

Presentation

THE EXISTENCE of highly organized bodies and their immense diversity constitutes the most impressive proof of the evolution of life on our planet. This continuous emergence of innovation is the result of dynamic interrelations between processes belonging to different levels of organization of the physical and social worlds on diverse levels.

In this issue, **INTERdisciplina** presents some of the more remarkable advances in the understanding of evolutionary phenomena, that are generated not only by the study of the interactions between heterogeneous physical, biological and social processes, but also by the increasingly complex nature of these studies; that is, the analyses of new interrelations between organisms and the environment, with the intervention of individualities which, at certain levels, are also environments. This research is leading to the discovery of new mechanisms in the transformation of living beings.

Among these discoveries, those that are updating Lamarck's contributions to evolutionary theory seem to be particularly relevant as they show, in the light of existing knowledge concerning biological plasticity and phenotypical continuity, that capacities and features acquired during development can be inheritable and that inheritance of acquired traits can trigger evolutionary change.

The awareness that epigenetic contributions can exist within inherited traits, alongside genetic input, goes beyond the abandonment of the conviction that biological inheritance is identified exclusively by the replication of the DNA molecule, because conceptual changes generated by these new contentions are coalescing into a whole new paradigm of life sciences in the face of which even the recursion principle, that renders linear causation explanations invalid, appears limited, if we only conceive cyclical interrelations in which a system only produces that which produces it.

Advances in post-genomic biology show that the comprehension of the behavior and evolution of living systems is more consistent when based on the concept of non-linear complex networks, because study limited to the interrelations of many genetic and non-genetic components is insufficient to explain the variability and change, as well as the stability of these components. Analyses of the regulatory role of these interrelations on these components in specific contexts and with unpredictable signals from the environment are crucial.

It is clear that the endeavor to reach an integral knowledge of the sciences of life faces important epistemological hurdles, but perhaps more importantly,

ideological obstacles emerging from the deterministic and linear vision of reductionist science. This reductionist view of biological phenomena also limits understanding of the evolutionary process. Its better comprehension not only requires the study of cellular dynamics in all its complexity, but it is also necessary to analyze the multiple biochemical and physiological interdependences linked to social dynamics. In this issue we show, too, how the development of biological species is conditioned by their economic value and their cultural significance, because their diversity and extinction depend also on the selective capacity exerted by these factors, with which biological evolution is revealed as interwoven with the historical social process.

The contributions of this volume towards the integral study of evolution are reminiscent of the notion of knowledge under construction, but also—borrowing an expression coined by Rolando Garcia in the title of one of his principal works—of the challenge posed by understanding a world under construction. The response to this challenge is, at the same time, a continuous contribution of new knowledge, in a process that could confirm Prigogine's assertion that human creativity is the most shining example of a universal attribute.

INTERdisciplina also expresses this renovating endeavor with the creation of a new section: *Resonancias*, in which we present papers that broaden and update the contents of those already published in our *Dossier* section. ■