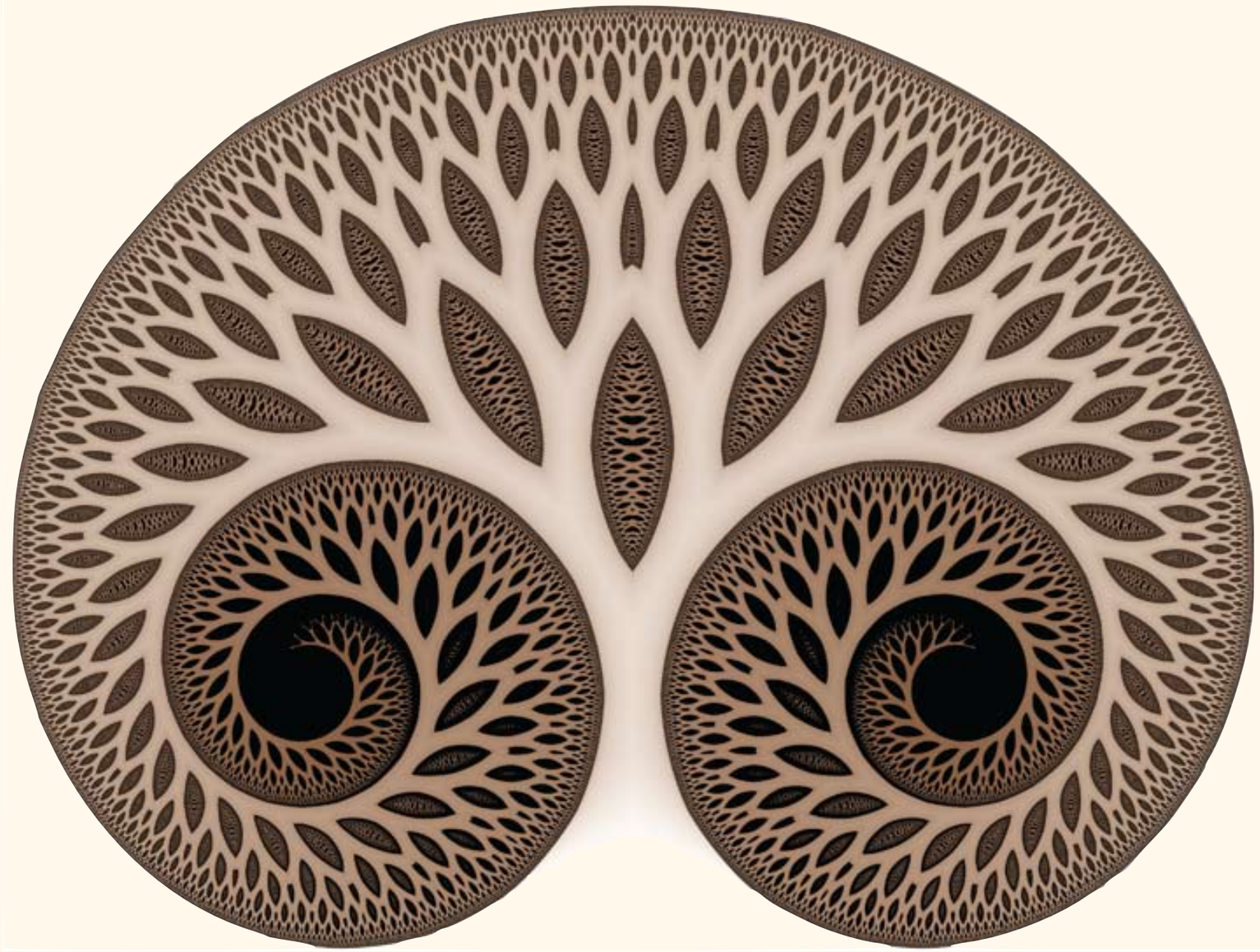
Graphs and Trees

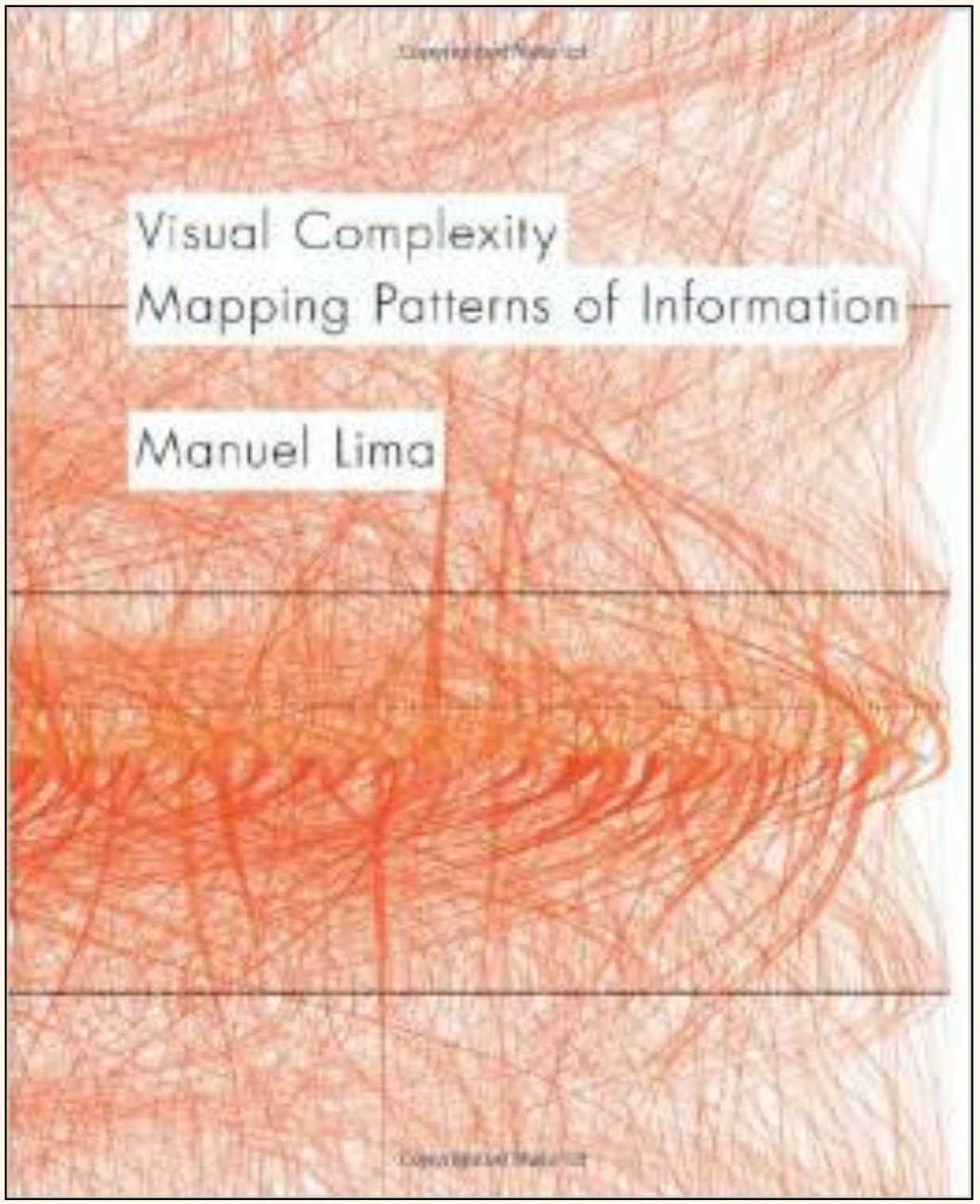
Examples (& Tools?)



Tom Beddard, *Fractal Tree*

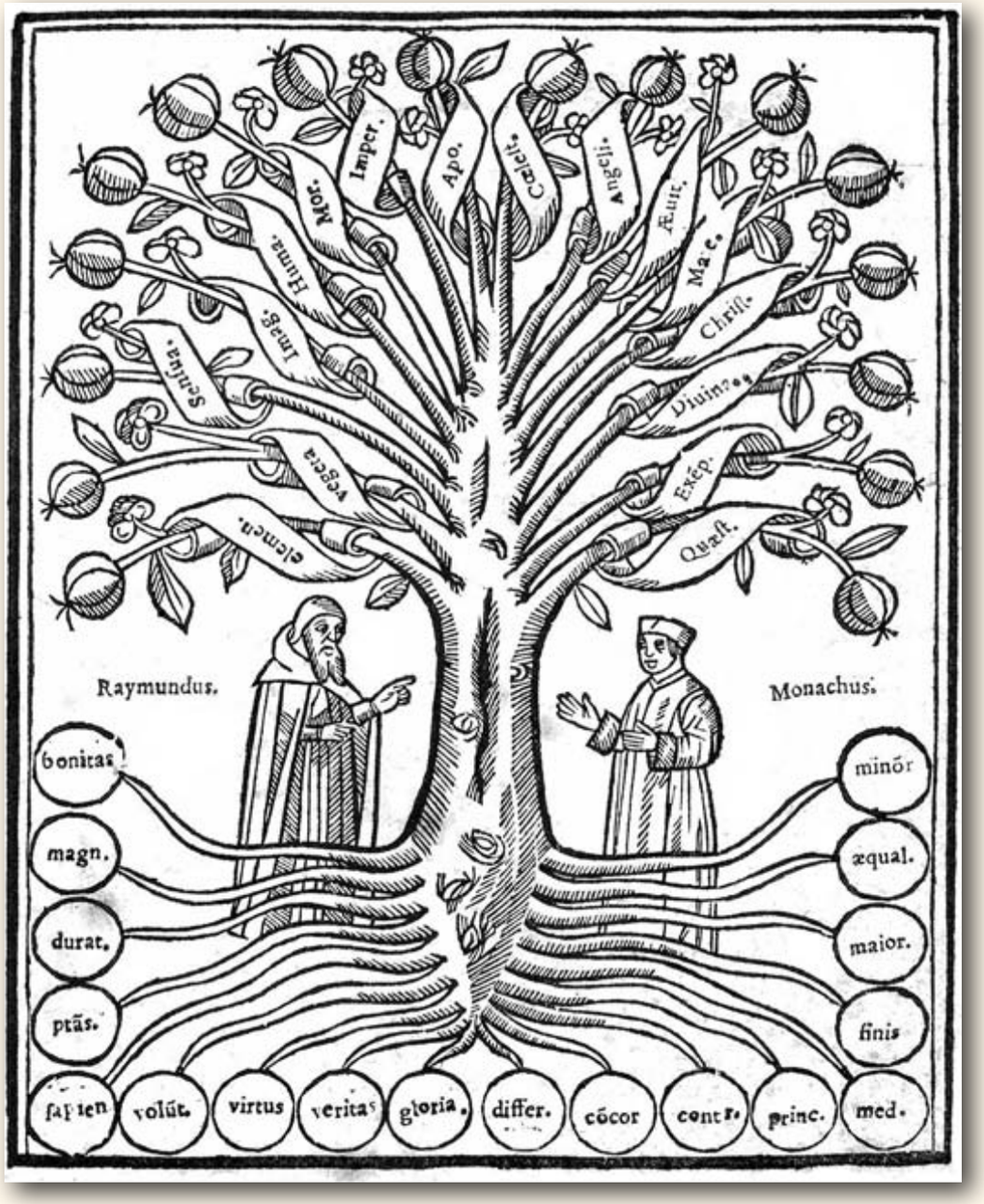
Jackie Wirz & Steven Bedrick

CONJ 610, 11/6/14

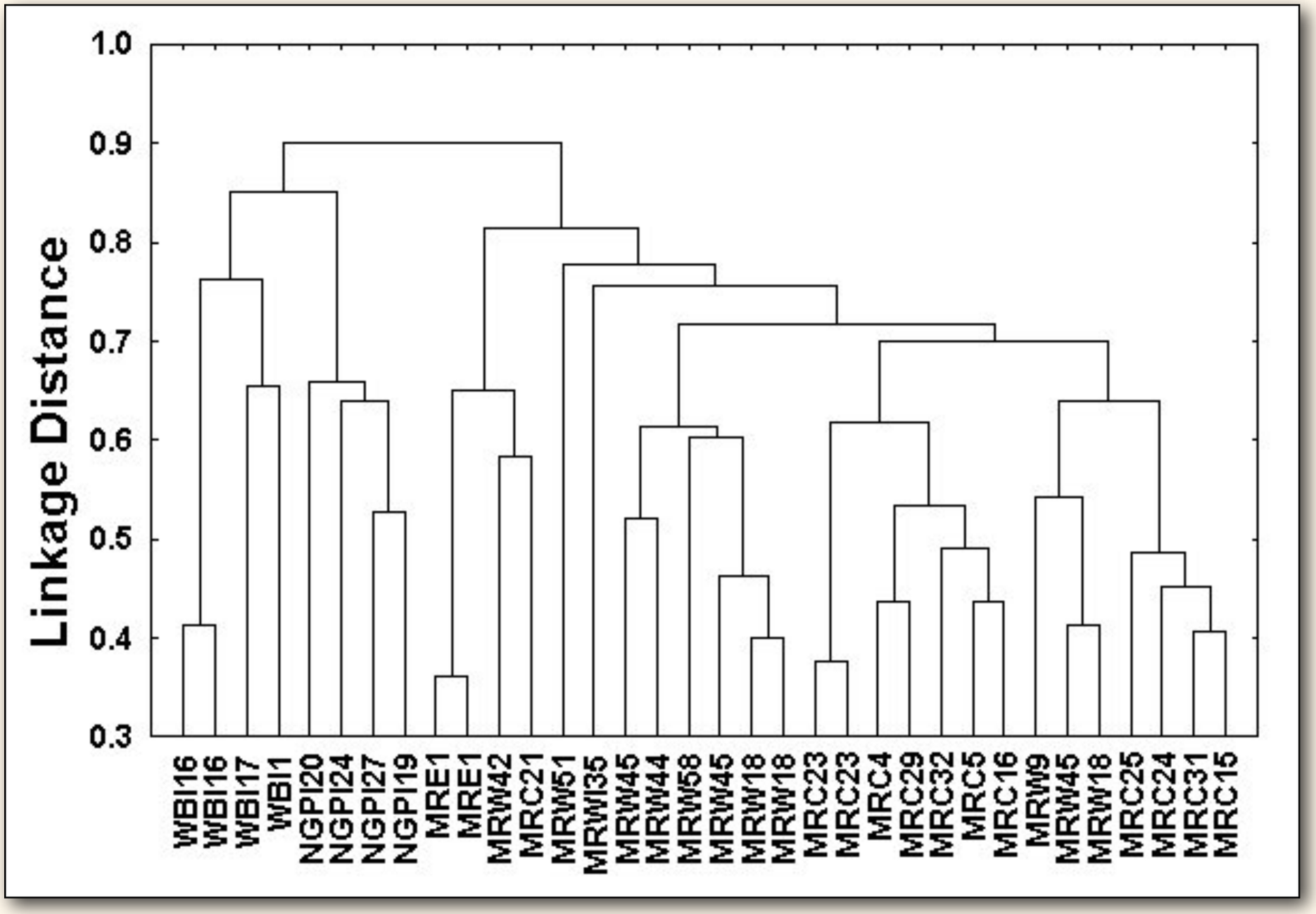

Visual Complexity
Mapping Patterns of Information
Manuel Lima

Tree metaphors for information are not new.

Geneology of Henry II, 1493



Arbor scientiae, Ramon Llull, 1515



http://water.epa.gov/scitech/monitoring/rsl/bioassessment/ch10main.cfm

Cautions regarding tree representations:

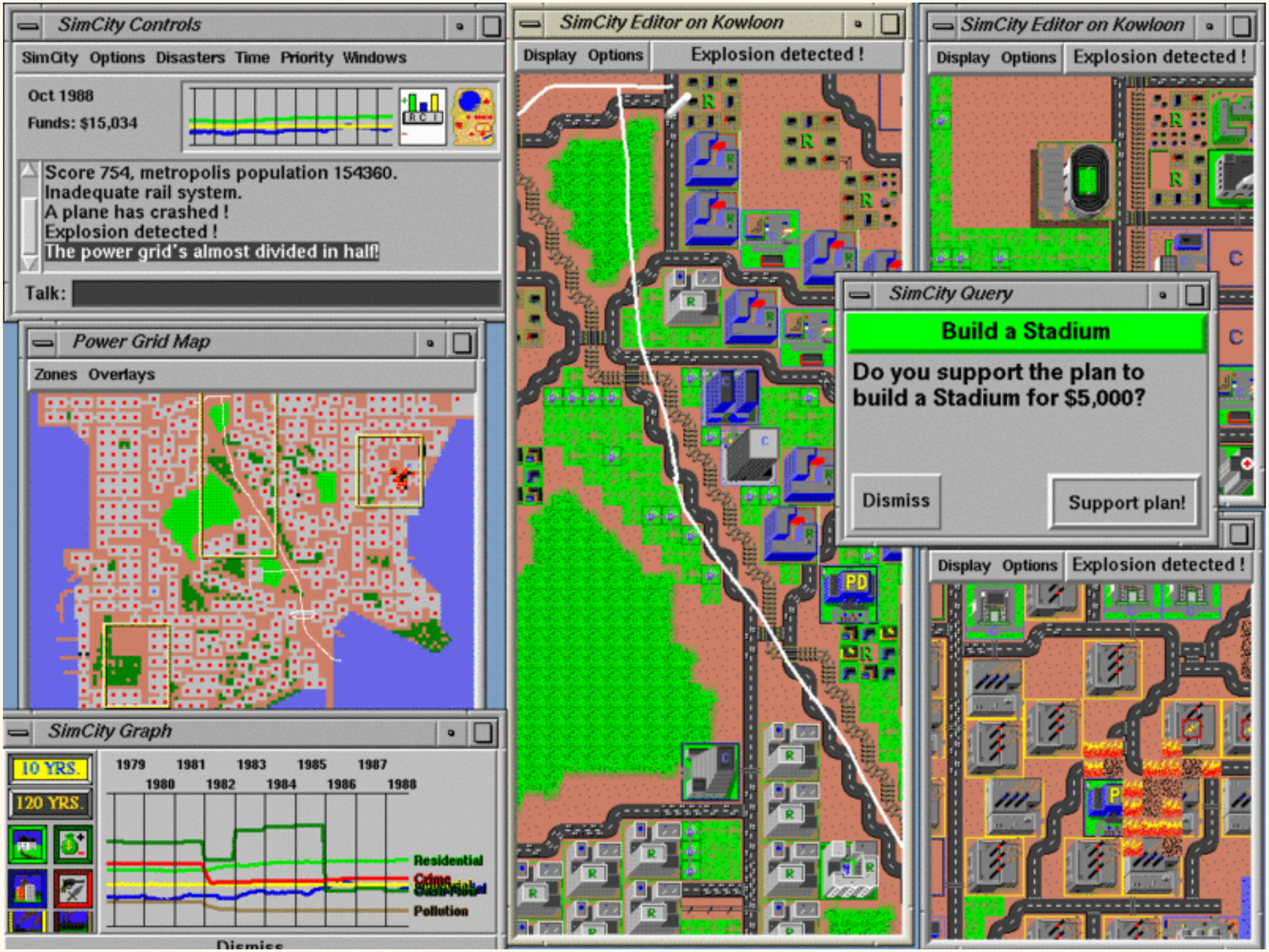
Some data are truly hierarchical...

... many are not.

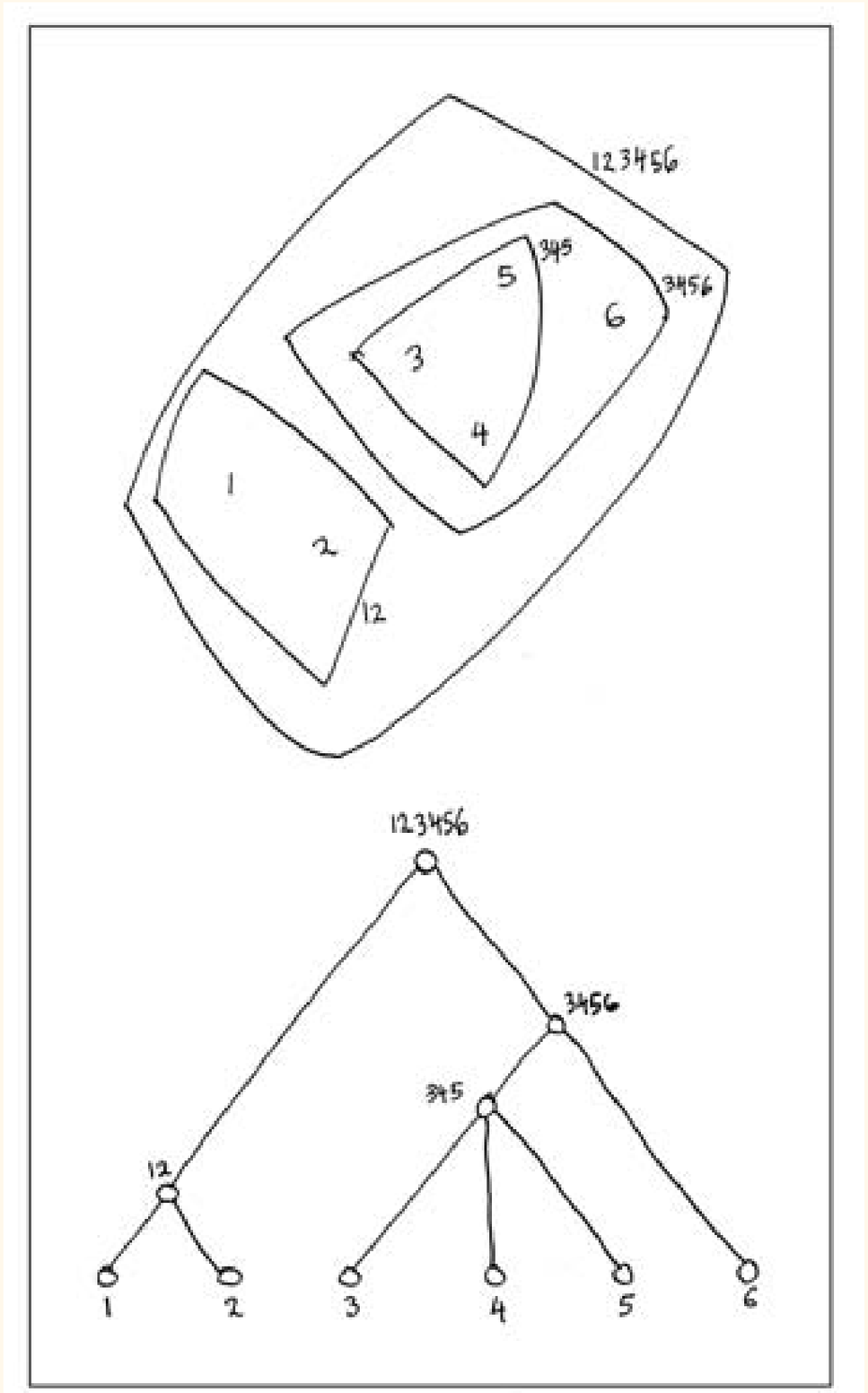
Points in a tree only exist in a single context...

... which is rarely the case in reality!

“The medium is the message.”



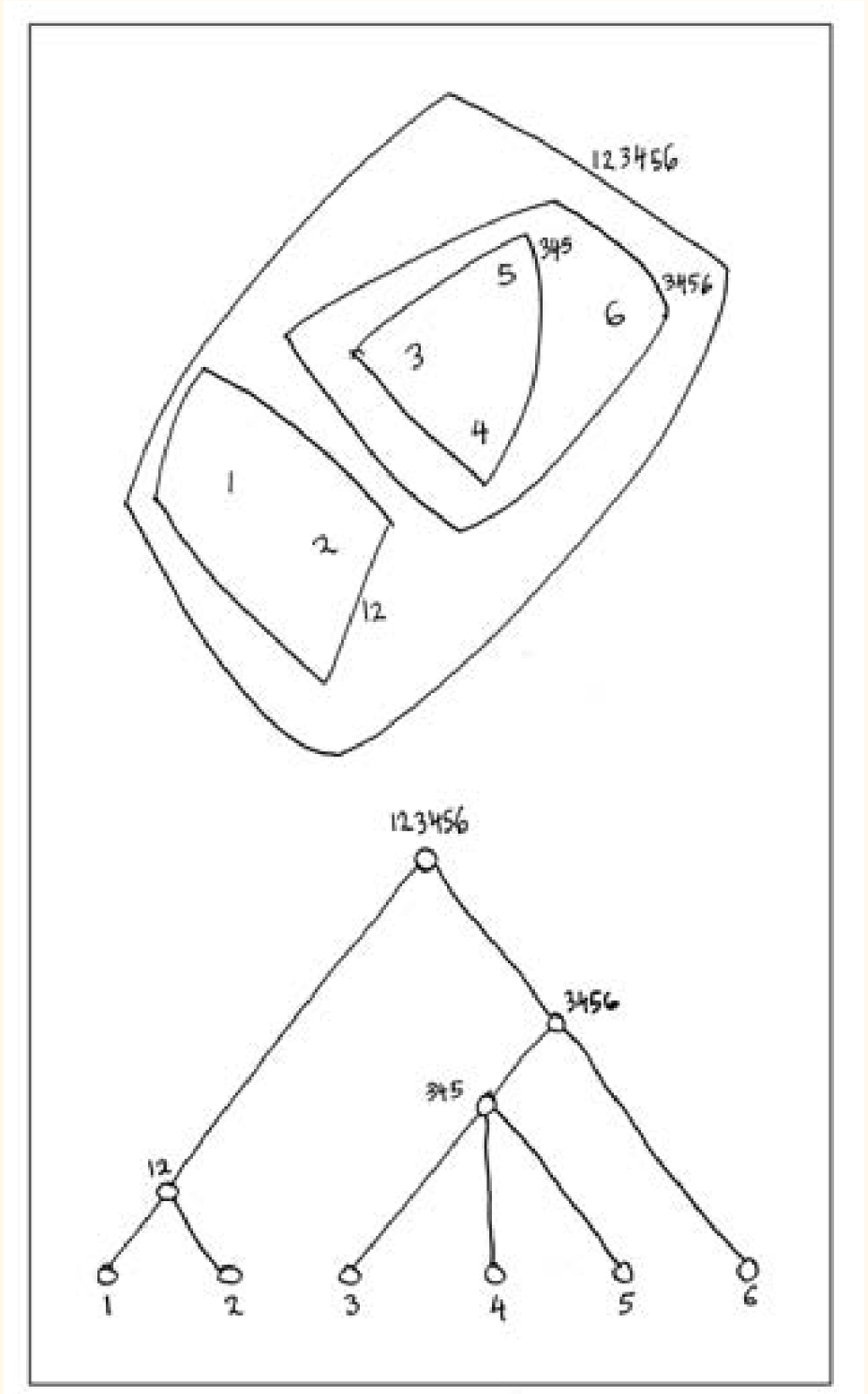
http://en.wikipedia.org/wiki/SimCity_(1989_video_game)#mediaviewer/File:SimCity-Indigo.gif

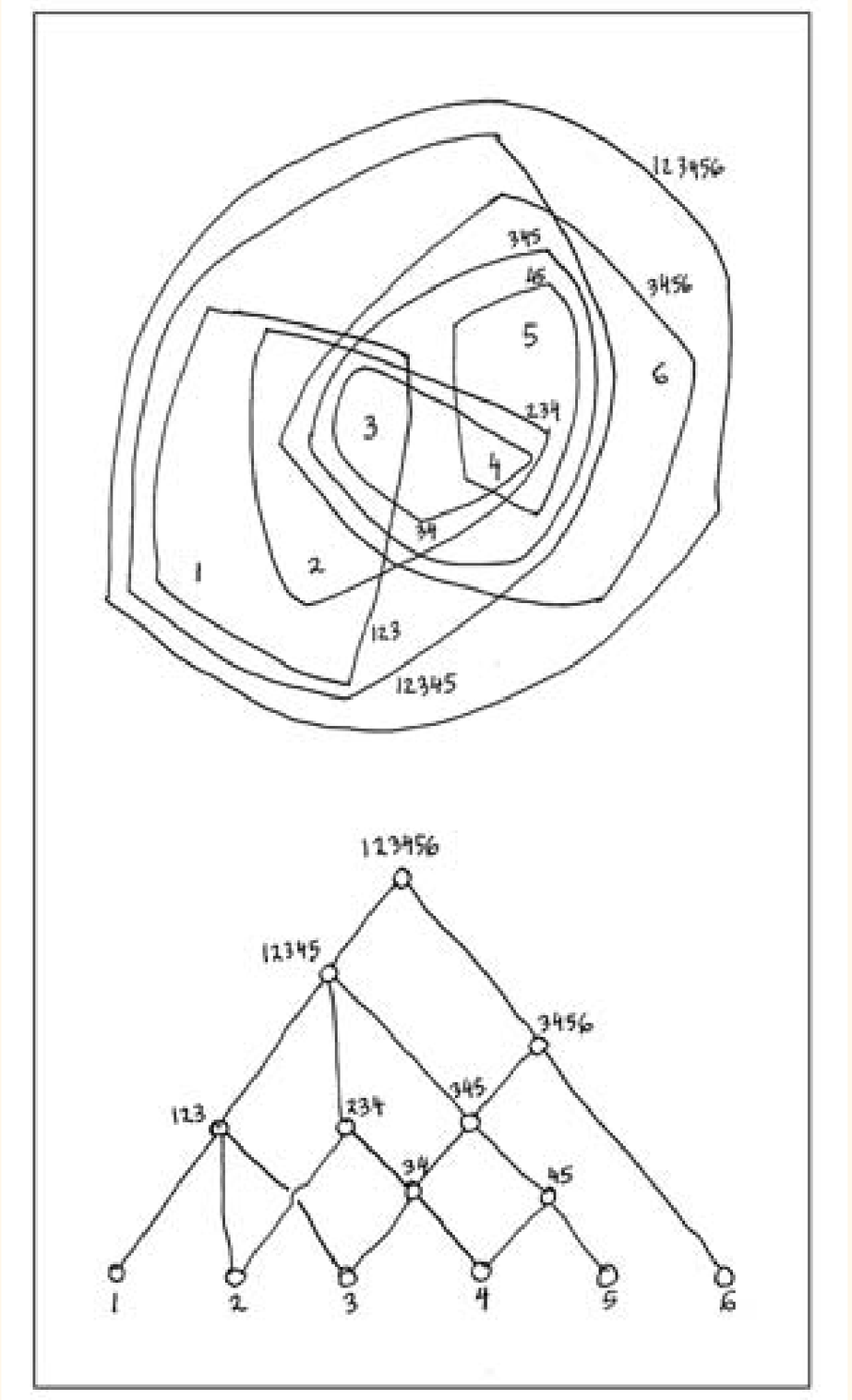


“A City is not a Tree”, by Christopher Alexander

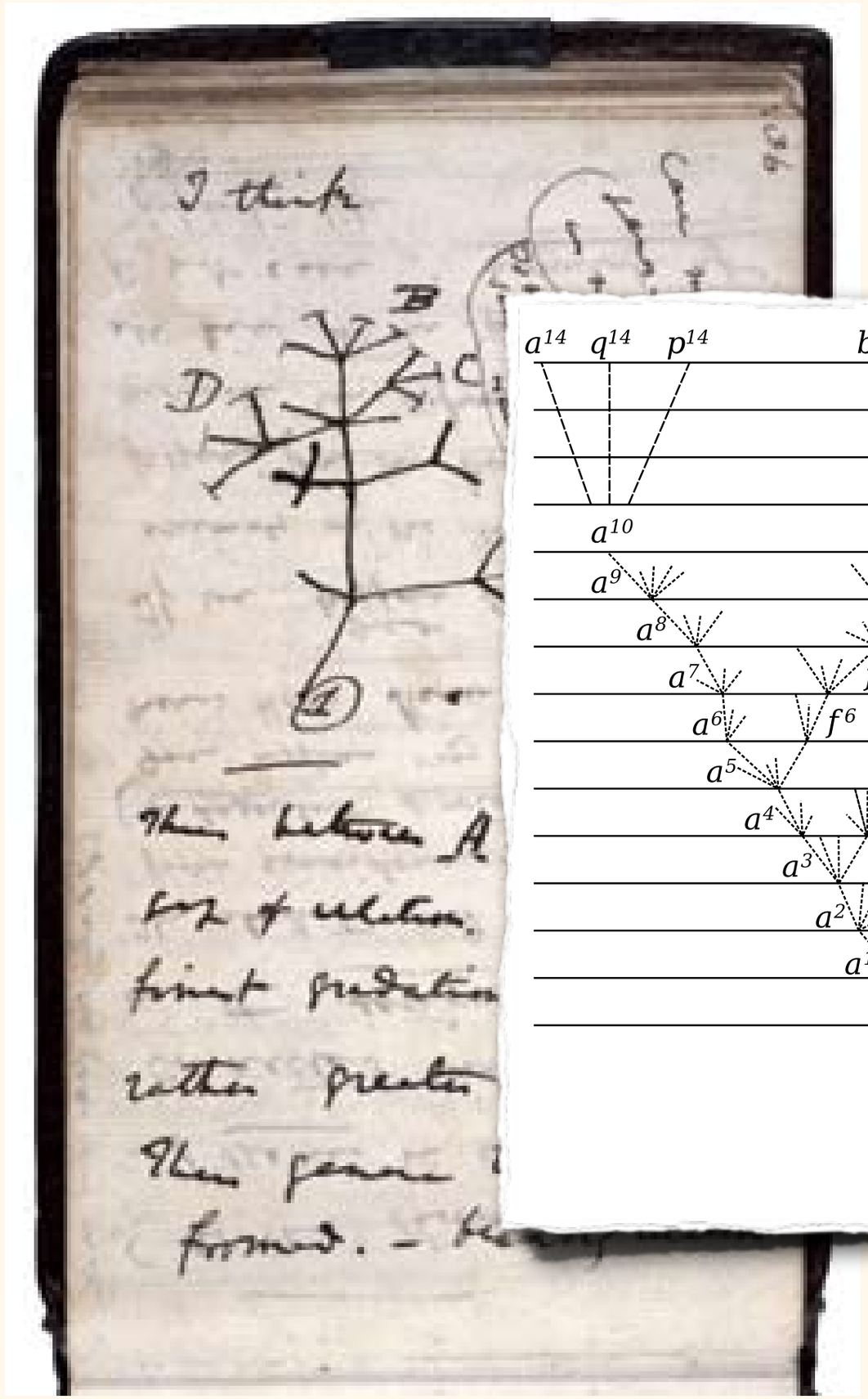
“...Alexander refutes the hierarchical and centralized organization of the urban landscape, characteristic of model cities such as Brasilia, in favor of organic cities like London and New York. He declares that many of these artificial cities have failed due to the rigid and insipid thinking of their creators, who planned areas of activity (e.g., residential, industrial, commercial) as independent and incommunicable modules, in a typical tree structure of separate branches.”

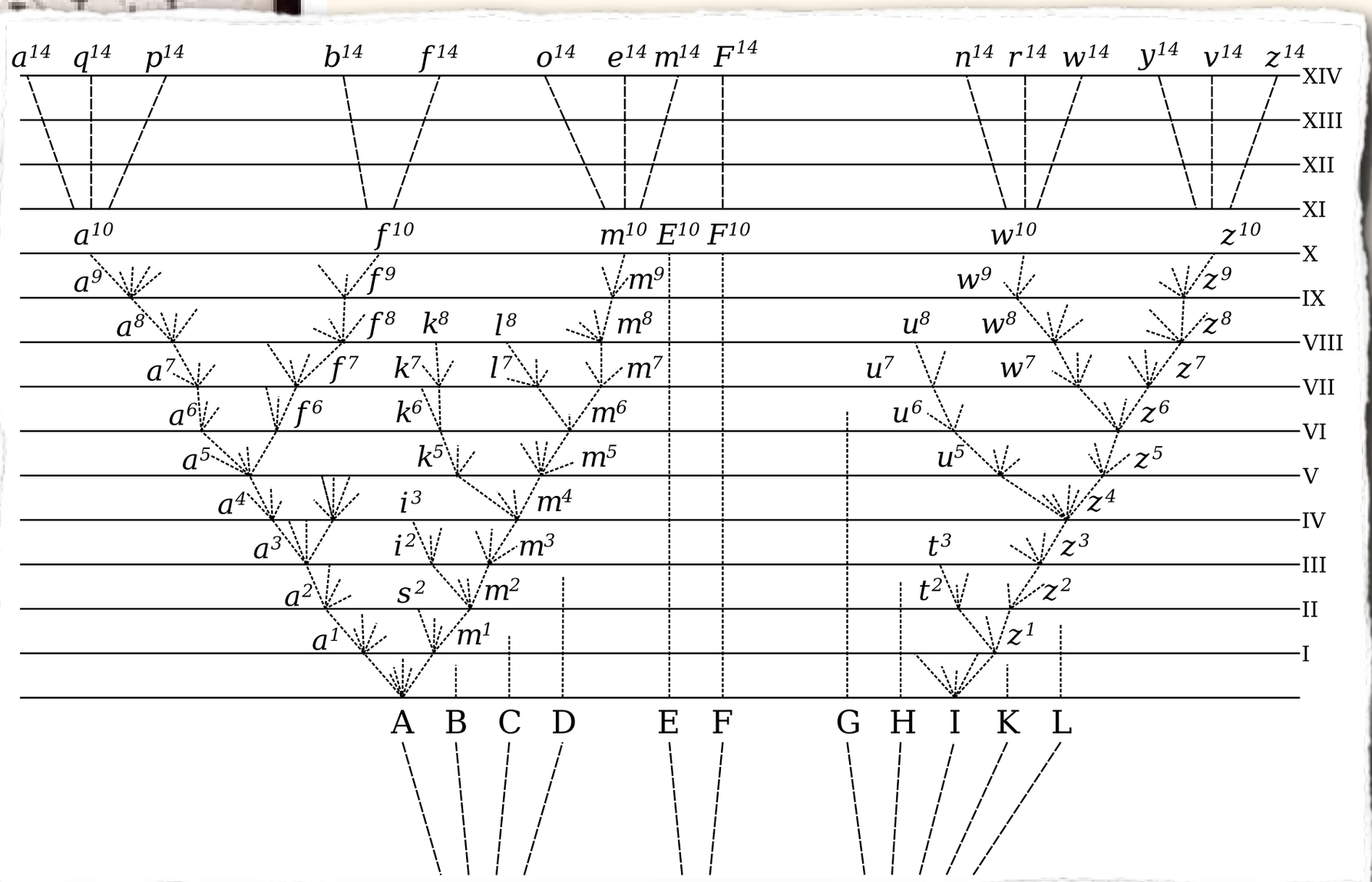
Quote from *Visual Complexity*, by Manuel Lima

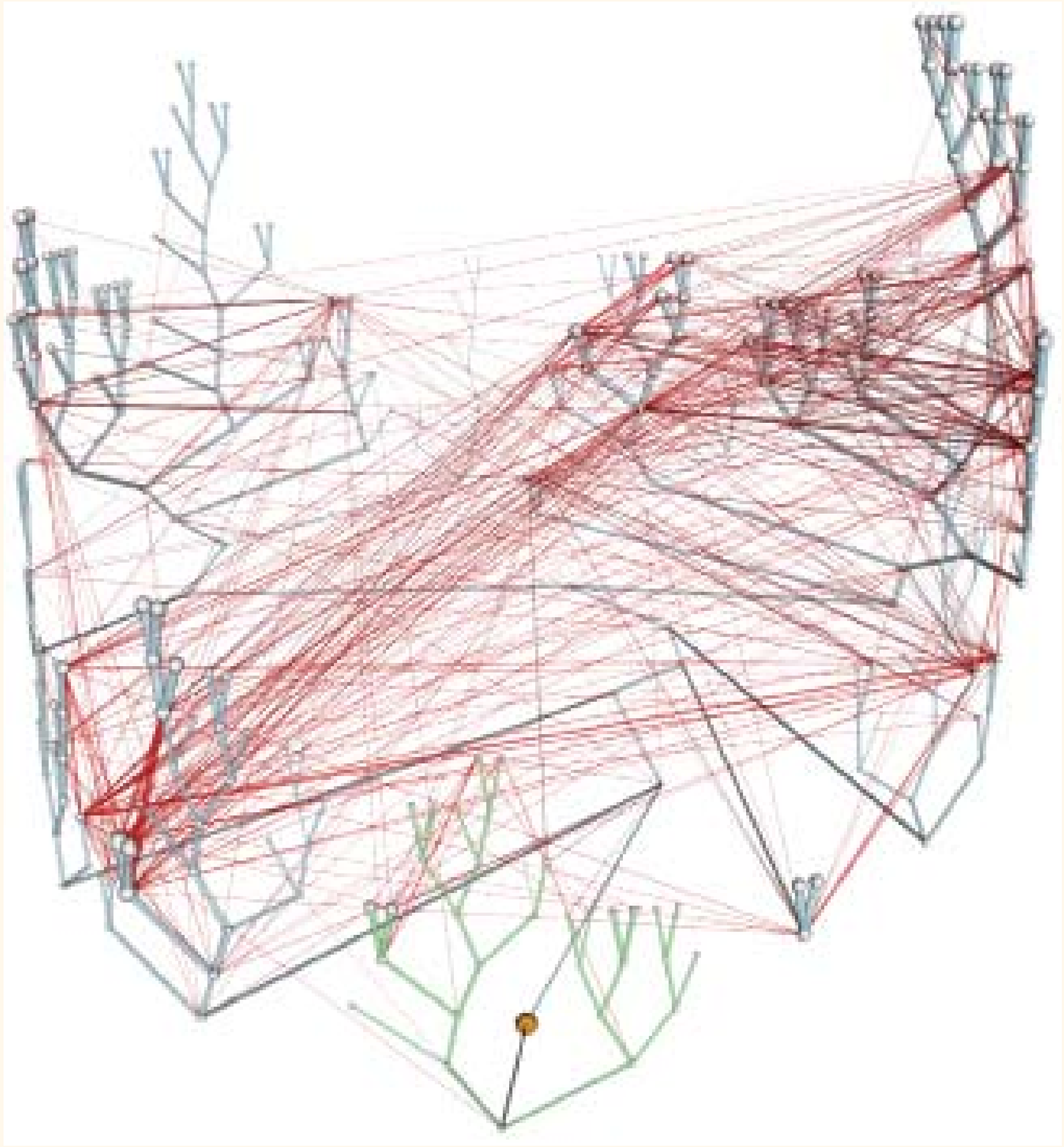




"A City is not a Tree", by Christopher Alexander


I think
B
D
C
1
Then between A
sep of relation.
finest gradation
rather greater
Then genera
formed. –

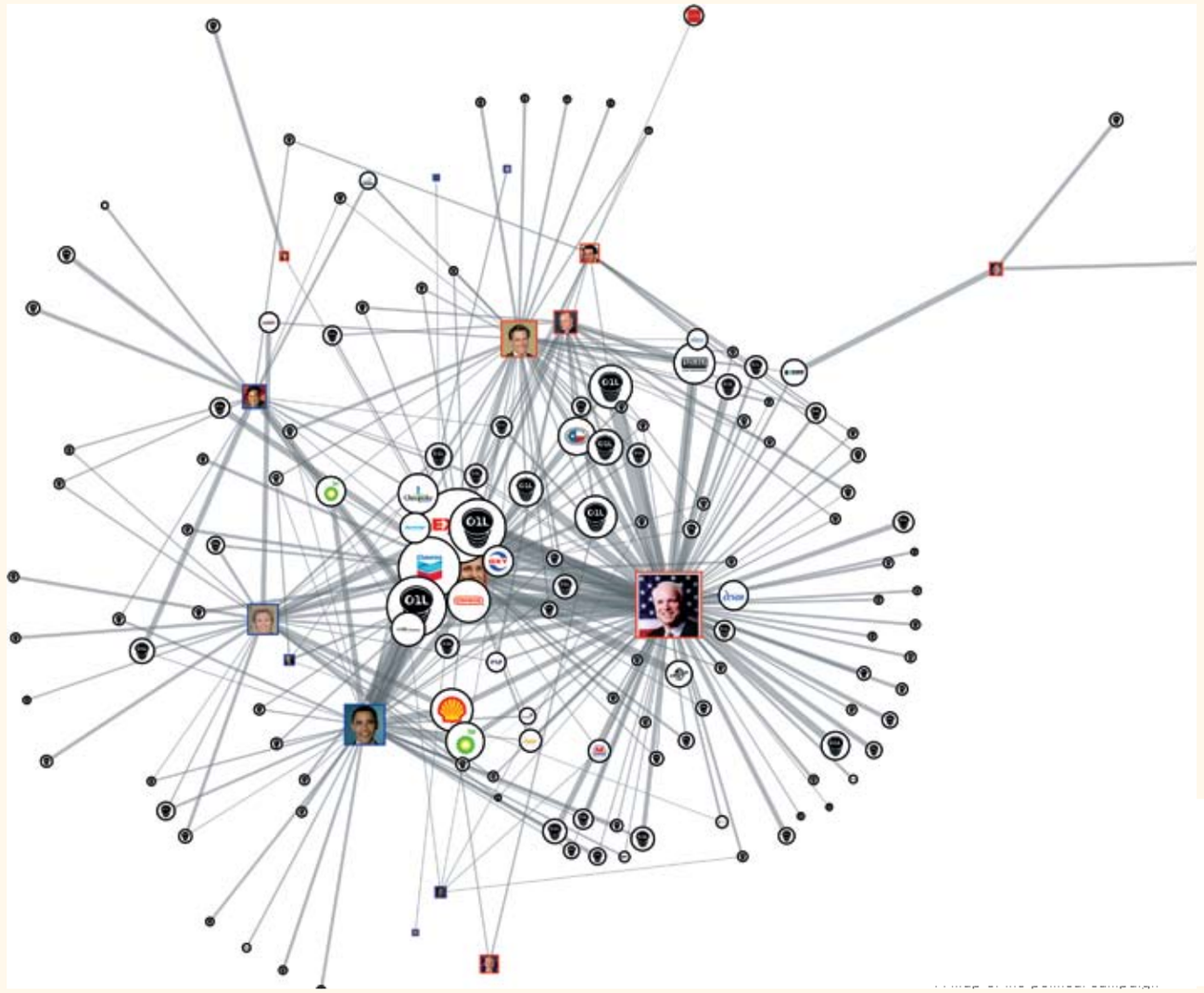

a14 q14 p14 b14 f14 o14 e14 m14 F14 n14 r14 w14 y14 v14 z14
XIV
XIII
XII
XI
a10 f10 m10 E10 F10 w10 z10
X
a9 f9 m9 w9 z9
IX
a8 f8 k8 l8 m8 u8 w8 z8
VIII
a7 f7 k7 l7 m7 u7 w7 z7
VII
a6 f6 k6 m6 u6 z6
VI
a5 k5 m5 u5 z5
V
a4 i3 m4 z4
IV
a3 i2 m3 t3 z3
III
a2 s2 m2 t2 z2
II
a1 m1 z1
I
A B C D E F G H I K L



Kunin V, Goldovsky L, Darzentas N, Ouzounis CA. The net of life: reconstructing the microbial phylogenetic network. Genome Res. 2005 Jul;15(7):954–9.

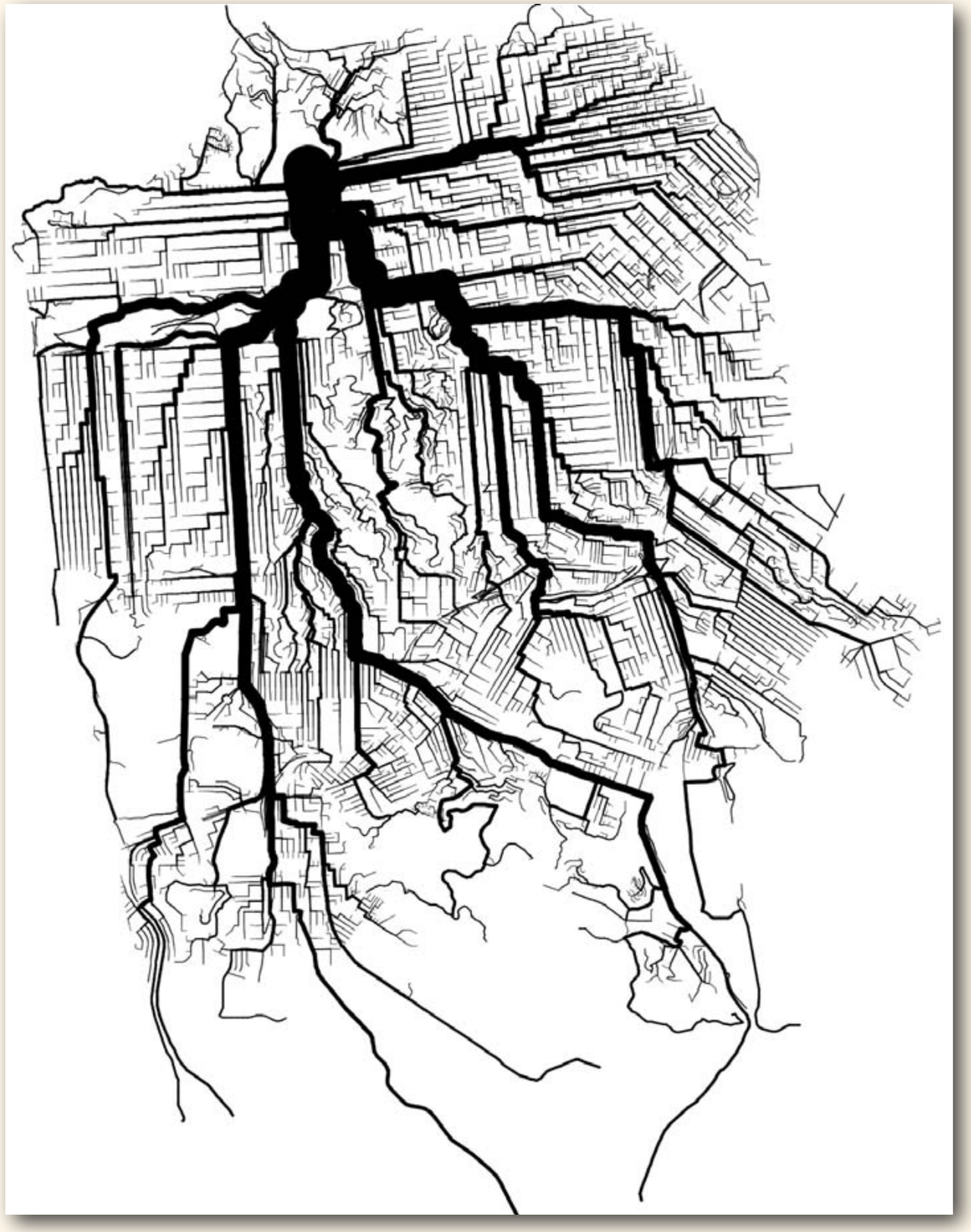
Caution regarding graph visualizations:

Don’t forget about Gestalt properties!



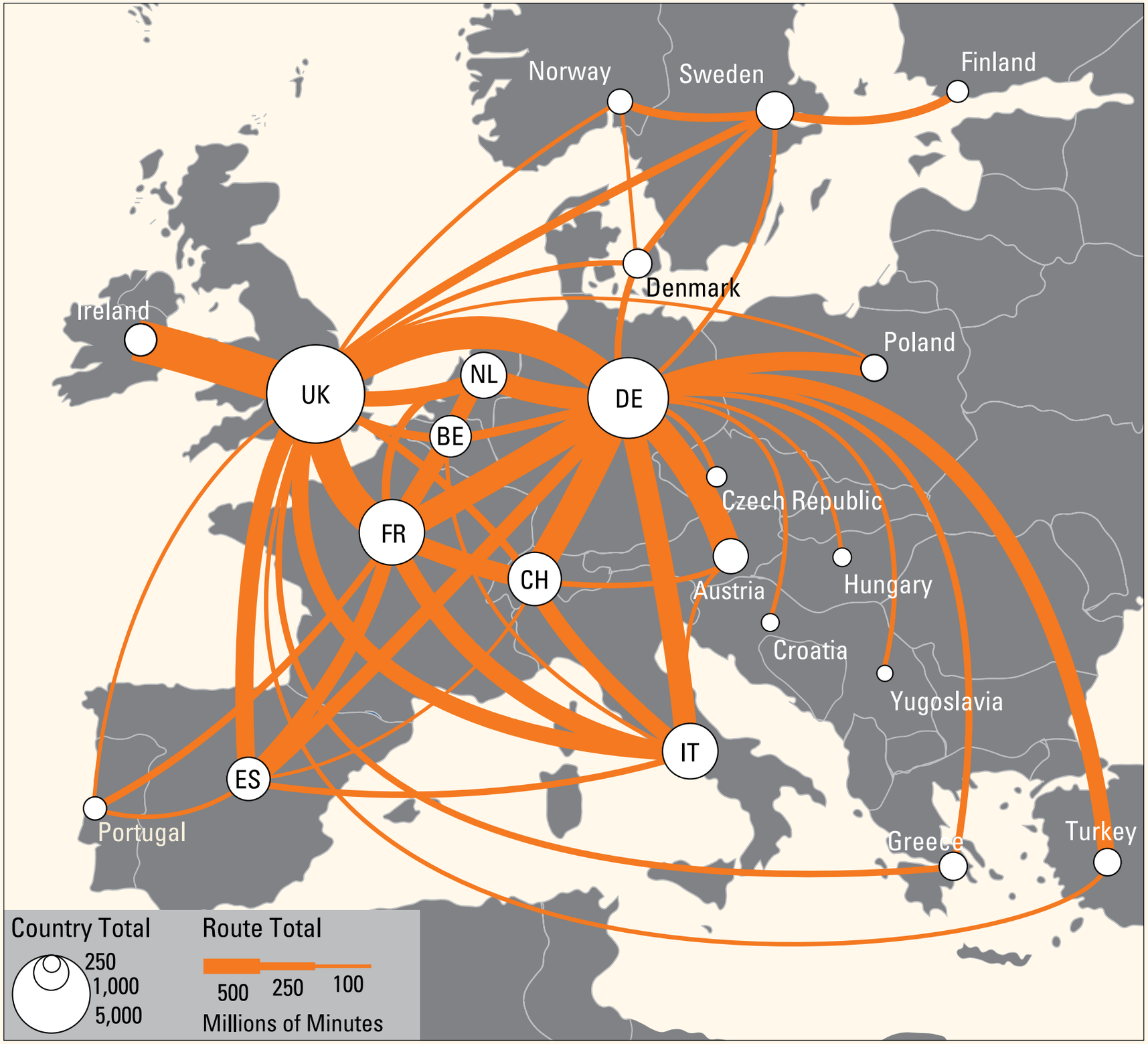
Oil Money, Skye Bender-deMoll and Greg Michalec

Mixing metaphors:



Shortest Path Tree, Brandon Martin-Anderson

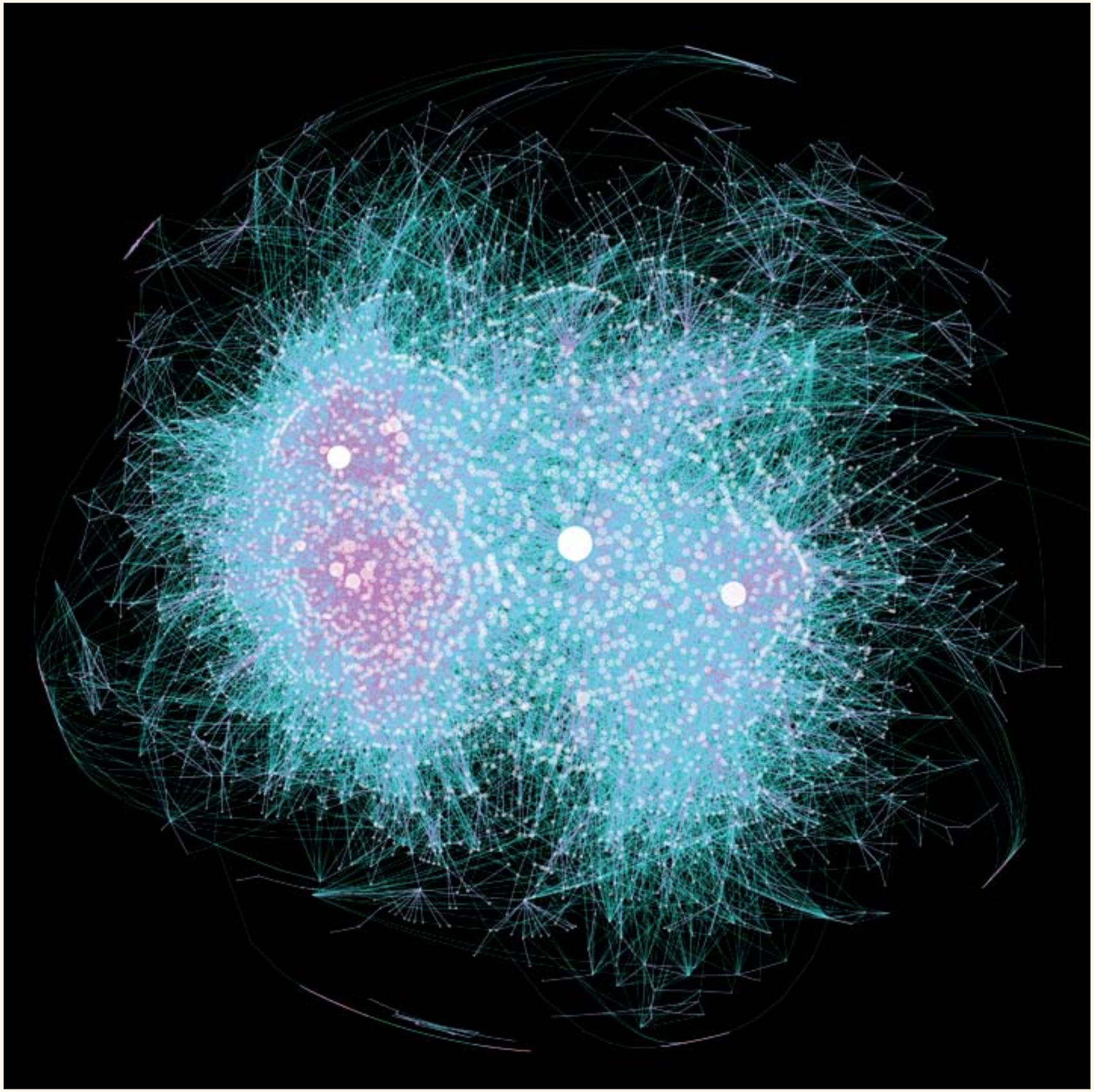
Mixing metaphors:



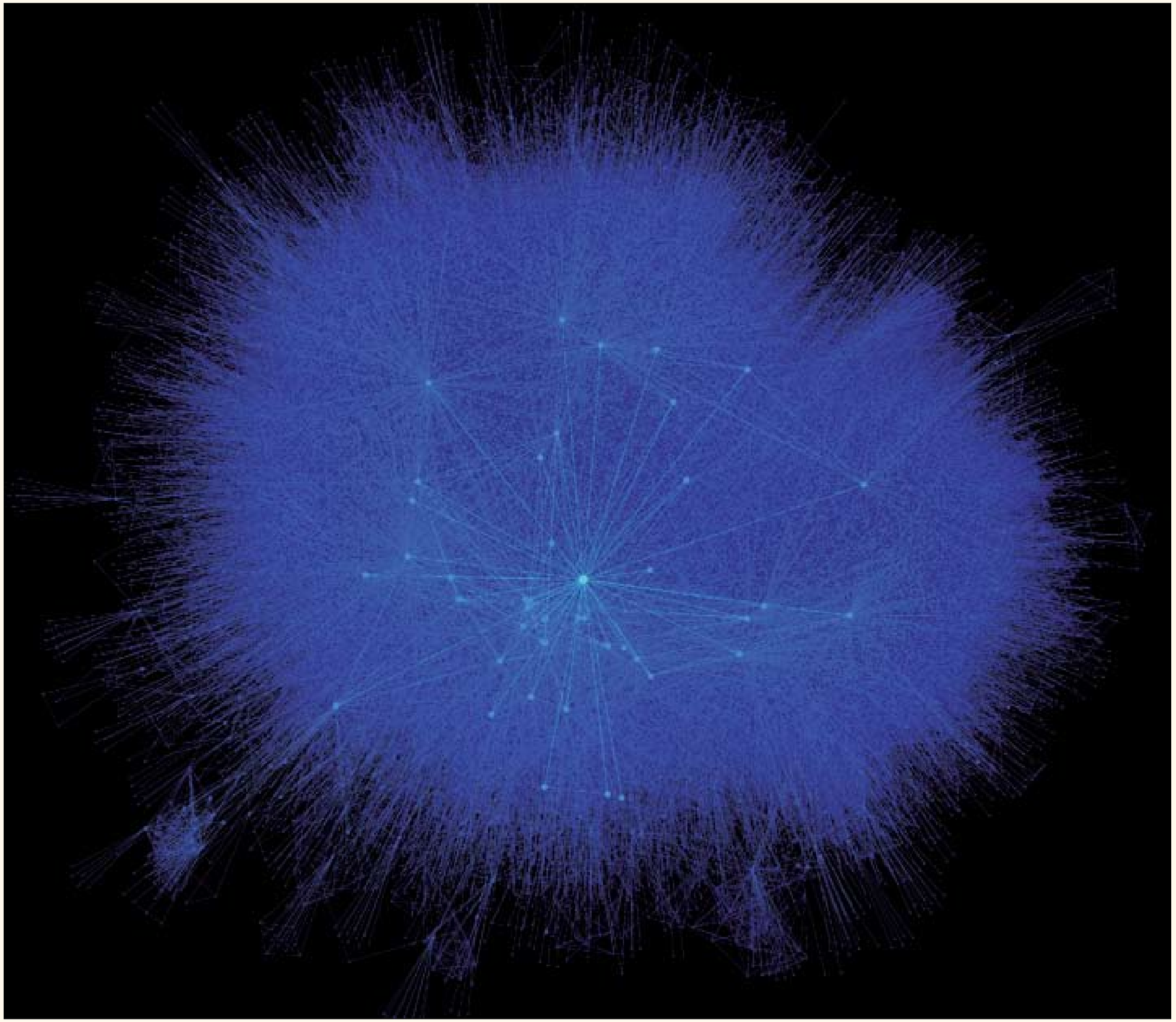
Traffic Flow Map, TeleGeography

Mixing metaphors:

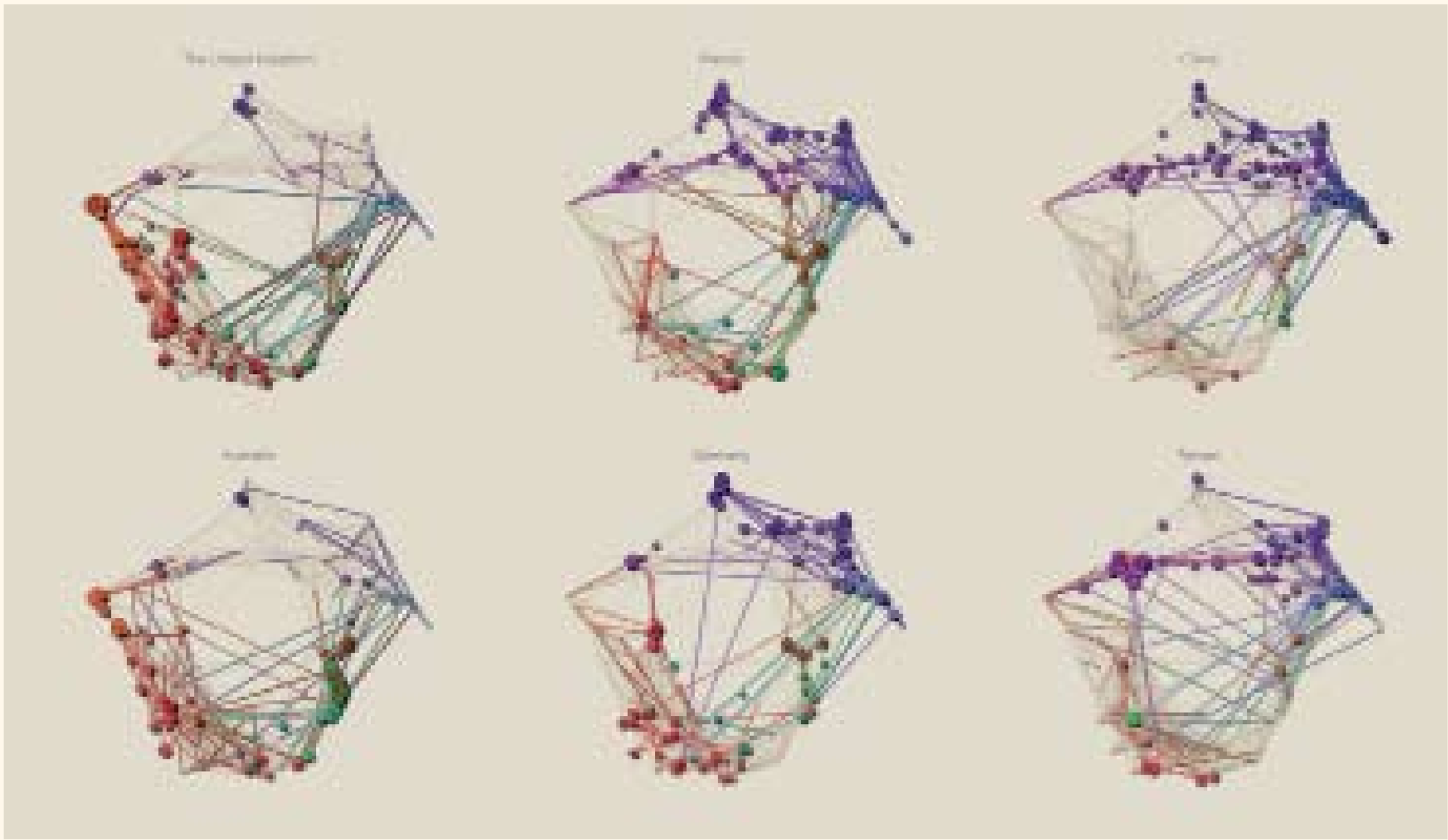
Just Landed, Jer Thorp



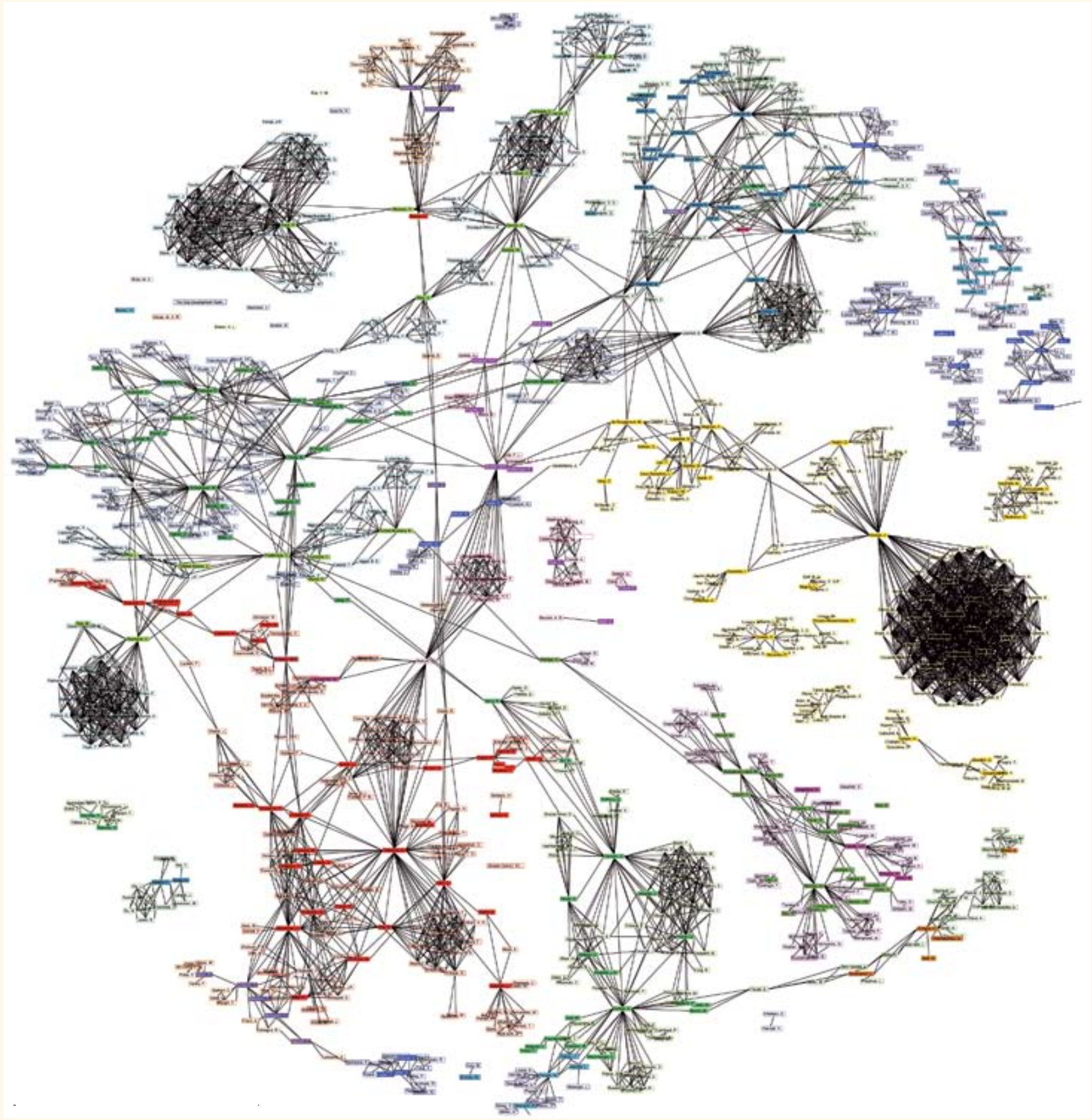
The Hyperbolic Blogosphere, Matthew Hurst



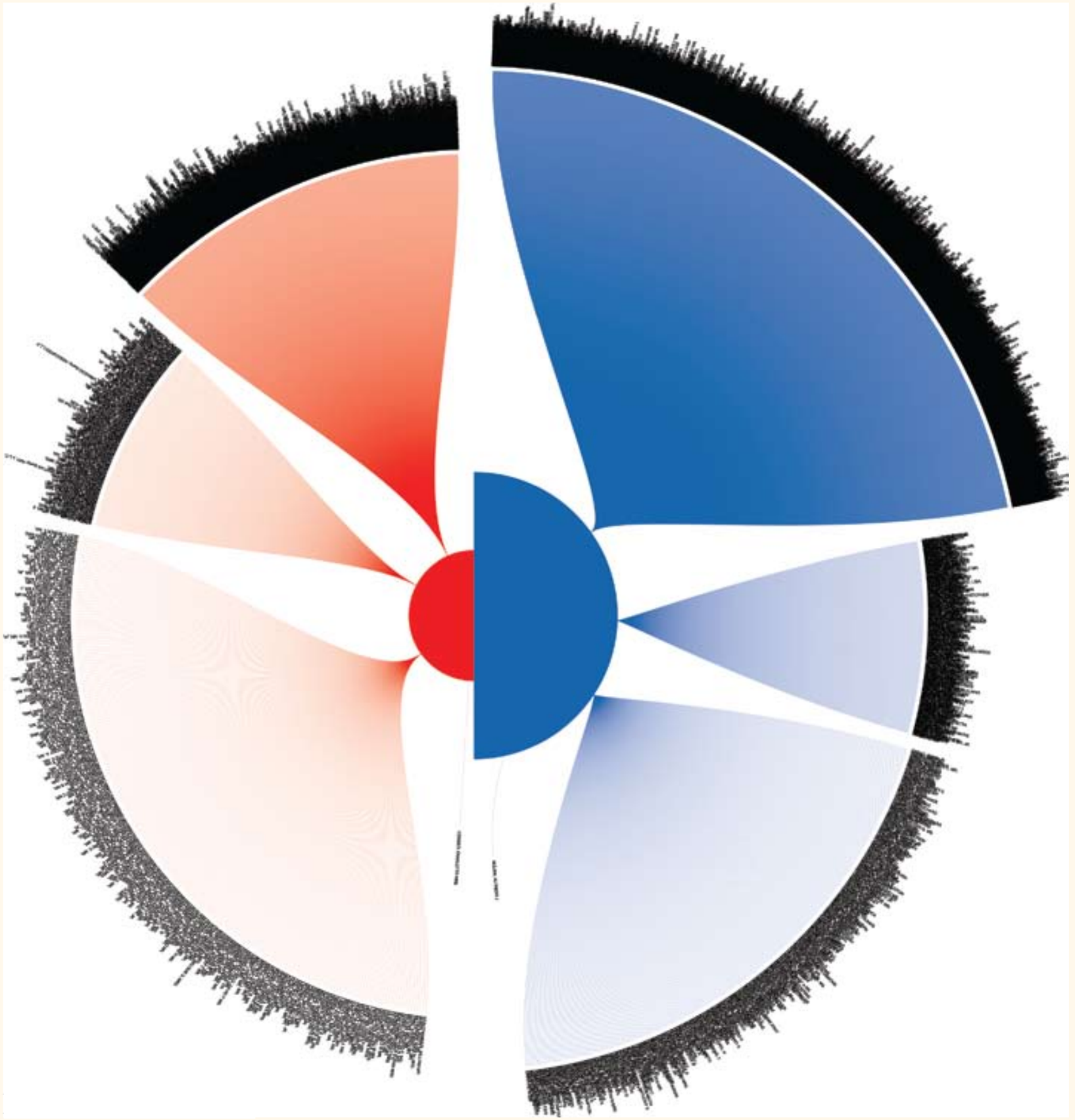
Personal Friendster Network, Jeffrey Heer



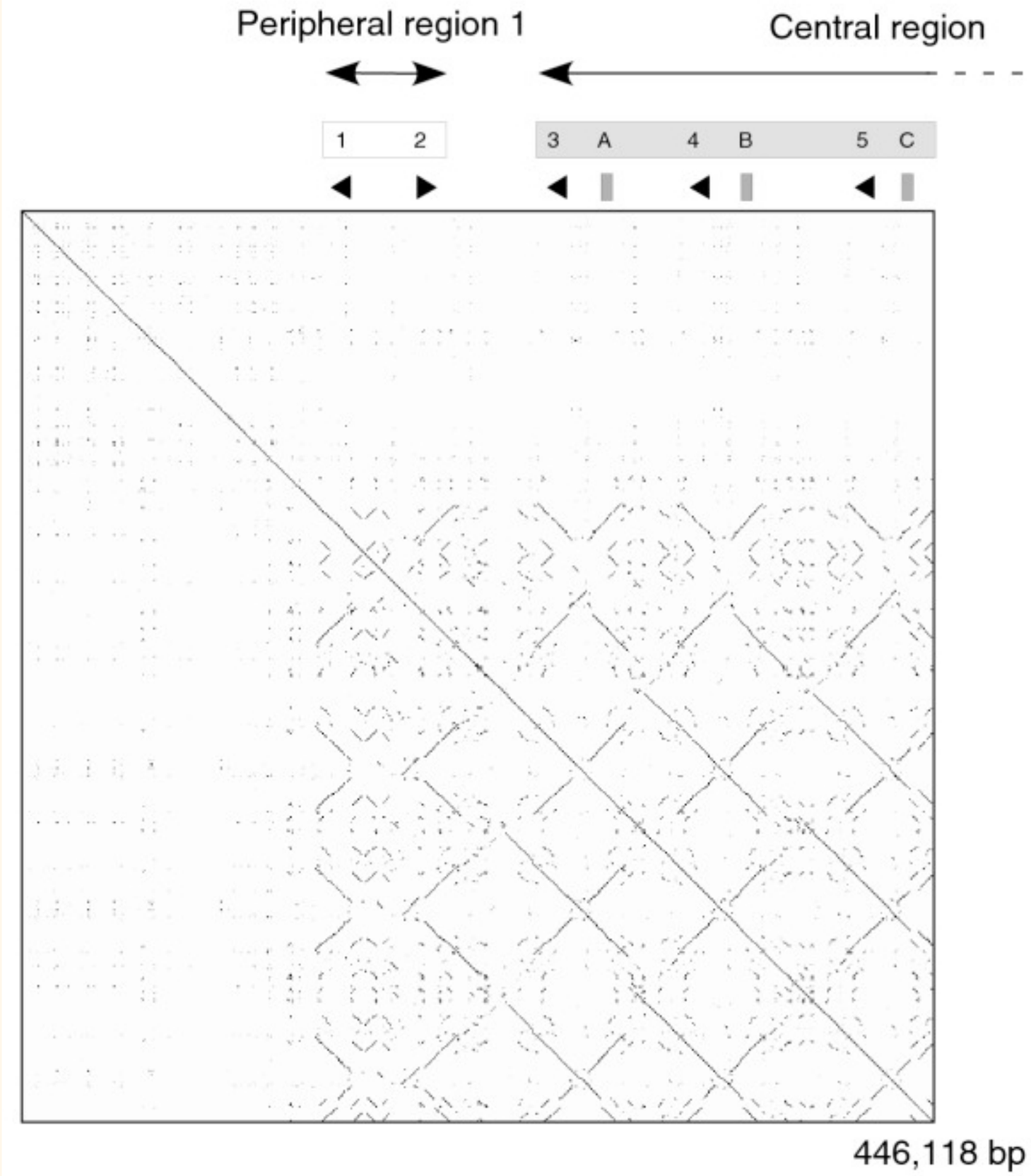
Strength of Nations, Paley et al.



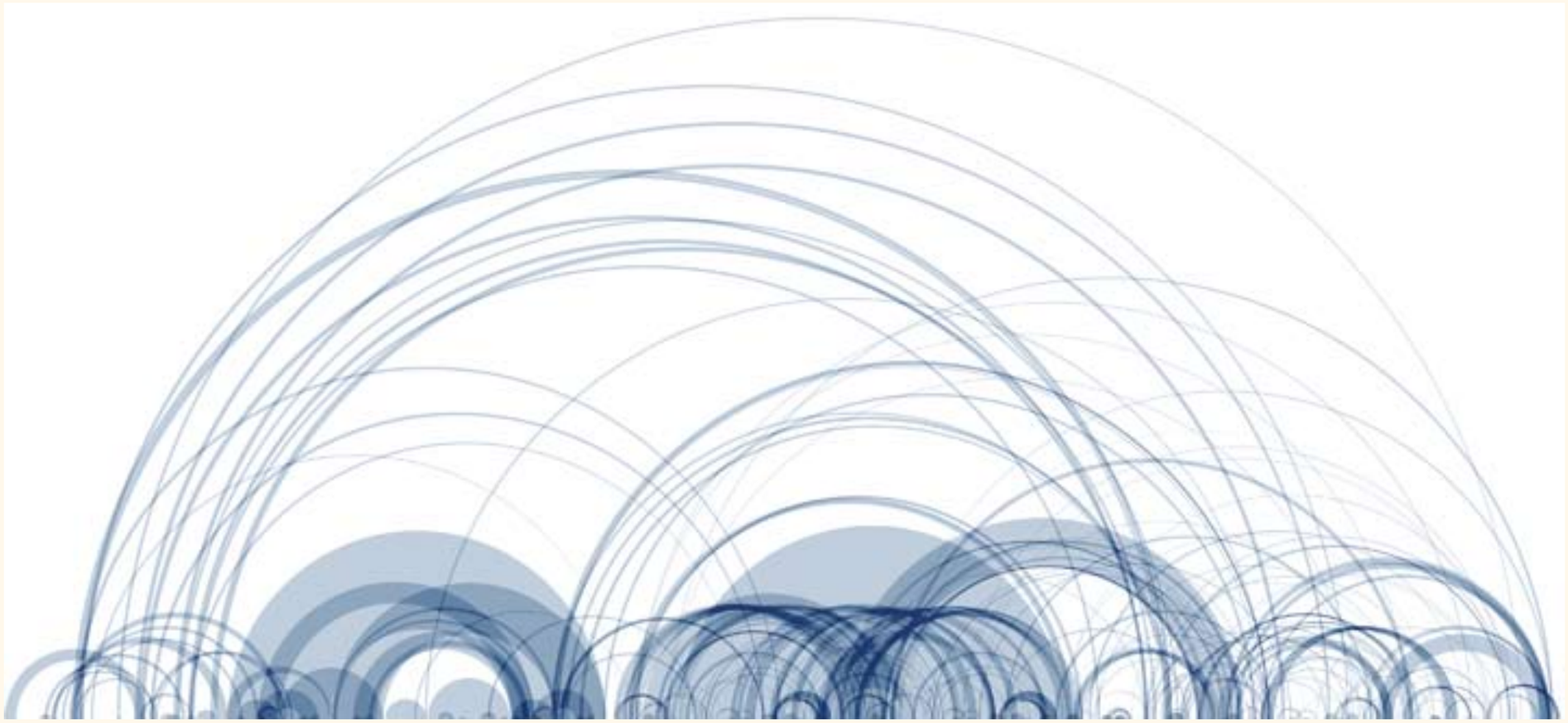
LRI Co-Authorshiop Network, Jean-Daniel Fekete



2008 Presidential Candidate Donations, Grubbs & Yahnke

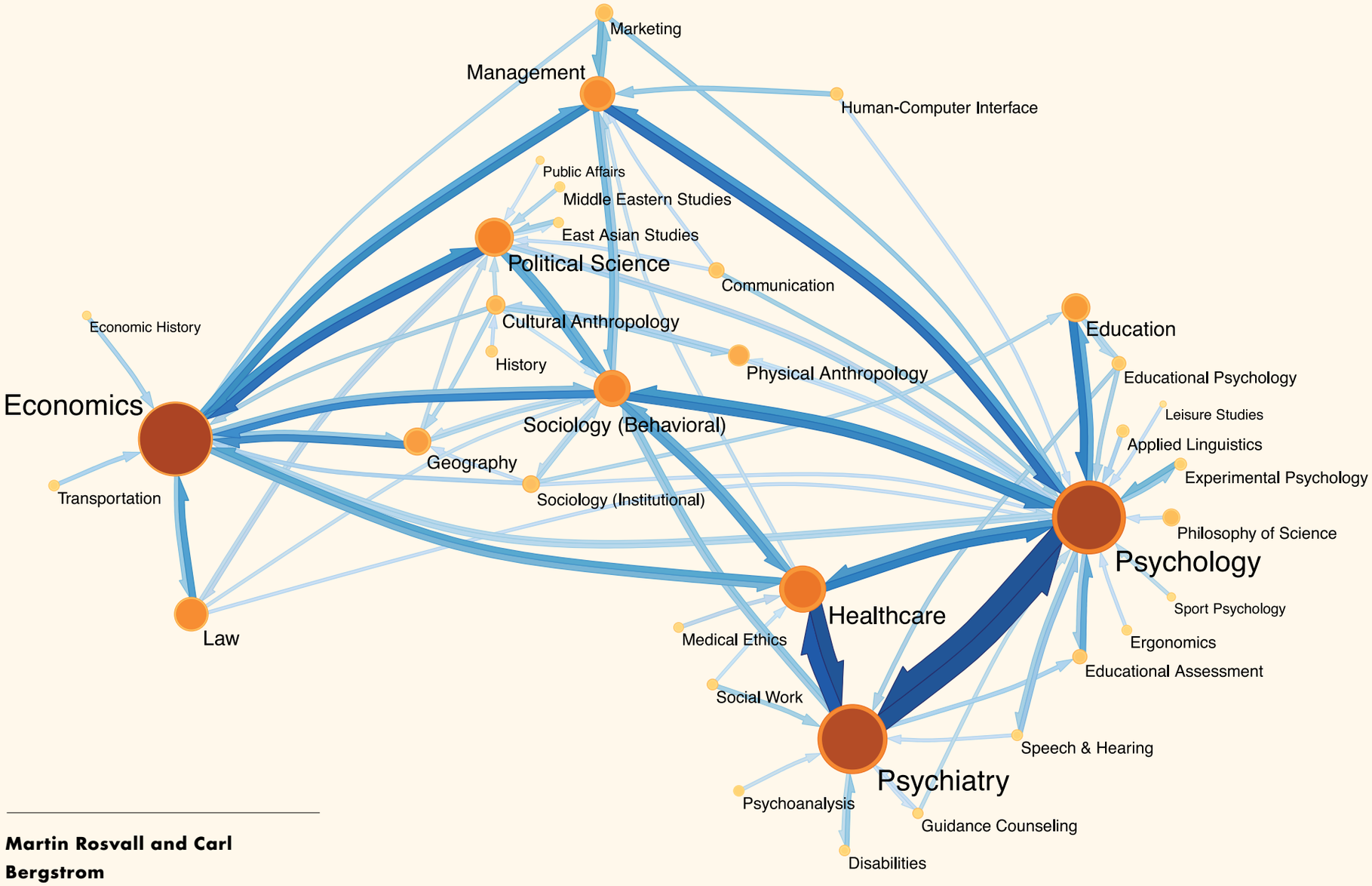


Jonathan M Mudge, Stuart D Armstrong, Karen McLaren, Robert J Beynon, Jane L Hurst, Christine Nicholson, Duncan H Robertson, Laurens G Wilming, and Jennifer L Harrow - Dynamic instability of the major urinary protein gene family revealed by genomic and phenotypic comparisons between C57 and 129 strain mice, Genome Biol. 2008; 9(5): R91.



The Shape of a Song, Martin Wattenberg

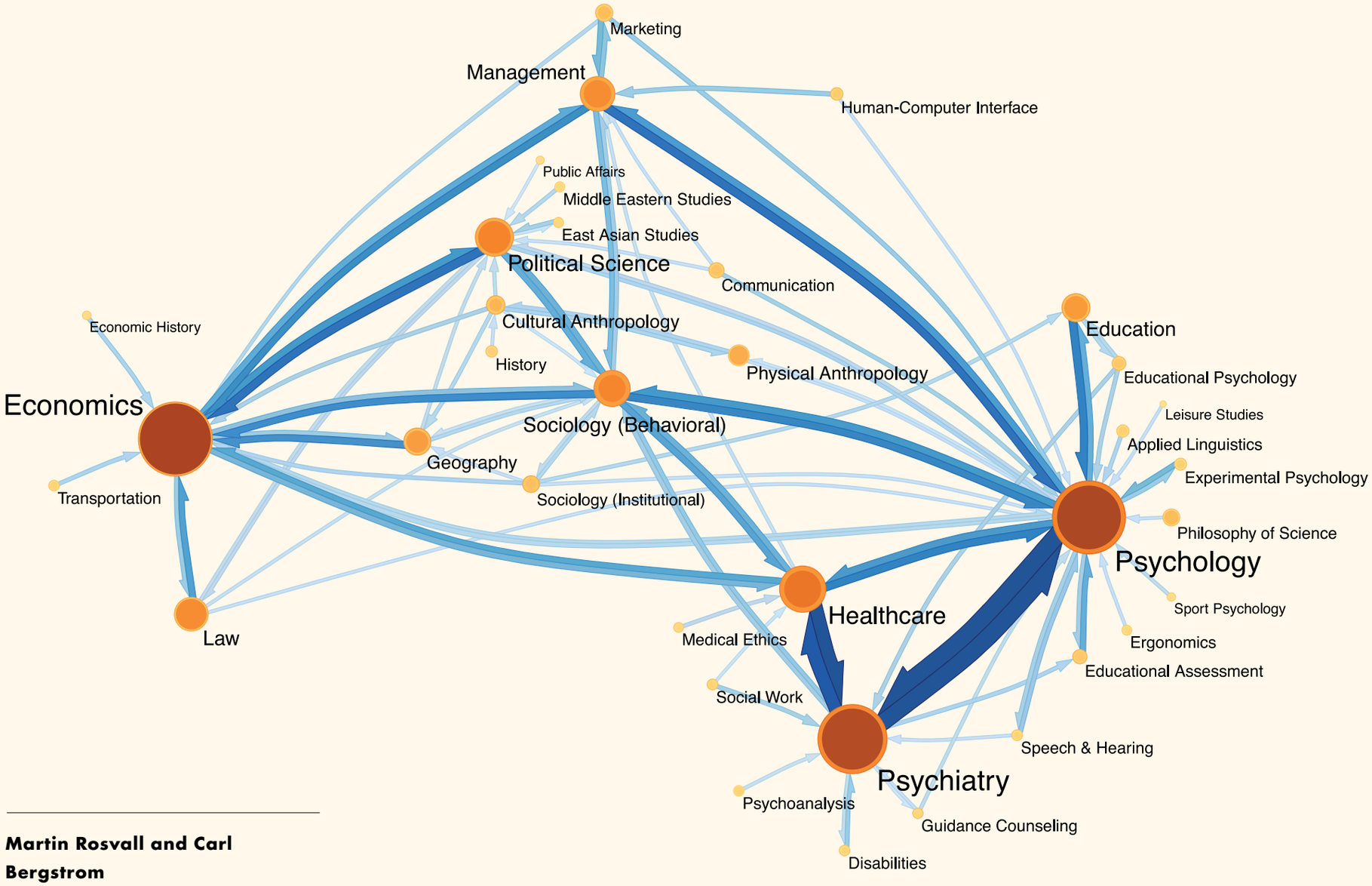
To smooth, or not to smooth?



Martin Rosvall and Carl Bergstrom

Map of science

To smooth, or not to smooth?



Martin Rosvall and Carl Bergstrom

Map of science