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Epistemological and Sociological Aspects in Contemporary Medicine

Abstract. Today we need new developments regarding new issues and perspectives of medical research, but also of medical realities. The fast changing world brings new types of illnesses, new ways to understand them, and this might require a revision of the old views and ways to practice medicine. This paper tries to discuss the main positions regarding the medical science, from a meta-theoretical point of view, and also from the technical, concrete point of view. There are those who argue that today medicine should turn to a more "humanistic" approach, and that this approach can help solve problems that seemed unsolvable in the past.

Keywords: medicine, medical sociology, metaphysics, organicism, humanism.

1. General background

The medical research today has to take into account not only the usual difficulties and questions of a technical stance, but also abstract, theoretical (or meta-theoretical) problems. Questions such as: what is the basis of scientific research, or what is the relation between mind and body, or even what is a patient from a medical point of view, are all there, and need to be answered. There is more than one way to approach these questions, and more than one theory that come forward to answer them.

In the light of these aspects, we'll try to develop in this study an analysis of the meta-theoretical level of medical sciences, and point out some difficulties and even express an option regarding the present debates.

Today, the *meta*-physical discourse deals "with questions that in some ways lie deeper than physics and most other branches of human enquiry: questions concerning the fundamental assumptions and

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theoretical foundations of these other inquiries" (Hormer and Westacott 2000, 1). Generally speaking, metaphysics is concerned with fundamental properties of objects, that is, in a word, ontology. Also, maybe even more important, it is concerned with the relationship among these properties, especially in terms of causation. This, as one can see, is a very general definition. Of course that based on this large domain, more than one type of metaphysics emerged. As James Marcum put it: "modern medicine is certainly part of a larger worldview that constitutes western culture" (Marcum 2008, 18). As such, medicine didn't develop its own metaphysical view, but rather simply chose one that proved to be more appropriate to its needs and stances.

As stated above, the metaphysical position that one assumes is important because it will shape everything that follows: the way one sees the patient, or the mind and body of the patient, or the relation between them – they all depend on the starting point, on the metaphysical point of view that one has chosen.

2. The biomedical model

In the case of medicine, the starting points are quite clear, as well shall see, in the sense that medicine didn't really *choose* its metaphysical stances that they were (at least in part) chosen by default, if we may use that term. Because it's a science, and it strives to be as precise, as exact a science as possible, medicine is forced to choose a certain type of metaphysical worldview, rather than others. And so it did. In the following pages we'll analyze this choice.

As James Marcum asserts, "the metaphysical position of the biomedical model is mechanistic monism" (Marcum 2008, 19). The monism states that there is only one ultimate substance that constitutes the world. Pojman defines it as "the theory that reality is all of one substance, rather than two or more. Examples are materialist monism, which holds that matter is the single substance that makes up all there is, and idealism, which holds that all reality is spiritual or made up of ideas" (Pojman 2006, 667). Monism must be distinguished from dualism, which holds that the world is based on two ultimate substances, and from pluralism, which holds that the world is made up of three or more ultimate substances.

One must also take into account that the ontological dimension of this principle is physicalism, which is accepted today by almost all the scientists.

Another thing that needs clarification is the *mechanistic* dimension of the above notion. According to Paul Thagard, "a mechanism is a system of parts that operate or interact like those of a machine, transmitting forces, motion, and energy to one another" (Thagard 1999, 106). Taking into account this definition, it can be stated that, from the mechanistic monism point of a view, the patient is a collection of parts and the specific functions are a result of a combination of these parts, much like a machine.

Also, one must take into account the presuppositions that are implied by the metaphysical commitment one chooses. Marcum argues that there are not one, but two types of presuppositions, absolute and relative:

> "For example, a physician may presuppose a particular disease is associated with a patient's chief complaint and ask questions accordingly. This presupposition is relative since it is used to ask questions but abandoned if the diagnosis does not substantiate it. An absolute presupposition, such that the disease is reducible to a particular mechanistic causation, is not abandoned but rather frames the diagnostic process. Importantly the logical efficacy of these presuppositions, i.e. their ability to prompt questions about the world, is independent of their truth-value; rather, this efficacy depends upon their being supposed. Thus, absolute presuppositions are required for framing questions about the natural world and are thereby critical for an analysis of the natural sciences" (Marcum 2008, 23).

So the assumptions that a scientist makes both tell him what to expect and create the parameters of understanding what is observed. There are more background assumptions that ground the activity of practitioners in the biomedical sciences (reductionism, determinism, emergentism etc.), but the most wide spread is naturalism, a presupposition that asserts that natural phenomena are the products of natural events and forces and that human reason can comprehend these events and forces; i. e. there is no need of forces outside the natural world to explain natural phenomena. There are two types of naturalism: theoretical and methodological. The first only is interested in observing natural phenomena that affect the medical world; the second one claims that *there is nothing* outside natural phenomena – as Francis Crick put it "you, your joys and your sorrows, your memories and your ambitions, your sense of personal identity and free will, are in fact no more than the behavior of a vast assembly of nerve cells and their associated molecules"

(Crick 1994, 3). This type of naturalism is intimately connected with physicalism or materialism. This leads us to reductionism as the absolute presupposition of the biomedical model, as Geoffrey Hellman and Frank Thompson observed: "traditionally, physicalism has taken on the form of reductionism – roughly, that all scientific terms can be given explicit definitions in physical terms" (Hellman and Thompson 1975, 556).

This would sum up the theoretical structure of the biomedical model, which is a mechanistic monism, taking physicalism and reductionism as ontological and methodological stances.

3. The humanistic approach

On the other side, the "humanistic" side of the biomedical world, the main presupposition is not the naturalistic reductionism, but rather the emergentism, which refers to the appearance of a higher order property from lower order properties. According to Phillip Clayton, one of the supporters of this theory, emergentism can be traced back as far as Aristotle, as his biological research "led him to posit a principle of growth within organisms that was responsible for the qualities or form that would later emerge. Aristotle called this principle the *entelechy*, the internal principle of growth and perfection that directs the organism to actualize the qualities that it contains in a merely potential state. According to his doctrine of 'potencies', the adult form of the human or animal emerges out of its youthful form" (Clayton 2004, 20). The author doesn't claim that the pupil of Plato actually discovered the concept of emergence used today (the term used by Aristotle was *entelechy*); merely that he anticipated it. Clayton himself states that, unlike the contemporary emergence theories, Aristotle held that the complete form is already present in the organism from the beginning, like a seed, and it just needs to be transformed from its potential state to its actual state. The contemporary emergentism, as Marcum puts it, takes the stance of being opposed to reductionism (although Clayton argues that the two can coexist, and that in fact there are topics in science where the difference between the two is irrelevant), in the sense that:

> "In contrast to reductionism, the higher order property is not reducible to or deducible from the lower order properties. In other words, a higher order property of a complex entity (E1) is emergent if it is conceivable for a different complex entity (E2) to lack the emergent property even though E2 is composed of the same parts as E1 and even though those parts resemble the same structure as E1. For example, E1 and E2 may

exhibit different behavioral patterns to a similar environmental cue" (Marcum 2008, 25).

The history of this term may begin with Aristotle, but it went through a continuous development, its contemporary form being reached in the 19th century, according to Brian McLaughlin, who claims that "according to British Emergentism there is a hierarchy of levels of organizational complexity of material particles that includes, in ascending order, the strictly physical, the chemical, the biological, and the psychological level" (McLaughlin 1992, 50).

Both Clayton and Achim Stephan talk about strong and weak forms of emergentism. According to Stephan, there are two strong forms of emergentism, depending on their grade of prediction and reduction, i. e. irreducibility and unpredictability.

The first form is called synchronic emergentism; the author states that, by irreducibility, the emergent propriety "cannot be deduced from the arrangement of its system's parts and the properties they have «isolated» or in other (more simple) systems" (Sttephan 1999, 51). Here we have two types of irreducibility. The first type implies that the behavior of the parts belonging to the system is not deducible from those same parts if they are observed in isolation. This type of irreducibility implies downward causation from the system's arrangement onto its parts. The second type involves properties that are impossible to analyze, and belong to the system's micro or macro structure. The most important property of these parts is that "they are not causal in any mechanistic sense but rather epiphenomenal in origin" (Marcum 2008, 26), as Marcum explains.

The second strong form of emergentism is called diachronic emergentism, which refers to the unpredictability of the properties of the system. This means that the systemic properties "could not have been predicted in principle before their first instantiation" (Stephan 1999, 49). There is one more reason for unpredictability, i. e. even for structures that are predictable, the property itself is irreducible, and since a novel property is irreducible, it is by definition unpredictable in terms of its first occurrence.

There is also one weak form of emergentism. This weak form depends on three theses. The first thesis is that emergent properties are properties of the system: "a property is a systemic property if and only if a system possesses it, but no part of the system possesses it" (Stephan 1999, 50). The second thesis is the physical monism, and it claims that all systems are composed of material parts. The third thesis, the synchronic

determination claims that systemic property depends on the system's structure or arrangements of the parts.

We should take into account that the humanistic views of the matter don't want to challenge the typical medical worldview – just to add to it, as the "humanists" of the medical world think that the classical view is too simple, and it runs the risk of losing sight of important aspects of the world, the patient, and his relationship with the doctor. As Marcum puts it "most humane or humanistic models of medical knowledge and practice recognize and appreciate the value of the biomedical model's reductive materialism, especially in terms of the technical advances for medical practice" (Marcum 2008, 29). However, more often than not these humanistic models try to temper reductionism by including a patient's integrative system as an etiological factor in diagnosis of illness and as a therapeutic factor in recovery.

4. The humanistic organicism

This position brings the humanistic models closer to a special type of ontological commitment, the organicism. Organicism, unlike physicalism, implies organic unity, and it emphasizes structure and organization in contrast to composition. The properties need not be reduced to physical or material ones: they are emergent properties need not be material. Laurence Foss talks about the return to organicism as something not necessarily restricted to the medical, or scientific world, but as a trend of the postmodernist era, a trait of a revisionary postmodernism:

> "By virtue of its return to organicism and its acceptance of nonsensory perception, it opens itself to the recovery of truths and values from various forms of premodern thought and practice that had been dogmatically rejected, or at least restricted to «practice», by modern thought. This reconstructive postmodernism involves a creative synthesis of modern and premodern truths and values" (Foss 2002, 19).

This model states that the nature of life contains many aspects that are simply non-reducible to physical elements – it is not simply the sum of its material or vitalist components, but it reflects the unity of its parts as a whole, especially from the point of view of its informational content: "consequently, properties emerge that cannot be derived or deduced from examining the individual parts in isolation; rather, only when the whole is examined can the emergent properties be explained" (Marcum 2008, 29).

Thus, the main difference between organicism and the reductionistic materialism is that the first focuses on the inter-relationships of parts as a complex matrix. From the organicist point of view, the whole cannot be explained by a simple observation of its parts.

Foss also explains that, starting from the eighteenth century, certain inventions changed to stance of the medic and his relation with the patient (the stethoscope, for example, reduced the degree of the physical contact with that patient; this kind of tools put a distance between the two). Also, the fact that the specialists were now allowed to perform autopsies was very important in this sense: "for the first time, the physician had access to the reality of disease independent of the patient's experience of it. The pathological can now be fully defined in terms of abnormalities visible at autopsy rather than through patient complaints. From death's point of view, the biological features of disease are granted autonomy from their social and cultural features" (Sullivan 1998, 254).

Foss notices that these new developments were accompanied by other types of scientific breakthroughs:

> "Parallel to these latter developments were the late nineteenth-century conceptual breakthroughs in the biological sciences associated with such illustrious names as Bernard (physiology), Virchow (cellular pathology), and Pasteur (bacteriology). Finally, by the early twentieth century, there appeared in North America the publication of the influential Flexner Report, patterned after the German model of medical education. This report called for consolidation of these biotechnical and conceptual developments into an energizing reform of the American and Canadian medical school curriculum. Its implementation led to the centralization in that curriculum of the sciences of pathophysiology and clinical biochemistry" (Foss 2002, 32).

Under these circumstances, the conduct of scientific inquiry was characterized by certain methodological directives. The most important were the reductionism and the objectivism. An explanation that is scientific, i. e. an explanation through causes, was, in the end, a physicalist explanation, being based on chemistry and physics. In the case of living things, the explanation had a biophysical character (using both biochemistry and physiology). Thomas Lewis argues that today "we use the hybrid term «biomedical» science as shorthand to describe the whole inquiry that underlies modern medicine. It is biological science that most of us in medicine are betting on for the future, and it therefore seems

natural to attack the words biology and medicine together to name the enterprise" (Thomas 1977, 111).

5. Conclusions

These are, in broad terms, the structures of the models of the biomedical world. To summarize: the biomedical model is characterized by a metaphysical position of mechanistic monism, a metaphysical presupposition of reductionism, and an ontological commitment of physicalism or materialism, the human models are different: they accept dualism or even holism as their metaphysical position; emergentism as metaphysical presupposition, and organicism as their ontological commitment.

Are we dealing with a paradigm shift? This question is complicated because the epistemological stance described above doesn't necessarily have an "either/or" solution. The question stated above begs other questions, such as whether or not a paradigm shift is possible in this context, or necessary, or unavoidable. Let's examine these issues a bit closer.

According to Thomas Kuhn, models are part of the metaphysical component of scientific practice. They provide, among other things, permissible metaphors, ways of viewing and expressing the world. "By doing so they help to determine what will be accepted as an explanation and as a puzzle-solution; conversely, they assist in the determination of the roster of unsolved puzzles and in the evaluation of the importance of each" (Kuhn 1996, 184). So, does the introduction of humanistic or humane medical models represents a paradigm shift, at least according to Kuhn's point of view?

To answer that we should take into account the position of Marcum, who points out that,

> "in a sense, the metaphors upon which the biomedical and humanistic models are based are incommensurable. While the biomedical model has a worldview based on a bottom-up approach to the world, the humane models are based on a top-down approach and there appears to be no intersection between them. […] However, this analysis also reveals that the lack of intersection is not global but often simply local. For some humanistic proponents, the humane models supervene on the biomedical model" (Marcum 2008, 31).

This might lead us to believe that the two can coexist, and so there is no need for a "revolution". As I stated above, there is more than one way this debate this problem. If the two models are not necessarily mutually exclusive, there are still two more possibilities: (1) that the two can work separately, maybe on different areas of the medical research, and (2) that the two could actually work *together*, to complement one another during medical research and even medical practice.

Thomas Kuhn thought that it is possible to have a form of cooperation between more or less different paradigms, to obtain viable solutions to certain problems:

> "Scientists can agree that a Newton, Lavoisier, Maxwell, or Einstein has produced an apparently permanent solution to a group of outstanding problems and still disagree, sometimes without being aware of it, about the particular abstract characteristics that make those solutions permanent. They can, that is, agree in their *identification* of a paradigm without agreeing on, or even attempting to produce, a full *interpretation* or *rationalization* of it. Lack of a standard interpretation or of an agreed reduction to rules will not prevent a paradigm from guiding research" (Kuhn 1996, 44).

The question is how big are the differences between the two models, and if there are more differences than agreements, and/or if the differences are more important then the points of agreement.

Taking into account the state of the medical epistemology today, we can agree with Foss, who identifies a "split" between what is called hard science research areas (like oncology and pulmonary and cardiovascular medicine), and humanistically-oriented fields, which are more relaxed (i. e. primary care, family practice, and psychosomatic medicine). The author argues that this split can also be found in the area of psychiatry, and it reveals itself "in the growing polarization between what is sometimes called right-brain (brainless) psychiatry, epitomized by an emphasis on psychoanalysis, and left-brain (mindless) psychiatry, epitomized by an emphasis on psychopharmacology" (Foss 2002, 33).

The problem is that one cannot accept reductionism, or mechanism, or objectivism as a prerequisite for doing science, unless he is ready to take into account the metaphysical implications of this decision. Adopting the mechanistic view, for the sake of doing science, implies, as Dennett observed, "analyzing a person into an organization of subsystems (organs, sub-routines, nerves, faculties, components – even atoms) and attempting

to explain the behavior of the whole person as the outcome of the interactions of these subsystems" (Dennett 1978, 153).

Another difficulty is that people are educated in a certain way, at university. It's very hard for them to change their perspective, afterwards:

> "Coupled with the voluminous amount of information typically stored in medical textbooks (Guyton's text runs to 1,079 pages), there is little inclination and less time to step back and reexamine the response of one's profession to this fundamental question: Are we really automatons? Further, who is to conduct this reexamination? The professional training of the faculty has taken place in the same foundational climate. Faculty and textbook writers alike were often socialized into medicine through earlier editions of the same texts. *Their* mentors wrote, or were contemporaries of those who wrote, the first editions" (Foss 2002, 35).

In the end, we can conclude that today we are dealing with the beginning of a paradigm shift, although there are difficulties about it. We must remember the statement of Thomas Kuhn that a change in a certain way of performing the scientific research only occurs when the "old" scientists are replaced by "new" ones: a scientist would seldom change his worldview; according to Kuhn, he simply has to be replaced by the new generation. On the other hand, as Foss explains in the above quote, the change of the generations doesn't necessarily guarantee a change in the scientific research, since the "old school" trains the new one.

A substantial change in the way research is performed also implies a change of perspective, a change in the way one sees things, in the way one looks for answers; as Kuhn put it, "what were ducks in the scientist's world before the revolution are rabbits afterwards" (Kuhn 1996, 111). That's how thorough a scientific revolution can be.

However, according to the new developments in the scientific world, a review of the perspective is imminent: the new epistemological realities are forcing the medical research to take them into account, as it is more and more obvious that the progress is impossible otherwise. The humanistic approach obviously presents a number of advantages that cannot be obtained by the mechanicist view alone. In the following years we will probably see this change taking place in the medical world, in the sense that the way the patient is perceived will change, and the process of diagnose and treatment will take more into account the role of the patient and the dialogue between him and the doctor.

The humanistic models also offer an approach that is more subtle, in the sense that the mechanistic monism, with its materialistic

reductionism tends to be too crude a tool for many circumstances. As science evolves, there is need for more subtle, more refined instruments of research. New questions, or new *kinds* of questions may appear, which cannot be answered in the old ways.

Medical science will, almost certainly, undergo a change of paradigm (at least a partial one), that would turn it towards a more "humane" way of seeing the patient and the structure of the medical research, including the relationship between medic and patient. As Thomas Kuhn put it, the scientific revolutions are more or less invisible, and yet they are always present, even if one doesn't acknowledge their course.

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