

[Keynote Address]

The Archaeology of Innovation: Lessons for the Sustainability of Our Times

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In the '90's he coordinated a large-scale interdisciplinary EU funded series of projects looking at the relationship between people and their environments, and in particular at land degradation, in all the countries of the Northern Mediterranean Rim, from Greece to Portugal. In February 2004, he joined ASU as Professor of Anthropology and Director of the School of Human Evolution and Social Change. Currently, he is also Dean of the School of Sustainability and Co-director of the Complex Adaptive Systems Initiative at Arizona State University. He is an External Professor of the Santa Fe Institute, a Corresponding Member of the Royal Dutch Academy of Sciences and a member of the Institut Universitaire de France. His publications include 16 books and over 120 papers and articles on archaeology, ancient technologies, socio-environmental and sustainability issues, as well as invention and innovation. *vanderle@asu.edu*

Abstract

In the last twenty years, researchers have come to the conclusion that we cannot study the evolution of societies separately from those of their environments. Over time, the two have become closely intertwined, so that we can now speak of the 'Anthropocene' the period in which humans have such an impact on their environment that the latter no longer follows its own dynamics. In the evolution that led up to this situation, we can distinguish three major phases in which humans invented major new ways to process matter, energy and information, as well as widening and deepening their interaction with the environment.

The first of these, covering most of the early evolution of human ancestors, is essentially a Darwinian biological process of acquisition of sufficient short-term working memory that frees people from the biological limitations of their cognition. The second encompasses the early stages of socio-cultural development of 'tools for thought' to deal with subsistence, technology and social aggregation. The third encompasses the creation of a feedback system between the creation of knowledge and the accumulation of energy that allows towns and empires to emerge.

The paper will elaborate this development and argue how it ultimately led to our current environmental crisis, in which we expect to innovate ourselves out of the predicament our tendency to innovate has driven us into. The fundamental driver in that process is the interaction between learning and intervention in the environment on the one hand, and the emergence of unintended consequences on the other.

In the final part of the paper, I will argue that we therefore need to change the role and scope of innovation in our society from one focused on 'value creation' through invention of artifacts for the consumer society, to one that much more selectively innovates, and is aware of the consequences of the innovation before it is implemented.

Keywords: Anthropocene, innovation, sustainability, the evolution of societies, unintended consequences, feedback systems, knowledge and environmental impacts, consumer society