Introspective Abstraction: An Inalienable Foundation for Information Science

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Abstract: This paper directly addresses the agenda of the Foundations of Information Science group. It surveys a few definitions of the agenda and settles on one determined to recast certain elements of science within the context of information. An agenda of "reinventing" science away from concepts of forces and fields to one of "semantic" conveyance or information exchange.

Evolution as a metaphor is posited as a useful notion. Cross-disciplinary boundaries are proposed as the core definition of the problem addressed by the new scientific perspective that the old deals with clumsily. Several such boundary problems are defined and one described as the example problem.

The example problem concerns the biological "conversations" at the molecular/cellular level and the "emergence" of the organic systems of animals. In particular, what these have in common in terms of information primitives is of interest.

The dynamics of science are examined as a system of governance and the "governance" mataphor is explored deeply. A distinction is made between things that seem natural (inalienable) and those that are matters of convenience.

The core of the paper explores which concepts are needful as basic concepts in an information-centric view, and which are convenient (but likely still necessary). A focus is on the suggested notion of "introspective abstractions", those that can cross boundaries like the internal semantics of particle interactions in physics and chemical and also externally be useful by the higher level emergent systems (chemical, biological, social). "Semantic distance" may be a useful bridge to the still useful notion of forces (in those domains where they apply).

Because FIS is an interdisciplinary activity, and obfuscating jargon is to be avoided, all the discussion topics are drawn from the electronic conferences of FIS from the beginning of open dialog (1997). Any success in this matter should have the elegance of clarity. Whether sufficient elegance can be drawn from these notions remains to be seen.