

## **THE PROBLEM OF THE SCIENTIFIC KNOWLEDGE AND THE AUTHORITATIVENESS OF THE EARTH SCIENCES.**

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Parole chiave: science, knowledge, epistemic, real.

Science (from the Latin “scio” and “ens”) means literally “I know the being”, where being is any real, any object, any specific phenomenon that occurs to our experience. Doing science means to have the possibility to observe, understand and control all the variables, all the synergistic force points inside the phenomenon. The scientist chooses an operating space and understands its causes, in order to vary them based on their expected functionality.

The object of investigation of the Earth Sciences is the planet Earth, its relationships with the other bodies of the universe, its composition and structure, its physical and biological phenomena in relation to time, its continuous transformation and evolution processes and the existing connections among all these characteristics and the human activities.

A large number of disciplines are included in the Earth Sciences: what joins them is not only their object or the similarity of their methods of analysis, but above all the substantial univocity in the vision of the Nature, considered as observation of the real in all its variables, and the consciousness that in the process of the scientific knowledge there must be the constant reversibility with reality. This is the carrying structure of the Earth Sciences, their force point.

Once a natural phenomenon has been observed, the Earth Sciences frame it, verify it, demonstrate it with the use of appropriate rational instruments often supplied by disciplines like physics, chemistry, mathematics. These disciplines guarantee rational rigor to the scientific knowledge procedure of the phenomena and turn out effective if applied in a functional way to man’s life and to the management of the Nature for man’s advantage.

Therefore, it does not make sense to attribute superiority to a discipline rather than to another one. Every classification among Sciences sets meaningless separations if we look at the question from a viewpoint of complementarity and interdisciplinary character, with the aim of the knowledge and the resolution of the man’s problems.

The authoritativeness of the Earth Sciences resides in their starting simply from the real data, from the observation of the natural phenomena, taking into account that the adaptation of each phenomenon inside a physical-mathematical model is only an abstract operation that makes possible scientific and technical applications.

It is fundamental to avoid the infiltration of dogmatic assumptions that depart from the understanding of the phenomena and to be aware that we are using these assumptions as conventions based on economic and functional criteria.

The Earth Sciences scientist has a privileged position compared with other scientists, because he/she is dipped in the real data, he/she starts from the natural phenomenon and for this reason he/she is much more conscious that the theoretical adaptation has only a functional aim. If the scientist retains this consciousness throughout the study, at the same time he/she will be capable to abstract the observation in order to theorize, make speculations and models.

Therefore, the research must proceed starting from the data and pass through repeated hypotheses with identical result. This is the process of scientific knowledge, that allows us to enter an epistemic experience, that means “to be in the root” of the experiment. A criterion is epistemic if it is able to identify the real and to construct the formula of behaviour of this real while it moves. A science is verified if there is correspondence with Nature.

The demonstration and the reliability of the Earth Sciences are given by the evidence of their results and the reversibility between the theoretical symbol and the real phenomenon. We have to start from the real, not from its theorization. If the exactness of the knowledge process is not recovered, doing science becomes impossible.