

The Covid-19 pandemic and the limits of Science

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The Covid-19 pandemic raised fundamental questions related to the reach of scientific knowledge, the predictability of natural events and the recognition of its own limits. Issues concerning the forms of transmission of the virus, the use of masks, application of restrictive measures, vaccine efficacy and the return to pre-pandemic normality (COEN, 2021) often require immediate and dichotomous responses that are practically non-existent in the Natural Sciences, especially in biology. These questions are necessary, as the world is facing one of the greatest crises in its history, but they also generate an enormous tension between the search for objective assertions and the field of possibilities, where Science is more at ease (SMITH, 2019).

Not only are the foundations of Science scrutinized, but the way in which scientific information is interpreted by society and the media, and by the scientific community itself, are put to the test. To reach the general population, through the media, scientific information is translated into lay language, after being converted into a condensed and generally over-simplified form, when not biased, which can alter its real meaning. Likewise, the interpretation of scientific data by those who do science can go beyond hypothetical limits, reaching the speculative sphere

(KÖCHE, 2011). These are relevant issues and should be widely debated to avoid a process of disinformation and extremism.

Ideally, the search for knowledge is the noblest objective of Science, as it promotes the elevation of the human being through knowledge, and that which “produces correction and good fortune”, according to Socrates in Eutidemus (HAMELIN, 2018). In the modern view, science takes on a utilitarian aspect, being valued for its ability to promote physical and material well-being, being especially represented by its tangible technological advances (REALE, 2014). In this appreciation of utility and praxis, current Science has become synonymous with scientific method. The “method” was developed in the scientific revolutions of the 16th and 17th centuries, especially represented by Bacon and Galilei, and became the dividing element between the Natural Sciences and the Ideal Sciences (HESSEN, 2012). Its foundation is based on the creation of contingent models of reality that allow the apprehension of certain aspects of nature, subjecting them to verification and quantification (SMITH, 2019).

The field of Biology, as already said, hardly presents its conclusions in a simplistic way. Biological events are extremely complex and our understanding is limited to the theoretical and instrumental arsenal available. The emergence of Covid-19 in the midst of the information and biotechnology age is a small sample of our misunderstanding of natural phenomena (WIERSINGA et al., 2020). Furthermore, we must remember that scientific investigation does not directly verify natural phenomena, as their scope and complexity are immeasurable, but on measurable particulars. Under such conditions, data obtained in analytical scientific research are commonly expressed in probabilistic terms, that is, included in the universe of possibilities, between the world of mathematical objectivity and subjective interpretation (MACIEL; TELLES, 2000).

It is precisely at this intersection between data obtained in scientific investigation and extrapolation to the “real world”, where Science takes its most significant step. This bridge from the circumstantial to the complex seeks to simplify the explanation of phenomena and their predictability, opening the doors to control over them. Although experiments provide solid estimates, experimental results and reality operate on parallel planes that seem to come closer and further apart as we progress in the quest for knowledge. Unfortunately, however, the current quantitative scientific model, which places excessive emphasis on practice and little study of the

theory of knowledge, makes scientists forget that their observations are models that operate within limits, and not a faithful representation of the finished reality (Smith, 2019). In this self-deception of what scientific investigation actually represents, and in the eagerness to provide objective answers, they go beyond the limits of their observations, drawing conclusions that operate in the speculative world.

In addition to the eternally provisional character of scientific theories, Science, far from operating on purely rational bases, is strongly based on subjective factors. The change in the paradigmatic consensus, for example, more than the scientific refutation of the theory, constitutes one of the main forces at work in the scientific march (KUHN, 1978). This characteristic is generally disregarded by the public, and even by the scientific body, as a vital factor in this amalgamation of values, concepts and precepts that make up what we call “Science”. Even so, the adoption of some criteria for what we consider as “valid scientific” can be useful, in the sense of avoiding a scientific relativism, in which everyone is the bearer of truths of the same weight. The formulation of hypotheses that can be verified and, therefore, refuted (SCHMIDT; SANTOS, 2007) has been considered a powerful criterion that separates a testable scientific proposition from a mere speculative activity.

In short, scientific knowledge is not a scientist's property, but a universal good (KÖCHE, 1997). As opposed to this, the modern society projected in Science an answer to all its ills, giving it precedence over other areas of knowledge (REALE, 2014). Within this world view, the occurrence of a pandemic makes the scientist's responsibility to society even greater in the search for solutions. In its inherent limitations, the scientific method remains one of the greatest inventions of the human being, capable of producing convincing answers, albeit “eternally provisional” (POPPER, 1993). The disregard of these structuring principles produces a value distortion of scientific propositions, opening the way for the dogmatization of knowledge, rooted in indisputable truths, which hurts the very nature of Science.

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