

Epistemological Foundations of Medical Education: Logos of Science and Aristotelian Tradition

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ABSTRACT: In the transition from *paideia* to *bildung* in medical education tensions are generated in the experience/observation relationship; to explore it, a horizon is reconstructed that contributes to the epistemological foundation of medical education. The relationship of logos with science and, later, the Aristotelian tradition is analyzed. In the logos of science, the relationship logos/science is thought through the thought of Heraclitus, Heidegger and Gadamer to define it in terms of a process by which the diverse is gathered in a whole that is shown to the being that is understood in the language. In relation to the Aristotelian tradition, following the thought of José María Mardones rehabilitates the teleological sense of the scientific explanation of the phenomena of nature. It is transited by the Aristotelian thought, the Darwinian posture, and the epistemological developments of the 19th and 20th centuries; highlighting the contributions of anthropic postulates, the theory of morphogenesis, as well as the theory of functional explanation. It is concluded that the Aristotelian tradition provides fundamental elements to reorganize the knowledge of medical sciences from an integral perspective that focuses the patient on the educational process of the medical student.

KEYWORDS: Aristotelian tradition, epistemology, medical education, science, logos.

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I. INTRODUCTION

Medical education is a complex process, and its foundation is shown, paraphrasing Spengler when referring to Heraclitus, as the soul of Hamlet, "everyone understands, however, everyone understands differently" (Spengler, 1947). The development of medicine as well as medical education is influenced by the logos; whether it is the reason, the word, the action, or, intelligence, scientific knowledge, wisdom, practical thinking, understanding, judgment, and articulated language (Benítez Prudencio, 2011). In the expression: "the passage from the myth to the logos", it is understood that the world of life in which it develops, both the health-disease process, and the process of training the medical student, is a totality that is based on in human rationality, so that the human being has the reason for the knowledge of reality and the direction of human behavior.

Education in general, and medical education in particular, is not limited to the transmission of scientifically based information; On the contrary, it is a socially determined activity of a practical and moral nature, for which Werner Jaeger (1944) will find in Hippocratic medicine a scheme of the Greek *paideia* representing the interconnection of education with culture and politics, through the *arete*, a ideal of virtues, capacities and forces that make it possible to define the human being that wants to be formed.

From this perspective, the transition from the *paideia* (Jaeger, 1944) to the *bildung* (Gadamer, 2004) in medical education, going through the "banking education" enunciated by Paulo Freire (2005), generates epistemic tensions, since each represents a model of philosophical and ideological nature. The tension that develops is similar to that observed among the scientific traditions described by José María Mardones (2003): the Aristotelian tradition and the Galilean tradition; Western philosophical and scientific thought have attributed dependency links between science and the Greek logos that would lead to the differentiation between *doxa* and *episteme*.

The epistemic obstacle based on Gastón Bachelard (2002) would explain the tension between both traditions, but the reproduction of the knowledge that is transmitted in medical schools, associated with "scientific experience" and "common experience", situates the epistemic problem in the relationship experience/observation. This relationship allows the student to appropriate knowledge, skills, attitudes and fundamental values for the development of medical practice. In this sense, the uniqueness with which it is intended to explain the development of medical sciences allows us to characterize the hermeneutical situation in the debate between explaining and understanding, which implies reconstructing the relationships between logos,

science and the Aristotelian tradition; that is, we aspire to look at the foundation of medical education in its different aspects of philosophical thought (Karpov, 2015).

To explore this line of reflection, in order to reconstruct the horizon of understanding that delimits essential principles to epistemologically establish medical education, two categories of analysis are presented below: the relationship of logos with science, and the Aristotelian tradition; one as a foundation and the other as a model of teleological explanation of the phenomena of nature and society linked to the teaching of medical sciences.

II. THE LOGOS OF SCIENCE

The History of Philosophy shows that the term logos has been interpreted as thought, reason, knowledge, speech, discourse, concept, word. In language, it is constituted as a concept that is understood linked to the context in which it is used, be it linguistic, philosophical or scientific. The understanding of the term linked to the cosmogonic sphere that underlies it in the background, provides the meaning to the recognition of the polysemic dialectic with which the term logos is characterized (Benítez Prudencio, 2011).

The term logos comes from Heraclitus of Ephesus, a Greek philosopher who developed a philosophy based on the following assumptions (Johnstone, 2014; Minar, 1939; Mashalidis, 2003): a) the logos is the universal and objective Law that governs all the events of the Cosmos, in a way that governs and explains the change, transformation or movement of the universe; b) man grasps the order and regularity of the universe through the psyche (reason, mind, soul), so that the logos is the rationality of the world and of man; c) the reflection of reality is aimed at discovering its ultimate and hidden background (logos), for which a practical-theoretical (ethical) attitude is adopted.

On these bases, by including the understanding of physis through the particular manifestations of the universal Law that governs the Cosmos, Heraclitus will consider logos as the foundation of objective knowledge, so that Reason is the Law, the universal Logos that everything governs it, but it will also be the stable, that which endures, that is, what remains offering the possibility of knowledge of the physis (Heidegger, 1980; Johnstone, 2014). The knowledge that is obtained by understanding the logos of the Cosmos, that is, what is permanent in all things, is transmitted through the word, language, in short, dialogue, expression that shows what is common to man. Eduardo Nicol (1965) points out that what is common to man manifests itself in thought, on the one hand, as "unity and community of the real," and on the other, as "unity and community of reason". The logos in Heraclitus will base the origin and the source of validity of the knowledge that man is acquiring, but it will also represent the community of thinking and being; which implies that knowing is adapting and listening to the dialogue between human thinking and the universal Logos; so that to listen to the physis is to understand the Logos (Schettino, 1968).

In this context, the logos will be for Heraclitus the community of inter-relations of three different concepts but united among themselves in understanding reality. In a first sense, it will be word, speech or language; in another, it will be the Law that governs the totality of the Cosmos, that is, to reality itself; and in a third sense it will be human reason and thought (González, 2009; Schettino, 1968). Points of convergence that will make it possible to differentiate the doxa from the episteme. The episteme, Xavier Zubiri (1987) points out, "is a mode of intellection that is determined by the vision of the internal structure of things, and, therefore, bears in itself the characteristics that assure the effective possession of what are the things in their intimate need". In this sense, the Aristotelian thought will make of the episteme the attitude that will make it possible to establish the de-monstration of the physis through the logos, that is, it will be the logos, the reason, the way to show the internal structure of Nature that remains it hides the senses.

In the transition from episteme to science, it is directed towards the precise and objective explanation of the phenomena of nature through the mathematical expression of facts. Thus, the quantitative explanation of the manifestations of nature begins to take shape, delimiting itself from the qualitative explanation of phenomena in order to understand the sense of reality that is being uncovered; what in Leibniz's thought was enunciated as the principle of sufficient reason: nihil est sine ratione; that is, "nothing is (or happens) without there being a reason for it to be (or happens), or without there being a reason that explains (or happens)" (Paz, 2017; Heidegger, 1991).

Modern science is heir to the conception of the Heraclitean logos and the Aristotelian episteme; so that logos, in their relation to science, is more than thought or reason; it is foundation (Grund). In the search for the truth, Heidegger (2001) establishes the relationship between the being and the logos, where the logos, coming from the verb *legein* (say or speak), will interpret it as a meeting; is, Heidegger (2001) points out in his essay on Heraclitus' fragment 5 entitled Logos, the groundsel that collects and links, has in itself the hiding-uncovering character, since the logos is in itself at the same time to uncover and hide; and in this process, logos and *aletheia* (the unveiled truth) are the "Same" (*das Selbe*). The foundation/truth relationship shapes the scenario of contemporary science to address the search for primal science; that is to say, of that pre-theoretical science that bases the presence of the object through the thematization of the experience, which requires an experiential

accompaniment to understand it (Heidegger, 2005b). In *Introduction to Metaphysics*, Heidegger (2000) will interpret the logos as "reunited whole that gathers, what it originally gathers", "what is constantly together", or the simplest "relation of a thing with other". The sense of understanding of the logos as the nexus of the meeting of the whole is closely linked to the ontological interpretation of physis, to the point of culminating in its explicit integration: "the logos is: the totality of the entity itself", or even in his identification: "physis and logos are the same"; therefore, the logos is a way of seeing the entity that is being talked about by showing it (Heidegger, 2010); so that the Heideggerian primal science aspires to the construction of a knowledge that is common to all forms of knowledge, so it resorts to hermeneutic intuition in the inductive construction of a phenomenological horizon to describe what is given (Heidegger, 2005a).

Following the Heideggerian thought, Gadamer (2004) affirms that the original sense of the logos is to gather, to count, although it has been translated as a concept, law, reason and thought. For Gadamer (2004) it will also mean language announcing that at the bottom of logos, there is language and being that is understood, is language. For this reason, through logos we think about the essence of things and we obtain a knowledge of things that can be verified at all times; and it will be the dialogue that recovers the internal self-forgetfulness of the speech in which the world is evoked, raising to the presence the memory of the experience of the world of life. This memory as anamnesis, as Gadamer (1996) will see in *The Enigma of Health*, is linked to the mneme (memory) constituting a form of thought, logos, the search for truth. Thus, the logos will be shown to understanding as the willingness to give an account of the foundations of everything that man considers true (Gadamer, 1996); so the medical conscience develops in parallel with the philosophical understanding of the essence of the logos; that is, medical knowledge confronts the Aristotelian tradition of teleological explanation in science, and that is linked to the understanding of the experience of the world, which in the words of Gadamer is expressed as follows:

"The articulation of the experience of the world in logos, speaking with one another, the communicative sedimentation of our experience of the world, which encompasses everything that we can exchange with each other, constitute a form of knowledge that, together with the great monologue of modern science and its growing potential collection of experiences continues to represent the other half of the truth" (Gadamer, 2001:30).

In this sense, when it is indicated that science has a logos, reference is made to the logos as the essence of knowledge of human know that has been transferred to the language transmitted in the Aristotelian tradition in its scientific reconstruction of reality.

III. ARISTOTELIAN TRADITION

In the Aristotelian tradition the "why" and the "for what" of the phenomena of reality are questioned; so that the understanding of the phenomena that are intended to explain scientifically is based; that is, the Aristotelian tradition will develop in the realm of understanding (*Verstehen*). The central axis that provides unity to the efforts to understand the facts of nature is the teleological or finalist paradigm, which develops the following principle: "nature does nothing in vain, but everything with a view to something" (Aristotle, 1998). The word "teleology" was developed by Christian Wolff in 1728, to designate the part of natural philosophy that deals with the ends of natural phenomena, and distinguish it from those processes that focus their interest on efficient causes (von Glasersfeld, 1990).

Aristotle will be the first exponent of the teleological tradition and will influence the way of doing science (Leunissen, 2010). The starting point of the scientific activity will be the observation, followed by the scientific explanation that aims to give the reasons for the observed phenomenon. In the construction of this explanation, Aristotle uses three processes (Mardones, 2003): induction, deduction and analysis of the causal relationship; so that it will be the demonstration, the methodological tool that will generate knowledge through deductive arguments.

The inductive process developed by Aristotle, went from the observed phenomenon to the general principles that explain it, for which he used the simple enumeration method or the direct induction method (Mardones, 2003; Nandasena et al, 2017). The deductive process is to deduce statements about the phenomena from the premises that include or contain the explanatory principles (Malink, 2015; Mardones, 2003). The analysis of the causal relationship that Aristotle demands in the construction of the explanation of the phenomena of nature is reflected in the elaboration of syllogisms; so that the relationship between general premises of the phenomenon to be explained is based and the conclusion of the syllogism in which the explanation of the observed phenomenon is exposed (Mardones, 2003; Nandasena et al, 2017). To elaborate the explanation, the formal cause must be specified, as well as the material cause, the efficient cause and the final cause (*telos*) (Johnson, 2005). The practical syllogism, as an instrument to support scientific explanation has shown, as Georg Henrik von Wright (1971) points out, a model of teleological explanation and constitutes a definite alternative to the model of coverage oriented to sustain the causal explanation in the natural sciences. The Aristotelian practical syllogism that has the following scheme (Mardones, 2003; Oriol Salgado, 2004): 1)

the starting point of the major premise of the syllogism mentions something intended or the goal of action; 2) the minor premise refers to some act conducive to its achievement something like a means directed to that end; 3) finally, the conclusion consists in the use of this means to reach the end in question.

The final result in the logic of the Aristotelian investigation is oriented to base the teleological explanation, that is, it will answer the questioning: "with the purpose of what". Thus, the final cause or telos, is of the greatest importance to understand the facts and phenomena of nature, and enables the teleological explanation to be constituted as the prototype of the sciences. Mardones (2003) recalls that the Aristotelian explanation of teleological nature included explanations based on characteristics associated with the substance of the substance, among which "properties", "faculties" or "powers" stand out. The use of conceptual terms associated with these characteristics, of a metaphysical nature, used to explain the purpose of the phenomena of nature, presupposes a worldview and marks the difference between the teleological deduction and the causal hypotheses of the Galilean tradition.

With the rise of modern science and the hegemony of Galilean conception of science, teleological thought was gradually declining. In the nineteenth century, the works of Charles Darwin and Claudius Bernard stand out, because they were based on postulates of teleological thought to try to explain the natural phenomena they studied. Through *The Origin of Species*, Darwin (2004) revolutionizes the conception of the evolution of life in the world, as well as the origin of man and the different species of living beings, arguing on the basis of the purpose of their biological characteristics; that is, a historical-teleological process is explained through biological mechanisms such as: variation, inheritance and selection. This line of thought, which will be rehabilitated by Jacques Monod (1971) in his book *Chance and Necessity*, in which he sets forth the purpose of living structures through the genetic advances of modern biology. Claude Bernard (1949) delved into the physiological studies of the biological structures of the human body; He highlighted the importance of the causal hypothesis and the scientific experiment as tools to support the scientific explanation of physiological phenomena in the study of human diseases; but heir to the biological vision of Aristotle and the teleological perspective of William Harvey (Lennox, 2017), came to sustain his scientific activity in teleological deductions.

The teleological paradigm has been rehabilitated during the 19th and 20th centuries through the contributions of hermeneutics, critical theory, and language games. Below are the main lines of reflection of these positions, following what was stated by José María Mardones (2003).

Teleology in the 19th century

The teleological explanation is paradigmatic in the biological sciences, where the teleological perspective is oriented to explain the capacity of living beings to seek and maintain a determined organization. In this case, it is structural immanentist teleology. One of the most important contributions in the development of teleological explanation will be in the field of social, human or spiritual sciences, in response to the hegemonic positions derived from positivism in the Galilean tradition.

Opposition to the principles of positivist philosophy was developed in Germany during the nineteenth century. Mardones (2003) indicates that the opposition was oriented towards the rejection of methodological monism, the mathematization of nature to support the scientific explanation of nature and society, the predictive interest to control the phenomena of reality; the scientific causality and its relation with the instrumentalization of the reason. Before positivism in the study of the phenomena of society and history, the hermeneutic current will be placed, through the contributions of Droysen, Dilthey, Simmel, Weber, Windelband, Rickert.

Johann Gustav Droysen, German historian, establishes the distinction between explanation and understanding. It emphasizes the coherence, teleological character and the know-how of the historical processes, reason why it argues that the way of understanding is the path that History must travel (Maclean, 1982). It exposes a material philosophy of history and a hermeneutical methodology for the study of historical facts; which will motivate that it promotes the hermeneutical understanding in the methodological conception of the social, human or spiritual sciences. In this line of reflection, Georg Simmel aims to distinguish social, cultural and spiritual life in two ways of understanding: through fixed and determined forms of life and dynamic and changing structures of life. Influenced by the evolutionary Darwinism of the species, Simmel will point out that understanding is a characteristic that enables the recognition of the historical contents of human reality. In this process of understanding, the relationship that is established between the subject that observes and the historical fact that is analyzed, underlying psychological structures that give form and content to the personal perspective, subjective and objective, in the understanding of the historical phenomenon, be cultural or social (Scaff, 2005).

The cultural, historical and spiritual world of man requires analysis from within the same historical process; so that the experience of living in the world of life, has to be understood from life itself. The analysis in this direction, will enable Wilhem Dilthey to identify the researcher's belonging to the same reality of the historical universe that he is investigating. Identity and subject-object unity will make of comprehension an original act of human thought, through which the world of the human spirit that manifests itself in externalities characteristic of life is captured (for example: signs, gestures, inscriptions) (Liashenko, 2018). On the other

hand, Dilthey will defend the autonomy of the human sciences; so that comprehension is the core of the scientific method that makes it possible to explore the properties of historical, social and human phenomena (Tool, 2007). While for Wilhelm Windelband (1998), the natural sciences are nomothetic sciences because they are sciences based on laws, that is, on universalizing criteria; while the social sciences are ideographic because they are aimed at understanding the socio-cultural and historical phenomena that are unrepeatable in human events, through the analysis of the individual and the biographical. This position will be deepened by Heinrich Rickert in "Sciences of Nature and Sciences of Culture" (Koptzeva and Makhonina, 2009). Max Weber will follow the thought of Rickert developing comprehensive sociology, through which he recovers the concept of "value relationship". Through this construct, Weber (1978) will expose the importance attributed to the meaning of the phenomenon under study, that is, the social meaning attributed by social communities to the empirical-real structures of socio-cultural and historical phenomena is valued.

In the transition from the 19th century to the 20th century, the historical conceptions of Benedetto Croce and Robin Georg Collingwood stand out. For Croce (1921), history is a process that is reflected in the circular unity of the dialectic that is concretized in practical life, in a way that tries to unite knowing with doing, so he understands that life is history; fundamental approach that will contribute to the materialist and historical conception of the natural evolution of the disease, in a sociocultural context. On the other hand, Collingwood (1994) will conceptualize history as a science of human nature, making it clear that scientific history is oriented towards the understanding of the past in order to know the man of today; thus, history is consolidated as a process in which historical facts are defined by what remains in the historical consciousness of the historical process that is changing. He also systematizes the use of the question in a dialectical question-answer process (Collingwood, 1939), which will later be recovered in the philosophical hermeneutics of Hans-Georg Gadamer (2004).

Teleology in the 20th century

Before the hegemony of the teleological perspective developed in Darwinian thought, and in reiterated opposition to the positivism of the nineteenth century, the ideal of teleological explanation is reflected in the thought of Edmund Husserl, considering that teleology confers unity on acts of knowledge and brings them together in a coherent system in cognitive units; thus, "consciousness manifests an infinite tendency to unify experience" (Conde, 2013). Following this line of reflection, during the 20th century, the Frankfurt School was founded, founded by Max Horkheimer and from which, Theodoro W. Adorno, Hebert Marcuse, Erich Fromm, Loventhal and Polloch, gave shape to the critical theory of society, which was subsequently continued by Jürgen Habermas and his theory of communicative action (Held, 2004). The position of the Frankfurt School, through Horkheimer and Adorno, marked the course of the Aristotelian tradition of understanding in the following areas (Mardones, 2003): origin of knowledge, scientific method, objectivity of science, and the interest that drives science. The critical theory rescues the dynamic character of reality, circumscribed to processes that imply the potentiality of its development; so that it is opposed, on the one hand, to the primacy of observation as a source of knowledge and, on the other, to the facts being the category of reality for excellence (Adorno, 1976). Horkheimer and Adorno assume, from critical theory, that the tension between knowing and not knowing is determined by the problem of the origin of knowledge, which is located at the beginning of science but linked to practical, real and concrete problems that derive from the *be* in the world (Mardones, 2003).

The approach to reality from the practical activity of man, arises from a worldview that anticipates a model of society where it is determined historically and critically, the search for means to achieve certain ends; that is, from a teleological perspective (Wilding, 2008). In this sense, critical theory recognizes the uniqueness of the method of science and bases it on critical reason, which will guide reason towards the emancipating, rational and searching tendency in the historical, social and natural context of the world of life; so that the "context of justification" is articulated with the "context of discovery". Mardones (2003) believes that through emancipatory reason, critical theory will propose to escape from the vicious circle of the Münchhausen trilemma and the repetition of the given, accounting for the social whole that frames and makes sense of the facts and concrete phenomena of life and world.

The critical part of critical theory, in opposition to critical rationalism, refers to the observation of particular data structured in the totality of natural and social reality; always directed by the emancipatory interest to penetrate the facts beyond the appearance; making the methodological approach the instrument through which the data obtained from reality is taken into account, but which places them in their production and use context to go beyond what appears to capture the phenomenon in its objectivity, which is achieved when the reason maintains a relative autonomy with respect to the facts (Mardones, 2003).

Mardones (2003) also recognizes that critical theory is not opposed to the logic of natural science research, but emphasizes the peculiarity of human and social sciences by recovering and rehabilitating their dual structure of objective and subjective nature; it transcends the object of study in its simple presence that lies there, in front of the researcher, manifesting itself in its objectual reality as a simple object that will be captured

by certain specific methods. In this case, the objectivity of science is reached with the critical method; but the critical path is not only formal nor is it limited to reflection on conceptual statements, methods and apparatuses; it also implies the criticism of the object (Horkheimer, 2002). From this objectual critique, all the moments of the subject and the subjects linked to socially organized science depend; said with words of Horkheimer: if the critic does not become critic of the society, its concepts are not true; highlighting with it the emancipatory interest of suppressing social injustice, in addition to appointing what no one names and revealing injustice as a way, as a negative way, to bring out the truth of the future society that we crave, so that critical theory will guide towards the attention of the developments of reality (Mardones, 2003). In the field of medical sciences, critical theory has been recovered for the analysis of health systems, health policies, administration of medical care, disease control, health economics, and for the understanding of the practice medical and medical education (Unger et al, 2011).

In the "context of justification" of the scientific advances of the medical sciences, the contribution of critical theory in general, and of Habermasian thought in particular (Scambler, 2001), stands out, which can be observed in the analysis elaborated from the comprehensive paradigm in the field of sciences social applied to medicine, such as: medical anthropology (Mishra, 2013), medical sociology, social medicine and public health (Laurel, 2018), and that will be reflected in the ideological content, social control and exclusion of the patient's social context, which occurs during the medical encounter (Waitzkin, 1989).

In this context, the historical thought of William Dray makes it possible to deepen the understanding of the teleological paradigm that underlies the medical sciences. Dray (1960) affirms that to explain an action is to show that this action was the appropriate or rational procedure in the considered occasion; what in medical science justifies the medical procedure from the evolutionary and historical perspective of the disease. Thus, the explanation, as the foundation of the "context of discovery" in the scientific practice of medicine, exposes logical peculiarities that allow the debate between qualitative and quantitative research (Everest, 2015); where intentionality, a concept contributed by G. E. M. Anscombe (2000), guides the analysis and offers a horizon of understanding to show how intentional behavior is associated with a determined behavioral description, but it stops associating when the behavior changes.

By observing the health-disease process through the glass of teleology, it is shown as a social fact. Considering that for Alfred Schütz (1982) social events are events that reveal intrinsic structures of significance that are inherent in the social world, health and illness are phenomena that unfold in the world of life, so they are structured significantly to show the complexity of the natural attitude of man in factual life. On the other hand, Schütz (1996) identifies the scientific constructions as second constructions that operate with a model of subjective interpretation of social actions or phenomena that should be logically coherent, and above all, adapt to the understanding that this action has the social actor in terms of common sense (Mardones, 2003). This view is interesting to understand the organized social response generated by the subject and his social group to meet health needs; but it also needs to be complemented with the vision of Peter Winch (1980) that is based on the analysis of social action through conceptual references and rules of conduct. In this sense, the doctor has to understand the meaning of the behavior or social behavior data observed in the patient; so that when recording the observed information, they can be treated as social facts, so the description (interpretation) of the data is used in terms of concepts and rules that determine the "social reality" of the patients studied. Without understanding the rules of the game there is no understanding of behavior in society (Mardones, 2003).

In the second half of the 20th century, the conceptualization of teleological explanation was widely developed. The works carried out by Charles Taylor, Peter Winch, Alfred Schütz, Jürgen Habermas, Karl-Otto Apel, Hans-Georg Gadamer, Martin Heidegger; that rehabilitate the phenomenology, the hermeneutics and the language game of Wittgenstein. Following these currents, positions of utility for the medical sciences were generated, rehabilitating the Aristotelian tradition of the scientific explanation. In their medical application they include: the overcoming of the epistemology of Taylor, the analysis of the social action of Winch, the phenomenology of the social world of Schütz, the theory of the communicative action of Habermas, the theory of truth and the ethics of discourse of Apel, the original science of Heidegger and the philosophical hermeneutics of Gadamer; sustaining with it the comprehensive turn in the foundation of the scientific explanation and the overcoming of the modern epistemology (Mardones 2003). On the other hand, in the field of natural sciences, of interest for the teleological approach of medical sciences, the following positions stand out: anthropic principle, theory of catastrophe, and theory of functional explanation.

The anthropic principle is aimed at substantiating the existence of material, social, cultural and spiritual conditions that make possible the existence of the human being. Three versions of the anthropic principle are defined (Barrow and Tipler, 1986):

- Weak Anthropic Principle: "Since humans exist, all the necessary conditions for their existence must necessarily exist".
- Strong Anthropic Principle: "the Universe must have the necessary properties for the emergence in it of intelligent life".

- Final Anthropic Principle: “If one adopts a teleological view of Nature, one could go so far as to affirm that matter possesses many of its present properties not because they are necessary for life at this time, but because those properties are essential for the existence of life in a distant future”.

The theory of catastrophe was elaborated by Rene Thom in 1960 and consists of a methodological analytical approach that makes it possible to describe the evolution of forms in nature through mathematically designed models (Thom, 1975); so that its main application was transferred to the life sciences. Morphogenesis, based on the theory of catastrophe, is shown as the term to designate the set of all the creative or destructive processes of forms. From this perspective, the structure of living organisms is a geometric form that will represent their form, which establishes interactions with internal and external dynamic processes. In the internal dynamic processes, the factors of attraction define the metabolic processes while the thermodynamic constants will define their catastrophes according to space-temporal patterns determined in the structure of the form; so that the relationship between structure and function will be established to give meaning to the existence of the stable structure and the creative form or the destruction of the form (Petitot, 2011).

From the works published by Larry Wright (1973) and Robert Cummins (1975) the importance of functional explanations is reoriented, so that three functional explanatory theories were elaborated: selectionist theory, intentionalist theory and systemic theory. The selectionist theory affirms that an event causally explains the function of a structure because it was selected and placed in that process for being able to perform a specific function. The intentionalist theory indicates that the cause will explain the function insofar as it was designed with the intention of participating in the biological process and developing the specified function. The systemic theory attributes the event that is associated with the function only to the extent that it makes it possible to explain the functioning of the entire system. Independently of the theory that is sustained, the reality is that at the end of the 20th century the horizon of teleological explanation opens again with the intention of broadening the sense of representation that man has of the world (Wright, 1976).

IV. CONCLUSION

Contemporary medicine, as well as medical education, is shaping up in the debate between the Aristotelian tradition and the Galilean tradition, in a way that adds to the philosophical and scientific discussion that underlies the explanatory sciences and the comprehensive sciences. To understand this process, linked to the rehabilitation of teleological thought, a brief historical review of the Aristotelian tradition but located in the logos of science has been made. Approaching the relationship logos/science showed the purpose of using methodological tools that enable reveal the truth that is hidden in the phenomena of Nature; ie, the physis, so that this relationship is defined as a process by which meets the diverse in a whole that is shown to be understood in language.

The construction and reconstruction of scientific discourse in reference to the world of life in which the human being is thrown, makes it possible to direct scientific analysis towards the search for scientific explanations of social behavior through a conceptual framework that is used by researchers, as well as the population in general. The study shows limitations derived from the breadth of the debate that underlies the Aristotelian tradition as well as the inability to perform a deeper analysis of each of the epistemological positions that have recently appeared in the field of natural sciences, since it would exceed the purpose of this communication. For this reason, it is necessary that other disciplines that contribute to the rehabilitation of teleology as an explanation of the "what for" of living beings, as well as natural phenomena and processes, are incorporated into the debate. In this sense, we aspire to think about the possibilities of application to medical education of the principles of immanent, internal teleology, and that categorically rejects any project designed or intended by an intelligent subject.

Following the line of reflection of José María Mardones, we reviewed the development of the explanation of natural phenomena from the position of Aristotle to the latest developments that have materialized with anthropic principles, the application of the theory of catastrophe to develop the perspective of morphogenesis, and finally, the theory of functional explanation. In general terms, they are shown as paradigms that can contribute to the linking of clinical sciences with the sociomedical disciplines and the medical humanities. Both recognize the judgment of clinical medicine: there are no diseases, but sick; in it lies the essence of medicine as a comprehensive science, that is, that medical explanations are not based exclusively on general laws; However, in relation to the teleological explanation, the last word has not yet been written, so this communication will help to keep the debate open as well as the search for applications in the development of medical education based on the fundamental postulates of the teleological explanation.

Bearing in mind the development of the analysis presented above, it is concluded that the Aristotelian tradition provides fundamental elements to reorganize the knowledge of medical sciences from an integral perspective that focuses the patient on the educational process of the medical student.

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