Reaching self-similarity over ten orders of magnitude and a revolution in lifestyle: T-patterns and T-strings from protein to human mass-societies

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Abstract:

This talk concerns what seems a unique and very sudden event in biological evolution. In a biological-eyeblink striking self-similarity appears between the internal workings of cells and recent human societies typically with population sizes of, for example, >104 individuals, thus far exceeding those of any other animal species except those of social insects, which do not share the essential kind of self-similarity.

The RNA world invented the purely informational DNA molecules and the living world became a DNA-world. Billions of years later only in humans writing appeared and in a biological eye-blink the human world became a text-based world. Thus the current world of humans is characterized by hyper-complex mass-societies that just as their recent science and technology are impossible without the extremely effective creation, copying, distribution and accumulation of chunks of durable memory, existing externally to the individuals and typically greatly outlasting them, while defining their behavioral potentials and tendencies.

Cells have genomes while human mass-societies have 'textomes" including all their essential texts, parts of which are frequently copied, such as for the numerous curricula defining the various kinds of specialized individuals.

But these striking analogies to the protein societies of cells rely on the analogous spatial structure of purely informational strings, molecular or textual, also detected in the temporal patterning of interactions among neurons in neuronal networks within brainsand among animals including humans and drawing attention to these analogies.

Ethology, the biology of behavior, received its first Nobel Prize in Medicine or Physiology in 1973 shared between N. Tinbergen, K. Lorenz and K. von Frisch and in 1975 E. O. Wilson's Sociobiology pointed to social insect societies as biological models for human mass-societies. But none of the studied organisms were components of any others, so Lorenz's Nobel lecture, "Analogy as a source of knowledge", had no mention of self-similarity/analogy. Fractal mathematics was still new and nano scale biological research in its infancy. Ethology was not ready for self-similarity and text-based mass-societies. In the only other animal mass-societies specialization of individuals (citizens) relied on very different means.

The present ethomathematical and computational project has since the 1970's focused on creating mathematical patterns including T-patterns and T-patterned strings, called T-strings, with detection algorithms and software (Theme) widely used for their detection in humans, animals and neuronal brain networks as well as in proteins thus drawing attention to ever deeper self-similarity from nano to human scales. A model has thus appeared in cells as mass-societies of highly specialized proteins shaped and controlled by giant purely informational T-strings (DNA) external to the individuals only paralleled in mass-societies of humans so recently shaped and controlled by purely informational giant T-strings called texts.

Revolutionary seems no exaggeration about the biologically sudden change from hunter-gatherer to current mass-social text (t-string) based lifestyle. Over a thousand fold increase in human knowledge notably in mathematics as well as most other sciences, but also the numerous problems now faced by nearly eight billion mass-social human individuals. Non-human primate or preliterate human groups no longer seem satisfactory as biological models for human existence and may divert attention from essential aspects of modern human existence. Cancer is sometimes seen as "misbehavior" of our inner mass-societies and as our human societies have suddenly began inadvertently copying their internal functioning many orders of size. and duration and levels of organization above, human existence has with a bio-mathematical continuum from nano to human scales revolutionized human existence and lifestyle as barely ever seen in evolution.

Biography:

Magnus S. Magnusson, PhD, Emeritus Research Professor, founder and director of the Human Behavior Laboratory (hbl.hi.is), University of Iceland. Author of the T-pattern, T-string and T-system model and the corresponding detection algorithms and software THEMETM (PatternVision.com), initially focusing on real-time organization of behavior. Co-directed DNA analysis. Numerous papers, talks and keynotes in ethology, neuroscience, mathematics, religion, proteomics, mass spectrometry, A.I., robotics and nanoscience. Deputy Director 1983-1988 in Museum of Mankind, National Museum of Natural History, Paris. Repeatedly invited Professor at the University of Paris, V, VIII and XIII in psychology and the biology of behavior. Now works in formal collaboration between 32 European and American universities initiated 1995 at the University Rene Descartes of Paris V, Sorbonne, based on "Magnusson's analytical model".

Publication of speakers:

1. Casarrubea, M., Magnusson, MS et al (2018) T-pattern detection and analysis for the discovery of hidden features of behavior. Journal of Neuroscience Methods, Volume 310, 1 December 2018, Pages 24-32. https://doi.org/10.1016/j.jneumeth.2018.06.013
2. Magnusson, MS. (2017) Why Search for Hidden Repeated Temporal Behavior Patterns: T-Pattern Analysis with Theme. Int J Clin Pharmacol Pharmacother 2017, 2: 128. https://doi.org/10.15344/2017/2456-3501/128
3. Magnusson MS (2016) Time and Self-Similar Structure in Behavior and Interactions: From Sequences to Symmetry and Fractals. In Magnusson MS, Burgoon JK, Casarrubea M, Eds. (2016) Discovering Hidden Temporal Patterns in Behavior and Interaction: T-pattern detection with THEME. Neuromethods, vol. 111. Springer New York, NY.
4. Nicol AU, Segonds-Pichon A, Magnusson MS (2015). Complex spike patterns in olfactory bulb neuronal networks. J Neurosci Methods. 2014 Sep 25. pii: S0165-0270(14)00341-0. doi: 10.1016/j.jneumeth.2014.09.016.
5. The Hidden Structure of Interaction: From Neurons to Culture Patterns (2005). Edited by: L. Anolli, S. Duncan Jr., M.S. Magnusson and G. Riva. April 2005, approx. 300 pp., hardcover. IOS Press. ISBN: 1-58603-509-6.