first is the idea that hope has some suis generis motivational force, and perhaps some other distinctive feature that cannot be captured by any account that compiles mental states such as beliefs, desires, etc. (Segal and Textor 2015). The second is the claim that there can be no necessary conditions for hope, even those of the Standard Theory, since we can always come up with examples that intuitively constitute hope yet are not instances of desiring an outcome or believing it has a chance of coming about (Blöser 2018).

Much of the appeal of such irreducible theories of hope depends on how broadly or narrowly we understand the constituent features of hope in the various amplifications or revisions of the Standard Theory. Blöser 2018, for example,

[4]For example, Chignell 2022 offers some counterexamples to Milona 2019, which echo an objection raised by Calhoun 2018, 84.

agrees that cases of hope typically involve a pro-attitude, but maintains that this pro-attitude is different than desire, although it can guide action and dispose one towards certain events, just like desire. But, if that is the case, then all we need is to present the more general pro-attitude as a constituent of hope, resulting in another revised version of the Standard Theory. Similarly with beliefs: one may hope for something without having any beliefs about its probability, or even its possibility. But, in such cases, there must be some *implied* belief about the outcome. It would be odd if someone who hopes for something without thinking much about it (say, he hopes that Roger Federer wins at Wimbledon this year) continues to do so once they have considered the related facts (Roger Federer's retirement from tennis a few years ago) and has concluded that the outcome is impossible. In that case, again, all we need is to understand the Standard Theory broadly enough to include both conscious and implied beliefs.

The radical strategy of abandoning the Standard Theory places a significant challenge to the goal of providing necessary or sufficient conditions for hope. But, even if we were to accept that *any* feature of hope, even the two central conditions of the Standard Theory, may not be present in some (probably marginal) cases of hope, this does not mean that hope is an irreducible and primitive mental state. If that were the case, then people who experience hope would be unable to describe and justify it, as is the case with other primitive states, such as having the experience of color. But this is not what usually happens. Even if there is no single necessary feature of hope that covers every instance of hope, there certainly are some core characteristics that usually accompany it and that separate it from other states, even those closely linked to hope, such as expectation or wishful thinking. Moreover, these features must have some common ground, otherwise they would just be an arbitrary and haphazard collection. The challenge is to *find the connecting link* between the features presented by the various augmentations and revisions of the Standard Theory. This will be the task of the next section.

The Complex Theory of Hope

The Complex Theory of Hope that this section will present is an expansion *and* a revision of the Standard Theory. Despite its inadequacies, the Standard Theory can provide a starting point for a theory of hope. The reason is that it captures some important intuitive ideas about hope, broadly construed along a cognitive and a conative axis (Chignell 2022). What the Standard Theory and its augmentations and revisions are unable to provide is a definite set of necessary and sufficient conditions for hope. But there is no need for that. We should not expect a psychological state with such a wide range of targets, related attitudes, and resulting actions to be reduced to necessary and/or sufficient conditions.

It is clear that we need to add more elements to the Standard Theory as originally proposed. Hope involves more than just a desire and a belief, and usually more than desires and beliefs.[5] Exactly how much more needs to be added

[5]The definition of hope in terms of beliefs and desires is, to some extent, a product of a particularly philosophical point of view. Psychologists and most non-philosophers do not typically group their

varies significantly from case to case. More importantly, the number of hope-related cognitive and conative states is only *one* of the conditions for hope. In addition, such states often *relate* to each other, in a way that provides mutual grounding. For example, beliefs about the probability of a desired outcome can be grounded on the ability to conceive possible pathways to success or to envision future states. Common intuition as well as research reports on hope suggest that people are generally able to express and analyze their hopes, and to describe how they feel and why, by connecting their hopeful attitudes with specific beliefs and desires. At the same time, people usually offer a variety of factors and causes for their hope-related attitudes, from the assessment of probabilities, to feelings of self-confidence and trust, to the existence of available pathways to success. Hope, in this sense, seems to be "multi-dimensional" (Rustøen 2018).

The Complex Theory of Hope maintains that hope is a psychological state that emerges from a complex system of interacting components that can be arranged along cognitive, conative, and affective axes. This means that hope *cannot be reduced* to any set of beliefs, desires, or mental images that the various augmentations of the Standard Theory have proposed. It rather *emerges* from the complex system created by these components. In this respect, the Complex Theory differs from the majority of the augmentations and revisions of the Standard Theory, which consider hope to be a collection of cognitive, desiderative, and emotive states. By seeing hope as more than a set of features, as the Complex Theory suggests, we can avoid the problem of explaining why people with the same beliefs and desires develop different hope-related attitudes, without having to introduce a new element every time. Instead, we can point to the fact that the same beliefs and desires can relate to each other in different ways, leading to different psychological states.

Looking at hope as a state that emerges from a complex system also makes it possible to separate hope from other hope-like states, such as optimism or wishful thinking, which often focus on a single aspect of our attitude towards an event, such as the probability of its coming about, in the case of optimism, or our desire for it, in the case of wishful thinking. It also allows us to attach to hope certain aspects that seem characteristic of hope, yet cannot be identified with a belief, desire, or affect. Two such characteristics are hope's dispositional aspect, its being a "way of looking at the future", and its motivational effect, the fact that one's hopes often motivate them to pursue a course of action or to experience certain emotions.

Some accounts of hope, such as those in Martin 2013 and Calhoun 2018, present hope as something that cannot be defined in terms of beliefs and desires alone. The Complex Theory follows a similar idea of hope as a way of looking at the future and of coordinating one's plans. Such a functionalist perspective also fits character traits (e.g., kindness, honesty), which emerge from a complex system of beliefs, desires, and other related psychological states and govern our behavior. A conception of hope as something that emerges from the interactions of cognitive, conative, and affective components arranged in a complex system can

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mental processes and states in terms of beliefs and desires. On the other hand, many of the non-belief or non-desire additional features of hope, such as envisioning pathways or looking at the future in a certain way can be associated with relevant beliefs and desires, even if they are not reduced to them.

supplement accounts such as those of Martin and Calhoun and allow for a better quantitative analysis of hope.

One notable difference from Martin's and Calhoun's account is that the motivational aspects of hope, such as the disposition to view the future in a way that requires a certain action or attitude (what Calhoun refers to as the "phenomenological idea of a determinate future" and Martin as the "representation of the probability in a licensing way") are not separate features of hope that exist parallel with or on top of the beliefs, desires, and related mental states one has, but rather aspects of hope that arise out of the structure and interactions between them. For example, a patient might come to view their condition as hopeful *because* their beliefs about the probability of recovery are colored by their envisioning of different pathways to success, and their general moral commitments (e.g. their belief in the value of resilience). The interaction between the different components of hope is also noted by Martin, in the presentation of her incorporation theory. Reasons and desires interact by constricting our options, by expanding them, or by presenting them in a different light. I think that such interactions are an integral part of hope. Moreover, by looking at hope as a state that emerges from one's beliefs, desires, and related mantal activities, we can give an account of the motivational aspects of hope that does not merely place them alongside the agent's probability estimates and preferences, as Martin and Calhoun seem to do.

The important claim, for the Complex Theory, is that, as an emerging property of a complex system, hope is more than the sum of its parts. This is evident when we examine people that share the same beliefs and desires yet exhibit different attitudes because of the different ways in which their beliefs and desires relate to one another. According to the Complex Theory, hope is not just one or more beliefs plus one or more desires, images of success and pathways to it. But hope is not separate from the complex system of cognitive and conative elements that give rise to it, either. Rather, it is a property of *the whole complex system* and cannot be identified with any subgroup of components. Thinking of hope in terms of complex systems can help us analyze it more accurately than the mono-dimensional accounts that many augmentations of the Standard Theory adopt. It also corresponds more closely to how people describe and justify their hopes, especially in times of crisis.

The wide range of systems that exhibit complexity make it practically impossible to give a single definition of complexity that covers all cases. Yet some features of complexity seem central to it and appear in the most representative examples of complex systems, especially those of the social sciences, such as social groups (e.g., political parties) and economic structures (e.g., the financial system). These include, among others: *numerosity* (the existence of multiple components/ parts that make up a system); a *structure* that is not imposed externally but comes out of the *interaction* between the component parts; *feedback* loops that occur as the parts of the system interact with each other, leading to changes of the parts that occur within the system, and often the *emergence* of a new arrangement (Ladyman and Wiesner 2020).

By drawing a parallel with these complex systems, we can reveal some prominent features of hope. These include:

a. *Numerosity*: hope includes multiple components, such as beliefs, desires, and mental images of future events.
b. *Structure*: some of hope's components can be grouped together based on their similarities (e.g., beliefs related to probabilities, or beliefs related to pathways and their conditions); also, some components are central features of hope (e.g., being future-oriented), while others are peripheral.
c. *Interaction and feedback*: changes in one component (e.g., envisioning available pathways to success) can affect other components (e.g., beliefs about the probability of success); often this involves feedback loops within the hope-structure.

According to the Complex Theory, these features are indispensable to hope, even if there are variations to the degree in which they stand out, depending on each case.

Numerosity

The Complex Theory maintains that there are more components to hope than the two conditions established by the Standard Theory. It also claims that hope cannot be separated from the beliefs, desires, and other cognitive and affective states that give rise to it. The arguments for both positions were presented in the previous section. There is no reason to try and limit the number of components of hope. Also, admitting one aspect does not require that we abandon any other. For example, we can include both seeing the outcome and a genuine possibility (Kwong 2019) and being disposed to focus on the outcome in a certain way (Chignell 2022) as aspects of hope. This does not mean that all components of hope that have been proposed by different philosophers in their augmentations of the Standard Theory are equally plausible, or equally paradigmatic of hope. Intuitively, some components are more central and ubiquitous (for example, a desire for what is hoped for).[6] But trying to rank every aspect of hope with respect to its significance and centrality would be a demanding and contentious task. What would suffice, at this point, is the general picture of hope as a complex state that contains a number of factors, some of which are more central and common, although none of them is prima facie necessary, especially if we are to include marginal or hypothetical cases of hope that serve as counterexamples in the philosophical literature.

The conception of hope as a psychological state that emerges from a system of multiple cognitive, conative, and affective components, has the advantage of allowing for distinctions between hope and other similar attitudes, such as expectation and wishful thinking. One way to make such distinctions is by adding to the complex system that gives rise to hope elements that do not appear in other hope-adjacent attitudes. For example, we can require that hope involves the belief that a desired outcome is unlikely (to exclude expectation), but still achievable (to exclude wishful thinking). This method appears intuitively plausible and can also be used to distinguish between different kinds of hope (Kwong 2020, Webb 2007, McGeer

[6]This is not to suggest that such a desire is a *necessary* condition for hope though. See Chignell 2022, 9, who offers a counterexample to the idea that all hopes imply that we desire the object of our hope. More such counterexamples can be easily created, even if they rarely occur.

2004). But the addition of new components every time we want to make a distinction between hope-related attitudes can also appear ad hoc and might introduce elements of hope that are not representative of its occurrences. A better way to distinguish hope from other relevant psychological states is by looking at the *structure* of the complex system of beliefs, desires, and related mental states from which hope emerges.

Structure

The idea that hope is a complex state that emerges from the *structure* and *interaction* between different cognitive, volitional, and affective elements can be best seen when comparing cases of people with the same beliefs, desires, and other related states regarding a certain outcome, who nevertheless develop different hope-related attitudes. Two patients might assign the same probability to their recovery, be aware of the same pathways to recovery, and even harbor similar mental images of their recovery. Yet, one of them might fail to connect these elements in the right way, leading to a state of despair, while the other hopes, due to her linking the same probabilities and pathways to the images of success.

Similarly, two patients might share the same belief that recovery is possible and might even make plans for their life after recovery. Yet, one of the two may base their optimistic outlook on a strong religious belief, with the thought that God always looks after him. In this case, his state is one of *faith*, rather than one of hope – quite literally, he states that he has "faith in his recovery." Similarly, the person who has no base for their belief that things will turn out well (even if probability-based beliefs are available) might be merely thinking wishfully. The patient who bases her plans for life after recovery on the probability of success, and the existence of the relevant pathways, on the other hand, can describe her situation as one of hope, a state different from wishful thinking, and from faith.

In many cases, the structure of hope's elements is based on providing grounds for one another. For example, a hopeful person might entertain images of success based on her consideration of multiple possible pathways, which is in turn based on the thought that success is not impossible, and on the belief that the situation is not out of one's hands. There may be some other interactions between hope's elements, involving dispositional effects or cognitive presuppositions. Strong desires can incline one to consider the relevant probabilities in a different light. Also, the ability to imagine the future in a certain way can depend on the conceptual range that is available; reading about medical advancements in prosthetics might widen the kinds of future an amputee can envision, which is the basis for their hope. The important claim, from the Complex Theory perspective, is to acknowledge that the relations among the different elements of hope lead to their structuring and to hope's emergence.

One important aspect of these structuring relations among the constituents of hope becomes evident when we examine the link between hope, agency, and action, which is crucial for the practical goal in promoting hope. Adrienne Martin's incorporation model points in this direction. According to Martin, hope can be seen as a syndrome where certain considerations that belong to it become parts of a *justificatory rationale*, which, in turn, factors into our rational agency or scheme of end (Martin 2013). In some of the examples Martin uses, such as her

Cancer Research example (Martin 2013, 28), people who hold the same beliefs and desires might act differently if these relate to one another in different ways, resulting in what Martin considers different kinds of hope. Not all the connections between the different elements of Martin's "hope syndrome" are necessarily conscious. In fact, they are often subconscious, especially in cases where someone experiences a recalcitrant hope-against-hope that contradicts their assessment of the probability of a desired outcome. In such cases, hope might arise due to a connection between desires or commitments that are part of someone's subconscious psychological framework and of their attitude towards the future.

Interaction and Feedback

Hope's complex structure is based as much on the components that give rise to hope, as on the relations between them. These relations are often dynamic and evolving, leading to loops that enhance or diminish one's hopeful attitude. For example, a cancer patient's hearing about some new antibody-based cancer treatment can lead to forming new pathways to success, even if the treatment is developed for a different kind of cancer and does not have a direct effect on the patient's belief about their chances of recovery. These added pathways can change the beliefs about the probability of remission, or the hope threshold, i.e., the probability that the patient considers to be hope-warranting. The change does not even have to be one where the patient's beliefs are revised. Maybe all that needs to change is the patient's focus (Chignell 2022). On the other hand, the assessment of one's current situation might lead to the abandonment of hope without any revision of future-directed beliefs and desires. A cancer patient may give up hope after having a few days of extreme pain, or after receiving little encouragement from doctors and family for a while. In response to these events, the patient may come to think that there are no reasons for hoping, even if she has not given any thought to her chances of recovery (as a matter of fact, doing that would reveal that they have remained unchanged).

The interactions between the components of the hope structure often reinforce one's attitude by creating loops that feed into one another. Envisioning some pathways to success can lead to strengthening the belief that the desired outcome might come about, which leads to having images of success, which opens the possibility for further pathways, and so on. These loops are crucial in practical cases that aim at fostering a hopeful attitude under medical challenges or adverse psychological conditions, such as depression (which themselves often tend to exhibit such loops and cascading sequences). The paradigmatic cases of hoping against all hopes also usually involve such loops, which circumvent any evidence that would normally lead to hope's abandonment. The terminally ill patient may refuse to give up hope, not because she holds the belief that recovery is probable, or even possible. Rather, she may have looped some peripheral beliefs (for example, the belief that she is "in good hands," meaning either the doctors or God), with images about the future (after all, being in good hands can function as grounds for being hopeful about the future), leaving aside the assessment of the probability of recovery. A lot of these interactions occur subconsciously, or automatically. So, while hope can incorporate different elements in an action-oriented and deliberate set of mental

states, much of the work is done by internal interactions among different hope-related mental states that occur without the agent realizing it.

The internal changes that occur as part of the interactions among the components of the hope structure can also explain some of the findings in the various measurements of hope in the psychology literature. These studies try to correlate a self-assessment of hopefulness with some preselected components that report an agent's sense of agency, their ability to find pathways to success, their self-confidence, or their spirituality (Pleeging 2022). This is a rather static picture of one's hope-related attitudes that does not take into account the possible interactions among these factors. Spirituality and religious beliefs are a good example here. While some studies find a correlation between spirituality and hopeful attitudes (Scioli 2011), it is hard to see how religious beliefs link to pathways or to a sense of agency – in fact, they seem to detract from it, since religious people often tend to downplay their agency in favor of the idea that what happens to them is part of a divine plan. So, while spirituality might seem to be a good indicator of hopeful attitudes (after all, thinking that God is looking after me can make me more hopeful), it turns out to be a rather isolated and not very useful factor. In fact, some research proposes that religious and spiritual attitudes do not have a statistical effect on the assessment of hope (Rustøen 2018). In general, the lists and correlations that appear in psychological studies of hope tell us a story, but it is only a partial story that should be expanded by looking at the internal interactions among the different components of hope.

Summing up, the Complex Theory of Hope maintains that hope is a complex state that emerges from multiple cognitive, conative, and emotive elements interacting with one another, and forming a structure. Where the Standard Theory, in its various expansions and revisions, tries to give some necessary and sufficient conditions for hope, the Complex Theory, as it has been presented, focuses on the relationship between the different components that make up hope, rather than merely providing a specific list of hope's constituents.

The Complex Theory of Hope in Practice

The proposed account of hope has a two-fold advantage. On the one hand, it can provide a solution to many of the problem cases that the philosophical literature on hope has raised. On the other, it can guide psychologists in assessing the hope-related attitudes of people under challenging circumstances and provide some insights into how hope can be maintained and enhanced.

Much of the philosophical literature on hope, starting with the criticism of the Standard Theory, is based on hypothetical and actual counterexamples where someone finds themselves in a situation that fits a proposed definition of hope, yet does not hope (Meirav 2009, Kwong 2019, Palmqvist 2021, Martin 2013). An oft cited example of the former is the case of Andy and Red, from the movie *Shawshank Redemption* (Bovens 1999, Meirav 2009). In the film, Andy and Red are two prisoners who both desire to escape and both believe that doing so is unlikely but not impossible. Yet Andy hopes of escaping while Red despairs. More generally, in many real-life situations, from the WWI trench soldiers in Palmqvist 2021, to cancer

patients in Martin 2013, two people might share the same beliefs about the probability of a certain outcome and desire for it coming about yet develop different hope-related attitudes. How is this possible?

The most likely reason for such an occurrence, the advocates of the augmenting strategy would maintain, is that hope involves more than the two elements of the original Standard Theory. For example, Palmqvist 2021 suggests that, while Red has the same belief about the probability of escape as Andy, he does not view escape as a "live possibility" because he has a higher probability threshold for warranting a hopeful attitude. Any probability below 2%, for example, might be a reason for despair for someone like Red but not for someone like Andy. Alternatively, Kwong 2019 claims that Red might be unable to envision possible pathways to success, although he harbors the same desire to escape. A similar strategy can be adopted in line with any of the proposed augmentations of the Standard Theory. Many of these augmentations are plausible responses, but they only partially answer the challenge. After all, we can create counterexamples where Andy and Red also share the same hope-warranting probability threshold, and even the ability to envision pathways to success (for example, Andy could have discussed a possible escape plan with Red). In that case, one would have to add yet another feature of hope, in order to distinguish between Red's and Andy's hope-related attitudes, leading to a possible regress.

The Complex Theory of Hope adopts a different strategy than augmentation. According to it, what prevents Red from hoping is not necessarily that he lacks a belief, desire, or envisioned pathway. Instead, he might lack the required *connection* between his relevant states and any *interaction* between them. In this case, Red might fail to see the escape plan as a pathway to freedom, or to connect the weaknesses of the prison security with his beliefs about the possibility of pulling off the escape. Andy, on the other hand, who has the same beliefs, desires, and envisioned pathway, connects them in a way that creates an attitude of hope. The Complex Theory suggests that we do not need to posit a new requirement for hope, in order to accommodate cases such as *Shawshank Redemption*. Instead, we can focus on the structure and connections of the components of the complex system that hope emerges from, in order to make the necessary distinctions between different hope-related attitudes, such as those of Red and Andy.

A similar strategy can be employed when looking at real life cases, such as incurable disease or permanent disability, where people maintain hope under circumstances that do not warrant it (what Martin 2013 calls "recalcitrant hope"), and cases where people abandon hope, without any seeming change in their beliefs about a desirable outcome, or their envisioned pathways to attaining it. Such medical cases often provide the background for psychological research on hope (Groopman 2004, Rizzo 1999, Katsaros 2014). Usually, researchers provide a list of factors whose relation to hope is to be investigated and see how these factors correlate statistically with patients' self-assessments of hopefulness. Unlike philosophers, psychologists are not primarily concerned with the definition of hope. This explains why they usually do not ask their research participants how they understand hope, when making a self-assessment of their hopefulness. But, despite the obvious variations in the different psychological descriptions of hope (Webb

2007), there seem to be some common ideas that correspond to the central features of the Complex Theory.

A common assumption among researchers is that hope is affected by a large number of factors (usually more than a dozen) that span over different aspects of human emotions, cognitive functions, and behavior (Pleeging 2022). By looking at the correlation of these factors to hope's self-assessment, two kinds of conclusions can be drawn. On the one hand, as one would expect, some factors, such as being able to envision pathways to success and positively accessing the possibility of success, have a higher correlation with self-assessments of hope and could be seen as core features of hope (Rustøen 2018), even if they do not always correlate in the same way across different conditions (Pleeging 2022 mentions some such variations). This is something that the Complex Theory of Hope also posits, due to the fact that complex systems exhibit a structure, with some elements being core and some peripheral.

In addition, some factors and their corresponding levels of correlation with hope tend to be grouped in broader categories. Examples of such categories include evaluations of one's sense of agency, the ability to envision possible pathways to success, the capacity to set goals, and one's level of determination (Snyder 1991, Herth 1992, Scioli 2011). This grouping of factors is compatible with the idea that hope emerges from a complex system of doxastic, desiderative, and affective states. Such systems exhibit a structure that allows the different components to interact with each other. For example, beliefs about one's agency clearly depend on each other. People who think that they are able to respond to challenges without requiring external help, usually also tend to believe that they are competent and independent and attach moral value to facing one's problems and not groveling about them. A person with a high sense of agency in a challenging situation, such as serious illness, might remain hopeful exactly because she considers herself to be an independent and competent person who is up to a challenge. In fact, this self-assessment is inseparable from the hopeful attitude. To hope, in this circumstance, is to view herself as up to the challenge.

One aspect of hope that is less apparent in psychological research has to do with the interaction between the different components of hope. Such interactions and loopbacks are common to complex systems and intuitively appear to affect one's hope-related attitudes. For example, the pathways a patient is able to envision are affected by their sense of agency and independence. A deteriorating disability does not only decrease one's range of actions, but also their imagined pathways to overcoming their condition, and the estimated probabilities of doing so. The important point, as the Complex Theory indicates, is that such changes do not require any conscious reassessment of the possible pathways, or a reevaluation of the recovery probability. Changes can be fully internal and may come about through the interaction between the different components of hope's complex system. In fact, it would be a mistake to think that any factor affects hope independently.

The complex character of hope indicates that it is not enough to merely check for independent correlations between different factors and the self-assessment of hope. In addition, one should examine the *relationship* between the factors themselves. For example, one should check whether high scores in a factor, such as the sense of agency and self-reliance, correspond with high scores in another factor, such as imagined pathways or the assessment of probabilities. Furthermore, the

possible interactions between different hope-related factors can be examined by structuring the interviews so that they have a priming effect. For example, the subjects could be asked about their assessment of success probabilities either before or after they are asked to reflect on their sense of agency, or to envision different pathways to success. Going through such mental imaging, the Complex Theory suggests, can affect one's assessment of probabilities. To what extent this is the case, can be statistically examined.

Apart from providing guidelines for improving the measurement of hope, the Complex Theory can also be used to provide practical strategies for enhancing hope, especially in precarious cases. There is ample evidence that hope can not only improve people's lives but also help them overcome personal challenges. On the other hand, it is often important to avoid unwarranted optimism and false hope, which can lead to behavior that ignores the existing dangers and ultimately worsens one's situation. Diagnoses of disease with a very low survival rate are such an example (McMillan 2014). While doctors do not want their patients to despair, they also do not want to give false hopes that might lead to a patient foregoing some necessary preparations for their likely death. Hope, in these cases, should not be based on withholding information and on trying to alter the patient's beliefs about the severity of their situation or the lack of pathways to success.

The Complex Theory of Hope can offer some insights into how hope can be enhanced in such cases. This can be achieved through the interaction among hope's components and through the feedback loops that these components form. These feedback loops can be exploited in practical attempts to increase hopefulness and its related attributes, such as a sense of agency and meaningfulness. For example, in cases that crucially depend in the fine balance between avoiding unreasonable expectations and promoting a sense of meaning in one's life, hope can be promoted by strengthening the feedback loops between some pre-existing hope-related attributes (e.g., images of a meaningful future and a sense of agency) and by channeling those in the right direction, away from a naïve denial of the patient's predicament and towards the goal of coming to terms with the prospect of death.

Similar to other complex systems, hope is often unpredictable and sometimes mysterious. We can find it in people that face insurmountable challenges and overwhelming odds, to the point that it sometimes defies rational justification. This might seem frustrating for someone who wants to give a crisp definition of hope, preferably furnished with a set of necessary and sufficient conditions. But, far from being a troubling peculiarity, hope's complexity is a valuable and essential feature that adds to its value and that should be taken into account when we attempt to describe hope's nature and to promote its positive effects.

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Cartesian Products: From Elements to Maps

*By Ivonne Pallares-Vega**

This paper addresses an ambiguity, within Zermelo-Fraenkel set theory, arising from the attempt to define the elements of cartesian products, viz. ordered pairs, and hence an ambiguity in the attempt to define cartesian products themselves. The proposed solution takes us to a different conceptual framework: category theory. More specifically, to the category of sets and maps between them, in which the ambiguity is removed in a natural way. The case of cartesian products is only one example of the interplay between these two ways of axiomatizing the concept of set. The proposed solution to the ambiguity requires, in particular, to make a transition from thinking of elements as a primitive concept (as it is done in Zermelo-Fraenkel set theory), to thinking of them as special maps, which is the basic concept in the category of sets.

Keywords: *category of sets, cartesian products, functions, ordered pairs, Zermelo-Fraenkel set theory.*

Introduction

Set theory and category theory share a remarkable feature: many mathematical concepts from various and diverse areas can be defined within them, although certainly in quite different ways. However, neither theory arose with this purpose. The origins of set theory go back to the 1870's in the work of the German mathematician Georg Cantor. Its first axiomatization, published in 1908, is due to another German mathematician, Ernst Zermelo[1]. In 1964, the American mathematician and philosopher, F.W. Lawvere, proposed for the first time an axiomatization of the category of sets and maps between them[2]. Thirty nine years later Lawvere, in co-authorship with Robert Rosebrugh, published a more thorough axiomatization of this category[3]. All the axioms for this category that I use in this paper, are from this second axiomatization.

The overall aim in the analysis presented here is to show an instance of what in my view is a quite fruitful interplay between these two approaches to the mathematical concept of *set*: More specifically, I focus here on the many different ways there are for defining the concept of *ordered pair* in Zermelo-Fraenkel set theory (hereafter ZF), all of them equally satisfactory. Whichever definition one chooses, it will always be arbitrary, perhaps even just a matter of taste. In other words, there is no strictly mathematical reason for preferring one definition over all the others. So it is in this sense that I consider the concept of *ordered pair* in ZF ambiguous[4]. The aim of the

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[1]Zermelo E (1908a).

[2]Lawvere FW (1964).

[3]Lawvere FW, Rosebrugh R (2003). To my knowledge, no other axiomatizations of the category of sets have been proposed since then.

[4]In philosophy of language this phenomenon is called *underdetermination of the referent*, where the *referent* in this case is precisely "the" ordered pair (a, b).

paper is then to show that by moving from ZF to category theory (and more specifically, to the category of sets and maps between them), we no longer face the problem of having to choose one, among many other possible and equally good ways, for defining the concept of *ordered pair*. In the category of sets and maps between them, this ambiguity simply dissolves and in a natural way.

The paper does not contain, nor does it aim to offer, any new mathematical results. Indeed, its mathematical content is quite basic, not only in the case of the definitions and axioms used, but also in the proofs given herein. The paper is rather an exploration of the interplay between two axiomatic characterizations of the concept of *set*: ZF and the category of sets and maps between them (hereafter CS). The particular interplay here concerns the definition of cartesian products and hence of their elements. Part II shows in detail how the dilemma arises in ZF, and Part III explains what happens when we move to CS.

As far back as 1964, another similar problem was addressed by the American philosopher Paul Benacerraf[5]. Back then, many philosophers had argued that ZF was the right foundation for mathematics, and Benacerraf P (1965) argued precisely against this claim. In any case, the dilemma I address here lends itself to philosophical scrutiny. Moreover, category theory has raised many issues among philosophers of mathematics[6]. So another caveat is in order. Just as this paper does not aim to give new mathematical results, it does not either aim to address philosophical issues, not even the standard ones such as *What are the right foundations for mathematics? What are numbers, sets, functions, etc.? What is the meaning of mathematical statements? What is the nature of mathematical truth?*[7] What it does aim to offer is an introduction, *via* ZF, to a few basic concepts from category theory to anyone interested in it but who may find it too abstract to understand.

Part I: Elements and maps

Our starting point is ZF. In this theory everything is a set and there is only one basic concept, *viz.* that of *element* or *membership*, which is a relation between sets[8].

The following statement is called the axiom of extensionality

Extensionality Axiom

For any given sets A and B, $A = B$ if and only if A and B have exactly the same elements.

In its contrapositive form, this axiom states that $A \neq B$ if and only if there exists an element a in A such that a is not an element of B (or, equivalently, if and only if there exists an element b in B such that b is not an element of A).

[5]Benacerraf P (1965).
[6]See, *e.g.* Landry E (2017),
[7]Shapiro S (2000) addresses precisely issues such as these.
[8]Like most authors, I am not considering the binary relation of equality as a formal part of ZF in the way membership is. Following the vast majority of textbooks, I simply assume that it is reflexive, symmetric and transitive, with its meaning intuitively given.

This axiom, like all others in ZF, can be written entirely in logical symbols. However, in many contexts it is interpreted as stating that a set is completely determined by its elements. And this in turn can be interpreted or read in different ways. For example, if we are given some set A and we somehow "remove" an element from it, the resulting set is different from A. Analogously, if we "add" a new element to A, we end up with a set different from A. The interpretation I propose for this axiom[9] is the following: if one claims that a certain set exists, one must state precisely what its elements are—and this could be done in many ways, *e.g.* by giving a recursive definition, by listing them one by one, by the requirement that they satisfy some formula, etc. If one cannot do this, then one is not justified in claiming the existence of the set involved. I shall use this interpretation in Part II below. In ZF, cartesian products, intersections, unions and many other sets, are defined or axiomatized (or even proven to exist) by stating (or exhibiting) what its elements are or are not, as it is the case with the empty set.

There is, however, another important point concerning the requirement that a set be completely determined by its elements. In what is called basic *algebra of sets*, there are many theorems stated as equalities between sets. For example, one theorem states that for any given sets A, B and C, the following equality holds

$$A \cap (B \cup C) = (A \cap B) \cup (A \cup C)$$

In order to prove this, one needs to know what the elements of the sets $A \cap (B \cup C)$ and $(A \cap B) \cup (A \cup C)$ exactly are. And the same happens in the case of cartesian products, which will be discussed in Part II below.

One of the first axioms of ZF is somewhat strange for it tells us that there is *a* set that has no elements whatsoever. With these two axioms, one can easily prove that there is only one set without elements. This justifies the use of a special symbol and a name for it: *the* empty set, denoted as $\varnothing$.

The pairing axiom allows us to give life to the set $\{\varnothing, \varnothing\}$ which apparently has two elements. However, it follows directly from the axiom of extensionality that $\{\varnothing, \varnothing\}$ is exactly the same set as $\{\varnothing\}$. Notice that $\{\varnothing\} \neq \varnothing$ because the set $\varnothing$ does not belong to $\varnothing$, since this latter has no elements. In contrast, $\varnothing$ is indeed an element of $\{\varnothing\}$, and hence $\{\varnothing\}$ is *not* empty. Hence $\{\varnothing\} \neq \varnothing$. So now we have two different sets living in the ZF universe: $\varnothing$ and $\{\varnothing\}$.

It is precisely the set $\{\varnothing\}$, together with some special properties it has, what we are going to use to make the transition from thinking of elements in the sense of ZF, to thinking of them in terms of maps. So we now turn our attention to this latter concept.

Within ZF, the concept of *map* or *function* is not basic, it is defined[10] in terms of

[9]This proposal is not intended as a mathematical result that follows from the axiom of extensionality. I do not intend it either as a philosophical interpretation, although perhaps that is what it is. My interpretation is inspired in the criticisms to Zermelo´s axiom of choice at the beginning of the XX century. The axiom stated the existence of a certain function, and Zermelo´s critics demanded that he exhibited the function, which not only he couldn't do but, as we now know, it just cannot be done within ZF.

[10]Some would say *reduced* instead of *defined*. Indeed, many mathematical concepts can be so reduced, and before category theory entered the philosophical realm, this is what *foundations of mathematics* was usually taken to mean. A cursory look at the contents of a few randomly

sets (hence in terms of the membership relation). However, for the purpose of this section, we are going to use what one might call the *intuitive* concept of function. This is the concept that is mostly used in the practice of mathematics and in many real life cases.

Let us consider, for example, the following two sets:

$$A = \{a, b, c, w\} \text{ and } B = \{7, 15, 18\}$$

A function *from A to B* should assign, to *each* element of A, *one and only one* element of B. We use the letter f to denote the function in question and, for any element x of A, the expression $f(x)$ shall denote *the* element of B that the function f assigns to the element $x \in A$. The following three are all examples of functions from A to B:

(1) $f(a) = 7, f(b) = 18, f(c) = 18, f(w) = 15$

(2) $f(a) = 7, f(b) = 7, f(c) = 7, f(w) = 7$

(3) $f(a) = 15, f(b) = 7, f(c) = 18, f(w) = 18$

In contrast to the second example, and at least on the surface, there seems to be no rule for the assignments in the first and third examples. Nonetheless, each one establishes a function from A to B. For the second example, we can simply say that the function f is given by $f(x) = 7$ for all $x \in A$. So, as long as each element of A gets associated with one and only one element of B, even if the association is completely arbitrary, there is a function from A to B.

Let us now consider *the* set $\{\varnothing\}$ and take *any arbitrarily chosen* set A. Then clearly, there is one and only one function from A to $\{\varnothing\}$: all elements of A get assigned to the only element of $\{\varnothing\}$, *viz.* the empty set $\varnothing$. In other words, if we call this function f, then $f(x) = \varnothing$ for all $x \in A$. And this holds true even if A is the empty set. This is due to the fact that in ZF functions are defined as certain *subsets* of cartesian products. So a function f from A to B is a collection of ordered pairs (a, b) with $a \in A$ and $b \in B$, in which b, the second coordinate is the only element of B that the function f assigns to $a \in A$. In order to make this more conspicuous, we change the notation and write $(a, f(a))$ to express that this is an element of the function f from A to B, so that $(a, f(a)) \in A \times B$. So, in general, a function f from A to B is (in ZF) a subset of $A \times B$ of the form

$$\{(a, f(a)) \mid a \in A\}$$

with the property that for any $x, y \in A$, if $x = y$, then $f(x) = f(y)$. Or, equivalently, if $f(x) \neq f(y)$, then $x \neq y$.

With this concept of function, it is clear that $\varnothing \subseteq \varnothing \times \{\varnothing\}$. However, in order for the empty set to *not* be a function, the above mentioned property must fail. This means

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chosen introductory textbooks on set theory exemplifies this: following the definition of the natural numbers, usually comes that of the integers, then that of the rationals, the reals, etc.

that there must be at least one element of ∅ that gets assigned to *two different elements* of {∅}, which is clearly impossible. So, strange as it is, the formal concept of function in ZF, together with the fact that the empty set is a subset of *any* set, imply two things: first, that ∅ is also a set of ordered pairs (albeit empty); and, secondly, that ∅ is a function (albeit empty as well), in this case from ∅ to {∅}. To sum up, given any set *A*, including the empty set, there is always one and only one function from *A* to the one-element set {∅}.

Here is a key point about the above arguments: instead of {∅} we could have taken *any* other set as long as it had just one element. And this is the starting point of our transition from thinking of elements as a (basic) relation between sets to thinking of them as special maps. So let us denote an arbitrarily given one-element set as 1. Thus 1 has the property that for given any set *A*, including the empty set, there is always *one and only one function* from *A* to 1. We shall denote the uniqueness of functions with dotted arrows as follows, for any given sets *A* and *B*

Diagram 1

$$A \overset{f}{\dashrightarrow} B$$

or

$$f\colon A \dashrightarrow B$$

Let now *A* be any given set and consider all functions *from* 1 *to A*

Diagram 2

$$1 \longrightarrow A$$

In this case, the number of such functions depends of course on the number of elements that *A* has. The set of all functions from 1 to *A* is denoted as A^1. More generally, for any given sets *A* and *B*, the set of all functions from *A* to *B* is denoted as B^A. And there is a good reason for this. When the exponent is 1, it is not difficult to see that there is a bijection between A^1 and *A*. And when *A* is empty, A^1 is also empty. In terms of cardinalities, this case yields the familiar equation $0^1 = 0$. Another familiar equation arises when *A* has only one element: $1^1 = 1$. But we can say more about this latter case. Since for any one-element set *A*, the set A^1 of functions from 1 to *A* has only one element, this element must be the identity function on *A*. So we see there is a very close connection between the arithmetical operation of exponentiation, and the cardinality of sets of functions B^A. Indeed, in general $\text{card}(B^A) = \text{card}(B)^{\text{card}(A)}$. Thus if *A* is the empty set ∅ and the cardinality of *B* is *n* then the cardinality of $B^{\varnothing}$ is n^0, and this number is always equal to one. For the empty set ∅ we have that $0^0 = 1$. This equation tells us that there is exactly one function from ∅ to ∅ (albeit empty within ZF), which we shall call *the* identity function on ∅. For any non-empty set *B* with

cardinality n, the equation $n^0 = 1$ tells us that there is exactly one function from ∅ to B. And we shall call it *the inclusion function* of ∅ into B, which is accordance with the theorem in ZF stating that the empty set is a subset of *any* set. Finally, for any set A, including ∅, the set A^A is never empty, for there always exists *the* identity function on A. In arithmetical terms, for any natural number n, including 0, $n^n \neq 0$.

But what about functions *from* 1 *to* any given set A? If A is empty, the number of these functions is 0^1 which is equal to 0. In other words, the number of these functions is equal to the number of elements of A. Suppose now that A is not empty. In this case we can always define functions $1 \rightarrow A$ as follows. Let $a \in A$ be an arbitrary element of A and let • denote the only element of 1. So we define $F_a(\bullet) = a$. And we can do this for *each element of A*. In other words, every element a of A determines a function $F_a: 1 \rightarrow A$.

Let us now consider an arbitrary function $G: 1 \rightarrow A$. Then G determines a unique element of A, namely, $G(\bullet) \in A$. It is not difficult to show that this way of "picking out" elements of A through functions $G: 1 \rightarrow A$, together with the definition above of F_a for each $a \in A$, establish a bijection between A^1 and A itself. In terms of cardinalities, if n is the number of elements of A, this yields the familiar equation $n^1 = n$ (which, as we just saw, includes the case when $n = 0$). Whenever a bijection exists between sets, we say that they are *isomorphic*. If we denote the set of all functions from 1 to A as A^1, what we have is then A and A^1 are isomorphic sets. But we leave this important point for now[11], in order to take a first look at the world of categories.

In category theory one fundamental basic notion is that of *morphism*. Categories are constituted by two "ingredients": *objects* and *morphisms*. And any given morphism always comes with two associated objects: its *domain* and its *codomain*. The notation is the same as the one we use for functions in general: morphisms are usually denoted with the letters f, g, h… and their domains and codomains with the letters A, B, C,… We can think of the axioms characterizing the concept of *category* as stating well-known properties about functions, properties that in ZF are theorems.

Following mathematical usage, arrows are used to denote morphisms. So if f is a morphism with domain A and codomain B, we write

Diagram 3.

$$A \xrightarrow{f} B$$

or

$$f: A \longrightarrow B$$

So here is the axiomatic characterization of the concept of *category*.

A *category* ***C*** is given by its *maps* and *objects*.

Let then f: $A \longrightarrow B$, g: $B \longrightarrow C$ and h: $C \longrightarrow D$ be any given objects and morphisms of ***C***.

[11]See the end of this section and Part IV below. It is in this latter, where I propose to use this bijection to make a transition from thinking of elements in the sense of ZF to thinking of elements in the sense of the category of sets.

Axiom 1: *Existence of composition of any pair of morphisms in which the codomain of one coincides with the domain of the other*

So there exists a morphism gf: $A \longrightarrow C$ (and also hg: $B \longrightarrow D$)

Axiom 2: *Composition is associative*

So $h(gf) = (hg)f$: $A \longrightarrow D$

Axiom 3: *For any object A of* ***C****, there is a special morphism with domain and codomain A, and which is neutral with respect to composition. This morphism is called the identity on* A[12] and it is denoted as id_A: $A \longrightarrow A$.

So given any objects A, B and C and any morphisms f: $A \longrightarrow B$ and g: $B \longrightarrow C$, the following two equalities hold

$$(id_B)f = f \quad \text{and} \quad g(id_B) = g$$

And that is all. Of course, particular categories, or even types of categories, like the category of sets and map, have additional axioms. The first one for CS is the following:

Axiom 1 (CS)

There is *a* set, say X, with the property that for any given set A there is always exactly one map from A to X.

Notice that the axiom characterizes X *not* by stating what its elements are, but by telling us how it relates to other sets, including X itself, through *maps*[13]. It is in this sense that this set X resembles one-element sets in ZF, for as we saw earlier, given any one-element set 1 and any arbitrary set A, there is exactly one function from A to 1. Now, in ZF there is an infinite number of one-element sets, so each one of them has this latter property. One may then wonder whether in CS there is also more than one set satisfying Axiom 1 above. The answer is that the theory simply does not tell us how many there are or might be. What it does tell us is that this question does not matter and this is why[14]. Let us suppose there is another object Y also satisfying Axiom 1 above. Hence there is a unique map f from Y to X *and* a unique map g from X *to* Y

[12]It is called *the* identity morphism because it is unique. However, the uniqueness is not part of the axiom since it follows directly from Axioms 1 and 3.

[13]This is typical in category theory. When an object such as X is characterized by postulating the existence of unique map(s) from other object(s) to X or from X to other object(s), we say that X has been characterized by a *universal property*. This has a very important consequence as we will see in the case of Axiom 1.

[14]This consequence is of the utmost importance, and it follows every time an object is characterized by a universal property.

Diagram 4

$$f: Y \dashrightarrow X$$

and

$$g: X \dashrightarrow Y$$

By composing these maps with each other, we obtain the maps *gf* and *fg*

Diagram 5

$$Y \xrightarrow{gf} Y$$

and

$$X \xrightarrow{fg} X$$

However, since CS is a category, there are also the identity maps

$$id_Y: Y \longrightarrow Y \quad \text{and} \quad id_X: X \longrightarrow X$$

But our hypotheses are that both X and Y satisfy Axiom 1. Therefore, gf: $Y \longrightarrow Y$ must be the same map as id_Y and fg: $X \longrightarrow X$ must be the same map the identity on X, id_X. We then say that X and Y are *isomorphic*. And the overall conclusion is that any object satisfying Axiom 1 (CS) is *unique up to isomorphism*. And that is all that CS can say about the question concerning the number that there might be of sets satisfying this axiom. And this is alright, for it is all that is needed in CS (and also in category theory in general).

Objects satisfying Axiom 1 above are called *terminal*. So this axiom is guaranteeing that in CS there is at least one terminal object. We shall denote as 1 for reasons we will see shortly. The defining property of 1 is then that for any given set A there is a unique map from A to 1

$$A \dashrightarrow 1$$

The first point to notice is that the identity map on 1 is the only map from 1 *to* 1. Let us now go back to the discussion within ZF in which we saw that for any given set A, there is a bijection between the set of functions A^1 and A itself. This bijection tells us in particular that the sets A^1 and A have the same number of elements. But I propose to see it as telling us that there is a close connection between two *concepts*: on the one hand, that of a *function from* any one-element set *to* any given set A; and, on the other hand, the concept of *element*. As we have just seen, in CS there is just one map from 1

to 1. Hence the notation we chose.

Part II: Cartesian Products and their Elements

In ZF everything is a set. So the elements of a sets are also sets, whose elements are in turn sets as well, whose elements are also sets, and so on.

The empty set axiom gives us *the* set $\varnothing$, the pairing axiom the set $\{\varnothing\}$. If we apply the pairing axiom again, we can obtain many other sets, such as the following three:

$$\{\{\varnothing\}\},\ \{\varnothing,\ \{\varnothing\}\},\{\{\{\varnothing\}\},\ \{\varnothing\}\}$$

Thus in ZF, not only are cartesian products sets, but also their elements. Let us see how this comes about.

Let A and B be arbitrary sets in ZF. Their *product* is denoted as $A\times B$ and it is defined as a certain subset of the power set of the power set of the union $A\cup B$. In symbols

$$A\times B \subseteq \mathcal{P}(\mathcal{P}(A\cup B))$$

The elements of $A\times B$ are called *ordered pairs*, and they are denoted as (a, b) with $a\in A$ and $b\in B$. Since $\mathcal{P}(\mathcal{P}(A\cup B))$ is a set, then all its elements are sets as well. And since all the elements of $A\times B$ are also elements of $\mathcal{P}(\mathcal{P}(A\cup B))$, then all elements of $A\times B$ are elements of $\mathcal{P}(\mathcal{P}(A\cup B))$ as well. Hence, all elements of $A\times B$ are sets.

Since an element (a, b) of $A\times B$ is in addition an element of $\mathcal{P}(\mathcal{P}(A\cup B))$, one needs to make sure that whichever definition for (a, b) one chooses, the resulting *set* (a, b) does indeed belong to $\mathcal{P}(\mathcal{P}(A\cup B))$. In addition, in order for (a, b) to be an *ordered* pair, its definition must distinguish (a, b) from (b, a) whenever $a \neq b$. For example, the axiom of extensionality implies that

$$\{a, b\} = \{b, a\}$$

So whenever $a \neq b$, we cannot choose the set $\{a, b\}$ as our definition for (a, b). Indeed, the requirement that guarantees that these sets (a, b) are indeed *ordered* is the following, where $a, a'\in A$ and $b, b'\in B$

$$(a, b) = (a', b') \text{ if and only if } a = a' \text{ and } b = b'$$

We shall refer to this requirement for any satisfactory definition of *ordered pair*, as simply ROP. Recall that according to the axiom of extensionality, any set is completely determined by its elements. As a consequence, if we want to define or construct the set $A\times B$ we must state clearly what its elements are. This in turn forces us to state clearly what the elements of each ordered pair (a, b) are. But whichever definition we may propose, we must verify that it satisfies ROP.

We have finally come to the problem or dilemma in ZF about the definition of

ordered pairs: there are many ways of defining (a, b) and ZF has no means for telling us which one is *the* right one. The grounds for preferring one definition over others, will always be non-mathematical[15]. Here are three proposals, all of them satisfying ROP, that have been made

$(a, b) = \{\{\ \{a\}, \varnothing\}, \{\{b\}\}\ \}$ (Norbert Wiener, 1914)

$(a, b) = \{\ \{a, \varnothing\}, \{b, \{\varnothing\}\}\ \}$ (Felix Hausdorff, 1914)

$(a, b) = \{\ \{a\}, \{a, b\}\ \}$ (Kazimierz Kuratowski, 1921)

In Kuratowski´s definition, when $a = b$, the set (a, b) has just one element. It might then be a little bit surprising that the definition does satisfies ROP. Moreover, the proof is straightforward, albeit somewhat tedious.[16]

In contrast, even when $a = b$, in the first two proposals, the sets (a, b) have exactly two elements. In other words, even when $a = b$, the following inequalities hold

$$\{\{a\}, \varnothing\} \neq \{\{b\}\}$$

and

$$\{a, \varnothing\} \neq \{b, \{\varnothing\}\}$$

It is Hausdorff's definition the one that in my view is the most interesting. What makes the difference between the sets $\{a, \varnothing\}$ and $\{b, \{\varnothing\}\}$ is that $\varnothing$ is empty whereas $\{\varnothing\}$ is clearly not. But that is all. So one might as well choose *any different* sets X and Y and define

$$(a, b) = \{\ \{a, X\}, \{b, Y\}\ \}$$

It is indeed surprising that this definition also satisfies ROP.[17] What I find of

[15]If we think of the elements of a cartesian product $A \times B$ as some kind of objects, then this multiplicity of options for being "the" right choice for (a, b) can be described as an undetermination of the referent of (a, b). What I show in Part IV below is that in the category of sets the of (a, b) is completely determined.

[16]It is perhaps because it does not introduce any other sets besides a and b, that Kuratowski's definition is the one most commonly used. Enderton HB (1977), p.28 after having introduced Kuratowski's as his chosen definition of an *ordered pair* and having proved that it does satisfies ROP, he comments: "As you have probably observed, our decision to use the Kuratowski's definition […] is somewhat arbitrary. There are other definitions that would serve as well. The essential fact is that satisfactory ways exist of defining ordered in terms of other concepts of set theory." I would add that Enderton's decision is most definitely arbitrary and that what he calls "the essential fact" is a problem within ZF, a problem which, as I hope to show in this paper, has a satisfactory solution in category theory. Of course, if one is just thinking of ZF as a suitable foundation for mathematics, it might in fact be enough that *ordered pair* can be defined within ZF.

[17]Indeed, this example appears as an exercise in Hrbacek K, Jech T (1999), p.18 and it consists in stating and proving the corresponding analogue of ROP above.

special interest is that this definition opens up an infinite number of possibilities for defining ordered pairs in ZF. And this is what I have called the problem or dilemma concerning the definition of the elements of cartesian products. So it is due time that we see how, as I claim, this dilemma vanishes in category theory. More specifically, in the category of sets and maps.

Part III: Products in Category Theory

As with most concepts in category theory, products of objects are defined by what are called *universal properties*[18]. So let ***C*** be a given category and let X and Y be any two given objects in ***C***. *A* product for X and Y in ***C*** consists of the following:

(1) an object in ***C***, which we shall denote as $X \times Y$, together with two morphisms in ***C***, called the *projections*

Diagram 6

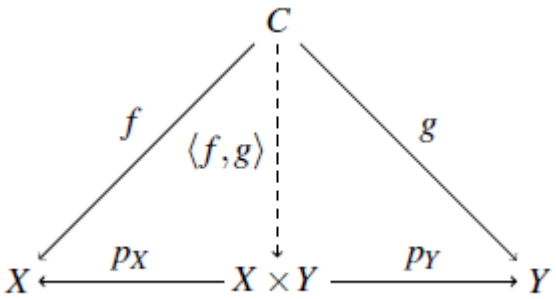
$$X \xleftarrow{p_X} X \times Y \xrightarrow{p_Y} Y$$

(2) *and* the following *universal property*

for any object C and any maps $f\colon C \longrightarrow X$ and $g\colon C \longrightarrow Y$ in ***C***, there is a *unique map* in ***C***, denoted as $\langle f, g\rangle\colon C \longrightarrow X \times Y$ since it depends on both f and g, such that $p_X\langle f, g\rangle = f$ and $p_Y\langle f, g\rangle = g$. Another way of expressing this is by saying that the following *diagram commutes*

[18] Although I prefer the word *limiting* instead of *universal*, I will follow standard terminology. The reason I find *limiting* a better adjective for these properties is that all of them are particular cases of the concept of *limit* in category theory. It can be argued that terminal objects, products and many other concepts defined by universal properties are "the best" approximations to various types of diagrams, where a *diagram* has also a formal and general definition that includes the various types of diagrams I discuss in this paper. But developing in detail such an argument falls far beyond the scope of this paper, so I adhere to standard terminology.

Diagram 7



Recall that Axiom 1 (CS) characterized the set 1 by postulating, for any set X, the existence of a *unique map* from any set X *to* 1. In the case of a product for X and Y, such as $X \times Y$ (together with the two projections), the definition also asserts the existence of a *unique map* from any set C *to* $X \times Y$, although in this case such map must satisfy some additional properties (expressed by the commutativity of the diagram above). We can think of the corresponding so-called universal properties in the following sense.

In the case of the set 1, we can think of it as a diagram or figure consisting of just one point and no maps at all:

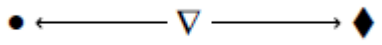
•

The universal property is thus telling us that any other diagram also consisting of just one point

♦

always bears a special relation to • *via* a *unique map* from ♦ *to* • . There are no further conditions since the diagram • contains no maps, it consists of just one point. Now, the general, abstract diagram corresponding to products is a little bit more complicated, for it starts with three objects and two maps

Diagram 8



Thus, the universal property of a product for any given objects X and Y

$$X \xleftarrow{p_X} X \times Y \xrightarrow{p_Y} Y$$

then tells us that *any* similar diagram such as Diagram 8 above, bears a special relation to the product diagram, again *via* a unique map from ∇ *to* $X \times Y$, but in this case such unique map must satisfy some further conditions, due to the more complex "structure" of the product diagram. These further conditions are expressed precisely in the

universal property of binary products (item (2) above).

As it happened in the case of the terminal object 1 in CS, products too are unique up to isomorphism. To see how this comes about for products, consider again *a* product for X and Y

Diagram 9

$$X \xleftarrow{p_X} X \times Y \xrightarrow{p_Y} Y$$

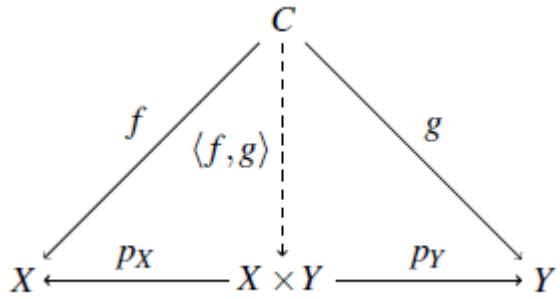
and suppose that the following diagram is also a product for X and Y

Diagram 10

$$X \xleftarrow{f} C \xrightarrow{g} Y$$

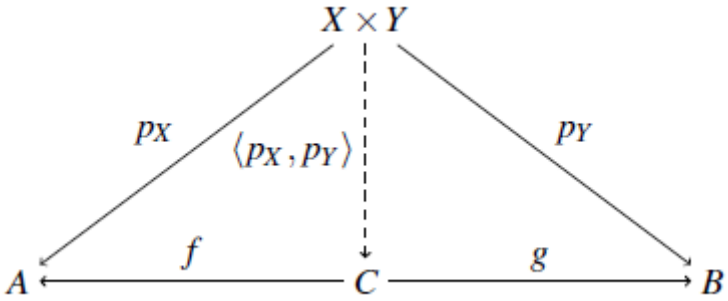
Then, due to the universal property of $X \times Y$, together with its two corresponding projections, there exists a unique map $\langle f, g \rangle : C \longrightarrow X \times Y$ making the following diagram commute

Diagram 11



Analogously, due to the universal property of C together with the maps f and g, there exists a unique map $\langle p_X, p_Y \rangle : X \times Y \longrightarrow C$ such that the diagram below commutes

Diagram 12



We can now compose the maps

$$\langle f, g\rangle : C \longrightarrow X \times Y$$

and

$$\langle p_X, p_Y\rangle : X \times Y \longrightarrow C$$

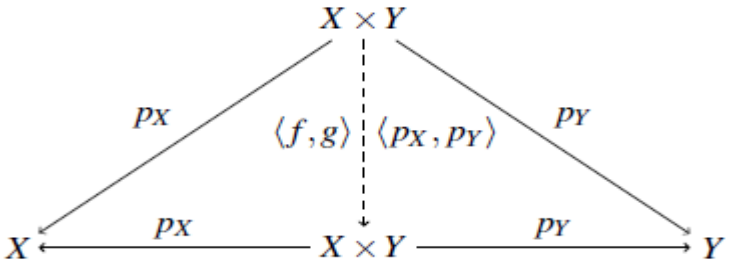
and obtain two more maps

$$\langle f, g\rangle\langle p_X, p_Y\rangle : X\times Y \longrightarrow X\times Y \quad \text{and}$$

$$\langle p_X, p_Y\rangle\langle f, g\rangle : C \longrightarrow C$$

Let us now consider the composition $\langle f, g\rangle\langle p_X, p_Y\rangle : X\times Y \longrightarrow X\times Y$ and the following diagram

Diagram 13



We now compose this map $\langle f, g\rangle\langle p_X, p_Y\rangle : X\times Y \to X\times Y$ with the first projection $p_X : X\times Y \to X$, but keeping in mind our hypotheses (see the left hand side triangles in Diagrams 11 and 12 above) about the map

$$\langle f, g\rangle : C \to X\times Y$$

Since composition is associative, we have the following equalities:

$$p_X(\langle f, g\rangle\langle p_X, p_Y\rangle) = (p_X\langle f, g\rangle)\langle p_X, p_Y\rangle = f\langle p_X, p_Y\rangle = p_X.$$

Therefore, the left hand side triangle in Diagram 13 is commutative. Using the commutativity of the corresponding right hand triangles from Diagrams 11 and 12, one can easily show that the right hand triangle in Diagram 13 is also commutative:

$$p_Y(\langle f, g\rangle\langle p_X, p_Y\rangle) = (p_X\langle f, g\rangle)\langle p_X, p_Y\rangle = gf\langle p_X, p_Y\rangle = p_Y.$$

So the composite map $\langle f, g\rangle\langle p_X, p_Y\rangle: X\times Y \to X\times Y$ makes commutative both triangles in Diagram 13. But clearly, the identity map on $X\times Y$

$$id_{X\times Y}: X\times Y \to X\times Y$$

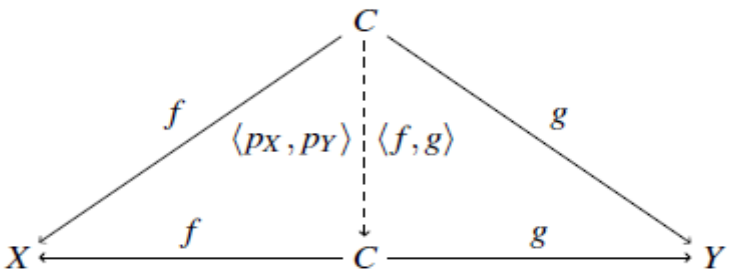
also makes the whole of Diagram 13 commutative, and since the map going from $X\times Y$ to $X\times Y$ in this diagram is unique, it follows that

$$\langle f, g\rangle\langle p_X, p_Y\rangle = id_{X\times Y}: X\times Y \to X\times Y.$$

In Diagram 14 below, the map going from C to C is the composition of the two maps

$$\langle f, g\rangle: C \to X\times Y \quad \text{and} \quad \langle p_X, p_Y\rangle: X\times Y \to C$$

Diagram 14



Using again our hypotheses from diagrams 11 and 12, together with the axiom stating that composition is associative, we can argue in a completely analogous way as we did for showing that

$$\langle f, g\rangle\langle p_X, p_Y\rangle = id_{X\times Y}: X\times Y \to X\times Y$$

and in this case conclude that

$$\langle p_X, p_Y \rangle \langle f, g \rangle = id_C$$

So products, like terminal objects such as 1, are unique up to isomorphism. In the following section we will see an important consequence this has in the context of defining ordered pairs within ZF, or perhaps more accurately, how it helps us solve the dilemma arising from having to choose one among the infinite number of possible ways in ZF to define the set (a, b), for any given sets a and b.

Part IV: Elements of Products in CS

Recall that in Part I we saw that, in ZF, for any given set A and any one-element set 1, there is a bijection between the set of functions *from* 1 *to A* and the elements of A. This means that the set of these functions, which is denoted as A^1 is isomorphic to A. I propose to go further and think of this bijection as establishing a (bijective!) correspondence between the *concept* of *element* as a basic, undefined notion, and the derived concept—all this in ZF— of *function*. In other words, I propose to see this bijection as one between two concepts: that of *element* of a given set A and the concept of *function from* 1 *to A*. I propose to use this conceptual bijection to transit from thinking of the *elements* of a set A as a basic, intuitively understood concept, to thinking of them as *functions* from any one-element set to A. Once this is achieved, we can then enter the world of sets as these are axiomatized in CS. For in CS *map* is a basic, undefined concept, and the concept of *element* is defined in terms of it. More precisely, given any set A in CS, an element of A is defined as a *map* from 1 to A. In particular, and as we saw earlier, the identity on 1 is then an element of 1. In fact, it is its only element. So in CS, 1 is a one-element set.

Let us finally see how, with this conceptual change, we can solve the problem concerning the definition of the elements of cartesian products, that is to say, the problem of defining ordered pairs. And for this we need the following

Axiom 4 (CS)

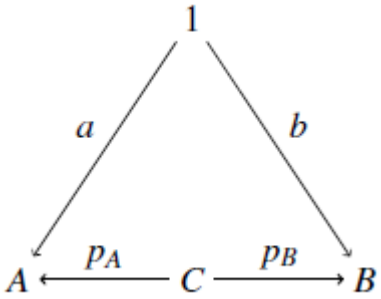
Any given sets A and B have a product.

So let then A and B be any given sets in CS and consider a product for them

$$A \xleftarrow{p_A} C \xrightarrow{p_B} B$$

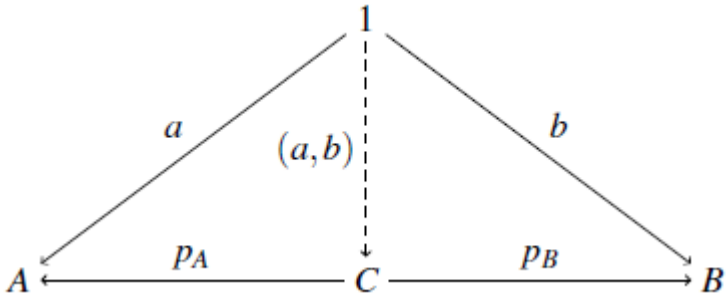
Consider now an arbitrary element of A a: $1 \longrightarrow A$ and an arbitrary element b: $1 \longrightarrow B$ of B. We now have the following

Diagram 15



By the universal property of products, there is a unique map from 1 to $A\times B$—which we might as well now denote as (a, b)—and hence a *unique element* of $A\times B$, such that the following diagram commutes

Diagram 16

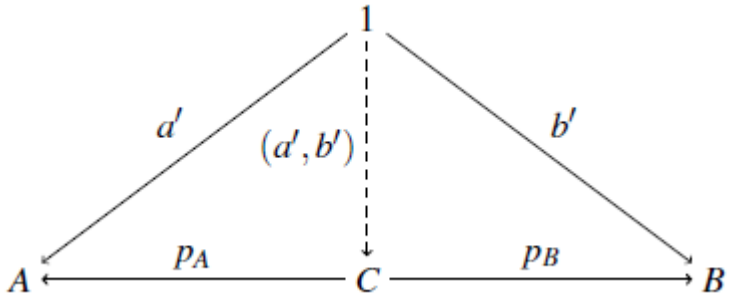


The commutativity of the left-hand triangle tells us that the first coordinate of the element (a, b) of $A\times B$ is precisely the element a of A. Analogously, the commutativity of the right-hand triangle tells us that the second coordinate of (a, b) is the element b of B.

So, and summing up, any pair of elements a: $1 \to A$ and b: $1 \to B$ determine a *unique* element (a, b): $1 \to A\times B$ of $A\times B$. Thus I think this provides us with enough justification for calling the map (a, b) *the ordered pair* determined by the elements a: $1 \to A$ and b: $1 \to B$. But there is more. This way of construing the concept of *binary products* and of *ordered pairs* also satisfies ROP from Part II, as we will now show.

Let then A and B be sets in CS, and let a: $1 \longrightarrow A$, a': $1 \longrightarrow A$, b: $1 \longrightarrow B$ and b': $1 \longrightarrow B$ be arbitrary elements. Thus, in addition to the commutative Diagram 16 above, the following diagram also commutes

Diagram 17



According to ROP

$$(a, b) = (a', b') \text{ if and only if } a = a' \text{ and } b = b'$$

So let us suppose first that $(a, b) = (a', b')$. Hence, due to the commutativity of Diagrams 16 and 17, all the following equalities hold

$$a = p_A(a, b) = p_A(a', b') = a' \quad \text{and} \quad b = p_B(a, b) = p_B(a', b') = b'.$$

And conversely, if $a = a'$ and $b = b'$ then, from the commutativity of Diagram 17, all the following equalities hold

$$a = a' = p_A(a', b') \quad \text{and} \quad b = b' = p_B(a', b')$$

Therefore, both the map (a', b'): $1 \to A \times B$, and the map (a, b): $1 \to A \times B$ make Diagram 16 commute. By the uniqueness of this latter map, we conclude that

$$(a, b) = (a', b')$$

Thus ROP is indeed satisfied in CS[19].

As we explained earlier in this section, definitions by universal properties—such as those of sets like 1 and $A \times B$—emphasize, *not* what the elements of the sets are, but how these sets are related to others with a similar "structure". And it is precisely this what guarantees that ROP is indeed satisfied for the elements of cartesian products.

Concluding Remarks

The formulation or analysis within ZF of the concept of *natural number* presents a similar problem to the one discussed here concerning the definition of the elements

[19]It is instructive to compare this proof with, for example, the one corresponding to Kuratowski's definition of *ordered pair*. See, *e.g.* the proof given in Enderton HB (1977), p.36.

of cartesian products[20]. In 1965 the American philosopher Paul Benacerraf argued that natural numbers could simply not be sets (in ZF) because we cannot tell which sets they exactly are[21]. The same happens with binary products in ZF, and in both cases the "culprit" is, in my view, the axiom of extensionality, given the way I proposed to interpret this axiom. It is important to notice here that the basic concept in ZF—*membership*—is playing a crucial role in this axiom: if ZF cannot tell us exactly, for some given set *S*, which elements belong to it, ZF has failed to determine the set *S* itself. In this paper this set was "the" cartesian product $A \times B$ of any two given sets *A* and *B*.

In CS the approach is, as we have seen, completely different, starting from the fact *map* is now a basic concept and *membership* a derived one. Moreover, uniqueness of sets such as cartesian products, is no longer a demand of the theory. In addition, and as we saw in Part IV, CS shows that what one can *do* with one product, one can *do* it with absolutely *any* other product, for they are all isomorphic. And the same happens with other set-theoretic concepts such as one-element sets, natural numbers[22], empty *sets*, power sets, etc. What does matter in CS is the uniqueness of *maps*, and this is always guaranteed in all constructions or definitions by universal properties. And of course, this also applies in the case of *elements*, for these are (re)defined as maps with domain 1, which in turn is a set characterized by a universal property and hence unique up to isomorphism.

We saw then how for any given sets *A* and *B* in CS, *any given elements a* of *A* and *b* of *B* do indeed determine *a unique element* of $A \times B$, but now this element is a map. If we were to consider some other product for *A* and *B*, say *C*, but the same elements *a* of *A* and *b* of *B*, then these elements would also determine a unique element, but this time of *C*.

The characterization of products is one applicable in any category[23] and it can be easily extended to products of any number, finite or otherwise, of objects.

So let us consider an arbitrary family of objects $\{A_i\}_{i \in I}$ in some given category. Then *a* product for this family consists of an object, say *P*, together with a family of morphisms

$$P \xrightarrow{p_i} A_i$$

with $i \in I$, such that for any object *C* and any family of morphisms

$$f_i : C \longrightarrow A_i$$

also indexed by *I*, there exists a unique map

[20]In this case too, CS offers a solution very much in the spirit of the one presented in this paper, since "the" set of natural is also defined by a universal property. See, *e.g.* Awodey S (2006), p.217, although there he is not interested in contrasting it with the concept of *natural number* in ZF.

[21]Benacerraf P (1965), pp. 47-73. However, his discussion goes well beyond this point.

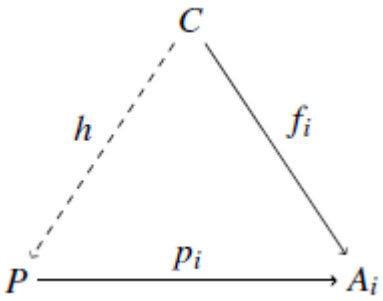
[22]For the natural numbers the dilemma arises when one tries to define "the" successor of any given natural number. This case has in addition quite interesting consequences dealing with the principle of mathematical induction and the simple recursion theorem.

[23]In fact, all characterizations by universal properties are applicable in any category.

$$h: C \dashrightarrow P$$

which makes the following diagram commute for each $i \in I$

Diagram 18



This more general and abstract setting makes it easy to see two somewhat extreme cases: one in which the index set I is just a singleton, and the other one in which it is empty. Let us then see the first case.

Consider an object A in some given category. Then a product for A must consist of a single morphism *to* A itself. We only need now to find the *domain* of such a morphism. The natural choice is, of course, the identity on A

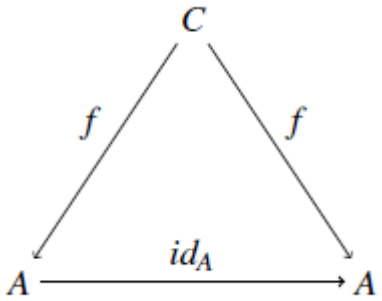
$$A \xrightarrow{id_A} A$$

since we do not know anything else about A. So let us see whether A together with its identity morphism is indeed a product for A. Let then C be an arbitrary object and f: $C \longrightarrow A$ any morphism from C to A. Notice that the relevant structure for this case looks like this

$$\nabla \longrightarrow A$$

So we have the morphisms f: $C \longrightarrow A$ and id_A: $A \longrightarrow A$, and we need to find a morphism, say h: $C \longrightarrow A$ such that $id_A h = f$. But due to the defining properties of identity morphisms, f is clearly such that $id_A f = f$. In other words, Diagram 19 below is commutative

Diagram 19

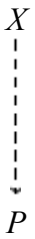


Moreover, and also due to the defining properties of identity morphisms, f: $C \longrightarrow A$ is the only morphism making Diagram 19 commute. So A together with its identity morphism is indeed a product for A.

Let us then consider our last case, *viz.* when the index set is empty. A product for zero objects must still consists of an object, say P, together with… no morphisms at all. But in order for P to be a product for zero objects it must satisfy a universal property. The relevant structure here is just P, so we must consider a single but arbitrary object of the category, say X.

The universal property then requires that there be a unique morphism

Diagram 20



such that… nothing, there are no further conditions that should be satisfied, since the index set is empty and hence there are no projection morphisms. So a product for zero objects is precisely a terminal object.

We have now come full circle. We started with the basic concept of *element* in ZF, and focused on one-element sets. We saw that for any set A and any one-element set 1, there is *a unique function* from A to 1. We also saw another important property any one-element set has: there is a bijection between, on the one hand, the elements of any set and, on the other, *functions* from any one-element set to the given set. These were the first steps of my proposal for making a conceptual change in which sets are to be thought of not in terms of their elements, but in terms of functions, either from them to other sets, or from other sets to them. All this set the stage for introducing the concept of *category* in which the basic notion is that of *morphism* and whose axioms state very general properties of the concept of *function* as this latter is used in the practice of mathematics.

Once we were in the framework of category theory, I introduced a few axioms for the category sets and maps that were necessary for the main topic of this paper. In Part II we saw the dilemma within ZF arising from the attempt to characterize cartesian products in terms of their elements. Then, in Part III I argued that CS offers us a solution to this dilemma, in my view entirely satisfactory. And *qua* solution, it involved in a crucial manner one-element sets (in the sense, of course, of CS).

I hope that some readers find the analysis presented here of the interplay between ZF and CS interesting in its own right. In the case of the definition of an *ordered pair* (*a*, *b*) within ZF, we saw that not only must one choose a specific set, among many other equally good candidates, for being "the" ordered pair (*a*, *b*), but that the grounds for choosing one candidate over all the others are *not* mathematical. Most textbooks (perhaps all of them) on Zermelo-Fraenkel set theory, simply bypass this issue and move on to "construct" cartesian products and to prove results about them. The content of this paper may be used as a pedagogical pathway for teaching the concept of *products* in category theory: start with a simple, non-mathematical problem within ZF—whose concepts are seemingly easier to understand than those from category theory—, then continue translating basic concepts from ZF into their counterparts in CS. In this way, the categorical concepts of *map*, *terminal object* and *binary products* get grounded in a comparatively more familiar terrain. And it is precisely in the categorical concept of *binary products* where the original problem dissolves completely.

There are other instances of this interplay between ZF and CS. For example, the apparent difference between how the axiom of choice is formulated in ZF and in CS. Showing that they are saying the same thing, leads to the construction of a category of sets different from those in CS, in which the axiom of choice fails[24]. The definition of "the" successor of a natural number in ZF presents a similar problem as the one discussed in this paper, since successors in ZF must, once again, be specific sets[25]. Moving to the, unique up to isomorphism, set of natural numbers in CS, not only solves the problem or ambiguity in ZF concerning the definition of successors, but it also serves to express the simple recursion theorem by universal properties. The proof of this theorem in ZF is convoluted and quite involved, and in my view it obscures the reason why it works for "the" set of natural numbers. One may even argue that the so-called construction of the natural numbers in ZF was done in an *ad hoc* manner in order for the principle of induction to follow directly from it. In any case, the principle of induction is also a theorem in CS and it is quite easy to prove. There is yet another instance of the interplay between ZF and CS: Zermelo's axiom of separation. Zermelo's contemporaries were not satisfied with its formulation, and Zermelo tried to reformulate it in various ways. The accepted solution was to bring *first order formulas* into the theory, with the result that the axiom became an axiom *schema*, one axiom for each well-formed formula. The original version stated that for each well-defined *property* of sets, one can always separate from a given set *A*, those and only those elements of *A having that property*, which results in a subset of *A*. The current version states that with each first-order well-formed formula, there is a set whose elements are those and only those elements of *A satisfying that formula*. The problem Zermelo faced consisted in that he was never able to give a precise meaning to these well-

[24]See Pallares-Vega I (2020).
[25]See Pallares-Vega I (2024).

defined properties. In any case, the move from *properties of sets* to *sets satisfying a well-formed formula*, seems to be at odds with the spirit of the other axioms Zermelo initially proposed for the concept of *set*[26]. In CS the notion *property* is quite simple and the truth-value axiom captures what I think Zermelo wanted these well-defined properties *to do*: to divide a given set *A* into two mutually exclusive parts, one with all those elements of *A* satisfying the property, and the other part with all those elements not satisfying the property. The truth-value *set* is defined by a universal property and in a more general context, truth-value objects in a category are called *subobject classifiers* and, along with other axioms, give the category in question the structure of what is called a *topos*. The concept of *subobject classifier* is certainly quite abstract and difficult to understand to non-specialists. Thus Zermelo´s well-defined properties can also be used as a pathway into the concept of *subobject classifier*[27].

All of these are cases in which one starts with different issues raised by certain concepts, axioms or theorems within ZF, and then one moves to CS in order to see the different ways in which they are formulated there. I hope to have shown how, by moving from ZF to CS, one may understand better the meaning of certain general and abstract concepts, axioms and theorems from category theory[28].

In Leinster T (2014), the author makes two somewhat strong claims: According to one of them ZF is, in sharp contrast with CS, practically of no use to professional, working mathematicians. He further claims, emphasizing the verb, that CS *is* set theory. Even if the first claim is right, my reply to it is why should mathematical theories be restricted to professional, working mathematicians? Why not try to make them accessible to anyone interested in them, at least at a basic level?[29] Or, why abandon a mathematical theory only because it is of no use to working mathematicians? The ideas I have presented in this paper, were intended to show how one can use ZF to *understand* quite abstract *concepts* in CS and, more generally, concepts in category theory. I think ZF is a wonderful theory in its own right and I still find it remarkable that many mathematical concepts can be recast within it. None of the theories mentioned by Leinster T (2014), apart from CS, shares this feature with ZF. And I disagree entirely with the second claim, *viz.* that CS *is* set theory. Like many other areas of human activity, mathematical practice (and *perforce* mathematics itself), changes over time and it is constrained by many factors (historical, cultural, perhaps even political). And I believe that this is a good thing, for there may come along in the future other, more interesting and challenging theories about the ubiquitous and seemingly modest concept of *set*.

[26]Zermelo F (1908a).
[27]See Pallares-Vega I (2022) for a detailed account of this approach.
[28]I find it noteworthy that in the construction or definition of sets in which the quantifiers and the logical connectives play a fundamental role, dilemmas like the one discussed here, do not arise within ZF. These are the cases of, for example, unions and intersections.
[29]Cheng E (2023) is an excellent example of how to make category theory accessible to outsiders.

Acknowledgements

I thank Professor Laura Campos-Millán, an expert in the philosophy of language and an esteemed colleague at the Autonomous University of the State of Morelos. She kindly explained to me the phenomenon I have discussed in this paper and which I, perhaps wrongly, have labeled *dilemma*. Any mistakes in the explanation I give here of the linguistic phenomenon called *undetermination of the referent* are mine.

I also wish to express my thanks to Luis Armando Cano-Armas, currently a PhD student in applied mathematics at the National Autonomous University of Mexico, for having drawn all the Diagrams in LaTeX.

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Isocrates' *Encomium of Helen* and the New Myth in the Dialogues of Plato

By Ranko Kozić[*]

What was only announced in the proemium to the Helen, namely a strict adherence to the concepts of Socratic and Platonic philosophy, was fully applied to the main body of the encomium, with Socrates' sharp critique of the old myth, along with his depiction of the successive forms of decline of an ideal, aristocratic type of government in the Republic, providing a guiding principle to the orator in his noble effort to elaborate on the key concepts of the philosophy of Socrates and Plato.The very fact that in the main body of his work Isocrates so heavily relied on the new myth, as used in Socrates' discourses on love in the Phaedrus and the Symposium, speaks volumes about the unity of the encomium and its philosophical aspect as well.

Introduction

In order to fully comprehend what has long been a subject of dispute, namely the unity of Isocrates' *Encomium of Helen*, it was necessary to shed light on many puzzles appearing in its proemium, an issue dealt with in our previous study[1] to which the present one is a sequel. The very fact that Isocrates' attitudes towards relations between rhetoric and philosophy in the proemium to the *Helen* – in which he, albeit enigmatically, declared himself a follower of Socratic-Platonic philosophy, adhering to principles of the new rhetoric in the *Phaedrus* – were consequently applied to the main body of the encomium speaks volumes about the immanent coherence of his work.

How faithfully Isocrates adhered to the aforementioned principles in terms of their practical application to a wide variety of literary and rhetorical genres can be inferred from the fact that the idea of supplanting the old myth through a new one[2]

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[1] "Sophistic, Eristic and Philosophy in Isocrates' Proemium to *Helen*," *Athens Journal of Philosophy* 4 (1925). https://doi.org/10.30958/ajphil.

[2] According to Manuwald (2002, 58-59), the new myths in the dialogues of Plato can be divided into two groups on the basis of a purely formal criterion such as the narrator and his attitude towards the subject matter of the narrative, i.e. myth. The myths recounted not by Socrates but by other participants in the dialogues make up the first group consisting of Protagoras' myth of the origins of living things (*Protagoras*), Aristophanes' myth about eros as mutual love endeavouring to combine two to one and heal the human sore (*Symposium*), Diotima's myth of Eros (*Symposium*), mythical eschatology recounted by the Eleatic Stranger in the *Statesman*, eschatology of the same kind, depicted by Timaeus in the dialogue named after him and Athenian's mythical eschatology dealing with divine justice and destiny of souls in the *Laws*. The myths recounted by Socrates himself belong to the second group that can be divided into two subgroups depending on whether Socrates himself heard them retold by others, as was the case with mythical eschatologies in the dialogues *Gorgia*s, *Timaeus*, *Phaedo* and *Republic* or tells them to his interlocutors by presenting them as his own creation, as is otherwise the case with the myth of the winged chariot in the *Phaedrus*. For a thorough summary of the myths, cf. Kobusch (1990, 13-32) and Szlezák (1993). For the full and detailed explanation of the myths, cf. Morgan (2000), Moors (1982) and Cerri (1991).

essentially based on the postulates of ethical philosophy, as advocated for by Socrates in the third and fourth book of the *Republic* (386a-445e),was fully applied to the encomium, with the new myth thus assuming characteristics of a major strategic factor for literary creativity and state-building,[3] as we will see shortly.

In full accordance with Socrates' sharp critique of the old myth and its use in poetry, Isocrates decided to supplant the old myth of Helen through a new one and thus faced the biggest challenge consisting in selecting from the legend of Helen as a glorious and yet shameless woman[4] all her positive character traits, no matter how few in number they were, so as to be in a position to not only fuse it all into one harmonious whole but also to sing a hymn to so controversial a women execrated by the poets as the cause of countless woes to the Greeks. It has been impossible to achieve this specific aim in mind without calling upon philosophy for help, which explains special importance attached to it in the proemium as well as Isocrates' express intent of identifying his own rhetoric with philosophy in the *Antidosis*[5]. In saying that it would have been impossible to achieve this specific aim in mind without calling upon philosophy for help, we mean above all the fact that, in full accordance with the method of Socratic-Platonic philosophy,[6] it was necessary to have first created an idealized image of Helen before bringing a very few number of her positive character traits that can be found in myth and legend into harmony with the mentioned idealized image, which in itself, in Isocrates' view, best serves compelling national and educational interests.[7]

As this was an impossible undertaking, Isocrates had to turn toward philosophy and to regard Helen as the embodiment of the idea of beauty on earth, so as to be in a position to sweep all her negative character traits under the carpet because, among other things, the Beauty itself and thus Helen as its earthly incarnation had already been granted a status of the good of special relevance for the aforementioned national and educational interests under the influence of the theory of beauty, expounded by Socrates in both the *Phaedrus* [8]and the *Symposium.* Thus the aforementioned theories of beauty along with Socrates' sharp criticism of the old myth of Theseus and Peirithous attempting dreadful rapes of Helen in the third

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[3]The very fact that Isocrates freely paraphrases the theses put forward by Socrates in his depiction of the successive forms of decline of an ideal, aristocratic type of government in the eight and ninth book of the *Republic* can serve as proof of this, as will be shown below.

[4] Cf. Aeschylus, *Agamemnon* 689 where she is characterized as "Ship's hell" (ἑλένας), "Man's hell" (ἑλάνδρος) and "City's hell" (ἑλέπτολις).

[5]41, 50, 147, 162, 170, 175, 176, 181, 183, 195, 205, 209, 215, 243, 247, 250, as opposed to 8 instances in which the author identifies as sophist (148, 155, 168, 197, 203, 220, 235, 237). In this connection, it is to be noted that what Isocrates means by Sophistic is Socrates' identification of his own philosophy with a noble and true-born art of sophistry in the *Sophist* (231b: *genei gennaia sophistike*).

[6]What is being referred to here are *synagoge* (perceiving the scattered particulars and bringing them together in one idea) and *diairesis* (dividing again by classes what was naturally brought together in one idea), as advocated for by Socrates in the *Phaedrus* (265d-e).

[7]Cf. *Helen,* 6, where his strong dislike for the exponents of ancient sophistic and eristic comes to expression on account of the fact that they care nothing at all for either private or public affairs and "take most pleasure in those discourses which are of no practical service in any particular" (τούτοις μάλιστα χαίρουσι τῶν λόγων οἱ μηδὲν πρὸς ἓν χρήσιμοι τυγχάνουσιν ὄντες). In this connection, it should be noted that all translations of the passages from the *Helen* are by L. van Hook (LCL).

[8] What is being referred to here is the myth of the winged chariot (246b-256e) and especially 251a-b.

book of Plato's *Republic* (391c-d) provided the starting point for Isocrates' shaping a new myth of Helen, open for other concepts and ideas which could only be derived from philosophy, as will be shown below.

Socrates' Ideas on Portraiture as Practical Guidelines for the Making of a Poetics

In order to achieve this specific aim in mind, Isocrates needed practical guidelines which can only be provided by the legend of Socrates in Xenophon's *Memorabilia.* What is being referred to here are Socrates' conversations with the major exponents of fine and plastic arts of his own age, Parrhasius the painter (3, 10, 1-5) and Cleito the sculptor (3, 10, 6–15), with the philosopher's explanation of Parrhasius' art having special relevance for unravelling secrets of Isocrates' method essentially based on *montage*, as will be shown below. It is Socrates' view of Parrhasius' pictorial technique that Isocrates was particularly receptive to because, among other things, he could create an idealized image of Helen only through the application of the mentioned painter's technique to literature, namely a technique that was lauded by Socrates in Xenophon's *Memorabilia*, as will be seen shortly. Truth be told, Isocrates, as demonstrated in our previous study,[9] used this same method in the proemium, only difference being that the selection of patterns for the main body of the encomium was, for the reasons mentioned, considerably more difficult due to, among other things, the fact that he was presented with a greater challenge in the latter.

Socrates explains the idealism of Parrhasius' art by pointing to his method of *montage* consisting in carefully selecting from among many single persons the most beautiful parts of their body and elaborately combining them into a harmonious whole[10] as a necessary prerequisite for making an idealistic portrait and,

[9]Especially the second and the third section entitled "Isocrates' most Cherished Ideals against the Background of Zeno's Dichotomies and Stilpo's Eristic" and "Isocrates' Play on Contrasts and the Principles of the New Rhetoric in the *Phaedrus*."

[10]Xen. *Mem*. 3, 10, 2: καὶ μὴν τά γε καλὰ εἴδη ἀφομοιοῦντες, ἐπειδὴ οὐ ῥάδιον ἑνὶ ἀνθρώπῳ περιτυχεῖν ἄμεμπτα πάντα ἔχοντι, ἐκ πολλῶν συνάγοντες τὰ ἐξ ἑκάστου κάλλιστα οὕτως ὅλα τὰ σώματα καλὰ ποιεῖτε φαίνεσθε. Lucian was so impressed with the conversation between Socrates and Parrhasius that he could not but use it as a basis for his dialogues *Essays in Portraiture* (*Imagines*) and *Essays in Portraiture Defended* (*Pro imaginibus*). Painting a portrait of Panthia with words is represented in the former (17) as if the greatest exponents of fine and plastic arts shared the task of portraying with each other and, consequently, shaped that part of her figure in the elaboration of which they were deemed peerless. Panthia's reaction to her portrait (*Pro im.* 10) deserves to be mentioned in this connection, as evident from her words that she, while commending both an artist's skill in modelling and the idea of the portraits, does not recognize the likeness and is not worthy of such compliments, not by a great deal, nor was any other mere woman. Therefore she absolves the authors (Polystratus, Lycinus = Lucian) from honouring her thus, and pays her homage to their patterns (*archetypa*) and models (*paradeigmata*). It should also be noted that, along with Polygnotus, Euphranor, Aetion, Apelles, Praxiteles, Alcamenus, Pheidias and Lysias (*Im.* 6-7), Socrates is represented as an exemplary painter and included in the canon of visual arts, created by Lucian in the aforementioned work (17): "We shall require many models […] and one, like herself (scil. Panthia), Ionic, painted and wrought by Aeschines, the friend of Socrates, and by Socrates himself, of all craftsmen the truest copyists because they painted with love," as translated by A. M. Harmon (LCL).

consequently, an idealistic art of special relevance for the aforementioned compelling national and educational interests, on which he had set his heart (Xen. *Mem.* 3, 10, 5).[11] That part of the discussion between Socrates and Parrhasius, with the great philosopher giving the painter advice as to how he should above all aspire to represent the invisible in his paintings such as the states of mind, as reflected in the face and the attitudes of the body (whether still or in motion) of a truly beautiful, good and lovable character (*Mem.* 3, 10, 5),[12] could hardly escape Isocrates' attention.

Socrates' advice regarding the importance of representing the invisible in portraiture proved invaluable to Isocrates, in so far as it offered a perfect solution for the making of his own poetics, as is evident from the fact that he was very well aware of his own shortcomings when it comes to creatively discovering ways in which to elaborate on the concepts of Socrates and Plato's philosophy[13] as a necessary prerequisite for elevating his own rhetoric to the heights of philosophy, as expected by Socrates in the *Phaedrus*(279a). In other words, he was forced to adopt Parrhasius' technique and to select, instead of the most beautiful parts of the body, chosen from among many truly good and lovable persons, the most beautiful concepts of the philosophy of Socrates and Plato so as to paraphrase them in such a way that makes them almost unrecognizable.

Simply put, Isocrates relocated Socrates' ideal about the need to represent the invisible in portraiture from the painting to another medium such as literature, as a consequence of which the ideal itself had to suffer distortion, or rather inversion, in so far as Isocrates, instead of representing the invisible in art, was hell bent on making his own models and patterns invisible, quite contrary to his followers in

[11]Socrates to Parrhasius: "Now which do you think the more pleasing sight, one whose features and bearing reflect a beautiful and good and lovable character, or one who is the embodiment of what is ugly and depraved and hateful?" as translated by Marchant (LCL). Cf. Aelian's account (*VH* 4, 4) of a law at Thebes which commands artificers, both painters and sculptors, to make the figures as good as may be, i.e. to create an idealized image of them. This law menaced to those who mould or paint them not well a pecuniary mulct.

[12]Socrates to Parrhasius: τὸ πιθανώτατον καὶ ἥδιστον και φιλικώτατον καὶ ποθεινότατον καὶ ἐρασμιώτατον ἀπομιμεῖσθε τῆς ψυχῆς ἦθος; ἢ οὐδὲ μιμητόν ἐστι τουτο; [...] ἀλλὰ μὴν καὶ τὸ μεγαλοπρεπές τε καὶ ἐλευθέριον καὶ τὸ ταπεινόν τε καὶ ἀνελεύθερον [...] καὶ διὰ τοῦ προσώπου καὶ διὰ τῶν σχημάτων καὶ ἑστώτων καὶ κινουμένων ἀνθρώπων διαφαίνει.

[13] Isocrates seems to have shared Socrates' critical attitudes towards his overall abilities in the *Euthydemus* (304d-306c), where he is described as the border-ground between philosopher and politician, instead of being regarded as a philosopher.

the period of the Second Sophistic who openly pointed[14]or made clear allusions to their role models.[15]

What we deal with here is the deepest enigma in so far as the researcher is forced to draw far-reaching conclusions about Isocrates' method and his conception of Sophistic from the slightest allusions in the text of hisencomium. It is this very wording ("drawing conclusions from the slightest indications")that we encounter in Philostratus' *Imagines*[16]or, to be more precise, in his description of the painting representing the Titan Atlas sustaining the burden of heavens and Heracles who earnestly desires his task, to judge from his state of mind, as indicated by the eager look on his face, the club thrown on the ground, and his hands that beg for the task (2, 20, 2).[17]

Socrates' attitudes to the painting are once more reflected in the description of the exhausted figure of Atlas showing, according to Philostratus, high degree of skill, in so far as the shadows on his crouching figure run into one another, and do not darken any of the projecting parts but they produce light on the parts that are hollow and retreating (2, 20, 2).[18] This description of the painting technique applied to the depiction of the exhausted figure of Atlas proved very valuable to us in so far as it provided the more suitable analogy for Isocrates' approach applied to the encomium and characterized by the shadows emerging from his assertions and formulations.

What we come across in Philostratus' description of another painting surpassed all expectations, in so far as the above-mentioned Socratic ideal about the need to represent the invisiblein portraiture such as emotions and feelings, is fully reflected in it. What is being referred to here is the description of the painting entitled *Ariadne*, in which it is said that there are countless characteristics of

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[14] Cf. Dio's assertion in his *Eighteenth Discourse* (*On Training for Public Speaking*), 13 that no branch of literature "could possibly be pleasing to the ear if it lacked the Socratic grace, just as no meat without salt will be gratifying to the taste," as translated by J. W. Cohoon (LCL). Cf. also his *Sixtieth Discourse* (*Nessus or Deianeira,* 10) in which Dio fully equates his own method with that of Socrates, which in itself speaks volumes about his attitudes towards oratory, his loyalty to the philosopher's testament in the *Alcibiades* and, above all, his adherence to the new myth (καὶ γὰρ ἐκεῖνοι (scil. κοροπλάθοι) τύπον τινὰ παρέχοντες, ὁποῖον ἂν πηλὸν εἰς τοῦτον ἐμβάλωσιν, ὅμοιον τῷ τύπῳ τὸ εἶδος ἀποτελοῦσιν· καὶ τῶν φιλοσόφων ἤδη τινὲς τοιοῦτοι γεγόνασιν, ὥστε ὁποῖον ἂν μῦθον ἢ λόγον λάβωσιν ἕλκοντες καὶ πλάττοντες κατὰ τὴν αὑτῶν διάνοιαν ὠφέλιμον καὶ φιλοσοφίᾳ πρέποντα ἀπέδειξαν· οἷον δὴ μάλιστα ἀκούομεν Σωκράτη γενέσθαι).

[15] Cf. Aristides' second oration (*A Reply to Plato: In Defense of Oratory*), 434 where he dons the mask of pretence by presenting his own palinode as Plato's, falsely implying that it is the latter and not himself that *here* (scil. in the myth retold by Socrates at the close of the *Gorgias*) clearly defines as the champion of truthful speech the thing that he *there* (scil. in the main body of the dialogue) called flattery, which gave rise to the assertion that he himself is now 'saying the same thing as Plato about oratory although the people may have thought that he was disagreeing," as translated by M. Trapp (LCL).

[16] 2, 20, 2: γέγραπται δὲ ὁ μὲν ἀπειρηκώς, ὡς ἱδρῶτι συμβάλλεσθαι, ὁπόσος ἀπ᾽ αὐτοῦ στάζει, βραχίονός τε ξυνεῖναι τρέμοντος [...]. The meaning "drawing conclusions from the slightest indications" is derived from the context in so far as the sweat trickling from Atlas and his trembling hand can be regarded as being the slightest indications of Atlas' labour. The Titan is represented as exhausted, to judge by all the sweat that trickles from him and to infer from his trembling arm.

[17]δηλοῖ δὲ τοῦτο ἥ τε ὁρμὴ τοῦ προσώπου καὶ τὸ ῥόπαλον καταβεβλημένον καὶ αἱ χεῖρες ἀπαιτοῦσαι τὸν ἆθλον.

[18] αἱ δὲ τοῦ Ἄτλαντος σκιαὶ σοφίας πρόσω· οὑτωσὶ γὰρ τοῦ συνιζηκότος συμπίπτουσί τε ἀλλήλαις καὶ οὐδὲν τῶν ἐκκειμένων ἐπιθολοῦσιν, ἀλλὰ φῶς ἐργάζονται περὶ τὰ κοῖλά τε καὶ εἰσέχοντα.

Ariadne's lover Dionysus for those who wish to represent him in painting and sculpture by depicting which even approximately the artist has captured the god (1, 15, 2),[19] in so far as the ivy clusters, a horn just springing from the temples and a leopard are the clear marks, or rather symbols of the god (1, 15, 2).[20] But what is very difficult to achieve is a skill to characterize Dionysus by love alone (1, 15, 2),[21] i.e. by something beyond picture, such as his amorous feelings at the moment when he, drunk with love, comes to the side of Ariadne (1, 15, 2),[22] something that can be accomplished only by conceptual or symbolist painter.

Thus we have found yet another useful analogy as it enabled us to better understand Isocrates' technique developed for concealing his patterns, a technique that is so complex and enigmatic that it might be compared to the efforts aimed at painting Dionysus' amorous feelings on canvas. It is indicative that Philostratus uses the terms *symbolon*,[23] s*ymballesthai*[24] and *syneinai*[25] to describe the mentioned painting technique in the *Imagines*, thus suggesting that he declared himself to be the proponent of symbolism not only in art but also in literature.

How well-received Socrates' ideas on portraiture were in the period of the Second Sophistic can be inferred from the three instances of their visualisation in Lucian's *Essays in Portraiture* (*Imagines*),[26]*Essays in Portraiture Defended* (*Pro imaginibus*)[27]and *The Dead Come to Life or the Fisherman* (*Piscator*), with the last mentioned one having a special significance for us due to one of the author's very honest admissions that what really matters the most in literary creativity is not so much his method of *montage* as the philosophical concepts on which it is based

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[19]οὐδ᾽ ἀπόχρη τὸν ζωγράφον ἐπαινεῖν, ἀφ᾽ ὧν κἂν ἄλλος ἐπαινοῖτο· ῥάδιον γὰρ ἅπαντι καλὴν μὲν τὴν ᾽Αριάδνην γράφειν, καλὸν δὲ τὸν Θησέα, Διονύσου τε μυρία φάσματα τοῖς γράφειν ἢ πλάττειν βουλομένοις, ὧν κἂν μικροῦ τύχῃ τις, ἥρηκε τὸν θεόν. All translations of the passages from Philostratrus' *Imagines* are by Fairbanks (LCL).

[20]καὶ γὰρ οἱ κόρυμβοι στέφανος ὄντες Διονύσου γνώρισμα, κἂν τὸ δημιούργημα φαύλως ἔχει, καὶ κέρας ὑπεκφυόμενον τῶν κροτάφων Διόνυσον δηλοῖ καὶ πάρδαλις ὑπεκφαινομένη αὖ τοῦ θεοῦ σύμβολον [...].

[21][…] ἀλλ᾽ οὗτός γε ὁ Διόνυσος ἐκ μόνου τοῦ ἐρᾶν γέγραπται.

[22][…] ἁλουργίδι τε στείλας ἑαυτὸν καὶ τὴν κεφαλὴν ῥόδοις ἀνθίσας ἔρχεται παρὰ τὴν ᾽Αριάδνην ὁ Διόνυσος, μεθύων ἔρωτι [...].

[23]Cf. n. 20. It is worth noting that in the Greek novel *ainigma* and *drama* are used as synonyms for *symbolon*, as can be inferred from Macrembolites' romance *Hysmine and Hysminias* (2, 8, 2) in which they are also used in a purely pictorial context: ἔχω σου, τεχνῖτα, τὸ αἴνιγμα, ἔχω σου τὸ δρᾶμα. Cf. also Aelian's account (*VH* 14, 15) of the painter Pauson's pictorial technique, in which it is compared to the discourses of Socrates. The painter being desired to make a picture of a horse tumbling on his back, drew him running. And when he who had bespoken the picture was angry that he had not drawn it according to his directions, the painter said: "Turn it the other way, and the horse which now runneth will roll upon his back," as translated by N. G. Wilson (LCL). So Socrates, in Aelian's view, did not discourse downright, but if his discourses were turned, they appeared very right. For he was unwilling to gain hatred of those to whom he discoursed and for that reason delivered the things enigmatically and obliquely.

[24]Cf. n. 16. Cf. also *Im.* 1, 1, 1 (Scamander): συμβάλωμεν ὅ τι νοεῖ.

[25]Cf. n. 16.

[26]Cf. n. 10.

[27]10. Cf. n. 10.

(6),[28] which in itself might explain why Isocrates turned toward philosophy and identified his own rhetoric with it.

What distinguishes Isocrates from the major exponents of the Second Sophistic is his strong inclination for hiding his patterns and models,[29] something that was an object of interest for almost all intellectuals of his own age, as can be inferred from Diogenes Laertius' assertion (IV 2) that Speusippus was the first to unravel and divulge the secrets of his art. And what kind of secret that was can be inferred from the fact that it was very hard, even through the application of, so to speak, microscopic technique, to find out what Isocrates actually meant by 'philosophy,'[30] to say nothing about other secrets of his art including his allusive method.

Paradoxically enough, it turned out that Isocrates managed to achieve all the essential goals by using of a simple method of reducing his models and patterns beyond all recognition, so as to be in a position to elaborate on and paraphrase them, in full accordance with his message conveyed at the close of the hisencomium, saying that he looks upon his own work as an ideal model for others to compete with him within the framework of the same conceptions and ideas (69),[31] just as he himself made efforts to "compete" with the concepts of Socratic and Platonic philosophy, as will be seen in more detail below.

Isocrates was very well aware that a great success in literature could hardly be achieved through the use of this simple method unless the main body of the encomium followsa multi-layered structure being similar to that already used in the proemium. That is the reason why the main body of encomium follows the aforementioned structure, with the encomia of Helen, Theseus and Paris interweaving, mutually enriching each other and thus providing new meaning to an ancient legend, in full accordance with Philostratus' description of the dual nature of the centaur, in which it is said that a horse and the human body are combined in such wise as to elude the eye of the observer who should try to detect where the human body ends

[28]αὐτὰ γοῦν ἅ φημι ταῦτα, πόθεν ἄλλοθεν ἢ παρ᾽ ἡμῶν (scil. φιλοσόφων) λαβὼν καὶ κατὰ τὴν μέλιτταν ἀπανθισάμενος ἐπιδείκνυμι τοῖς ἀνθρώποις; οἱ δὲ ἐπαινοῦσι καὶ γνωρίζουσιν ἕκαστον τὸ ἄνθος ὅθεν καὶ παρ᾽ ὅτου καὶ ὅπως ἀνελεξάμην, καὶ λόγῳ μὲν ἐμὲ ζηλοῦσι τῆς ἀνθολογίας, τὸ δὲἀληθες ὑμᾶς καὶ τὸν λειμῶνα τὸν ὑμέτερον [...]. Which philosophers are meant is evident from the fact that in this passage from the *Piscator* (*The Dead Come to Life or the Fisherman*) Lucian employs the concept of poet as a bee fleeting from flower to flower as well as that of the garden of letters, as elaborated by Socrates in both the *Ion* (534a-b) and the *Phaedrus* (276d) respectively.

[29]As may be inferred from the above, Philostratus, more than any other major exponent of the Second Sophistic, adopted Isocrates' method, as is evident from his enigmatic narrative in the *Lives of the Sophists.*

[30]Cf. n. 5.

[31]ἢν οὖν τινες βούλωνται ταῦτα διεργάζεσθαι καὶ μηκύνειν, οὐκ ἀπορήσουσιν ἀφορμῆς, ὅθεν Ἑλένην ἔξω τῶν εἰρημένων ἔξουσιν ἐπαινεῖν, ἀλλὰ πολλοῖς καὶ καινοῖς λόγοις ἐντεύξονται περὶ αὐτῆς. In this connection, it should be noted that Macrembolites takes the same attitude to his novel *Hysmine and Hysminias* (11, 22, 4) as Isocrates to his encomium, regarding it as a model for others to compete with him within the framework of the same conceptions: καί τις τῶν ὀψιγόνων καταρρητορεύσει ταῦτα καὶ ὡς ἀθάνατῳ στήλῃ τοῖς λόγοις ἀνδριάντα χακλουργήσει κατάχρυσον.

and that of a horse begins and what might be considered genuinely human in the centaur's hybrid form (2, 2, 4).[32]

The Structure of the Encomium

Proemium aside, Isocrates, faithfully adhered to the structure of the genre, which in itself gave the delusive impression that there is no noteworthy difference between his encomium and the other representatives of the genre, as a result of which his work was regarded as being quite an ordinary writing. This was mainly due to the fact that his covert allusions in both the proemium and the main body of the encomium were not noticed by the scholars in previous research on the subject.

Isocrates fully observed rules of the genre by telling his praise of Helen in chronological order,[33]as is evident from the fact that he starts his encomium with talking about *genos*, i.e. with the beginning of the family of Helen referred to as the only daughter of Zeus (16: πλείστων γὰρ ἡμιθέων ὑπὸ Διὸς γεννηθέντων μόνης ταύτης γυναικὸς πατὴρ ἠξίωσε κληθῆναι).As proof of this, he cites the fact that Theseus, "reputedly the son of Aegeus, but in reality the progeny of Poseidon, seeing her not as yet in the full bloom of her beauty, but already surpassing other maidens, was so captivated by her loveliness that he, accustomed as he was to subdue others, and although the possessor of a fatherland most great and a kingdom most secure, thought life was not worth living amid the blessings he already had unless he could enjoy intimacy with her (18)."

There follows what is crucial in understanding of the entire work, namely the praise of Theseus (23-37), a lengthy digression structured in accordance with *aretai,* i.e. the cardinal virtues (*andreia*, *episteme*, *eusebeia*, *sophrosyne*) and essentially based on comparison between Theseus and Heracles. Then the story is told about how Alexander Paris, when he was appointed judge in strife among the goddesses for the prize of beauty, and when the kings and potentates of that time "disdained the wedlock at home and went to Sparta to woo Helen," chose to live with Helen before all else, thereby neglecting the proferred gifts of Hera and Athena and giving rise to so great a war between Europe and Asia (38-51) or, to be more precise, the greatest of all wars in the violence of its passions, with Isocrates' condemnation of all those authors who reviled Alexander's choice ending this segment of his encomium (45-48) and being yet another digression from the central narrative theme.

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[32]ἀλλὰ ἵππον ἀνθρώπῳ συμβαλεῖν θαῦμα οὐδέν, συναλεῖψαι μὴν καὶ ἑνῶσαι καὶ διαδοῦναι ἄμφω λήγειν καὶ ἄρχεσθαι καὶ διαφεύγειν τοὺς ὀφθαλμοὺς εἰ τὸ τέρμα τοῦ ἀνθρώπου ἐλέγχοιεν.

[33]According to Russell (2012) "a well-defined rhetorical structure" of the encomium "developed early, exemplified by the praises of Eros in Plato's *Symposium* (esp. Agathon's speech), Isocrates' obituary of Evagoras and Xenophon's *Agesilaus*. This pattern proved adaptable to the praises of cities; it also influenced the development of biography," with the theory itself appearing also in the 4th century B.C. in the *Rhetorica ad Alexandrum*. It should also be noted that, according the same author, some poems of Simonides, Pindar and Bacchylides were classed as encomia by Alexandrinian scholars, with prose encomia beginning to appear in the fifth century B.C. and not always being a serious substitute for poetry, but more *jeux d'esprit*, i.e. *paignion*. It is this term that Gorgias, Isocrates' rival, used to describe his *Helen*, with the sophist Polycrates going so far as to praise salt and mice, to Isocrates' utter amazement (*Hel.* 12). For the structure, see also Münscher (1916) 2184-2185.

Thereafter follows the praise of beauty and its power over gods and men (52-60), which in itself explains the deification of Helen and her acting as a goddess, which is why it is duty of those "who have great wealth to propitiate and to honour her with thank-offerings, sacrifices and processions," as distinguished from the philosophers who "should endeavour to speak of her in a manner worthy of her merits" (61-66).

The story concludes with the epilogue (67-69) in which it is said that much of what could be utilized for the praise of Helen has necessarily been left unsaid on account of the greatness of her personality. This is evidenced by the fact that it was because of her that the Greeks "became united in harmonious accord, organized a common expedition against barbarians and Europe set up a trophy of victory over Asia for the first time," with Isocrates thus announcing the unity of the Greeks as a major theme of his political discourses, inspired by Socrates' political testament in the *Alcibiades,* briefly discussed in our previous study.

In order to identify well-concealed allusions and, consequently, to "detect" Isocrates' paraphrases of the key passages from Plato's dialogues *Phaedrus, Symposium* and *Republic,* it was necessary to notice a central idea around which the overall narrative of the encomium revolves. Despite its being well-hidden at the very beginning of the encomium, we have managed to notice the aforementioned idea, something that could not be achieved without doing a lot of repeated reading of the same text, namely that of the third and fourth book of Plato's*Republic*.

Essentially, this means that anyone with an ambition to fully grasp the encomium's structure and its final message should keep fresh in mind, among other things, the whole content of the mentioned books of the *Republic*, which in itself is a telling indication of the challenges facing research on Greek literature. The finding itself is heavy with meaning, as evidenced by the fact that the aforementioned third book of the *Republic* provided the starting point for Isocrates' narrative, namely the book in which Socrates levels sharp criticism at Homeric poetry while at the same time putting forward his theses on a new literature developing in tune with the spirit of his ideal state,that is, the one ruled by the philosopher king.

All this assumes greater significance in the light of the fact that in none other than the aforementioned book of the *Republic* we come across the subdivision of poetry (392d-394d), based on the criterion of narrating person and rightly deemed important for the poetics of the Greek novel,[34] as is evident from the fact that the

[34]What is being referred to here is the division of poetry in the third book of the *Republic*, as reflected in both Cicero (*Inv. rhet.* 1, 27) and the author of the *Rhetorica ad Herennium* (1, 8, 12-13) and applied to the third type of narrative which was not used in a cause actually pleaded in court and was designed solely as a convenient practice or, to be more precise, school exercise for "handling the first two types more advantageously in actual causes." This scholastic type, called *drama*, *dramatikon*, *plasmatikon* or *argumentum*, is, in its turn, divided into the two subtypes (*genus in negotiis* and *genus in personis positum*), with the latter further subdivided into three subtypes according to the criterion of a speaking person: *genus enarratiuum* (the author himself is speaking), *genus imitatiuum* (characters acting on the stage are speaking) and *genus commune* (both the author and the characters acting on the stage are the speakers). The other two types of narrative are those used in actual causes on which a decision is to be rendered, with the first type consisting in "setting forth the facts so as to win the victory" and the second "entering into a speech as a means of winning belief or incriminating the adversary or effecting a

above-mentioned subdivision was widely reflected in manuals of Greek and Latin grammar and rhetoric of classical, late antique and Byzantine period.[35] This evidence suggests the assumption that the trend to use the third and fourth book of the *Republic* for the making of a new poetics may be considerably influenced by Isocrates and his *Helen* clearly inspired by Socrates' attitudes to literature in the aforementioned poetological books of the *Republic*, as will be shown below. It would, after all, fit in well with the orator's aspiration to become one of the first executors of Socrates' political and literary testament in the *Alcibiades*.

Socrates' Ideas on the New Myth and Isocrates' Encomium

What we deal with here are the opening passages from the third book of the *Republic* in which Socrates, except for expressing his disapproval of depicting the realities in the underworld (386b),[36] levels sharp criticism at the representations of gods and heroes in Homeric poems, with the men of repute showing feelings of fear and terror, bursting into wailings (387d),[37] lamentations and laughter (389a),[38] wholeheartedly praising carousals and the bounteous tables laden with bread and meat as the fairest thing in the world (390a),[39] and moreover craving for money and gifts (390e).[40] It is just in this part of his conversation with Adeimantus that Socrates categorically states that both of them will affirm the tales of such a kind to be lies, and won't suffer the youth of an ideal state ruled by the philosopher king to believe that Achilles, the son of goddess and of the most chaste of men, was of so perturbed a spirit as to be affected with two contradictory maladies, the greed that becomes no free man and overweening arrogance towards gods and men. Likewise, they won't believe this or suffer it to be said that Theseus, the son of Poseidon, and Peirithous, the son of Zeus, attempted such dreadful rapes, nor that any other child of a god and hero would have brought himself to accomplish the terrible and impious deeds that they now falsely relate of them (391c–d).[41] Then Socrates takes an even stronger stance by saying that both of them must constrain the poets either to deny that these are the deeds of heroes or that they who performed them are the children of gods, but not to make both statements (391d: ἀλλὰ προσαναγκάζωμεν τοὺς ποιητὰς ἢ μὴ τούτων αὐτὰ ἔργα φάναι ἢ τούτους μὴ εἶναι θεῶν παῖδας, ἀμφότερα δὲ μὴ λέγειν).

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transition or setting the stage for something" (*aut fidei aut criminationis aut transitionis aut alicuius apparationis causa*), as translated by H. Caplan (LCL). Cf. Barwick (1928, 282), Müller (1976, 116) and Kozić (2023, 193-220).

[35]Cf. Rostagni (1955) 223ff.

[36]τὰν ῞Αιδου ἡγούμενον εἶναί τε καὶ δεινὰ εἶναι οἴει τινὰ θανάθου ἀδεῆ ἔσεσθαι[...].

[37]καὶ τοὺς ὀδυρμοὺς ἄρα ἐξαιρήσομεν καὶ τοὺς οἴκτους τοὺς τῶν ἐλλογίμων ἀνδρῶν [...].

[38]οὔτε ἄρα ἀνθρώπους ἀξίους λόγου κρατουμένους ὑπὸ γέλωτος ἄν τις ποιῇ, ἀποδεκτέον [...].

[39]ποιεῖν ἄνδρα τὸν σοφώτατον λέγοντα ὡς δοκεῖ αὐτῷ κάλλιστον εἶναι πάντων, ὅταν - παρὰ πλεῖαι ὦσι τράπεζαι σίτου καὶ κρειῶν [...].

[40]οὐδὲ τὸν τοῦ ᾽Αχιλλέως παιδαγωγὸν [...] ἐπαινετέον ὡς μετρίως ἔλεγε συμβουλεύων αὐτῷ δῶρα μὲν λαβόντι ἐπαμύνειν τοῖς ᾽Αχαιοῖς [...].

[41][...] μηδὲ τάδε [...] ἐῶμεν λέγειν, ὡς Θησεὺς Ποσειδῶνος ὑὸς Πειρίθους τε Διὸς ὥρμησαν οὕτως ἐπὶ δεινὰς ἁρπαγάς, μηδὲ τιν᾽ ἄλλον θεοῦ παῖδά τε καὶ ἥρω τολμῆσαι ἂν δεινὰ καὶ ἀσεβῆ ἐργάσασθαι [...].

This gave occasion to Socrates for his heavy involvement in the matter of poetry and poetics, as is evident from his warning to the poets not to attempt to persuade the youth that the gods are the begetters of evil, and that heroes are no better than men, given that such utterances are both impious and false, as proved by the impossibility for evil to arise from gods (391d).[42] And at the end of this part of his argumentation Socrates points to the pernicious effect of such myths and fables on the well-being of a city-state ruled by the philosopher king, in so far as every man will be lenient with his own misdeeds if he is convinced that such are and were the actions of the near-sown seed of gods, close kin to Zeus, which is why, in his view, such tales must be put down lest they breed in the youth great laxity in turpitude (391e).[43]

It is none other than this Socratic reference to the myth of the abduction of Helen by Theseus and Peirithous and its pernicious effect on the education of the youth that inspired Isocrates to such an extent that he decided to further elaborate on it in full accordance with the spirit of Socrates' and Plato's philosophy so as to emphasize both the strategic significance[44] of the theses put forward in the third book of the *Republic* and his own role of the faithful executor of Socrates' political and literary testament in the *Alcibiades*, something that was perhaps yet more important to him than the elaboration of ideas derived from the archetype.

In writing his encomium, Isocrates was most likely inspired by the emblematic scene from the prologue to the *Phaedo*, in which Socrates is represented as having recourse to both the poetic paraphrase of a comic prose model such as Aesop's fable and a sublime hymn to Apollo (60d)[45] as soon as his prison chains were unfastened (60b-c),[46] thus blending together, on the last day of his life, the serious and the laughable in an amazing combination of polar opposites. Socrates' characterization of his artistic endeavours as making music speaks volumes about the true nature of his paraphrase, as can be inferred from his assertion that what he was working at on the

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[42] μηδὲ ἡμῖν ἐπιχειρεῖν πείθειν τοὺς νέους ὡς οἱ θεοὶ κακὰ γεννῶσιν, καὶ ἥρωες ἀνθρώπων μηδὲν βελτίους [...] οὐκ ὅσια ταῦτα οὔτε ἀληθῆ [...].

[43] καὶ μὴν τοῖς γε ἀκούουσιν βλαβερά· πᾶς γὰρ ἑαυτῷ συγγνώμην ἕξει κακῷ ὄντι, πεισθεὶς ὡς ἄρα τοιαῦτα πράττουσίν τε καὶ ἔπραττον οἱ θεῶν ἀγχίσποροι [...] ὧν ἕνεκα παυστέον τοὺς τοιούτους μύθους, μὴ ἡμῖν πολλὴν εὐχέρειαν ἐντίκτωσι τοῖς νέοις πονηρίας.

[44] Cic. *De or*. 2, 94, seems to point to none other than this dimension: *ecce tibi est exortus Isocrates, magister iste oratorum omnium, cuius e ludo tamquam ex equo Troiano meri principes exierunt; sed eorum partim in pompa partim in acie inlustres esse uoluerunt. atque et illi Theopompi, Ephori* […] *multique alii naturis differunt, uoluntate autem similes sunt et inter se et magistri; et hi qui se ad causas contulerunt, ut Demosthenes, Hyperides* […] *etsi inter se pares non fuerunt, tamen sunt omnes in eodem ueritatis imitandae genere uersati*.

[45] περὶ γάρ τοι τῶν ποιημάτων ὧν πεποίηκας ἐντείνας τοὺς τοῦ Αἰσώπου λόγους καὶ τὸ εἰς τὸν Ἀπόλλω προοίμιον καὶ ἄλλοι τινές με ἤδη ἤροντο [...].

[46] ὡς ἄτοπον […] ἔοικέ τι εἶναι τοῦτο ὃ καλοῦσιν οἱ ἄνθρωποι ἡδύ· ὡς θαυμασίως πέφυκε πρὸς τὸ δοκοῦν ἐναντίον εἶναι, τὸ λυπηρόν, τὸ ἅμα μὲν αὐτὼ μὴ ἐθέλειν παραγίγνεσθαι τῷ ἀνθρώπῳ, ἐὰν δέ τις διώκῃ τὸ ἕτερον καὶ λαμβάνει, σχεδόν τι ἀναγκάζεσθαι ἀεὶ λαμβάνειν καὶ τὸ ἕτερον, ὥσπερ ἐκ μιᾶς κορυφῆς ἡμμένω δύ᾽ ὄντε [...] ὥσπερ οὖν καὶ αὐτῷ μοι ἔοικεν· ἐπειδὴ ὑπὸ τοῦ δεσμοῦ ἦν ἐν τῷ σκέλει ἀλγεινόν, ἥκειν δὴ φαίνεται ἐπακολουθοῦν τὸ ἡδύ.

last day of his life was only a popular kind of music regarded as being a simplification of, or a specific supplement, to the greatest kind of music such as his philosophy (61a).[47]

Isocrates was very well aware that he was not fully capable of following in the footsteps of his great master in so far as he was not so poetically gifted to either achieve the mentioned daemonic combination of the serious and the laughable[48] or to contemplate pure, perfect forms collected together in the place beyond heaven (hyperouranion).

Thus Isocrates was left with no alternative other than what was characterized by Socrates as a popular kind of music, that is, paraphrase, albeit with some limitations due to his natural abilities. And, indeed, in a key passage from the *Antidosis* Isocrates labels his literary creativity or rather "philosophy" as a music (47-48),[49] omitting at the same time the qualifier 'popular' so as to conceal his dependence on the emblematic scene from the *Phaedo*. It is the limitations just mentioned that essentially determined the true nature of Isocrates' popular music in so far as its classical, Socratic type such as the poetic paraphrase of a prose model had to be left aside and replaced with some kind of surrogate such as a prose paraphrase of prose patterns, or rather ideas mainly derived from the philosophy of Socrates and Plato. It might serve as a further explanation for why Isocrates was so inspired by the emblematic scene from the *Phaedo* and why he regarded his own art of paraphrasing as a popular music, something that sheds further light on his tendency to call his own rhetoric philosophy.

It is precisely this characteristic of Isocrates' method that further supports the assumption that Socrates' criticism directed at the close ofthe *Euthydemus* at an unnamed orator staying in the border-ground between philosopher and politician applies to Isocrates[50] who, far from seeing anything polemical or unpleasant in that, regarded it as an objective judgment on his own abilities, very well-aware that he was left with no possibility other than to join in the mission of popularizing his master's legacy and putting it into practice in his political course of action, in keeping, one would say, with the spirit of Socrates' political and literary testament in the *Alcibiades*.

As it was very hard to notice a guiding principle in the conception of the main body of the encomium, so it was very difficult to detect in it echoes of some of the central theses put forward by Socrates in the *Phaedrus*, such as those used by Isocrates to develop his lines of argumentation when it comes to explaining the

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[47][…] καὶ ἐμοὶ οὕτω τὸ ἐνύπνιον ὅπερ ἔπραττον τοῦτο ἐπικελεύειν, μουσικὴν ποιεῖν, ὡς φιλοσοφίας μὲν οὔσης μεγίστης μουσικῆς, ἐμοῦ δὲ τοῦτο πράττοντος. νῦν δ' [...] ἔδοξε χρῆναι, εἰ ἄρα πολλάκις μοι προστάττοι τὸ ἐνύπνιον ταύτην τὴν δημώδη μουσικὴν ποιεῖν, μὴ ἀπειθῆσαι αὐτῷ ἀλλὰ ποιεῖν.

[48]What is involved here is not only the mixture of the sublime and the laughable but also a fruitful tension between *mythos* and *logos*, poetry and dialectic, the music of images and the music of speech, as pointed out by Reale (2000, 294): "Si tenga presente che Platone costruisce il *Fedone* (come del resto non pocchi dialoghi) appunto sfruttando in modo sistematico la feconda tensione fra mito e *logos*, poesia e dialettica, musica di immagini e musica di discorsi. In un certo senso, l'impianto del *Fedone* è addirittura paradigmatico. I due grandi blocchi di ragionamento dialettico sono seguiti da due grandiosi miti."

[49][...] οὓς (scil. Isocratis orationes) ἅπαντες ἂν φήσαιεν ὁμοιοτέρους εἶναι τοῖς μετὰ μουσικῆς καὶ ῥυθμῶν πεποιημένους. See among other passages from Eunapius the following (*VS* 501–502) modelled on the *Phaedrus* (271d): ὥσπερ οὖν τὰ κάλλιστα καὶ γλυκύτερα τῶν μελῶν πρὸς πᾶσαν ἀκοὴν ἡμέρως καὶ πράως καταρρεῖ (scil. Chrysanthii oratio) [...] καὶ [...] πᾶσιν ἦν ἐναρμόνιος, καὶ τοσαύταις διαφοραῖς ἠθῶν ἐνέπρεπε καὶ καθηρμόζετο.

[50]Cf. Plat. *Euthyd.* 304d-306c.

importance of beauty for not only the life of every individual and every poet but also for the well-being of every state, society and nation. Incapable though he was of achieving greater effect by combining together, like his great master, the music of images and the music of speech, Isocrates was nonetheless fully able to elevate the paraphrase to new heights by the most careful elaboration of the basic concept of philosophy, which in itself was not at all an easy endeavour, as evidenced by the fact that, largely due to that, his encomium assumed characteristics of a popular music.

The Place beyond Heaven in the *Phaedrus* and Isocrates' Popular Music

What is being referred to here are the key theses on beauty, put forward by Socrates in his great discourse on love in the *Phaedrus*, with the philosopher holding a view that beauty as Being shone in brilliance among realities in the place beyond heaven, or rather *hyperouranion* (250b),[51] and that "since we came to earth we have found it shining most clearly through the clearest and sharpest of our senses" such as sight (250d),[52] and that none other of the realities on the top of the vault of heaven can be seen by the mentioned sense, including Wisdom "which would arouse terrible love, if such a clear image of it were granted as would come through sight (ibid.)."[53] As a result of this "beauty alone has this privilege, and therefore it is most clearly seen and loveliest" among all the realities in the place beyond heaven (250d).[54]

What comes across in Isocrates' encomium is a well-hidden paraphrase of Socrates' theses on beauty, with the orator passing over in silence an unbreakable bond between beauty and the place beyond heaven and speaking only of beauty as manifested in this world, and Helen as its embodiment, as is evident from his assertion that Helen "possessed beauty in the highest degree," and that "beauty is of all things the most venerated, the most precious, and the most divine," and for precisely that reason "most highly esteemed, because it is most beautiful of ways of living (*Hel*. 54)."[55]

That the mentioned theses advocated by Socrates in the famous passage from the *Phaedrus* are freely interpreted by Isocrates can be inferred from other attitudes he took towards beauty in the same context of his encomium, in which it is said that "many things which do not have any attributes of courage, wisdom or justice will be seen to be more highly valued than any one of these attributes," or rather virtues, "yet of those things which lack beauty we shall find not one that is

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[51]κάλλος δὲ τότ᾽ ἦν ἰδεῖν λαμπρόν, ὅτε σὺν εὐδαίμονι χορῷ μακαρίαν ὄψιν τε καὶ θέαν (scil. εἴδομεν) [...] ἣν θέμις λέγειν μακαριωτάτην, ἣν ὠργιάζομεν ὁλόκληροι μὲν αὐτοὶ ὄντες καὶ ἀπαθεῖς κακῶν ὅσα ἡμᾶς ἐν ὑστέρῳ χρόνῳ ὑπέμενεν.

[52]περὶ δὲ κάλλους [...] μετ᾽ ἐκείνων τε ἔλαμπεν ὄν, δεῦρό τ᾽ ἐλθόντες κατειλήφαμεν αὐτὸ διὰ τῆς ἐναργεστάτης αἰσθήσεως τῶν ἡμετέρων στίλβον ἐναργέστατα. ὄψις γὰρ ἡμῖν ὀξυτάτη τῶν διὰ τοῦ σώματος ἔρχεται αἰσθήσεων. In this connection, it should be noted that translations of the passages from the *Phaedrus* are by H. N. Fowler (LCL).

[53][…] ᾗ (scil. ὄψει) φρόνησις οὐκ ὁρᾶται – δεινοὺς γὰρ ἂν παρεῖχεν ἔρωτας, εἴ τι τοιοῦτον ἑαυτῆς ἐναργὲς εἴδωλον παρείχετο εἰς ὄψιν ἰόν – καὶ τἆλλα ὅσα ἐραστά.

[54]νῦν δὲ κάλλος μόνον ταύτην ἔσχε μοῖραν, ὥστ᾽ ἐκφανέστατον εἶναι καὶ ἐρασμιώτατον.

[55]εὐλόγως δὲ κἀκεῖνοι (scil. θεοί) τοῦτ᾽ ἔγνωσαν, κἀγὼ τηλικαύταις ὑπερβολαῖς ἔχω χρήσασθαι περὶ αὐτῆς· κάλλους γὰρ πλεῖστον μέρος μετέσχεν (scil. Ἑλένη), ὃ σεμνότατον καὶ τιμιώτατον καὶ θειότατον τῶν ὄντων ἐστίν.

beloved (54-55)."[56] And, lastly, an attentive reader will learn how against his will Isocrates betrayed his heavy dependence upon the theses advocated by Socrates in his great discourse on love in the *Phaedrus* by saying that all of the mentioned attributes, or rather virtues, are despised, except in so far as they possess in some degree the outward form of beauty, and that, in keeping with that, every one of them can be most highly esteemed only if permeated by beauty (54).[57] This was already implied at the very beginning of the main body of the encomium, in which it is said that Zeus, devoted though he was most of all to Heracles and the sons of Leda, showed his preference for Helen and her beauty, as compared with Heracles and his strength of body (16),[58] namely a beauty that was able to overpower and bring into subjection to it the strength itself of Theseus (18),[59] Heracles' closest rival.

Yet another key thesis advocated by Socrates in the *Phaedrus*, namely that "he who is newly initiated, who beheld many of those realities in the place beyond heaven, when he sees a godlike face or form which is a good image of beauty, shudders, at first, and something of the old awe comes over him, and, as he gazes, he reveres the beautiful one as a god, and if he did not fear to be thought stark mad, he would offer sacrifice to his beloved as to an idol or a god (251a),"[60] is also reflected in the encomium (56), with Isocrates freely interpreting it lest his heavy dependence upon the patterns in the *Phaedrus* should be recognized as such.

These results are fully confirmed by yet another instance of Isocrates' obvious dependence on Socrates' theses on beauty in the *Phaedrus*, as is evident from his view that "while we are jealous of those who excel us in intelligence or in anything else, unless they win us over by daily benefactions and compel us to be fond of them, yet at first sight we become well-disposed toward those who possess beauty, and to these alone as to the gods we do not fail in our homage (*Hel*. 57)."[61] As if this wasn't enough, Isocrates further continues to freely interpret Socrates' theses by saying that "we submit more willingly to be the slaves of such beautiful ones than to

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[56]ῥᾴδιον δὲ γνῶναι τὴν δύναμιν αὐτοῦ (scil. κάλλους)· τῶν μὲν γὰρ ἀνδρίας ἢ σοφίας ἢ δικαιοσύνης μὴ μετεχόντων πολλὰ φανήσεται τιμώμενα μᾶλλον ἢ τούτων ἕκαστον [...] τῶν μὲν γὰρ ἄλλων ὧν ἂν ἐν χρείᾳ γενώμεθα, τυχεῖν μόνον βουλόμεθα, περαιτέρω δὲ περὶ αὐτῶν οὐδὲν τῇ ψυχῇ προσπεπόνθαμεν· τῶν δὲ καλῶν ἔρως ἡμῖν ἐγγίγνεται, τοσούτῳ μείζω τοῦ βούλεσθαι ῥώμην ἔχων, ὅσῳ περ καὶ τὸ πρᾶγμα κρεῖττόν ἐστιν.

[57] τῶν δὲ κάλλους ἀπεστερημένων οὐδὲν εὑρήσομεν ἀγαπώμενον ἀλλὰ πάντα καταφρονούμενα, πλὴν ὅσα ταύτης τῆς ἰδέας κεκοινώνηκε, καὶ τὴν ἀρετὴν διὰ τοῦτο μάλιστ᾽ εὐδοκιμοῦσαν, ὅτι κάλλιστον τῶν ἐπιτηδευμάτων ἐστίν.

[58] σπουδάσας δὲ μάλιστα περὶ τε τὸν ἐξ Ἀλκμήνης καὶ τοὺς ἐκ Λήδας, τοσούτῳ μᾶλλον Ἑλένην Ἡρακλέους προὐτίμησεν ὥστε τῷ μὲν ἰσχὺν ἔδωκεν, ἣ βίᾳ τῶν ἄλλων κρατεῖν δύναται, τῇ δὲ κάλλος ἀπένειμεν, ὃ καὶ τῆς ῥώμης αὐτῆς ἄρχειν πέφυκεν.

[59]Cf. n. 33.

[60]ὁ δὲ ἀρτιτελής, ὁ τῶν τότε πολυθεάμων, ὅταν θεοειδὲς πρόσωπον ἴδῃ κάλλος εὖ μεμιμημένον ἤ τινα σώματος ἰδέαν, πρῶτον μὲν ἔφριξε καί τι τῶν τοτε ὑπῆλθεν αὐτὸν δειμάτων, εἶτα προσορῶν ὡς θεὸν σέβεται, καὶ εἰ μὴ ἐδεδίει τὴν τῆς σφόδρα μανίας δόξαν, θύοι ἂν ὡς ἀγάλματι καὶ θεῷ τοῖς παιδικοῖς.

[61]τοῖς δὲ καλοῖς εὐθὺς ἰδόντες εὖνοι γιγνόμεθα, καὶ μόνους αὐτοὺς ὥσπερ τοὺς θεοὺς οὐκ ἀπαγορεύομεν θεραπεύοντες [...].

rule all others, and that we are more grateful to them when they impose many tasks on us than to those who demand nothing at all (57)."[62]

The Secrets of Isocrates' Art of Paraphrasing

But Isocrates was very well aware that greater effect cannot be achieved by using technique of amplification unless it is based on a method solely capable of giving it magical powers. That method is mentioned only once in Isocrates' oeuvre, which made it extremely hard to detect, because, among other things, the author alluded to it where we would expect it the least, namely in his highly unusual, and moreover well-concealed palinody in the *Panathenaicus*. What we mean by 'highly unusual' is the fact that the mentioned palinody, as was otherwise the case with that of Aristides in his *First Platonic Discourse* (or. 2) entitled *A Reply to Plato: In Defense of Oratory*,[63] sits somewhere at the end of the discourse, "buried" under a fair amount of evidence provided by Isocrates in the central part of his lengthy discourse, which is why it continuously escaped the attention of the scholars.

In the mentioned palinode,[64] Isocrates' pupil, most probably Theopompus, speaks out his opinion on the *Panathenaicus* by pointing to the reception it is most likely to get from the audience and saying that "the discourse will appear to be ingenuous and easy to comprehend to all those who read it casually, though to those who scan it thoroughly and endeavour to see in it what has escaped all others it will reveal itself as difficult and hard to understand, packed with history and philosophy, and filled with all manners of devices and fictions – not the kind of myths and fictions which, used with evil intent, are wont to injure one's fellow-citizens, but the kind which, used by the cultivated mind, are able to benefit or to delight one's audience (246)"[65] – and the community as a whole, if we may add.

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[62]ἥδιον δουλεύομεν τοῖς τοιούτοις ἢ τῶν ἄλλων ἄρχομεν, πλείω χάριν ἔχοντες τοῖς πολλὰ προστάττουσιν ἢ τοῖς μηδὲν ἐπαγγέλλουσιν. It can also be noticed that, except for this addition, we encounter in the same context (56) Isocrates' variation on the same theme such as the superiority of beauty over all virtues: καὶ τοῖς μὲν κατὰ σύνεσιν ἢ κατ᾽ ἄλλο τι προέχουσι φθονοῦμεν, ἢν μὴ τῷ ποιεῖν ἡμᾶς εὖ καθ᾽ ἑκάστην τὴν ἡμέραν προσαγάγωνται καὶ στέργειν σφᾶς αὐτοὺς ἀναγκάσωσι [...].

[63]Aristides takes it one step further, placing his fairly brief and almost unnoticeable palinode at the very end of his lengthy *Reply to Plato.* See also n. 15.

[64]We come across it at the height of the discourse or, to be more precise, in a passage in which Isocrates' masterful, erudite and controlled expositions start to assume features of *drama*, and what is being referred to here is a moment when the author, due to his having spoken of Sparta with, as it seemed to him, extreme bitterness and the lack of moderation, faces a dilemma as to whether to burn what he had written or use a palinode, just like Socrates did in the *Phaedrus,* to recant what he had said (232: οὐ γὰρ μετρίως ἐδόκουν μοι διειλέχθαι περὶ αὐτῶν (scil. Λακεδαιμονίων) οὐδ᾽ ὁμοίως τοῖς ἄλλοις, ἀλλ᾽ ὀλιγώρως καὶ λίαν πικρῶς [...] ὥστε πολλάκις ὁρμήσας ἐξαλείφειν αὐτὸν ἢ κατακάειν μετεγίγνωσκον, ἐλεῶν τὸ γῆρας τοὐμαυτοῦ καὶ τὸν πόνον τὸν περὶ τὸν λόγον γεγενημένον).

[65][...] προελόμενον δέ σε συνθεῖναι λογον [...] τοῖς μὲν ῥᾳθύμως ἀναγιγνώσκουσιν ἁπλοῦν εἶναι δόξαντα [...] τοῖς δ᾽ ἀκριβῶς διεξιοῦσιν αὐτόν [...] χαλεπὸν φαινόμενον καὶ δυσκαταμάθητον καὶ πολλῆς μὲν ἱστορίας γέμοντα καὶ φιλοσοφίας [...] καὶ ψευδολογίας, οὐ τῆς εἰθισμένης μετὰ κακίας βλάπτειν τοὺς συμπολιτευομένους, ἀλλὰ τῆς δυναμένης [...] τέρπειν τοὺς ἀκούοντας. Papillon (1996, 14) speaks of Isocrates' making a distinction between the adjective *mythodes* and the noun *mythos*, with the latter – unlike the former charged with being useless

In this palinody, we encounter key terms and phrases such as the ones that follow: "discourse packed with history and philosophy and filled with all manners of devices and fictions (*pseudologia*)," "cultivated mind," a kind of myth and fictions "not used with evil intent" but, quite to the contrary, "being able to benefit the whole community"in full accordance, it seems, with the theses advocated by Socrates in the *Republic*. What we deal with here are terms containing in a nutshell Isocrates' poetics and further explaining what has been said in our previous study about his attitude towards philosophy and his strong desire for being recognized as a philosopher.

All this gives rise to the question as to what the origin of this daemonic combination of history, philosophy and myth might be, although the appearance of the term 'philosophy' in the mentioned combination already suggested the answer to the question, but what is still lacking is a clear evidence that confirms the assumption.

It is none other than Dio Chrysostom's *Fifty-Fifth Discourse*, or rather his short essay on Homer and Socrates that provides this evidence, namely an assay in which the author goes so far as to advocate the thesis on the near total similarity between these two creative colossi of the literary world, as demonstrated by the fact that they both possessed unrivalled skills at blending together myth, fable and history (11),[66] and moreover an unparalleled ability to make similes and comparisons (9). The only difference being that Dio failed to include philosophy into this daemonic combination, which can be explained by the fact that, under the influence of his great master Socrates, he regarded the mentioned combination as a very philosophical way of expressing oneself.[67]

Lucian's attitudes towards his own method of *montage* essentially based on archetype,[68] i.e. Homeric, Socratic or Platonic concepts, shed further light on why the mentioned daemonic combination of history, myth and fable was regarded as having magical powers. When Lucian implicitly establishesa close relationship between the aforesaid method and the life in eternity,[69] we can clearly see that he is fully inspired by Isocrates' palinody in the *Panathenaicus* (260)*,* in which blending together the categories of narration such as history, myth, fable and philosophy is directly equated

– regarded as beneficial, whereas it would make more sense to speak of the new and old myth, in so far as the wording "myths and fictions which, used with evil intent, are wont to injure one's fellow-citizens" points, as it seems, to the old myth. That's why Isocrates in his *Helen*, as Viidebaum (2021, 69) put it, "focuses only on those aspects of her representation that can be wholeheartedly praised, and avoids getting caught up with topics that associate her with negative fame," with Livingstone (2001) sharing almost the same view on the issue and talking about the 'pure genre' of the encomium. Cf. also Zajonz (2002) 145.

[66]"Ομηρος διά τε μύθων καὶ ἱστορίας ἐπεχείρησε τοὺς ἀνθρώπους παιδεύειν [...] καὶ Σωκράτης πολλάκις ἐχρῆτο τῷ τοιούτῳ [...].

[67]Cf. n. 14. In this connection, it is worth mentioning that the myths in the dialogues of Plato are deeply rooted in the tradition of the new myths, in which the new religiousness, cultivated in the western Greek colonies of Sicily and southern Italy, found its expression, with this new spirituality appearing for the first time in the poems of Empedocles and having its origin in Pythagoreanism, as pointed out by Ebert (2002) 254.

[68] Cf. Luc. *Prom. verb.* 3.

[69]The very fact that in Lucian's view (*Prom. verb.* 3) originality (inventiveness) as a method – otherwise diametrically opposed to *montage*, and symbolized by Promethean clay figures becoming living creatures as soon as Athena breathes into the mud – is closely connected with life in time, necessarily implies that *montage,* or rather paraphrase, is the only approach capable of bestowing immortality upon the author.

with immortality.[70] Thus a stylistics and history of ideas-related timeline crystallized once again, starting from Socrates' political testament in the *Alcibiades,* passing through the oeuvre of Xenophon and Isocrates, the testament's first executors, and leading up to the major exponents of the Second Sophistic such as Dio, Lucian and Philostratus. This concordance between Isocrates and the aforementioned major exponents of the late Greek renaissance of the second century A.D. speaks volumes about his influence on it.

This breakthrough into Isocrates' poetics brought out a secondary result which is of the greatest significance for fully understanding the praise of Helen*,* in so far as it turned out that Theopompus' critical judgment on the *Panathenaicus* is fully applicable to the encomium so that it can rightly be said that the *Helen* "will appear to be ingenuous and easy to comprehend to all those who read it casually, though to those who scan it thoroughly and endeavour to see in it what has escaped all others it will reveal itself as difficult and hard to understand, packed with history and philosophy, and filled with all manners of devices and fictions." What is involved here is the aforementioned daemonic combination as the only method[71] that could benefit or delight the community as a whole, but, unfortunately, that has gone largely unnoticed in previous research on the subject.

It is therefore no wonder that Isocrates chose Helen and the Trojan war as the theme of his encomium if we take into account the fact that the aforesaid topics contain a perfect combination of history, myth and fable that were blended into organic unity in Homeric poems to such an extent that it was difficult even for an experienced eye to determine where myth ends and history begins and what is mythical in what appeared at first sight to be a historic event – in full accordance with Philostratus' description of Centaur's dual nature, as shown on the painting. But Isocrates was very well aware that such a combination of myth and history can truly be called "daemonic" only with the inclusion of philosophy, which in itself explains his conception of the encomium essentially basedon the theses on beauty, as advocated by Socrates in his great discourses on love in the *Phaedrus* and the *Symposium*, if, for a moment, we put aside the aforementioned philosopher's sharp critique of the old myth in the opening passages from the third book of the *Republic.*

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[70] δοκεῖς γάρ μοι ζῶν μὲν λήψεσθαι δόξαν [...] παρὰ πλείοσι δὲ καὶ μᾶλλον ὁμολογουμένην τῆς νῦν ὑπαρχούσης, τελευτήσας δὲ τὸν βίον μεθέξειν ἀθανασίας, οὐ τῆς τοῖς θεοῖς παρούσης, ἀλλὰ τῆς τοῖς ἐπιγιγνομένοις περὶ τῶν διενεγκόντων ἐπί τινι τῶν καλῶν ἔργων μνήμην ἐμποιούσης. What transpires from this passage is Isocrates' attempt to subject philosophy to the categories of literature, as reflected in Cicero's philosophical oeuvre, according to Gigon (1992, 417): "Die Philosophie genügt sich nicht selbst. Sie ist literarischen Kategorien unterworfen und verfolgt literarische Absichten. Historisch ist Cicero von Isokrates abhängig; aber diese Abhängigkeit ist kein partikularer Zufall. Sie ergibt sich aus der geistigen Situation Ciceros."

[71] It should be said that Prohaeresius employed the same method characterized by Eunapius as "transferring contemporary events into the depths of mythical time" (*VS* 492: ταχὺ μάλα μετέστησεν εἰς τὸν ἀρχαῖον ὄγκον τὰ γιγνόμενα). It should also be noted that Prohaeresius' zeal to imitate Socrates' life down to the last detail went so far as to induce him to spend cold winters in Gaul barefooted and clad in a tiny threadbare cloak (492) as well as to drink nearly freezing water of the Rhine regarded as being the height of luxury (492), with the obvious aim of surpassing his master's legendary achievement during his military episode in ice-cold Potideia (Plat. *Symp.* 220b).

What was applied to the proemium, namely a technique of covert allusions essentially based on a careful *montage* of the patterns derived from the philosophy of Socrates, Plato and Aristotle was not fully applicable to the encomium due to the very nature of the genre, in so far as a higher degree of creativity was now required for Isocrates to prove himself as a great author and to create, almost at the very beginning of his literary activity, a work which might roughly be comparable to the *Phaedrus.* In other words, Isocrates could employ a method used in the proemium only to a certain extent, which means that the guiding idea of his encomium, i.e. Socrates' theses on beauty, put forward in his discourses on love in the *Phaedrus* and the *Symposium*, had to be well concealed so as to make it possible for him to abandon himself to the paraphrase of the aforementioned theses and to finally round off his subtle approach with the inclusion of his own ideas in the whole. Isocrates fully realized his ideas and for precisely this reason his encomium is, unlike the other representatives of the genre, a great achievement of literary mimesis, because of, among other things, the emergence of a peculiarly modern poetic sensibility in a typically scholastic genre.

A Modern Poetic Sensibility in the Encomium: Dying for the Beauty and Helen as its Earthly Incarnation

What we deal with here is no ordinary creativity but one owing to which Isocrates reached the heights of poetry, as can be inferred from one of his key concepts such as *dying for the beauty*, which shows a great similarity with a modern poetic sensibility. Helen and her beauty, according to Isocrates, drove not only the Greeks and the barbarians, but also the gods to undergo hardships of that expedition so much so that the latter "did not dissuade even their own children from joining in the struggles around Troy,[72] thinking it more honourable for them to die fighting for the daughter of Zeus than to live without having taken part in the perils undergone on her account" and thus to be lacking in such a horrible, unique and above all wonderful experience (53).[73] Even more importantly, they showed their children the way in so far as they themselves "engaged in a far greater and more terrible struggle than when they fought the Giants; for against those enemies they had fought a battle in concert, but for Helen they fought a war against one another (53)."[74]

In the same context we encounter yet another concept which shows a great similarity with modern poetic sensibility such as *remaining in a foreign land to grow old there just for the sake of beauty*, i.e. Helen, a concept worked out so well that it could rightly be regarded as worthy of Isocrates' great master. When Isocrates says that "although the Trojans might have rid themselves of the misfortunes which encompassed them by surrendering Helen, and the Greeks

[72]*Hel.* 52: τοιοῦτος δ᾽ ἔρως ἐνέπεσε τῶν πόνων καὶ τῆς στρατείας ἐκείνης οὐ μόνον τοῖς Ἕλλησι καὶ τοῖς βαρβάροις ἀλλὰ καὶ τοῖς θεοῖς, ὥστ᾽ οὐδὲ τοὺς ἐξ αὐτῶν γεγονότας ἀπέτρεψαν τῶν ἀγώνων τῶν περὶ Τροίαν [...].

[73][...] ὅμως αὐτοὺς συνεξώρμησαν καὶ συνεξέπεμψαν, ἡγούμενοι κάλλιον αὐτοῖς εἶναι τεθνάναι μαχομένοις περὶ τῆς Διὸς θυγατρὸς μᾶλλον ἢ ζῆν ἀπολειφθεῖσι τῶν περὶ ἐκείνης κινδύνων.

[74] αὐτοὶ γὰρ πολὺ μείζω καὶ δεινοτέραν ἐποιήσαντο παράταξιν τῆς πρὸς Γίγαντας αὐτοῖς γενομένης· πρὸς μὲν γὰρ ἐκείνους μετ᾽ ἀλλήλων ἐμαχέσαντο, περὶ δὲ ταύτης πρὸς σφᾶς αὐτοὺς ἐπολέμησαν.

might have lived in peace for all time by being indifferent to her fate, neither so wished (50),[75] but quite to the contrary, "the Trojans allowed their cities to be laid waste and their land to be ravaged, so as to avoid yielding Helen to the Greeks (50),[76] and the Greeks chose rather to remain and grow old in a foreign land and never to see their own again, than, leaving her behind, to return " to their dear native land (ibid.),[77] we can clearly see that Helen became guarantor of happiness of not only the entire states but also the entire continents such as Europe and Asia. Thus the personality of Helen, as interpreted by Isocrates, assumed characteristics of a cosmic entity shrouded in magic and mystery and thus, in a certain sense, became an earthly incarnation of the beauty on the top of the vault of heaven (*hyperouranion*), as depicted in the *Phaedrus*.

But there is much more to this than meets the eye. In saying that, we mean above all the fact that we will gain a firm understanding of these concepts reminiscent of a modern poetic sensibility only if we notice well-hidden montage of other concepts derived from the philosophy of Socrates and Plato and used in what seemed to be a digression loosely connected to the main body of the encomium, namely the praise of Theseus and his *aretai*.

To tell the truth, it was none other than Isocrates himself that gave occasion to others to interpret the mentioned praise as a digression, by saying that he perceives that he is being carried away beyond the proper limits of his theme, something that makes him afraid that some may think he is more concerned with Theseus than with the subject matter which he originally chose. Just this seemingly honest admission shows more than anything else how subtle Isocrates' art is, as evidenced by the fact that it was designed to meet one purpose and one purpose only, to conceal the author's heavy dependence on the ideas derived from both the *Republic* and the *Symposium*, and it was so well done that even an experienced eye could hardly detect a trace of it in the encomium of Isocrates. In saying that, we mean above all the fact that Isocrates made his patterns unrecognizable by following them in their highly abridged version so as to be in a position to enlarge on them, as a result of which they could not be detected without doing a lot of repeated reading of the same text, to say nothing of keeping fresh in mind almost the whole content of the relevant books of both the *Symposium* and the *Republic.* What we deal with here is a hardly detectable art of paraphrasing, as a result of which Isocrates' statements about his own art of speaking are as a rule taken too literally, thus creating a highly distorted image on not only his work but also the entire literary periods.

Isocrates' Allusive Technique at its Best: The Ladder of Love and other Socratic Concepts in the *Helen*

What Isocrates' allusive technique and art of paraphrasing looks like in practice can be shown on the example of his rephrasing of the theses on the ladder of love, as advocated by Socrates in his discourse in Plato's *Symposium*, namely a

[75] ἐξὸν δὲ τοῖς μὲν ἀποδοῦσιν Ἑλένην ἀπηλλάχθαι τῶν παρόντων κακῶν, τοῖς δὲ ἀμελήσασιν ἐκείνης ἀδεῶς οἴκεῖν τὸν ἐπίλοιπον χρόνον, οὐδέτεροι ταῦτα ἠθέλησαν.

[76] ἀλλ᾽ οἱ μὲν περιεώρων καὶ πόλεις ἀναστάτους γιγνομένας καὶ τὴν χώραν πορθουμένην, ὥστε μὴ προέσθαι τοῖς Ἕλλησιν αὐτήν [...].

[77] οἱ δ᾽ ᾑροῦντο μένοντες ἐπὶ τῆς ἀλλοτρίας καταγηράσκειν καὶ μηδέποτε τοὺς αὑτῶν ἰδεῖν μᾶλλον ἢ ἐκείνην καταλιπόντες εἰς τὰς ἑαυτῶν πατρίδας ἀπελθεῖν.

discourse that is essentially based on the new myth. Out of six stages of the ladder of love in the philosopher's discourse such as "climbing aloft, as on the rungs of a ladder, from one to two (210a),[78] and from two to all beautiful bodies (210b),"[79] from all beautiful bodies to the beauty of soul (210b-c),[80] from the beauty of soul to that of institutions (210c),[81] from beautiful institutions to the beauty of learning (210c-d),[82] from the beauty of learning "to that particular study which is concerned with the beautiful itself and that alone (210d-e),"[83] we encounter only two in Isocrates' praise of Theseus in the *Helen*, namely the first (ensuing beauty of form, or rather body, i.e. that of Helen)[84] and the fourth (contemplating the beautiful as emerging in the institutions and laws).[85] The covert allusion to the fourth stage of the ladder of love does clearly indicate that, in the author's view, Theseus assumed characteristics of an ideal ruler in full accordance with the concept of the philosopher king (36),[86] as proposed by Socrates in Plato's *Republic*, all the more so since the mythical hero, unlike other men who had won renown, was not, as Isocrates put it, lacking in any virtue (21).[87]

What served as a model for Isocrates to depict tyrannical rule as the exact opposite to Theseus' democracy disguised as monarchy was Socrates' account in the ninth book of the *Republic* of how the tyrannical man develops from the democratic type, with a youth bred in his democratic father's way rejecting beliefs held from boyhood about the honourable and the base and being overmastered by the opinions newly emancipated and released, namely opinions that formerly, when he was under the control of his father, were freed from restraint only in sleep. As a result of this he is now continuously and in waking hours what he rarely became in sleep,

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[78]δεῖ γὰρ τὸν ὀρθῶς ἰόντα ἐπὶ τοῦτο τὸ πρᾶγμα ἄρχεσθαι μὲν νέον ὄντα ἰέναι ἐπὶ τὰ καλὰ σώματα, καὶ πρῶτον μέν, ἐὰν ὀρθῶς ἡγῆται ὁ ἡγούμενος, ἑνὸς αὐτὸν σώματος ἐρᾶν καὶ ἐνταῦθα γεννᾶν λόγους καλούς [...].

[79]ἔπειτα δὲ αὐτὸν κατανοῆσαι ὅτι τὸ κάλλος τὸ ἐπὶ ὁτῳοῦν σώματι ἀδελφόν ἐστι, καὶ εἰ δεῖ διώκειν τὸ ἐπ᾽ εἴδει καλόν, πολλὴ ἄνοια μὴ οὐχ ἕν τε καὶ ταὐτὸν ἡγεῖσθαι τὸ ἐπὶ πᾶσι τοῖς σώμασι κάλλος. "But next he must remark how the beuaty attached to this or that body is cognate to that which is attached to any other, and that if he means to ensue beaty in form, it is gross folly not to regard as one and the same the beauty belonging to all," as translated by H. N. Fowler (LCL).

[80]μετὰ δὲ ταῦτα τὸ ἐν ταῖς ψυχαῖς κάλλος τιμιώτερον ἡγεῖσθαι τοῦ ἐν τῷ σώματι, ὥστε καὶ ἐάν [...] τις [...] σμικρὸν ἄνθος ἔχῃ, ἐξαρκεῖν αὐτῷ καὶ ἐρᾶν καὶ κήδεσθαι καὶ τίκτειν λόγους τοιούτους καὶ ζητεῖν, οἵτινες ποιήσουσι βελτίους τοὺς νέους [...].

[81][…] ἵνα ἀναγκασθῇ αὖ θεάσασθαι τὸ ἐν τοῖς ἐπιτηδεύμασι καὶ τοῖς νόμοις καλὸν καὶ τοῦτ᾽ ἰδεῖν ὅτι πᾶν αὐτὸ αὑτῷ συγγενές ἐστιν, ἵνα τὸ περὶ τὸ σῶμα καλὸν σμικρόν τι ἡγήσηται εἶναι [...].

[82][…] μετὰ δὲ τὰ ἐπιτηδεύματα ἐπὶ τὰς ἐπιστήμας ἀγαγεῖν, ἵνα ἰδῃ αὖ ἐπιστημῶν κάλλος [...].

[83][…] ἀλλ᾽ ἐπὶ τὸ πολὺ πέλαγος τετραμμένος τοῦ καλοῦ καὶ θεωρῶν πολλοὺς καὶ καλοὺς λόγους καὶ μεγαλοπρεπεῖς τίκτῃ καὶ διανοήματα ἐν φιλοσοφίᾳ ἀφθόνῳ, ἕως ἂν ἐνταῦθα ῥωσθεὶς κατίδῃ τινὰ ἐπιστήμην μίαν ταύτην, ἥ ἐστι καλοῦ τοιοῦδε.

[84]Cf. n. 33.

[85]*Hel.* 31: […] τὴν δὲ ἄλλην ἀρετὴν καὶ τὴν σωφροσύνην ἔν τε τοῖς προειρημένοις καὶ μάλιστ᾽ ἐν οἷς τὴν πόλιν διῴκησεν (scil. ἐπεδείξατο).

[86]τοσούτου δ᾽ ἐδέησεν ἀκόντων τι ποιεῖν τῶν πολιτῶν ὥσθ᾽ ὁ μὲν τὸν δῆμον καθίστη κύριον τῆς πολιτείας, οἱ δὲ μόνον αὐτὸν ἄρχειν ἠξίουν, ἡγούμενοι πιστοτέραν καὶ κοινοτέραν εἶναι τὴν ἐκείνου μοναρχίαν τῆς αὐτῶν δημοκρατίας.

[87]νῦν δὲ τῶν μὲν ἄλλων τῶν εὐδοκιμησάντων εὑρήσομεν τὸν μὲν ἀνδρίας, τὸν δὲ σοφίας, τὸν δ᾽ ἄλλου τινὸς τῶν τοιούτων μερῶν ἀπεστερημένον, τοῦτον δὲ μόνον οὐδ᾽ ἑνὸς ἐνδεᾶ γενόμενον, ἀλλὰ παντελῆ τὴν ἀρετὴν κτησάμενον.

refraining from no atrocity of murder nor from any food or deed, with Eros who dwells in him as a tyrant living in utmost anarchy and lawlessness and," so to speak,"urging the polity of him in whom he dwells to dare anything and everything in order to find support for himself and the hubbub of his henchmen (574d-e)."[88]

Isocrates passes over in silence an unbreakable bond between Eros living in utmost anarchy and lawlessness in a youth bred in his democratic father's way and tyranny, and speaks only of the newly made tyrant's political course of action by rephrasing Socrates theses put forward in the eighth book of the *Republic* where it is said that the aforementioned tyrant "when he has come to terms with some of his exiled enemies and has got others destroyed and is no longer disturbed by them, is always stirring up some war so that the people may be in need of a leader (566e)."[89] The same is also true of Socrates' assertions in the mentioned book of the *Republic* that the newly made tyrant plots against all those brave, great-souled, wise and rich "whose enemy he must necessarily be until he purge the city (567c),"[90] offending by such conduct the citizens and thus ending up having "the greater need of more and more trustworthy bodyguards (567d)"[91] for whose feeding "he will spend both sacred treasures in the city as long as they last and the property of those he has destroyed, thus requiring smaller contributions from the populace (568d)."[92]

This is reflected in Isocrates' theses that those who seek to rule their fellow-citizens by force are themselves the slaves of others (*Hel.* 32),[93] that those who keep the lives of their fellow-citizens in peril themselves live in extreme fear (32),[94] and are forced to make war, on the one hand, with the help of citizens against invaders from abroad, and, on the other hand, with the help of auxiliaries

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[88] καὶ ἐν τούτοις δὴ πᾶσιν, ἃ πάλαι εἶχεν δόξας ἐκ παιδὸς περὶ καλῶν τε καὶ αἰσχρῶν, τὰς δικαίας ποιουμένας, αἱ νεωστὶ ἐκ δουλείας λελυμέναι, δορυφοροῦσαι τὸν Ἔρωτα, κρατήσουσι μετ᾽ ἐκείνου, αἱ πρότερον μὲν ὄναρ ἐλύοντο ἐν ὕπνῳ, ὅτε ἦν αὐτὸς ἔτι ὑπὸ νόμοις τε καὶ πατρὶ δημοκρατούμενος ἐν ἑαυτῷ· τυραννευθεὶς δὲ ὑπὸ Ἔρωτος, οἷος ὀλιγάκις ἐγενετο ὄναρ, ὕπαρ τοιοῦτος ἀεὶ γενόμενος οὔτε τινὸς φόνου δεινοῦ ἀφέξεται οὔτε βρώματος οὔτε ἔργου, ἀλλὰ τυραννικῶς ἐν αὐτῷ ὁ Ἔρως ἐν πάσῃ ἀναρχίᾳ καὶ ἀνομίᾳ ζῶν […] τὸν ἔχοντά τε αὐτὸν ὥσπερ πόλιν ἄξει ἐπι πᾶσαν τόλμαν […]. Cf. also 572e-573a: […] ὅταν δ᾽ ἐλπίσωσιν οἱ δεινοὶ μάγοι τε καὶ τυραννοποιοὶ οὗτοι μὴ ἄλλως τὸν νέον καθέξειν, ἔρωτά τινα αὐτῷ μηχανωμένους ἐμποιῆσαι προστάτην τῶν ἀργῶν καὶ τὰ ἕτοιμα διανεμομένων ἐπιθυμιῶν, ὑπόπτερον καὶ μέγαν κηφῆνά τινα [...]. Translations of the passages from the *Republic* are by P. Shorey (LCL).

[89] ὅταν δέ γε πρὸς τοὺς ἔξω ἐχθροὺς τοῖς μὲν καταλλαγῇ, τοὺς δὲ καὶ διαφθείρει, καὶ ἡσυχία ἐκείνων γένηται, πρῶτον μὲν πολέμους τινὰς ἀεὶ κινεῖ ἵν᾽ ἐν χρείᾳ τοῦ ἡγεμόνος ὁ δῆμος ᾖ. See also Arist. *Pol.* 5, 9, 5 (1313b28): ἔστι δὲ καὶ πολεμοποιὸς ὁ τύραννος, ὅπως ἄσχολοί τε ὦσι καὶ ἡγεμόνος ἐν χρείᾳ διατελῶσιν ὄντες.

[90] ὀξέως ἄρα δεῖ ὁρᾶν αὐτὸν τίς ἀνδρεῖος, τίς μεγαλόφρων, τίς φρόνιμος, τίς πλούσιος καὶ οὕτως εὐδαίμων ἐστίν, ὥστε τούτοις ἅπασιν ἀνάγκη αὐτῷ, εἴτε βούλεται εἴτε μή, πολεμίῳ εἶναι, ἕως ἂν καθῄρῃ τὴν πόλιν.

[91] ἆρ᾽ οὖν οὐχὶ ὅσῳ ἂν μᾶλλον τοῖς πολίταις ἀπεχθάνηται ταῦτα δρῶν, τοσούτῳ πλειόνων καὶ πιστοτέρων δορυφόρων δεήσεται; Cf. Arist. *Pol.* 5, 8, 7 (1311a): […] τὸ τὸ τέλος (scil. tyrannidis) εἶναι πλοῦτον (οὕτω γὰρ καὶ διαμένειν ἀναγκαῖον μόνως τήν τε φυλακὴν καὶ τὴν τρυφήν) [...].

[92] δῆλον ὅτι, ἐάν τε ἱερὰ χρήματα ᾖ ἐν τῇ πόλει, ταῦτα ἀναλώσει, ὅποι ποτὲ ἂν ἀεὶ ἐξαρκῇ τὰ τῶν ἀποδομένων, ἐλάττους εἰσφορὰς ἀναγκάζων τὸν δῆμον εἰσφέρειν.

[93] ὁρῶν γὰρ τοὺς βίᾳ τῶν πολιτῶν ἄρχειν ζητοῦντας ἑτέροις δουλεύοντας [...].

[94] [...]καὶ τοὺς (scil. βίᾳ τῶν πολιτῶν ἄρχειν ζητοῦντας) ἐπικίνδυνον τὸν βίον τοῖς ἄλλοις καθιστάντας αὐτοὺς περιδεῶς ζῶντας [...]. Cf. Plat. *Resp.* 578a: "Must not such a city, as well as such a man, be full of terrors and alarms."

against their fellow citizens (32)[95] and that Theseus saw them despoiling the temples of the gods, putting to death the best of their fellow-citizens, distrusting those nearest to them and living lives no more free from care than do men who in prison await their death (33).[96]

From what has been said so far we could see quite clearly to what extent Isocrates derived ideas from the philosophy of Socrates and Plato when writing his encomium, which cannot be said of his rigorous, systematic approach to selecting, elaborating and bringing the mentioned ideas into a harmonious whole.

More than anything else, the mentioned approach helps us gain an understanding of the true nature of Isocrates' "philosophy," as evident from the fact that the new myth, as used in Socrates' discourses on love in both the *Phaedrus* and the S*ymposium*, was the main reason why he so heavily relied on the mentioned dialogues, all the more so since the principles of the new rhetoric (*diairesis*, *synagoge*), of great significance for his own art of speaking, are given in broad outline in the former. What was only announced in the *Phaedrus*, namely a method with the two aforementioned opposite, alternating principles was further elaborated in the dialogues *Sophist*, *Euthydemus* and *Statesman,* which explains why Isocrates when composing his proemium to the *Helen* was highly dependent on the concepts developed in the aforesaid dialogues, with Socrates' sharp critique of the old myth, along with his depiction of the successive forms of decline of an ideal, aristocratic type of government in the *Republic,* providing a guiding principle to the orator in his noble effort to elaborate on the key concepts of the philosophy of Socrates and Plato.

All this, along with the key words of both Socrates' political testament in the *Alcibiades* and the *Gorgias, epimeleia*[97] and *gymnastike*[98] respectively, explains why in his self-interpretation in the *Antidosis* Isocrates identifies his own sophisticwith training of the intellect (*phroneseos askesis = gymnastics of the mind*),[99] as opposed to the

[95] […] καὶ πολεμεῖν ἀναγκαζομένους μετὰ μὲν τῶν πολιτῶν πρὸς τοὺς ἐπιστρατευομένους, μετὰ δ' ἄλλων τινῶν πρὸς τοὺς συμπολιτευομένους [...] What we deal with here is probably an echo of Socrates' thesis in the poetological, fourth book of the *Republic* (422-423a) that each one of other cities, unlike the one he is depicting, is many cities (states), not a city, as there are two at least at enmity with one another, the city of the rich and the city of the poor, with each of the two containing in itself many others.

[96] ἔτι δὲ συλῶντας μὲν τὰ τῶν θεῶν, ἀποκτείνοντας δὲ τοὺς βελτίστους τῶν πολιτῶν, ἀπιστοῦντας δὲ τοῖς οἰκειοτάτοις, οὐδὲν δὲ ῥᾳθυμότερον ζῶντας τῶν ἐπὶ θανάτῳ συνειλημμένων.

[97] Cf. *Ant.* 210-211 where Isocrates' rhetoric is characterized as *melete*, *epimeleiai* and *philoponiai,* or, in other words, gymnastics (*phroneseos askesis*), as opposed to that of his rivals, denoted as *teratologiai*, that is, mental juggling, with the two first mentioned terms (*melete*, *epimeleiai*) being also the keywords of Plato's *Alcibiades* andXenophon's *Memorabilia*, which points to the conclusion that they were derived from Socrates' political testament in the aforementioned dialogue.

[98] Cf. Plat. *Grg,* 465c where the famous analogy is drawn between beauty care, gymnastics, sophistic and legislation on the one side, and cookery, medicine, rhetoric and justice on the other (as beauty care is to gymnastics, so is sophistic to legislation, and as cookery is to medicine, so is rhetoric to justice), with the true rhetoric, in Isocrates' view, thus ending up being essentially identical to the gymnastics. It is also worth mentioning that the same analogy is reflected in Aristides' *Reply to Plato* (or. 2, 215), with the expression γυμνασθὲν καὶ πονῆσαν in the *Antidosis* (210) providing a clue to Isocrates' understanding of Sophistic.

[99] *Ant.* 209.

sophistic of his rivals, indulging in shocking, amazing narratives (*teratologiai*)[100] and thus resembling Lucian's completely black Bactrian camel or, in other words, a freak.[101]

Conclusion

Close analysis of Isocrates' encomium has shown that what was announced in the proemium was fully applied to the main body of the work, that is, a strict adherence to the basic tenets and concepts of Socratic-Platonic philosophy, as evidenced by the fact that Isocrates heavily relied on the theory of love, as expressed through the new myth in both the *Phaedrus* and the *Symposium.* What was only announced in the former, i.e. the principles of the new rhetoric (*diaireseis*, *synagogai*), was fully applied in the dialogues *Sophist, Statesman* and *Euthydemus* that in their turn served as models for Isocrates to conceive his proemium. The very fact that Socrates' sharp critique of the old myth, along with his depiction of the successive forms of decline of an ideal, aristocratic type of government in the *Republic,* provided a guiding principle to the orator in his noble effort to elaborate on the key concepts of Socratic-Platonic philosophy speaks volumes about the encomium's philosophical nature, unity and coherence. More importantly, what we deal with here is the first attempt in the intellectual history at subjecting literature to the categories of philosophy, as advocated for by Socrates in the poetological books of the *Republic*, something for which supplanting the old myth through a new one was a necessary prerequisite.

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[100]*Ant.*284-285. In this connection, it is also worth mentioning that Isocrates when referring to the ancient sophists in the *Helen* means those of the older generation almost immediately preceding his own time, and not, as some believe, Presocratic philosophers.

[101]*Prom. verb.*4.

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Systems Theory Towards a New Interpretive Paradigm: From the Concept of Component to the Concept of Action

*By Wasim Sifo**

This paper explores a transformative shift in Systems Theory, moving from traditional Newtonian ontologies prioritizing static objects to a contemporary understanding emphasizing dynamic interactions and change. In this new interpretive paradigm, the functionality and organizing principles of systems take precedence over their structural components. The theory posits that truth is found at higher levels of abstraction, defined by the relationships and positions among components rather than their isolated identities. Consequently, the agent's role is redefined to focus on the agency inherent in actions rather than on the agents themselves. The concept of "state" emerges as crucial, representing the context within which actions occur and highlighting the relational dynamics between agents and events. This framework characterizes contemporary systems through three interrelated elements: agents, states, and actions, emphasizing dynamic processes over static entities. Actions serve as the ontological basis, with agents acting as executors that can be replaced without disrupting the overall system. This collective and distributed nature of action contributes to system resilience against disturbances. The research asserts that any agent can perform the same action as another, reinforcing the notion that agents play a secondary role while actions remain primary. The theory applies universally, encompassing systems from elementary particles to complex societies, where the common denominator is the concept of action. Additionally, it introduces a temporal dimension associated with states, contrasting with the spatial dimension of agents. As a result, the focus shifts from seeking truth in fixed components to understanding it through evolving actions. Ultimately, this paradigm shift redefines our understanding of existence and knowledge acquisition, moving from reductionist frameworks to transdisciplinary, holistic methodologies. The implications of this new ontology challenge traditional notions of essence and secondary characteristics, paving the way for a more comprehensive understanding of complex systems. This shift opens new horizons for philosophy, redirecting the focus from mere understanding and interpretation to the proactive design of systems, which is particularly relevant in the context of rapid scientific advancements and the rise of artificial intelligence. The study suggests that system design methodologies should be viewed as universal frameworks applicable across various domains, transcending specialized interpretations and fostering a more integrated understanding of complex systems.

Keywords: *Systems Theory, action ontology, Agent, State, Action, Complexity, Transdisciplinary Approach, Systems Design.*

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Introduction

Systems theory emerged in the mid-20th century as an interdisciplinary framework aimed at understanding complex phenomena across various domains, including biology, sociology, and engineering. 'Observed phenomena in the natural and human-made universe do not come in neat disciplinary packages labeled scientific, humanistic, and transcendental; they invariably involve complex combinations of fields, and the multifaceted situations to which they give rise require a holistic approach for their solution' (Laszlo & Krippner 1998). Ludwig von Bertalanffy[1] is often credited with laying the groundwork for general systems theory, emphasizing the importance of viewing systems as wholes rather than merely aggregations of their parts. This holistic perspective challenges reductionist approaches that dominate many scientific disciplines. By transcending reductionist paradigms and embracing a holistic vision of existence, systems theory provides a valuable framework for exploring complexity in all its manifestations, offering fresh insights into the nature of matter and the interconnectedness of life.

Historically, systems theory has evolved from various academic disciplines over time. Its origins can be traced back to the contributions of several key figures.[2] Norbert Wiener, a mathematician and philosopher, played a pivotal role in developing this field through his foundational work on cybernetics. 'His two main ideas—communications and control—rely on feedback of operational properties and transmission of this information' (Adams 2012). Following Wiener, Gregory Bateson broadened the application of systems thinking within anthropology by investigating the intricate patterns and relationships found in ecosystems and human cultures. He highlighted the significance of context and interconnectedness in these systems (Bateson 1972). Other influential scholars contributed to the evolution of systems theory; for instance, Jay Forrester advanced the concept of system dynamics, while Humberto Maturana made significant strides in understanding biological systems.

[1]Ludwig von Bertalanffy (1901–1972) was the originator of general systems theory. His original work was in organismic system theory where he studied the thermodynamic equilibrium of steady state in living organisms as open-systems. His research culminated in the notion of a general systems theory where he states: The formal correspondence of general principles, irrespective of the kind of relations or forces between the components, leads to the conception of a 'general systems theory' (9) as a new scientific doctrine, concerned with the principles which apply to systems in general. [Bertalanffy, (1950), p.28] Authors note: The (9) refers to Bertalanffy (1949) Bertalanffy continued to espouse general systems theory, and in 1954, he and his colleagues Kenneth Boulding, Anatol Rapoport, and Ralph Gerard founded the Society for General Systems Research (SGSR). The aims of society, captured in its bylaws were: 1 to investigate the isomorphy of concepts, laws, and models from various fields, and to help in useful transfers from one field to another 2 to encourage development of adequate theoretical models in fields which lack them 3 to minimise the duplication of theoretical effort in different fields 4 to promote the unity of science through improving communications among. (Adams, 2012. p: 210)

[2]General Systems Theory includes Bertalanffy (1949, 1950, 1968) and Boulding (1956). Living Systems Theory is represented by Miller (1978), while Mathematical Systems Theory features Mesarovic (1964), Wymore (1967), and Klir (1968). Cybernetics has contributions from Rosenblueth et al. (1943), Wiener (1948), and Ashby (1947, 1952, 1956), and Social Systems Theory includes Parsons (1970, 1979, 1991) and Luhmann) (1995,2012). (Adams, 2012. p: 210)

Together, these pioneers helped establish systems theory as a comprehensive multidisciplinary framework (Adams 2012).

As we note, these figures have contributed to the development of systems theory within their respective fields of expertise. However, the overarching goal is to establish a unified interpretive context that is applicable across all specialized domains. The common thread among the theories proposed by these scholars is their emphasis on analogous organizational structures across different systems, a notion explicitly articulated by Ludwig von Bertalanffy in his General Systems Theory. Nevertheless, a more comprehensive approach offers an integrated ontological perspective that draws significantly from the works of influential thinkers such as Valentin Turchin and Belgian cyberneticist Francis Paul Heylighen[3]. These theorists advocate for a view that prioritizes action over the actor, thereby enabling the application of the same approach to all types of systems, irrespective of their components, as transdisciplinary. Their contributions encourage a reorientation of philosophical inquiry from traditional dialectics toward practical endeavors in designing and simulating real-world systems, particularly in light of contemporary technological advancements. This contribution aims to emphasize two crucial aspects—transdisciplinary methodology and systems design—in the advancement of systems research.

The significance of this research lies in its potential to contribute a novel ontological perspective on existence by linking systems theory with the actions produced by their components. Thus, the application of systems theory extends beyond individual disciplines into an interdisciplinary methodology where the same approach can be applied universally. This perspective highlights the capacity for self-organization while emphasizing contextual factors and organizational similarities among diverse systems. It is not a traditional approach, but rather a design-based approach. In doing so, it opens new horizons for philosophy, moving from understanding and interpretation to design—particularly relevant in light of rapid scientific advancements and the rise of artificial intelligence.

From this discussion, the central question of this paper emerges: What are the dimensions and methodological implications of the new explanatory paradigm arising from the ontological perspective provided by systems theory, which prioritizes action over components? This inquiry invites an exploration of how this paradigm shift influences our understanding of knowledge formation, the role of agency within systems, and the methodologies employed to study complex interactions. It also encourages a reevaluation of our approaches to complexity, advocating for a design framework that is applicable across diverse systems rather than merely seeking to explain them. Such a perspective enriches our understanding of both theoretical and practical applications across various fields.

In this paper, we review the literature that has shaped the development of systems theory, distinguishing between the traditional perspective articulated by researchers

[3]Research professor at the Free University of Brussels (Vrije Universiteit Brussel), where direct the transdisciplinary research group on "Evolution, Complexity and Cognition, the Global Brain Institute, and soon the Center "Leo Apostel". Also affiliated with the Department of History, Art and Philosophy (HARP). Have for long been an editor of the Principia Cybernetica Project, an international organization for the collaborative development of an evolutionary-systemic philosophy, which is now essentially dormant after the death of its founder, Valentin Turchin. (http://pespmc1.vub.ac.be/HEYL.html)

from multiple disciplines—of which general systems theory is the apex—and the new ontological perspective advanced by scholars such as Turchin and Heylin, which serves as the focal point of this study. We examine their innovative ontological conception of existence, which emphasizes action and regards the agent primarily as a facilitator. Furthermore, we differentiate between the collaborative approach championed by proponents of the traditional view and the transdisciplinary approach inherent in the new ontological perspective, highlighting the challenges associated with implementing both methodologies. We propose that systems design can effectively embody a multidisciplinary approach suitable for various types of systems. Finally, we synthesize the key findings presented by this new interpretive paradigm and engage in a discussion and critique, employing a predominantly historical-critical approach throughout this paper.

General System Theory (GST)

The German biologist Ludwig von Bertalanffy established the General Systems Theory when he first presented his ideas on the theory in 1937 at the University of Chicago, but the first article was published twelve years later in 1949[4] (Drack & Apfalter 2007). This theory is not a single explanation that reduces everything to one framework; rather, it serves as a new intellectual or methodological framework that provides a comprehensive view without overlooking particulars. According to Lotfi Zadeh, the main task of system theory is to study the general characteristics of systems without considering their material details and to develop an abstract foundation of concepts and frameworks for studying various behaviors of different types of systems (Lin 2002). Furthermore, Bertalanffy noted that 'it is a logico-mathematical discipline, which is in itself purely formal, but applies to all sciences concerned with systems' (Bertalanffy 1950).

General System Theory (GST) represents a new perspective on the nature of systems by comparing different systems to identify common patterns and functions, ultimately seeking to establish fundamental characteristics applicable across all types. As von Bertalanffy notes, 'the concept of 'system' constitutes a new 'paradigm,' in Thomas Kuhn's phrase, or a 'new philosophy of nature" (Bertalanffy 1972). Unlike the analytical causal mechanical model, which restricts itself to studying material systems

[4]This theory soon evolved and expanded, and with its growing significance, the Society for General Systems Research, Bertalanffy continued to espouse General Systems Theory. In 1954, he and his colleagues Kenneth Boulding, Anatol Rapoport, and Ralph Gerard founded the Society for General Systems Research (SGSR). The aims of society, captured in its bylaws, were [31]: 1. To investigate the isomorphy of concepts, laws, and models from various fields, and to help in useful transfers from one field to another; 2. To encourage the development of adequate theoretical models in fields which lack them; 3. To minimize the duplication of theoretical effort in different fields, and 4. To promote the unity of science through improving communications among specialists." [Adams, K., Hester, P., Bradley, J. M. (January 2013), p. 2]. The philosophical aspects of General Systems Theory were addressed by Ervin Laszlo in 1972, who called for "seeing things as a whole" and perceiving the world as an interconnected and continuously evolving field unto itself (Chen 1993, p. 450). This indicates that there is an interconnection and integration among concepts and laws across all fields, which leads us to transfer concepts and laws from one domain to another.

as the sole representatives of real systems, GST also encompasses conceptual and abstract systems (Chen 1993). Although these systems may differ in their components, they share similar organizational structures.

Consequently, GST marginalizes the individual components while focusing on the overarching system applicable to all types. It posits that a system consists of something more than structure: it is a structure with certain properties; when the structure is understood from the perspective of its properties, it is understood as a system; we speak of the 'solar system' rather than solar composition (Spirkin 1983). This shift in understanding from structure to function renders research into components secondary to exploring the overall purpose of the system. Thus, the division of systems based on their components—such as material and organic systems—becomes irrelevant. Instead, GST introduces a teleological dimension, indicating that 'system elements are rationally connected" towards a shared purpose' (Mele et al. 2010). This suggests that the system has an aim it strives for, with its constituent parts working collaboratively to achieve it, marking a departure from previous scientific views that transcended teleological explanations.

However, the teleology proposed by GST is distinct from Aristotelian teleology; it is grounded in internal interpretations occurring within the system rather than in a transcendent goal pursued by the system. In essence, GST shifts the research focus from a reductionist view concerned with individual parts to a holistic view centered on the system as a whole. The properties of partial components differ when considered within the context of the entire system. Consequently, 'Systems theory is an interdisciplinary theory about every system in nature, in society and in many scientific domains as well as a framework with which we can investigate phenomena from a holistic approach' (Mele et al. 2010). This interdisciplinary nature arises from the organizational similarities among structurally diverse phenomena.

As a result, there has been an ongoing search for a methodology applicable across all types of systems; 'system theory emphasized the organization of parts into wholes and maintained that the same principles of organization, such as negative feedback, would be found applicable in physics, chemistry, biology, the social sciences, and technology' (Kuipers 2007). Rather than reducing various disciplines to physics alone, GST applies consistent organizational principles across different fields, fostering a more integrated understanding of complex systems.

The organizational similarity between systems and self-organization has led some researchers to propose a more profound ontological perspective within systems theory. This perspective offers a unified ontological framework for diverse systems, thereby justifying not only a collaborative approach but also a cohesive transdisciplinary methodology.

The Ontological Implications of Systems Theory in the New Interpretive Paradigm

Systems theory has shifted towards a more dynamic understanding of systems, emphasizing actions and processes rather than static components. This perspective moves from a focus on structure and the laws governing that structure to an emphasis on function, internal organization, and self-organization within systems. Instead of examining components, one can consider the functions they serve, which are similar across all systems regardless of their components. For instance, there is a parallel between the growth of ecological systems and human development, as well as between the regulation of body temperature in humans and mechanisms of power maintenance in political systems (Weckowicz 2000). As Heylighen (2006) notes, 'Its internal structure or substance can be considered wholly irrelevant to the way it performs that function'. Therefore, what matters is the observable and goal-directed behavior of the system, not its material components.

This transformation reflects a shift in the ontological understanding of existence. As noted by Heylighen (2011), 'the most fundamental components of reality are actions and agents'. While Newtonian ontology regarded 'Objects as primary, change as something secondary' (Turchin 1993), contemporary ontology views objects as secondary and change as primary. The functions or actions performed by a system are deemed more fundamental than the structure itself. Consequently, it is emphasized that 'it is not the 'essence' of the described entities that matters, but their organizing principles' (Turchin 1977). This perspective justifies the pursuit of truth at higher levels, considering it unachievable through mere knowledge of constituent parts. Thus, components no longer hold paramount importance; rather, the configurations and relationships among them express their identity.

The role of the agent is now limited to agency for action; thus, agents share similarities in terms of agency. The space in which action occurs is expressed through the concept of state. Therefore, 'some prefer to treat actions as relationships between agents and events' (Stanford Encyclopedia of Philosophy 2020). Action is the agent's choice of a state among an infinite number of possible states. From this standpoint, systems are composed of three interrelated fundamental elements: agents, states, and actions.

Agents

The components of complex systems are typically referred to as agents, including 'Typical examples of agents used in complex system models are people, firms, animals, cells, computer programs and molecules' (Heylighen 2013). Despite the differences in complexity among agents, they are treated within the same context due to their shared organizational mechanisms. Bertalanffy, in his theory of organisms, posited that matter has multiple levels of complexity; there is no division between organic and inorganic levels, as Descartes had suggested before him. Furthermore, it does not reduce organic matter to the framework of inorganic matter as Newton did; rather, each represents a level of the system that is more or less complex. 'They become more complex and adaptive, and therefore more 'mind-like' and less 'matter-

like" (Heylighen 2013). Thus, while agents exhibit similarities in organization, they differ in degrees of complexity.

Action serves as the ontological foundation, with the agent executing the action by choosing one of the available states. As R.M. Hare states, "To be an agent is to be capable of intentional action" (Hare 1981). Although the agent does not vanish with the action's cessation—'an agent can be seen as a cause or producer of actions that does not vanish after the action' (Heylighen 2011)—we do not perceive the agent itself; we only observe the action emanating from it (Turchin 1993). Therefore, 'any individual agent can be eliminated or replaced without damaging the resulting structure. The process is truly collective, i.e., parallel and distributed over all the agents. This makes the resulting organization intrinsically robust and resistant to damage and perturbations' (Heylighen 2008). This indicates that the agent plays a secondary role within the system while the action assumes primary significance.

General systems theory can be applied to various types of agents ranging from elementary particles and atoms to molecules, living organisms, minds, societies, languages, and cultures' (Bertalanffy 1969). The common denominator among these systems is the concept of the agent. This understanding may elucidate the self-organization exhibited by systems based on decentralization; there is no central hierarchical authority dictating what components should do; rather, each agent makes its decision based on what is most suitable for its local conditions.

States

The state of a system, also referred to as the subsystem, carries a temporal dimension, contrasting with the agent, which embodies a spatial and structural dimension. As Turchin (1977) states, it directly depends on our temporal intuition and can only be defined by reference to experience. When we say that something has changed in some respects, we mean that it has transitioned to a different state. Thus, the state describes the agent at different temporal moments, reflecting changes in the world. Turchin further argues that if the world were static, the concept of state would not arise. In those fields where the world is viewed as static, for example in geometry, there is no concept of state. Consequently, there is no room for multiple states from which the agent can choose. However, the agent can indeed select one of the available states, such that 'a state of a part of the world is the set of actions that are possible in this state, with their probabilities' (Turchin 1993). This leads us to face a vast number of possible states, each serving as a starting point for many other potential states.

Each state presents a unique set of potential actions, which agents can select based on their goals and contextual factors. For instance, consider a biological organism in an ecosystem: its state—defined by factors such as available resources and environmental conditions—determines its possible actions, such as foraging for food or seeking shelter. This interplay between agents and states leads to a vast number of possible configurations, each serving as a starting point for myriad other potential states. As agents interact with their environment, they not only respond to changes but also actively shape the trajectory of those changes through their actions. For example, in social systems, individuals (agents) may alter their behaviors based on

shifts in societal norms or policies (states), thereby influencing the overall dynamics of the community.

Actions

In the ontology of systems, action is regarded as the fundamental truth, to the extent that '(the word fact itself comes from the Latin facere, which means to do or to make)' (Turchin 1993). Thus, the search for the truth of reality is connected to the exploration of changing actions rather than focusing on components associated with a specific time and place. 'This can be seen as an indication that action should have a higher existential status than space, time, or matter' (Turchin 1993). From this perspective, action is a primary process or simply a change: a transition from an initial state (cause) to a subsequent state (effect) (Heylighen 2011). This distinction highlights the difference between studying processes and examining structure; while processes refer to changes affecting the system, structure denotes the relatively fixed set of interconnections (Heylighen, 2011). 'Which considers change ('becoming') as more fundamental than static existence ('being')' (Heylighen 2011). Therefore, 'the action approach is concrete and practical, as it is concerned with the actions that we as subjects perform in the real world' (Heylighen 2011), rather than being metaphysical inquiries into foundational essence'.

The term "action" is frequently employed in various philosophical contexts, from ethics to metaphysics. However, its definition can vary significantly across different theories. As philosopher Elizabeth Anscombe notes, "an action is something that is done intentionally" (Anscombe 2000). "Action is a fundamental ontological construct that encompasses not only physical movements but also intentional behaviors, decisions, and interactions." (Smith 2020) A rigorous definition of action must account for intentionality, causation, and the distinction between voluntary and involuntary actions. This understanding of action as intentional aligns with the notion that change ('becoming') is more fundamental than static existence ('being') (Heylighen 2011). Therefore, "the action approach is concrete and practical, as it is concerned with the actions that we as subjects perform in the real world" (Heylighen 2011), rather than being metaphysical inquiries into foundational essence. "Understanding systems requires a focus on actions that drive change and evolution rather than merely analyzing their constituent parts." (Heylighen 2011)

The transformative potential of this understanding becomes particularly evident when examining the parallels between different systems. Weckowicz (2000) highlights significant similarities between ecological growth and human development, as well as between physiological regulation and political power maintenance. Such comparisons illuminate the idea that "its internal structure or substance can be considered wholly irrelevant to the way it performs that function" (Heylighen 2006). Consequently, what truly matters in this framework is the observable and goal-directed behavior of the system rather than its material components.

However, it is crucial not to treat agents in the same context while ignoring the varying actions they produce. Although all agents tend to choose the best option among potential choices that bring them closer to their goals, the 'freedom' of a particle or molecule is of course very limited when compared to more complex and intelligent

decision-making agents such as bacteria, organisms and people (Heylighen 2011). Therefore, there must be a distinction between mental events (such as John's decision to wear shoes) and physical or physiological events (like the firing of neurons related to that decision) (Stanford Encyclopedia of Philosophy, "Events"). Our actions are characterized by being voluntary and mentally controlled; humans possess introspection and prior intention for action, meaning that actions differ based on the human agent who decides on a particular state among available options. This choice is conditioned by our minds, as we do not perceive external things in the same way. The causal theory of action asserts that what distinguishes intentional action is the agent's intentions or perhaps their beliefs and desires that appropriately cause their behavior (Stout 2005).

This raises questions about the ability to consider actions as similar, as well as the possibility of a transdisciplinary methodology that can be applied to all types of Agents. Such a methodology would need to account for the complexity of these Agents and the margin of freedom they have to choose their actions.

The Methodological Dimensions Emerging from the New Ontological Interpretive Paradigm Offered by Systems Theory

Systems theory has emerged as a critical response to the challenges posed by complexity, instability, and unpredictability. It aims to foster interdisciplinary collaboration by reconnecting disparate fields of study. This approach addresses complex phenomena from multiple perspectives, transcending reductionist analytical methods that confine phenomena to a singular viewpoint. By doing so, it mitigates the risk of generating new crises in other disciplines while attempting to resolve specific issues within a particular domain.

The new ontological perspective proposed by systems theory posits that action is more fundamental than the agent, necessitating a novel methodology that can encompass all systems based on their actions. In this context, a transdisciplinary methodology has been suggested. While the collaborative approach faces significant challenges, it remains a viable option; conversely, the implementation of a transdisciplinary approach presents greater difficulties.

However, this transdisciplinary methodology can be realized through a fundamental shift in methodological thinking: rather than prioritizing understanding, explanation, and description, we can pivot towards design. Design can be applied across various systems due to the inherent similarities in their mechanisms of action, thereby functioning as a cohesive transdisciplinary methodology.

Interdisciplinary Methodology

Opinions have diverged regarding the nature of the interdisciplinary approach. While some consider that this approach eliminates and consolidates specific disciplines within a single framework, others argue that it aims to enhance collaboration among them. In this context, Margaret Boden distinguishes between two fundamental types of interdisciplinary perspectives: collaborative interdisciplinary methodology and

synoptic interdisciplinary methodology. (Alvargonzal 2011). 'Klein and Newell would argue that simply adding together disciplinary insights is just multidisciplinary, while integrating these is necessary for interdisciplinarity.' (Szostak 2007) Consequently, Klein and Newell's concept of collaboration among disciplines aligns with Boden's perspective, while their notion of integration points to a comprehensive methodology for disciplines according to their vision.

The fundamental problem with the specialized approach lies in specialists in a specific field being unaware of the scientific output from other disciplines. As a result, 'similar concepts, models and laws have often appeared in widely different fields, independently and based upon totally different facts' (Bertalanffy 1969). Consequently, their colleagues in other fields remain unaware of these laws. From this perspective, Edgar Morin argued that we must redesign our educational programs and policies (Morin 1999) to meet the need for connecting dispersed knowledge. This ensures viewing the system in its interconnections and from all its aspects; thus, our knowledge becomes closer to reality rather than being simplified to ease our minds.

Therefore, the importance of interdisciplinary theory is manifested in its ability to transcend the specialized view, which constitutes a limited perspective on the studied problem and leads to the creation of more severe issues in other areas. According to Morin, 'the fragmentation of knowledge prevents from linking and contextualizing.' (Morin 2005). Failing to see things in their entirety and from all angles diverts us from observing the general context in which they occur; thus, it becomes challenging to find solutions. Numerous examples can be cited; for instance, the construction of the Aswan Dam in Egypt was aimed at economic and organizational goals. However, 'it resulted in obliged the farming population to desert the fields and overpopulate large metropolises like Cairo' (Morin 2005). Therefore, development cannot be localized but must be comprehensive, as problems and phenomena should be viewed and assessed as interconnected elements within a holistic system. This highlights the weakness in development processes in third-world countries, which we believe remain far from a systemic vision and are trapped in a localized partial view that leads these countries to accumulate and entangle problems, making development nearly impossible. In another example, ‘By adopting a food systems perspective, researchers can better understand the complex relationships between agricultural practices, dietary patterns, and environmental health, leading to more effective policies for sustainable food security.’ (Paine 2015). This interdisciplinary approach not only enriches the analysis of food systems but also highlights the necessity of collaboration across various fields, including sociology, economics, and environmental science.

The collaborative approach between disciplines is being implemented despite the inherent difficulties it faces, and there are calls to strengthen this collaboration. However, the transdisciplinary approach presents significant challenges that complicate its realization. Boland illustrates this issue by identifying the problem as one of dispersion and a lack of mutual awareness among specialists from different fields, along with the difficulties associated with crossing disciplinary boundaries (Kaiser et al 2014). Furthermore, researchers trained in specific research methodologies often struggle to acquire skills outside their expertise; instead of acquiring such non-standard skills, it may be easier for a researcher to ask someone from another field for support regarding a particular method (Lang et al 2017).

Consequently, it is frequently more feasible to assemble a group of specialists to collaborate on a specific issue than to establish a comprehensive methodology applicable across all disciplines.

Moreover, this proposed methodology tends to overlook the uniqueness and interests inherent to each discipline. As noted, each field has its typical types of research goals and typical types of questions that interest it (Lang et al 2017). Therefore, each discipline possesses methodologies best suited to its particular needs. Some fields necessitate a deductive approach employing qualitative language, while others require an inductive approach utilizing quantitative language (Lang et al 2017). Additionally, the specific terminology used varies significantly from one discipline to another; for instance, the terminology employed in psychology differs from that used in brain physiology (Alvargonzalez 2011). Each discipline may address the same subject matter but from distinct perspectives: For example, while legal studies often focus on the relationships between legal texts, philosophy is concerned with the ethical level even when both discuss the same topic (Lang et al 2017).

Thus, the comprehensive methodology rooted in the new ontological perspective proposed by systems theory suggests that action is more fundamental than the agent, highlighting a fundamental similarity among systems. However, implementing this approach proves challenging due to the difficulties of transcending the unique methodologies inherent to each discipline. The obstacles encountered stem from the methodological nature of this perspective, which is grounded in interpretation and shaped by the distinct interpretive frameworks of various fields. This underscores the need for innovative methodologies that can bridge these interpretive divides. In this light, systems design emerges as a promising avenue for realizing a genuinely transdisciplinary methodology, capable of integrating diverse perspectives and fostering trans disciplinarity.

Systems Design

The shift in methodology brought about by systems theory has transformed the focus from merely studying systems and seeking their truths to designing artificial systems. This transition involves transferring organizational structures from natural systems to artificial systems. The act of designing is a form of inquiry that leads to new understandings. (Schön 1983). This transition involves transferring organizational structures from natural systems to artificial systems. The shift in methodology brought about by systems theory has transformed the focus from merely studying systems and seeking their truths to designing artificial systems. This transition involves transferring organizational structures from natural systems to artificial systems. This transition is exemplified by the emergence of cybernetics, where thinkers like Norbert Wiener emphasized feedback loops and communication within complex systems (Wiener 1961). Additionally, complexity science, explored by philosophers such as Ilya Prigogine, highlights how order emerges in dynamic systems, moving away from static interpretations (Prigogine Stengers 1984). Moreover, technology ethics emphasizes the practical implications of design over abstract theories (Verbeek 2011), There for designers must consider the ethical implications of their work, recognizing their role in shaping society. (Friedman et al. 2006) while ecological design reflects a commitment

to sustainability by recognizing the interconnectedness of all life (Capra 1996). Systems philosophy advocates for understanding the interrelatedness of different domains (Laszlo 2003), further highlighting the importance of these shifts in perspective.

Design thinking has further contributed to this shift by prioritizing user-centered solutions and practical problem-solving (Buchanan 1992). emphasizes that "design is a way of thinking that transcends the traditional boundaries of disciplines". This perspective highlights how design thinking integrates diverse fields to address complex challenges. Consequently, systems theory is closely linked to applied sciences in its perception of reality and understanding of truth, rather than being confined solely to a theoretical framework. 'Systems Engineering, i.e., scientific planning, design, evaluation, and construction of man-machine systems; Operations research, i.e., scientific control of existing systems of men, machines, materials, money, etc.;' (Bertalanffy 1969). Thus, systems theory transcends the ongoing debate between explanation and understanding by attempting application; it does not limit itself to description, comprehension, or interpretation but also strives for the design of systems.

This change in perspective is logical and has been necessitated by technological and informational acceleration. As machines have evolved and gradually taken over roles traditionally held by humans, our understanding of truth has also changed. Baudrillard articulated this notion, stating: 'Our systems of signs are no longer anchored in the real world; they float on our screens and multiply in our computers and databases. There is no longer a ‘real’ and an ‘imaginary’ (the interpreted meaning of the real); everything has collapsed into the level of signs and their interactions' (Cilliers 1998). This has led to the emergence of information as a fundamental component of systems, making it more crucial than the physical equipment itself.

Designing systems enables us to comprehend complex real-world situations and provides an effective foundation for problem-solving. 'Better models can give scientists a much firmer grasp on the complexities encountered in economics, biology, medicine, psychology, sociology, law and politics, to name but a few.' (Cilliers 1998). Through modeling phenomena and simulating them via computers, 'actual laboratory experiment can be replaced by computer simulation, the model so developed then to be checked by experimental data.' (Bertalanffy 1969). This allows us to select optimal solutions instead of conducting numerous costly and time-consuming experiments. We can tailor designed systems to maximize benefits; "Products and services can be developed efficiently and effectively, solving human societal problems.

The design process involves employs a collaborative methodology that integrates specialists from the humanities with their counterparts in the natural sciences. This approach facilitates addressing the increasing complexity imposed by technological advancements and allows us to make timely decisions (Laszlo 2009). For example, when dealing with designs for rockets, airplanes, and new building materials, we need collective effort to combine many different aspects of knowledge; these aspects intertwine to form a giant and complex system consisting of people, machines, and many other components (Lin 2002). This aims to reconcile machine design with human needs (Laszlo 2009), allowing for the modeling of human and social realities through natural sciences. Therefore, Ontology can be set aside, allowing for the pursuit of models applicable to any system, irrespective of its ontological components,

based on the premise that organizational behavior is consistent and that action is more fundamental than components.

On the other hand, design models often serve as simplifications that risk overlooking critical variables and interactions, which can lead to misleading conclusions. As McNamara (2002) notes, "Models are inherently simplifications of reality, and their utility is contingent upon the accuracy of their assumptions". This reliance on models can create a "false sense of certainty" in decision-making processes, particularly in fields where human behavior is unpredictable. According to Taleb (2007), "The problem with models is that they are often based on historical data and fail to account for unforeseen events". In social sciences, this can be particularly problematic, as "human behavior is complex and often defies quantification" (Giddens 1991). Consequently, decision-makers may find themselves relying on flawed models that do not adequately capture the intricacies of real-world scenarios.

In light of these connections, the design of systems emerges as a manifestation of the transdisciplinary approach. This perspective allows for a unified design framework that can be applied across diverse systems, emphasizing a transcendent interpretation of both design and organizational mechanisms. By moving beyond a narrow focus on individual components, this approach advocates for a more holistic understanding of complex interactions. Consequently, this research may pave the way for the development of universally applicable designs that transcend disciplinary boundaries and enhance our comprehension of various systems on a global scale. But on the other hand, it risks oversimplification and neglecting details.

Results

This ontological shift in understanding existence, as articulated through the relationship between systems theory and action ontology, encompasses several significant philosophical implications:

1. A New Vision of Reality: This perspective offers an innovative understanding of reality grounded in organizational structure. It moves beyond the traditional notion of essence, emphasizing the actions performed by agents, their functions, and the relationships among them.
2. Action Over Agent: The concept of action takes precedence over that of essence, highlighting the role of the agent who acts, selects from available options, and considers the choices of other agents. In this framework, any agent can replicate the actions of a previous agent, positioning the agent within a secondary role in the system while elevating action to primary importance.
3. Shifting Philosophical Focus: This theory redirects philosophical inquiry from the dialectic of understanding and interpretation to a new focus on system design, simulation of real-world systems, and the construction of novel systems. This shift resonates with contemporary technological advancements.
4. Changing Perspectives on Systems: There has been a transformation in our understanding of systems, moving from a traditional view—where external structures and laws govern organization—to a concept of self-organization

that recognizes systems as emerging from within, organizing themselves in a decentralized manner

5. Consciousness, Teleology, and Intentionality: The theory prompts exploration of consciousness, teleology, and intentionality, suggesting that components may exhibit a form of "awareness" regarding the overarching goals of the system. This awareness can lead to conflict or cooperation among agents.
6. Evolving Epistemological Approaches: Our approaches to knowledge have evolved; understanding is no longer the primary guide for human thought but rather application. This shift acknowledges the complexity of systems and our challenges in isolating or defining their boundaries. Consequently, we move away from epistemological debates concerning the primacy of subject versus object or the relativism versus absolutism of truth, toward a new dimension focused on system design and the application of organizational structures across diverse systems.
7. "Design" serves as a synoptic interdisciplinary methodology applicable to all systems, transcending their ontological components. It emphasizes the primacy of action and interaction in shaping outcomes across diverse contexts.

Discussion

The applicability of the methodology provided by systems theory prompts critical inquiries regarding its significance in advancing human thought. Is it a genuine progression aimed at fostering organization, or does it merely represent another attempt to impose structure upon complexity? Does systems theory offer a pragmatic vision that seeks to transcend metaphysical dilemmas while simultaneously providing comprehensive explanations of existence? If so, can we reconcile this with the possibility that it reflects a reductive perspective, despite its claims of holism?

The actions of agents striving for self-organization may indeed suggest novel metaphysical interpretations. What mechanisms enable these agents to remain conscious of their own goals, the purposes of others, and the overarching objectives of the system? Are there underlying laws that govern this organization—laws that may not necessarily signify self-organization but could instead indicate an imposed order dictated by yet undiscovered principles or perhaps a novel form of regulation?

Moreover, is there potential for applying the same organizational structure across diverse fields, such as the humanities and natural sciences? Can we transcend the fragmentation of disciplines by establishing connections through a transdisciplinary methodology?

This inquiry evokes the relentless pursuit within science for a singular theory that explains everything. Does this methodology represent yet another manifestation of the drive toward a singular explanation, reflecting a cognitive bias towards simplification? Or does it embody a new approach that aligns with contemporary perspectives on organized complexity, seeking to observe and analyze complexity from multiple angles and perspectives?

Can design be understood as a legitimate methodology for navigating complexity, or is it merely an ad hoc response lacking a formal legal framework? What

implications does this distinction hold for our understanding of design's role in various disciplines?

We must consider whether this theory presents philosophy with a new role that transcends its traditional functions of understanding and interpretation. Traditionally, philosophy has focused on conceptual analysis, but the emergence of systems-oriented methodology may prompt a shift toward more active engagement in system design. This new role involves philosophical inquiry into the principles and values that underpin system designs.

Philosophers could play a crucial part in shaping methodologies, addressing ethical considerations, and exploring the implications of system interactions. This engagement bridges the gap between theoretical understanding and practical application, fostering a dialogue that enriches both philosophy and science.

Ultimately, this approach does not render philosophy irrelevant; rather, it invites philosophers to actively participate in scientific practices. The interplay between philosophy and science in system design can lead to a deeper understanding of complexity, ensuring that philosophical insights inform scientific endeavors while allowing philosophical thought to evolve through practical engagement with real-world complexities. This nuanced exploration of their interrelationship underscores the importance of continued discourse on their respective contributions to our understanding of complex phenomena.

Conclusion

The contemporary viewpoint provided by systems theory introduces an innovative understanding of existence, emphasizing the notion of action. This perspective advocates for a novel methodological approach that theorists strive to adopt, despite the inherent challenges associated with a transdisciplinary framework applicable to diverse system types. However, these challenges can be addressed by progressing towards the design of systems that are universally applicable across various domains.

The epistemological implications arising from the ontological framework provided by systems theory extend beyond merely describing the world or seeking to understand and explain it. Instead, these efforts encompass the creation of new worlds and the reengineering of existing systems. The objective is to accurately represent reality and develop innovative systems that address the growing needs of humanity, as well as the profound complexities and challenges we face. This endeavor reflects the spirit of our age, characterized by technological advancement and the information revolution, amid our struggle with the unknown.

Rather than simplifying systems, we embrace their complexity, allowing us to model them and entrust our machines with the task of navigating these intricacies. This shift may grant philosophy a new role that transcends its traditional functions of understanding and explanation, enabling us to usher in the age of artificial intelligence**.**

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