

HOMEOKINETICS AND SOCIAL PHYSICS

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ABSTRACT

In the 1940s, while working on problems in exobiology, Arthur Iberall began observing an area that physics has neglected, that of complex systems with their very long internal factory day delays. He was observing systems associated with nested hierarchy and with an extensive range of time scale processes. With Harry Soodak, Iberall was able to turn keen observations and insights into a new field of the physics of complex systems. They called it homeokinetics. It was such connections, referred to as both up-down or in-out connections (as nested hierarchy) and side-side or normal physics among atomistic-like components (as heterarchy) that became the hallmark of homeokinetic problems. By 1975, Iberall and Soodak began to associate them with nature, life, humankind, mind, and society.

Social physics, in a homeokinetic sense within a nested hierarchy, is the study of the physics of groups, colonies, settlements, political units, civilizations engaged in trade and war, as well as of the history, development, and evolution of species, including the human. As large structure social time scales, Iberall and colleagues have identified various time scales of the atomisms that are part of social physics, such as the 4 hour scale of biophysical organization of the individual person (the scale for chemical thermodynamic near equilibrium), upwards to the time scale of political command-control with some added complexity for the economic scaling of the very general trading process and/or war process.

All fields, at their bottom, are atomistic-like. Thus, the key homeokinetic problem is how the bottom collective structure and functions is connected to the functionally remote character of the top collective.

In this talk, we will present an overview of key concepts of homeokinetics and then outline how a homeokinetic analysis can identify the factory day of a social system. Conservations emerge from the factory day. Each factory day or level has to be attended to by its physics, by its conservations. As one runs through the entire gamut of such factory days, one finds an entire cascade spectrum of energetic processes. Energy flows through, transforms level to level.

Keywords: homeokinetics, social physics, hierarchy, factory day, conservations, energetics