



# The hegemony of the physical sciences: an exploration in complexity thinking

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## Abstract

Traditionally the natural sciences, particularly physics, have been regarded as the Gatekeepers of Truth. As such the legitimacy of others forms of knowledge have been called into question, particularly those methods that characterise the ‘softer’ sciences, and even the arts. This paper begins with an extended discussion concerning the main features of a complex system, and the nature of the boundaries that emerge within such systems. Subsequent to this discussion, and by assuming that the Universe *at some level* can be well-described as a complex system, the paper explores the notion of ontology, or existence, from a complex systems perspective. It is argued that none of the traditional objects of science, or any objects from any discipline, formal or not, can be said to be real in any absolute sense although a *substantial realism* may be temporarily associated with them. The limitations of the natural sciences is discussed as well as the deep connection between the ‘hard’ and the ‘soft’ sciences. As a result of this complex systems analysis, an evolutionary philosophy referred to as quasi-‘critical pluralism’ is outlined, which is more sensitive to the demands of complexity than contemporary reductionistic approaches.

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“No human being will ever know the Truth, for even if they happened to say it by chance, they would not know they had done so.”

Xenophanes

“If you see things as they are here and now, you have seen everything that has happened from all eternity. All things are an interrelated Oneness.”

Marcus Aurelius

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## 1. Introduction

### 1.1. Realism versus constructivism

There are at least two broad perspectives from which the status of our scientific knowledge claims can be understood. The first is a purely realist view of scientific knowledge, referred to as scientific realism. According to this view the “theoretical entities that are characterized by a true theory actually exist even though they cannot be directly observed. Alternatively, that the evidence that confirms a theory also serves to confirm the existence of any theoretical or ‘hypothetical’ entities characterized by that theory” (Fetzer and Almeder [17: 118]). This definition suggests that scientific knowledge gives us *direct* knowledge of entities that exist independent of the existence of any observer, i.e. rigorous application of scientific methods yields theories of certain entities that exist mind-independently (independently of what we believe or feel about those entities). In this view an objective reality does exist, and that it is through the application of method that we can have objective scientific knowledge of ‘reality’. In complete opposition to the realist position is idealism. This position argues that, though there does exist an objective reality, we can never have direct objective knowledge concerning that reality. Accordingly, knowledge is manufactured rather than discovered. The manufacturing process is inherently biased by our methods of production and is incapable of delivering objective knowledge of some external reality: objectivity becomes no more than a myth. Social constructivism, which is a form of idealism, in its extreme form regards scientific knowledge as merely a socially-constructed discourse that is inherently subjective in nature. As there can be no objective knowledge, there can be no dominant discourse because there can be no test or argument that could conclusively support the dominance of one discourse over another. As such, science is just another approach ‘out there’ to making sense and should be treated with no more reverence than any other approach. As Masani [30] laments, “constructivism is anti-scientific to the bone.”

### 1.2. The relationship between language and objective reality

An alternative way to distinguish between realism and idealism is to consider the relationship between the language we use to *describe* reality and reality itself. Realists argue that there is a one-to-one correspondence between our language and reality. This leads to a number of interesting consequences like, for example, the belief that there is a best, or universal, language for describing reality and that that language happens to be the language of science, namely mathematics and logic. Idealists, specifically relativists, on the other hand argue that there is no relationship whatsoever between our language and reality. The terms or labels we use are no more than useful sense-making tools that, though convenient, have no intrinsic basis in some notional objective reality. Though I do not believe that anyone who supports either of these positions is naïve enough to believe in them wholeheartedly, this is generally how the debate between realism and idealism is set up. Physical scientists are criticized for their intellectual arrogance/imperialism, which is justified through strongly realist beliefs,

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