



New philosophical and scientific issues in the life sciences: the ‘revolution’ of epigenetic in our representation of living beings

Organized by Luciano Boi (Centre de Mathématiques, EHESS, Paris, France)

Abstracts

Paul-Antoine Miquel (Université de Toulouse Le Mirail 2)

“Epigenetics mechanisms in biological systems”

Abstract. This presentation will focus on two examples of multilevel explanation, in which epigenetic regulations are also involved: aging and the chromatin structure.

Yet, what we will emphasize is not epigenetic mechanisms of regulation, but how they are involved, as mere elements, in a more complex and circular causal structure. We will try to understand how, in such a structure, there are not only interactions of objects, but also interactions of levels.

We will show, that through such interactions, physical and topological parameters play not only a structural, but also a functional role in biological systems. And we will ask the following question: how such extensive physical properties can be epistemologically characterised?

Luciano Boi (EHESS-Centre de Mathématiques-Equipe Mésologiques)

“From genetics to epigenetic and beyond”

Abstract. In a post-genomic era, the importance of epigenetics has become increasingly apparent. Its definition is constantly evolving to encompass the many phenomena that cannot be accounted for by the simple genetic (DNA) code, and the term now refers to extra layers of instructions, informations, processes and meanings (especially related to the cellular, organismal and environmental layers) that influences genes expression and cells activity without altering the DNA sequence. In this context, the chromatin-chromosome/epigenetics/environment interface is one of the foremost frontiers of recent research in biology. Philosophically, we are thus in the need of a deep and global rethinking of some fundamental concepts like “gene code”, “molecu-

lar mechanism” and “genetic information”.

At least, they require to be supplemented by the concepts, respectively, of “histone code”, “multilevel regulatory mechanisms” and “epigenetic information”.

It appears that the chromosome and the organism itself are the true carriers of biological information and meaning. Thus, a new, deeper and larger definition of the “living systems” has to be carried out.

Flavio Keller (Università Campus Bio-Medico, Roma)

“On the notion of person, from the biological and ethical points of views”

Abstract.