

CYBERNETIC VIEW ON HIERARCHICAL STRUCTURE OF THE HUMAN PSYCHE

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ABSTRACT. Material carrier of the human mentality is proposed to consideration in context of a system concept of Humankind as a self-controlling hierarchical system. From this point of view a structure of the substrate of the mentality of *Homo sapiens* is analyzed. Notion is stated that the development of new mental layers-carriers is equivalent to beginning of new system levels in sequential process of human intelligence sophistication. The suggested cybernetic purposeful approach adequately correlates with Aristotle notion of *causa Finalis*.

KEYWORDS: substrate of mentality, psyche structure, hierarchic self-controlling system, cybernetic model, purposive approach, *causa Finalis*

Hierarchic “layers” in human psyche have been emphasized by many scholars [among them Yung, Porshnev, and Petrenko; 1–3]. It is clear that corresponding psyche layers have to arise during human evolutionary development and continue to exist in its current reality. However, there are some questions: do such psyche layers lead to Yung’s number of “individual-family-tribe/clan-community-people-Humankind” (which has qualitative character as it can be seen) or it also includes other layers (first of all between “tribe/clan” and “Humankind”)? Is it possible to indicate quantitative characteristics for representatives of similar sequence, e.g., their typical size? The finally question is what the physical media (the substrate) of these or alternative psyche layers?

Considering psyche-related concepts of self-regulation and self-control, we propose to analyze its structure and evolution by using previously formulated [4, 5] interdisciplinary interpretations of inanimate, animate and individuality-social-industrial (Humankind) nature systems of adapted behavior. These interpretations are described in terms of cybernetic self-controlling of the hierarchic systems executing their functions. These interpretations are conveniently described in terms of the cybernetic self-control over the functional activity of hierarchic systems. The latter (cybernetic self-control) has the property of search-optimization activity on all the hierarchic components. Self-control is performed by means of “hierarchic adaptive search optimization” algorithms through goal criteria of energetic character. Suggested cybernetic purposive approach adequately correlates with Aristotle’s aetiological force *causa Finalis* [6].

It’s important that in the process of Humankind system formation each newly formed tier-community in social hierarchical segment (i.e. “higher” individual/person

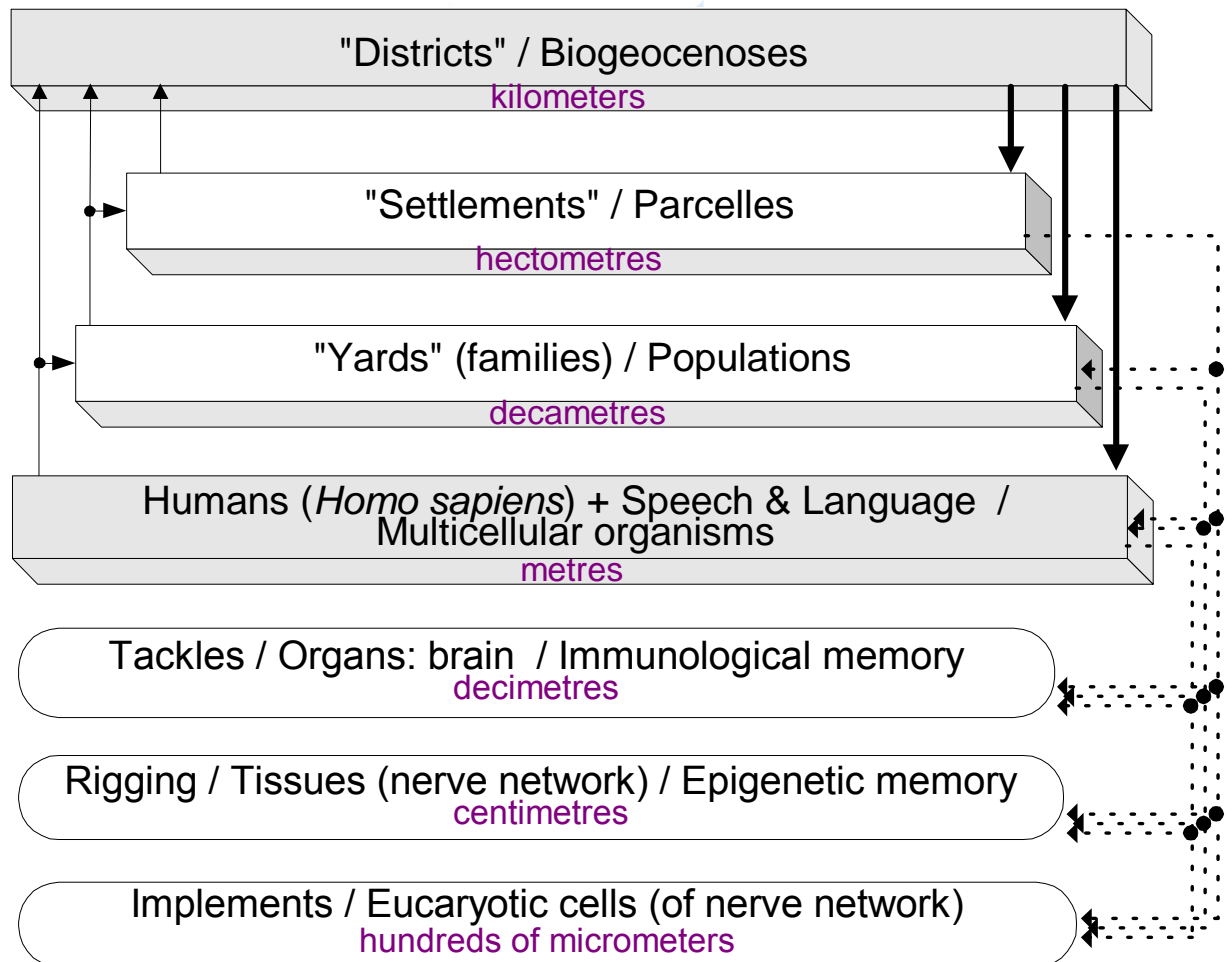
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tier) corresponds symmetrically to the tier-precision of most thin anthropogenic impact in its productive-laboring segment (i.e. “lower” individual/person tier). This “hierarchic” symmetry is manifested both in qualitative and quantitative sense. Precisely, it is revealed in increasing/decreasing tendency of typical spatial characteristics of agents corresponding tiers in hierarchy with growing/reducing tier number. Whereas the psyche is located at the crossing of biological and individuality-social-industrial hierarchies [7].

Schematic view of such subsystems is given in next figures 1–4. *Rising continuous arrows* on these schemes denote the *search functional activity* of adaptive behavior of all tiers in hierarchy. *Descending continuous arrows* reflect influence of *search optimization target criteria*, set by tier, located above in hierarchy. *Descending dotted arrows* reflect “*system memory*” of Humankind, i.e. the adaptive influences of overlying tiers representatives in hierarchy on underlying structure. Calculated estimates of particular hierarchic subsystems areal sizes and accuracy of appropriate working technologies are also indicated in scheme.

Homo sapiens-1 appeared around 120.000 years ago. They had a speech and language. They grouped into families, settlements (clans) and districts (tribes). They created tools with accuracy on hundreds of micrometers. Their memory and mind are based on nerve eukaryotic cells (neurons) as whole basic unit.

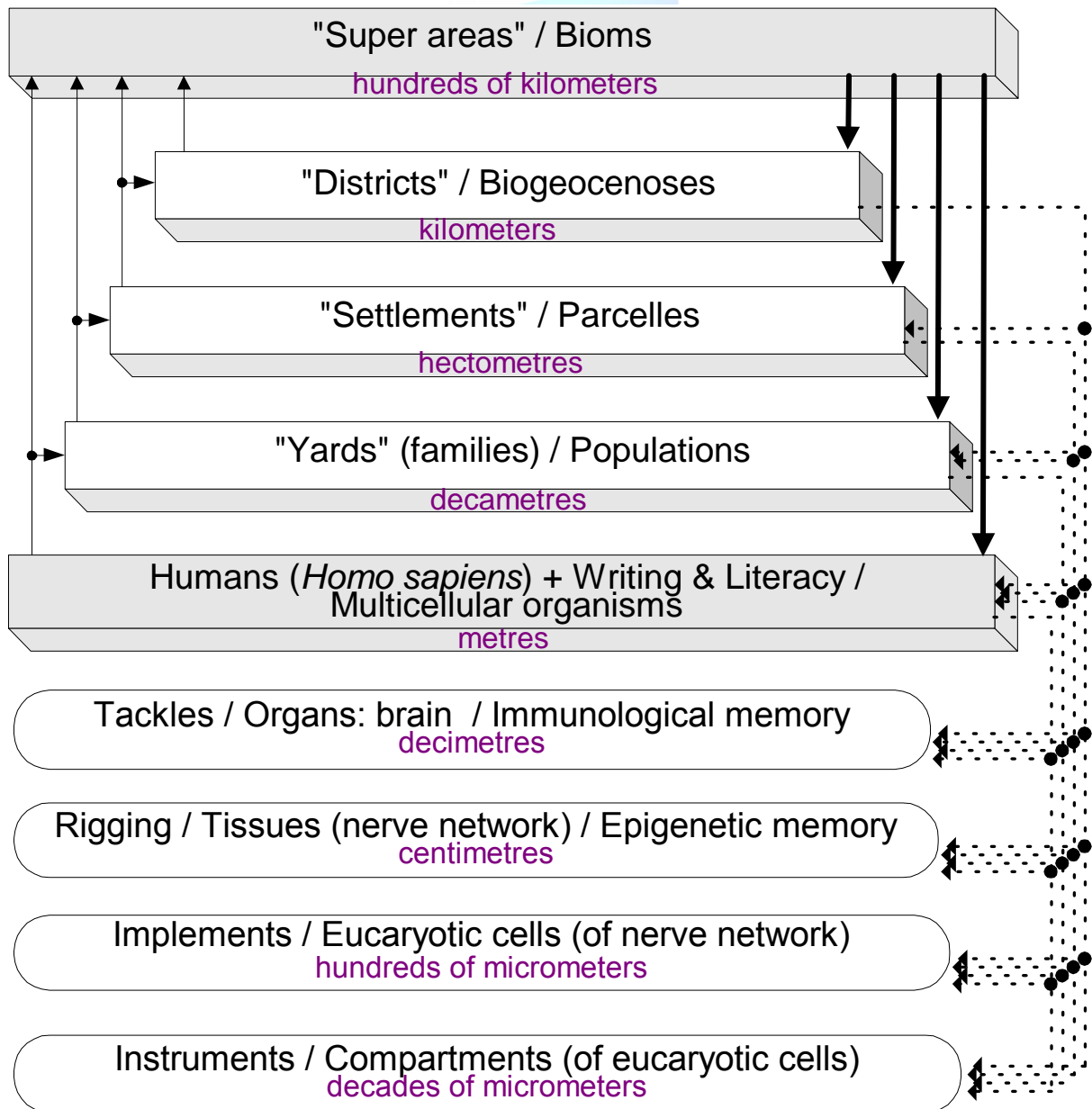
Their successors – *Homo sapiens-2* created a writing system about 8.1 thousand years ago. They united together in families, settlements (clans), districts (tribes) and tribal alliances (society measuring about hundreds of kilometers). They were able to create tools that have an accuracy of tens of micrometers. Their memory and mind based on compartments of neural eukaryotic cells (neurons) as a whole basic unit.



Characteristically for ~123 - ~8.1 thous. years ago and beyond

Fig. 1. The hierarchy of Humankind's subsystem levels, formed by *Homo sapiens-1* having information technology of speech and language.

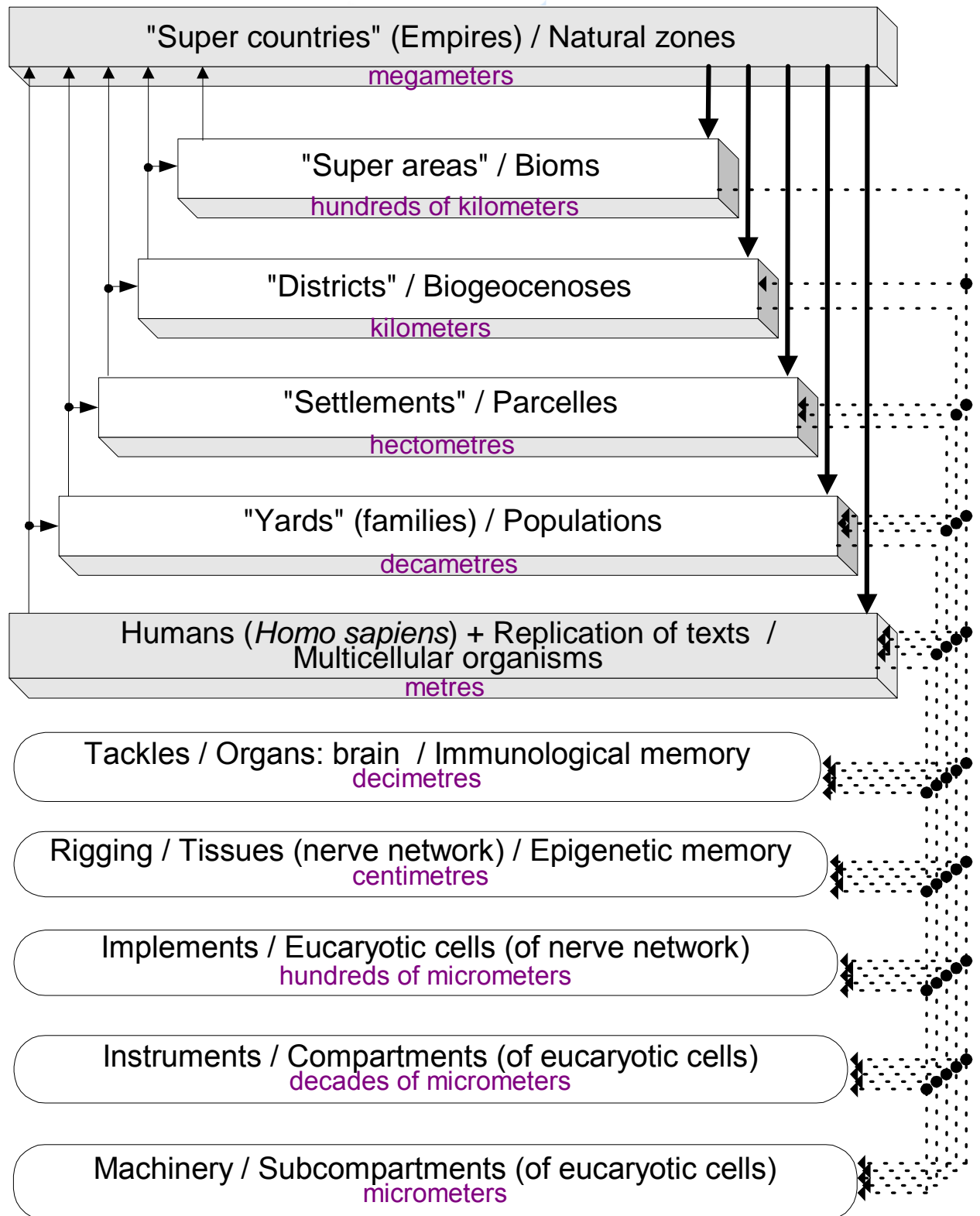
In the middle of the XIV century their successors – *Homo sapiens-3* developed technology of texts replicating, or typography. They began to form societies with the size of several thousand kilometers. They were able to build machines and mechanisms, which have an accuracy of micrometers. Their memory and mind are based on the sub-compartments of eukaryotic nerve cells (neurons) as a whole basic unit.



Characteristically for ~8100 years ago - 1446 and beyond

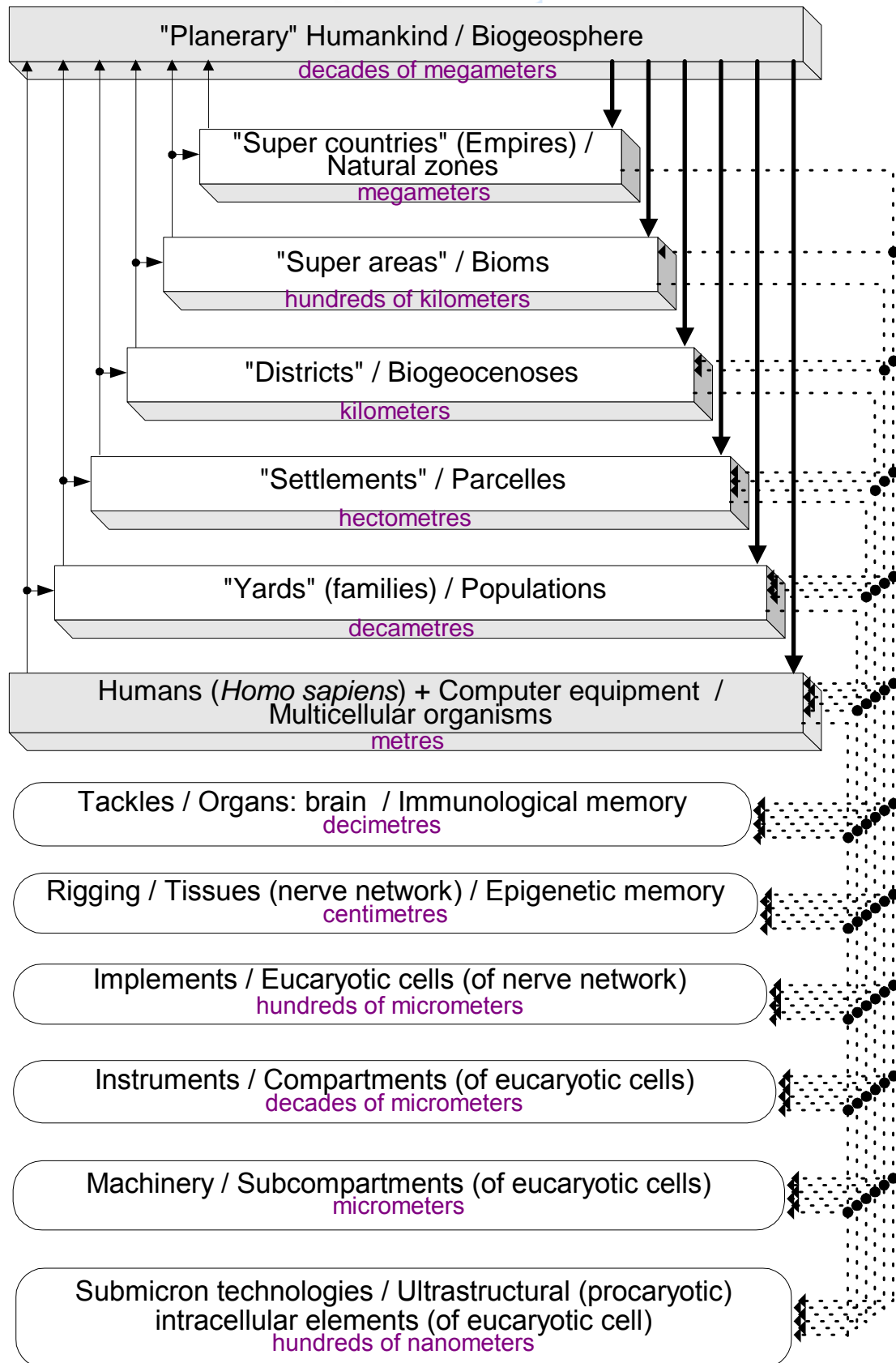
Fig. 2. The hierarchy of Humankind's subsystem levels, formed by *Homo sapiens-2* having information technology of writing.

In the middle of the XX century their successors – *Homo sapiens-4* created a computer information technology. They began to form societies with the size nearly several tens of thousands kilometers. It exceeds the size of the Earth – globalization began! They were able to create sub-micron working technologies. Their memory and mind based on the ultrastructural (prokaryotic) cells of nerve eucaryotic cells (neurons) as a whole. And so on.



Characteristically for ~1446-1946 years and beyond

Fig. 3. The hierarchy of Humankind's subsystem levels, formed by *Homo sapiens-3* having information technology of texts replicating, or typography.



Characteristically for ~1946-1979 years and beyond

Fig. 4. The hierarchy of Humankind's subsystem levels, formed by *Homo sapiens-4* having computer information technology.

Thus human (intellectual and mental) degrees of complexity are consistently formed – from the form Homo sapiens-1 up to the form Homo sapiens-4 and further on.

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