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Rhetoric in Science and Technology Studies: in Defense of Classical Rhetoric. Against Posthumanist Rhetoric

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ABSTRACT

While the problem of applying rhetorical theory (*téchne rhetoriké*) in research encompassing areas such as feminist new materialisms and object-oriented ontologies rests on the problematization of rhetoric, and in some cases even its rejection, contemporary rhetorical theory has enthusiastically embraced this "ethico-onto-epistemological" program. Without questioning the compelling results of these studies, I pose a question that, in my opinion, touches on the essence of the problem associated with the application of classical rhetorical theory. The tools of rhetorical theory arose from: first, research on language; and second, the accuracy of communication and mutual understanding between the speaker and their audience. The issues outlined above assume that, unlike classical rhetorical theory (*téchne rhetoriké*), there exists a contemporary version. It is unclear, however, how it would differ from classical theory and what its tools would be.

Referring to the problems of applying rhetoric to the study of texts from the fields of science and technology, or rather, technology, I will attempt to demonstrate that the tools of classical rhetorical theory are fully sufficient to describe both the applications and the texts themselves. I should also point out from the outset that classical rhetorical theory (*téchne rhetoriké*) was from the outset linked to the *Organon*, or Aristotle's logical writings. Certain proposals that appeared in the history of rhetoric, particularly in the 16th century and by scholars such as Pierre Ramus and Audomar Taleus, and in the 20th century, in the studies of Richard McKeon, among others, did not actually contribute much new. Separating research on logic and then language (especially after de Saussure's work and the subsequent emergence of research from the Formalists and Structuralists) from classical rhetorical theory only complicated the description of the problems. Classical rhetorical theory (*téchne rhetoriké*) must be viewed as a theory of the stages of shaping any text. Rhetoric understood in this way, especially in its inventive phase, possesses tools (including topical theories, but also considered as part of argumentation and the study of status, as well as general principles of text preparation) that facilitate the description and analysis of objects, as well as the correct formulation and subsequent resolution of research questions.

This study aims to demonstrate that classical rhetorical theory (*téchne rhetoriké*) remains a valid and useful tool, and that its modifications do not necessarily advance it.

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Introduction

Classical rhetorical theory (téchne rhetoriké), as Ulrich von Wilamowitz-Moellendorf and Wilhelm Windelband have already pointed out, is an element of the Aristotelian Organon, or logical writings [1,2]. At the same time, as Wolfram Ax pointed out, it is rhetoric, not grammar or poetics, that shapes linguistic expression [3]. This stems from the fact that rhetoric deals with the shaping of thought (dianoia), while grammar deals with the correctness of expression (lexis). Poetics "operates" at the level of elocutio, but is subordinated to rhetoric, as the choice of words (lexis) depends on the thought (dianoia) that the speaker wishes to convey in his text.

Finally, Gert Ueding has shown that classical rhetorical theory describes not parts of rhetoric but phases of text formation [4,5]. Finally, let me remind you that the main sections of the inventio phase, such as topic and status theory, are the basis for building arguments in the prepared text [6-10]. Wayne C. Booth took a similar stance when he pointed out why rhetoric is the most effective method of communication [11]. It's also worth citing Sonja K. Foss, who unequivocally stated.

Rhetorical theory has come a long way from theorizing designed to help litigants in ancient Greece and Rome. Rhetorical theory now addresses all aspects of the rhetorical situation—exigence, audience, and rhetor—as well as the larger contexts in which any given rhetorical act occurs. Rhetorical theory cannot be divorced from questions about human agency, the role of symbols in the creation of the human world, and the power of audiences to construct that world [12].

An important question is the separation of logic from rhetoric, which occurred in the 16th century, and the removal of rhetoric as an important tool in linguistic studies, especially with the

development of text linguistics [13-18].

However, these changes did not result in changes in the classical theory of rhetoric itself [19,20]. This is probably due to two facts: firstly - rhetoric is a formal system/formal science [21]; secondly - each text that is constructed, or analyzed, using its tools has a teleological (purposeful) character [22,23]. Moreover, there are works that use classical rhetorical theory in contemporary research [21,24-27]. Is it therefore justified to say that the previously mentioned changes in the approach to rhetoric are fully embedded in the tradition of rhetorical studies, treated as a tool for shaping any text?

Statement of the Problem

The answer to the question with which I concluded the previous chapter is, in my opinion, negative. Rather, there has been a rejection, or rather a dismissal, of rhetoric as a tool either unnecessary or "unwieldy." This stems from the fact that, de facto, since the 16th century, rhetoric has been treated exclusively as elocutio and actio, and its other phases have been adopted either by logic (inventio and dispositio) or by the developing study of language, including text linguistics. The memoria phase has therefore been eliminated and simply omitted.

The research question is therefore clear: does the classical theory of rhetoric, viewed as a theory of the phases of text construction, still apply or can still apply? And, to use Richard McKeon's term, is it still "productive"? My answer to these questions is positive.

Example Analysis

Let us therefore turn to examples. They will be taken from the fields of science and technology. In both, the method of text construction is fundamental. The essential phases for such texts are inventio and dispositio, as well as actio. How does classical rhetorical theory (téchne rhetoriké) "work" in these areas? I presented this in the volume "In Search of the Best Form of Communication, or Why Do We Still Need Rhetoric?", but I will now cite other examples [10].

In science, we have quite rigorous rules for text construction that we must adhere to, regardless of whether we are talking about the field of so-called Geistwissenschaften or Naturwissenschaften (I use this distinction, aware that these terms may raise some doubts about their correctness today, cf. Lyotard 1997, but Lichański 2025, pp. 3987-3997) [28,29]. These principles apply to the previously identified phases of text construction and the clear formulation of the research problem during the inventive phase. It should be added, of course, that in this research, we draw on hermeneutics to precisely define our research question and strongly connect it to the facts we will examine and then describe in a specific text [29,30].

Within the sciences, regardless of whether they are Geistwissenschaften or Naturwissenschaften, we can de facto identify two methodological approaches. This approach is determined, among other things, by the classical research procedure, which begins with defining the research question, then analyzing the current state of research, and so on [29,31,32,33]. Or we proceed according to the principles of grounded theory [34]. In both cases, we adhere to the general principles of research methodology [35]. In each of these cases, we utilize classical rhetorical theory, because in the inventio phase, when we precisely define the subject of our research, we utilize the guidelines of status science. Furthermore, if we treat the topic as a set of already-prepared solutions, we determine whether we are merely developing a known idea or actually solving a new, previously unknown, or poorly described problem. We must follow the same path when, in the dispositio phase, we prepare the composition of our text [19-21,36].

It should be emphasized that in scientific proceedings, the elocutio and actio phases are subordinated to principles that, independently of each other, were defined by, among others, Rudolf Carnap, Hans Reichenbach and, most fully, Hans Seyle [37-39].

As examples, I will take scientific, in the field of technology and popular science texts by authors such as Alfred North Whitehead, Sir Arthur Eddington, Willard Van Orman Quine, but also Rudolf Carnap, Hermann Bondi, and Stanisław Lem [37,40-50]. They represent such branches of science as: mathematics [40], physics [41], cosmology and astrophysics [45,47], logic [37,44], AI [49], philosophy and literary studies [32,33,52,51] [42,43,46,48], technology [50].

In the case of texts in the fields of science and technology, the answers to the questions: to whom, why, and where is the speech being delivered, and what is my role as a speaker (should I teach, move, or entertain) in relation to the audience, as well as what should I do (advise/dissuade, praise/reprove, accuse/defend) are simple. I speak to people who are more or less familiar with the topic; I speak to explain a clearly presented problem in the sciences or describe an issue or solution in technology; I speak (or write) within "my" environment or within a community of people interested in the issues discussed; and my goal is to teach, advise, defend, and criticize other solutions. The structure of speeches is usually quite formulaic, and the language must be as clear as possible and free from any "embellishments." For this type of speech, any "embellishment" is unnecessary.

Regarding the indicated texts the neo-Aristotelian approach, i.e. the use of classical rhetorical theory, seems almost "natural". Why? For the authors, the correctness and comprehensibility of their arguments (lexis) are "sufficient," and thought (dianoia) depends precisely on the clarity and correctness of the argument at the level of lexis. Therefore, one could say that the level of dianoia, even when it appears, is consciously reduced by the authors. Hence, these texts appear "unadorned," and this is a conscious decision.

I would link this with the view of Philodemus, who clearly indicated in his Rhetoric that its principles apply to literature; all other texts are to be subordinated to truth [51,52].

We encounter similar behavior in the field of technology. As I demonstrated in my study "In Search of the Best Form of Communication…" [10], the researcher's behavior is strictly subordinated to specific principles and can be described using tools drawn from classical rhetorical theory. Moreover, these principles cannot be violated under penalty of rejection of a differently composed text.

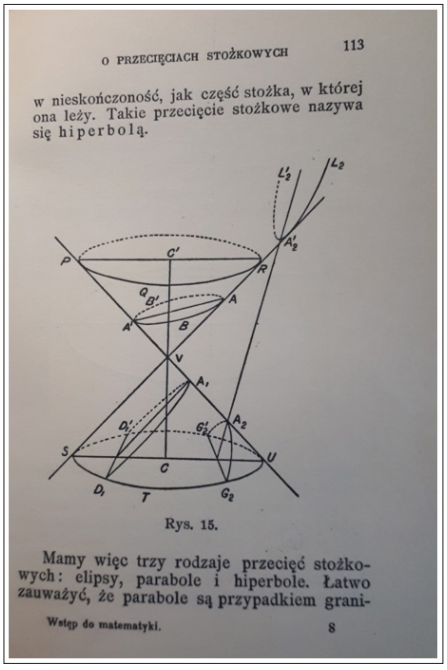
Are these principles subordinated to the tools of classical rhetorical theory, and moreover, can they be described using them? Yes, because they must contain a clearly formulated technological problem that has not yet been solved; moreover, they must present arguments in the form of an analysis of the state of technological research and include arguments that the proposed solution is the best and technically feasible. Finally, as with scientific texts, this must be achieved using correct and understandable language

(lexis), and the thought (dianoia), i.e., the description of the technical solution, depends precisely on the clarity and correctness of the argument at the level of lexis.

It should be noted that in the case of texts related to technology, additional elements include illustrations, technical drawings, and other visual materials (these also appear in texts belonging to the field of science). A perfect example of this is the encyclopedia devoted to space technology [50], in which illustrative material supplements the text, which consists of 24 entries devoted to the title problem. Moreover, without the illustrative material, the entire publication would be difficult to understand. The entries themselves are composed in a way that is as understandable as possible to both the specialist and the general public.

Let us add that the previously mentioned visual materials play a significant role in these texts. This is well illustrated by two examples: the first is taken from Alfred North Whitehead's work, the second from Kenneth Gatland's work.

Example 1: A. N. Whitehead, op. cit., p. 113:



O PRZECIĘCIACH STOŻKOWYCH 113

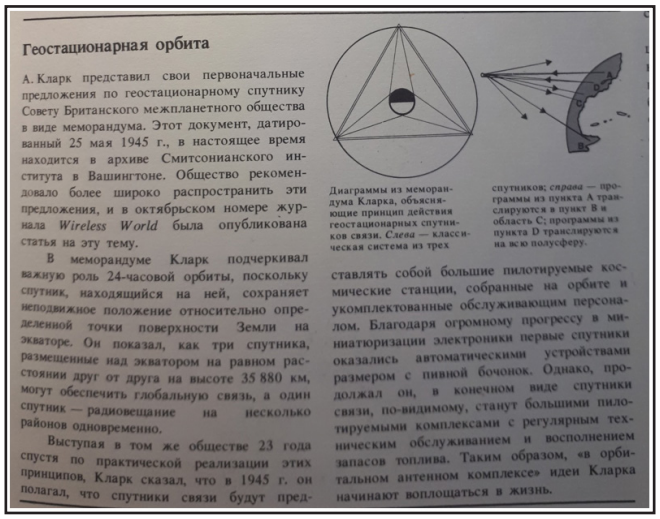
w nieskończoność, jak część stożka, w której ona leży. Takie przecięcie stożkowe nazywa się hiperbolą.

Rys. 15.

Mamy więc trzy rodzaje przecięć stożkowych: elipsy, parabole i hiperbole. Łatwo zauważyć, że parabole są przypadkiem grani-

Wstęp do matematyki. 8

Example 2: K Gatland op. cit, p. 55:



Геостационарная орбита

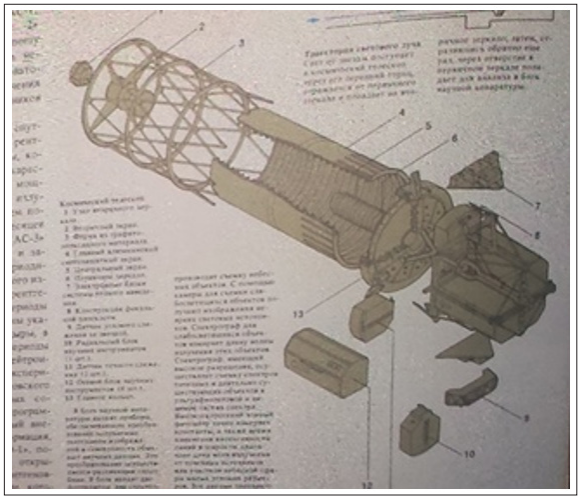
А. Кларк представил свои первоначальные предложения по геостационарному спутнику Совету Британского межпланетного общества в виде меморандума. Этот документ, датированный 25 мая 1945 г., в настоящее время находится в архиве Смитсонианского института в Вашингтоне. Общество рекомендовало более широко распространить эти предложения, и в октябрьском номере журнала *Wireless World* была опубликована статья на эту тему.

В меморандуме Кларк подчеркивал важную роль 24-часовой орбиты, поскольку спутник, находящийся на ней, сохраняет неподвижное положение относительно определенной точки поверхности Земли на экваторе. Он показал, как три спутника, размещенные над экватором на равном расстоянии друг от друга на высоте 35 880 км, могут обеспечить глобальную связь, а один спутник — радиовещание на несколько районов одновременно.

Выступая в том же обществе 23 года спустя по практической реализации этих принципов, Кларк сказал, что в 1945 г. он полагал, что спутники связи будут представлять собой большие пилотируемые космические станции, собранные на орбите и укомплектованные обслуживающим персоналом. Благодаря огромному прогрессу в миниатюризации электроники первые спутники оказались автоматическими устройствами размером с пивной бочонок. Однако, продолжал он, в конечном виде спутники связи, по-видимому, станут большими пилотируемыми комплексами с регулярным техническим обслуживанием и восполнением запасов топлива. Таким образом, «в орбитальном антенном комплексе» идеи Кларка начинают воплощаться в жизнь.

Диаграммы из меморандума Кларка, объясняющие принцип действия геостационарных спутников связи. *Слева* — классическая система из трех спутников; *справа* — программы из пункта А транслируются в пункт В в область С; программы из пункта D транслируются на всю полусферу.

Example 3: K Gtaland, op.cit, s 104:



These materials require no further commentary, as they are sufficiently explained in the text itself, and the illustrations merely supplement the theoretical exposition.

Texts produced in the fields of science and technology belong to the advisory genre (genus deliberativum), perhaps also to the judicial genre (genus iudicialae), and as such, in accordance with Philodemus's observation, are intended to pursue truth, limiting the exposition of theory solely to its epideictic variety:

[...] rhetoric is the art of writing and delivering epideictic speeches [51].

This opinion, which Philodemus claims belongs to the Epicureans, is incorrect if we treat the terms rhetoric and sophistry interchangeably [ibid.!]; for issues related to judicial or advisory oratory are not the subject of sophistic considerations. And this is precisely what we encounter in science and technology.

Case Analysis - Annex

I will return to the issue of using classical rhetorical theory in the analysis of scientific and technical or technological texts. The "intrusion of rhetoric" into the sphere of seemingly formal arguments can be associated with a phenomenon comparable to the role of the third-person narrator, who, as in Shakespeare's stage directions, limits himself to informing us only about the actions of a given character or the setting, while in the case of scientific or technical texts, he informs us about certain obvious facts or actions. The entire argument boils down to an exposition of formulas, reasoning, proofs, and so on. However, when, like Rudolf Carnap or Hermann Bondi, or any of the aforementioned authors, we wish to explain the course of our reasoning, we must, at least momentarily, "introduce natural language into formal reasoning." And then, as a rule, these arguments themselves begin to play a role similar to visual representations as evidence. We might ask, is this inevitable?

When we want to popularize certain fields of knowledge whether technique or technology, we absolutely must draw on the teachings of classical rhetorical theory. Reading articles, for example, from "Scientific American," clearly confirms this. When we go beyond the realm of strictly professional language, we inevitably fall into the "arms of Lady Rhetoric." For example, when our goal becomes to convince readers of our arguments. The intention of the article inevitably compels us to reveal not only our scientific knowledge

(which is trivial), but also our beliefs, norms, and beliefs—in short, the axiology that guides us. I'm not judging whether this is good or bad; from a rhetorical perspective, I'm simply pointing out the inevitability of such a process.

How a Statement Changes in Natural Language and in a Formal Language

The issues discussed can be presented in the form of a table:

No.	A. Natural language	B. Formalized languages	Commentary
1.	The subject of the statement is any issue that can be presented without the use of special terminology, although it is possible to use so-called Professional jargon.	The subject of the statement is usually highly abstract and requires specialized language.	In field A, rhetoric is one of the basic communication techniques; in field B - it should generally not appear (rules of statement construction in formalized languages). NOTE - the phenomenon of "bullshit" may occur (H. Frankfurt).
2.	The recipient is every language user - regardless of substantive preparation.	The recipient is a specialist in a given field, although it is possible that the text is accessible to every recipient.	These two groups of recipients are not, for obvious reasons, separated from each other.
3.	The sender can be a specialist in a given field of knowledge, technology, or medicine.	The sender is exclusively a specialist in a given field of knowledge, technology, or medicine.	As above.
4.	When speaking about problems in the fields of knowledge, technology, or medicine, simplifications inevitably occur, but these simplifications stem from, among other things, in school education.	When discussing issues in fields of knowledge, technology, or medicine other than the speaker's own, or when the goal is to convince the audience of new ideas, simplifications may inevitably occur, but these simplifications have their sources, among other things, in school education	In such situations, the only field of knowledge that is helpful in constructing argumentative structures is rhetoric. We are dealing with proving hypotheses, and therefore we must find all means to convince opponents (ARIST., rhet.,).
5.	In natural language, we usually speak of the interpretation of facts; when we speak of facts, we usually understand them in a colloquial way. We often use opinions, beliefs, and common understandings on a given topic.	In formalized languages, we usually speak of facts, which we further define to limit arbitrariness in understanding concepts, facts, etc.	We must distinguish between: - talking about facts and the interpretation of facts, - using definitions of concepts, facts, etc., - using the everyday understanding of various terms
6.	Elegance of expression, but sometimes also bluntness and the pursuit of effective expression.	Elegance of expression, but it must always be characterized by formal correctness.	In both fields, this concept means two completely different things!
7.	EXAMPLES Statements in the fields of science, technology, and medicine, e.g., in newspapers, in popular media broadcasts, in everyday conversations, etc. Rhetoric supports the persuasiveness of messages.	EXAMPLES Statements in the fields of science, technology, and medicine, for example, in narrowly specialized journals, scientific studies, narrowly specialized seminars, etc. Precision is required, usually combined with a method of argumentation acceptable in a given field (usually formalized) and based on certain premises/true premises	NOTE Only when statements in field B. exceed the scope of a given field - is it permissible to change the language of the statement, and it is often necessary to abandon professional language/jargon to achieve a good (?) understanding of the views presented. Rhetoric is then necessary as a method for proving arguments based on uncertain premises.

In Conclusion - first, a quote from Murray N. Rothbard's famous text on, among other things, hermeneutics and its application to research in the field I am discussing here:
Obviously, deconstruction and hermeneutics are self-refuting on many levels. If we cannot grasp the meaning of any text with our minds, why should we even bother, or seriously consider the works and doctrines of authors who aggressively proclaim their own incomprehensibility? [53].

I mention this because it reminds us of a rather unpleasant fact that is often overlooked. When we depart from formalized language (with all its limitations!), we are in danger of the kind Rothbard mentions. However, applying the rules of rhetoric does not lead to the self-contradiction indicated. Despite certain flaws, rhetoric—in its classical form—assumes that we can always "grasp the meaning of any text with reason." The only requirement is knowledge of the language in which the text is expressed and knowledge of the rules governing that language—rhetoric, viewed as a theory of argumentative text.

Preliminary Conclusions

Before I present my preliminary conclusions, it is necessary to explain why I classify texts belonging to the fields of science and technology as advisory and judicial (genus deliberativum and genus iudicialae)? In their case, the authors propose and advise the adoption of their proposed solution to a research problem, while simultaneously rejecting another solution. They base this on the

description and analysis of experimental results, even if these are so-called thought experiments (as is the case in both science and technology). Moreover, they generally try to use concepts that are clear, correct, and commonly used within both fields. This is what all of the authors mentioned do; otherwise, their judgments would not be judgments, but merely opinions, and as such, they would have to be questioned. The arguments they employ rely precisely on the correct use of lexis so that their thought (dianoia) is unquestioned and is clear and understandable to the audience. As Alfred North Whitehead puts it:

[Mathematics] operates with properties and concepts that can be applied to objects as such, regardless of the feelings, impressions, or emotions we associate with them [40].

The same observation can be applied to technology, because when we describe the operation of a device, we are not talking about the impressions or emotions it evokes in us, but about its correct operation.

Texts belonging to the fields of science and technology, even if these are issues related to, for example, AI tools, are supposed to be correct, and therefore consistent with the assumptions or purposes for which they were constructed (within technology) or described in science, and their operation consistent with the assumptions (within technology) and, in science, are supposed to be characterized by correct argumentation. Classical rhetorical theory is therefore entirely sufficient to describe them. Moreover, when applied to the description and analysis of a rhetorical situation, as presented by scholars such as Sonja K. Foss and Wayne C. Booth, to name a few, it will allow for the assessment of the correctness or incorrectness of the text's composition.

I would like to point out that while their affiliation with the advisory genre (genus deliberativum) should not raise any doubts, it is necessary to indicate why they can and should be associated with the judicial genre (genus iudicialae). Every text within the fields of science and technology must "judge" and either accept or reject judgments that either agree or disagree with the authors' proposed solution, and provide reasons (arguments) for doing so. The authors mentioned: Alfred North Whitehead, Sir Arthur S. Eddington, Willard Van Orman Quine, Rudolf Carnap, Hermann Bondi, and Stanisław Lem all do just that.
Therefore, I believe that I have fully answered the research question posed earlier.

Discussion

However, one rather serious objection can be raised to the arguments presented here. Perhaps within the fields of science and technology, classical rhetorical theory is sufficient to describe the texts produced within them. However, there are other fields, for example, the social sciences, where this theory will be not only unreliable but also of little use. For example, in situations where the very feelings, impressions, or emotions rejected by Whitehead, which we associate with the subject of study, are not only important but actually define the objects. In this case, classical rhetorical theory may not only be unhelpful, but the results of descriptions and analyses of such objects and the feelings, impressions, or emotions associated with them may prove to be downright false or, at best, of little use. George A. Kennedy takes a similar position when he says:

The term rhetoric has clearly had différent meanings in différent historical cultures and thè phenomena that we cali "rhetoric" have been called différent things at différent times. I suppose rhetoric is not a "substance" in the logicai sense, though it does seem to me that there is something found in nature that either resembles rhetoric or possibly constitutes the starting point from which it has culturally evolved [54].

The researcher is not entirely correct, as classical rhetorical theory, as I pointed out earlier, is related to logic and is arguably an important tool for composing texts in fields such as science and technology. Without entering into polemics with Kennedy's cited article and to simplify the argument, I will point to literary works, which, after all, contain objects that, beyond their description and analysis from the perspective of grammar and poetics, contain precisely the feelings, impressions, and emotions that we associate with the subject of study. Are the tools of classical rhetorical theory sufficient for their description and analysis? The answer is seemingly negative, as we are discussing something that, it seems, exceeds its scope. Moreover, can a literary work be considered, as suggested by the previously cited Sonja K. Foss, as an example of a rhetorical situation? This, after all, refers to some conflict or crisis; in the case of a literary work, however, we are dealing with emotions, values, and more generally: aesthetic and axiological values.

These problems relate to the individual reception of the message, and not to the reception that characterizes the approach to a text in the field of science or technology.

I will begin by recalling a significant observation made by Philodemus. He points to the important fact that:

Rhetoric [...] is an art that [necessarily] possesses methods [principles] and conveys specific [specific] knowledge. [...] The purpose of rhetoric is not to persuade, but to persuade [by means of] rhetorical speech [speech developed according to the rules of rhetorical theory]. The philosopher persuades through the power of logic, Phryne through her beauty; neither persuades rhetorically [51].

The quoted opinion of Philodemus demonstrates various ways of arguing, adapted to specific situations. As Krystyna Bartol says:

Philodemus is essentially limited to its epideictic variety, i.e., showy, aimed at evoking aesthetic experiences in the recipient [55]. Only this type of eloquence is considered an art (téchne) based—like poetry or medicine—on precisely defined principles and rules, in contrast to courtroom and political speeches, in the creation of which chance plays a significant role. Philodemus's aversion to these latter two varieties of rhetoric stemmed, of course, from a negative attitude toward public activity, inherited from the founder of the Garden and from his direct teacher, Zeno. A purely aesthetic conception of rhetorical art, postulating clarity as a fundamental characteristic of style, decisively rejects any possibility of its educational impact. The denial of the utilitarian-didactic functions of rhetoric resonates with Philodemus's theory concerning other fields of art, namely music and poetry [56].

We thus have a partial answer to the question posed earlier—the classical theory of rhetoric is also suitable for describing literary works, or works of art. The epideictic genus (genus demonstrativum) allows us to describe what we have previously defined as feelings, impressions or emotions that we associate with the subject of research. This stems from the appropriate choice of vocabulary, including tropes and figures, the style we will use and the ideas of style, and also from the use of a well-thought-out topic. A certain "ornateness" or "unornamentedness"

is intended by the author and consciously employed in the text. And the feelings, impressions, or emotions we associate with the subject of study (in this case, a work of art - note: JZL) are, as it were, potential in the work, "included" by the author precisely in the process of reception. I will omit these examples, as they are obvious (although one can point out those mentioned in the works of, among others, Markus Asper, Wayne C. Booth, Kenneth Burke, Walter Jost and Wendy Olmsted, Heinrich F. Plett, or the writer of these words, cf. Asper 2019, 655-674; Booth 1991; Burke 1969; Jost, Olmsted 2012; Plett 2000; Lichański 2007, vol. 2, passim) [13,21,24,25,27,52].

However, a more serious problem arises from the so-called Constructive Empiricism, the basic assumptions of which were formulated in 1980 by Bras C. van Fraasen [57].

Science aims to give us, in its theories, a literally true story of what the world is like; and acceptance of a scientific theory involves the belief that it is true [58].

As Chad Mohler adds

In contrast, the constructive empiricist holds that science aims at truth about observable aspects of the world, but that science does not aim at truth about unobservable aspects. Acceptance of a theory, according to constructive empiricism, correspondingly differs from acceptance of a theory on the scientific realist view: the constructive empiricist holds that as far as belief is concerned, acceptance of a scientific theory involves only the belief that the theory is empirically adequate [57].

One can conclude from this that Constructive Empiricism rejects the wisdom of using classical rhetorical theory to analyze texts in the field of science and technology, because in the texts' justifications we are dealing with belief, not the pursuit of truth. However, Aristotle already pointed out that in any texts, although we strive for truth, we rely on beliefs [59]. Therefore, in this case, I do not see the need to reject the tools of téchne rhetoriké, because they also allow for the analysis of texts in the field of Constructive Empiricism.

Conclusions

Despite what has been said, the conclusions are not entirely clear. Classical rhetorical theory (téchne rhteoriké) is absolutely useful in describing and analyzing the composition of all texts, whether scientific or technical or technological. This is also true for the composition of any text; Philodemus also pointed this out. However, is it also fully "productive" when we want to demonstrate, just in relation to texts from the fields of science and technology, that their correct construction summarizes or expands our knowledge of reality? Or, as Sonja K. Foss would have it, does it allow us to construct our reality? [12,22,23].

The problem, therefore, boils down to the question of the correctness or incorrectness not only of judgments about reality, but also of the answer to the question of language and its adequacy in describing it. Wolfram Ax's theory, which I cited earlier, only addresses the levels of language; Chris Mantzavinos's study of hermeneutics only determines whether there is a connection between reality and the way of speaking about it, and whether the text does so in an understandable and correct manner [3,30]. We are responsible for the final form of the statement; however, there must be an understanding between the sender and the recipients, or rather, as Kenneth Burke would have it, an identification [13].

However, it can and should be pointed out that texts from the fields of science and technology, in particular, play a significant role in the process of cognition. Following Immanuel Kant, I assume that this process is defined by four components: Anschauung, Begriffe, Gedanken und Inhalt (intuition, concepts, thoughts, content) [60]. It is also important to remember that intuition (Anschauung) is an essential component of all our knowledge [60]. All of these components are included in classical rhetorical theory (especially in the phases of inventio, dispositio, elocutio) and are an integral part of Burke's identification.

Immanuel Kant, moreover, clearly points to the importance of classical rhetorical theory in the field of science, but I would extend this to technology as well, when he defines the relationship between knowledge and the way its results are presented:

Whoever, possessing clear insight, commands language in its richness and purity, and endowed with a fertile imagination capable of illustrating his ideas, is keenly and wholeheartedly concerned with the true good, is vir bonus dicendi peritus, an orator without art but full of emphatic force [emphasis added - JZL] [61].

And with this judgment of Immanuel Kant, I summarize the entire argument. Classical rhetorical theory, in a sense, does not grant us complete freedom in shaping linguistic expression, but imposes certain constraints, among which Plato's kalokagathia is a necessary condition.

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