A Map Is a Living Structure with the Recurring Notion of Far More Smalls than Larges

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[Maps] are no longer merely considered as aids…, but as products of scientific research which, being complete in themselves, convey their message by means of their own signs and symbols and through these furnish the basis for further geographic deduction. … . [the subjectivity] must not predominate: the dictates of science will prevent any erratic flight of the imagination and impact to the map a fundamentally objective character in spite of all subjective impulses.

Max Eckert (1908)

The Polish mathematician Alfred Korzybski (1933) first introduced the mantra *"a map is not the territory"* which points out two important facts about maps: (1) a map has a similar structure to the territory, and (2) a map is the map of the map of the map, and so on endlessly. This similar structure is actually living structure (Alexander 2002–2005) that possesses – in a recursive manner – far more small things than large ones. For example, a green tree with leaves is a living structure, because it has far more small branches than large ones, and importantly small branches are embedded in large ones. The notion of *"far more smalls than larges"* differs fundamentally from that of *"more smalls than larges"*, as "far" indicates the distinct disproportionality between smalls and larges. This disproportionality is what underlies the 80/20 Rule or Pareto Principle (Koch 1998). The second fact is essentially derived from the first one, i.e., a map – due to the living structure of the territory – is considered to be the map of the map of the map, and so on endlessly. This is a recursive perspective through which all small-scale maps are subsets of the single large-scale map, and they all retain the underlying living structure. Motivated by the mantra *"a map is not the territory"* or more specifically by the two facts about maps, this paper argues that not only a territory but also its associated maps are a living structure, and it is the living structure of the Earth's surface or of a territory that makes maps and mapping possible.

The Earth's surface or any territory is a coherent whole or subwhole, in which the notion of *"far more small things than large ones"* recurs at different levels of scale ranging from the smallest of a couple of meters to the largest of the Earth's surface or that of the territory. The coherent whole has the underlying character called wholeness or living structure, which is a physical phenomenon pervasively existing in our environment and can be defined mathematically under the new third view of space conceived and advocated by Christopher Alexander: *space is neither lifeless nor neutral, but a living structure capable of being more alive or less alive*. This paper argues that both the map and the territory are a living structure, and that it is the inherent hierarchy of *"far more smalls than larges"* that constitutes the foundation of maps and mapping. It is the underlying living structure of geographic space or geographic features that makes maps or mapping possible, i.e., larges to be retained, while smalls to be omitted in a recursive manner (Note: larges and smalls should be understood broadly, in terms of not only sizes, but also topological connectivity and semantic meaning). Thus, map making is largely an objective undertaking governed by the underlying living structure, and maps portray the truth of the living structure. Based on the notion of living structure, a map can be considered to be an iterative system, which means that the map is the map of the map of the map, and so on endlessly. The word endlessly means continuous map scales between two discrete ones, just as there are endless real numbers between 1 and 2. The iterated map system implies that each of the subsequent small-scale maps is a subset of the single large-scale map, not a simple subset but with various constraints to make all geographic features topologically correct.

Acknowledgements:

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