

CHALLENGES OF DESIGN
Imagination, Aesthetics and New Technology

Spherical Network Visualizations

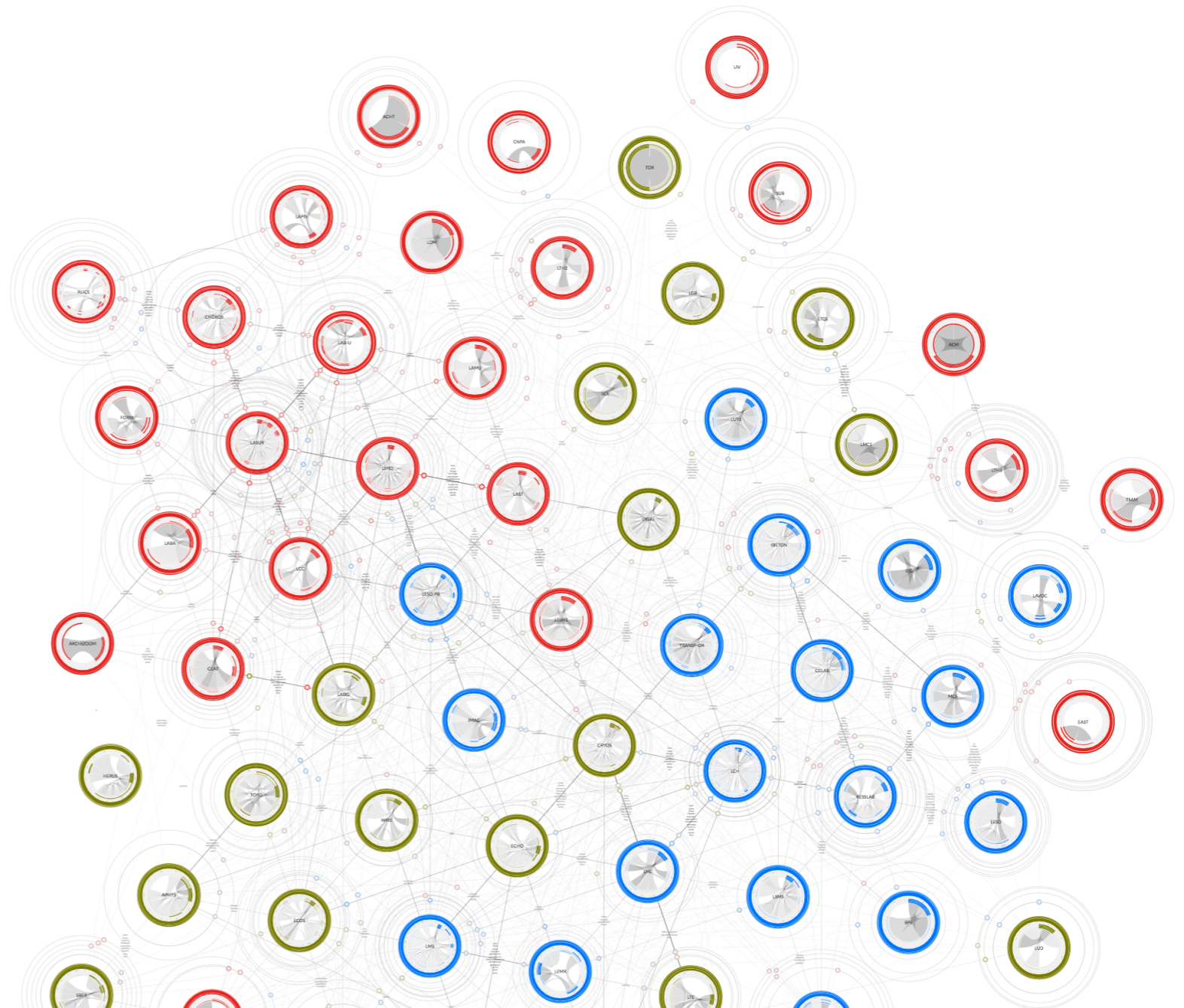
Dario Rodighiero (MIT) and Philippe Rivière

University of Porto
Tuesday 26 June 2019

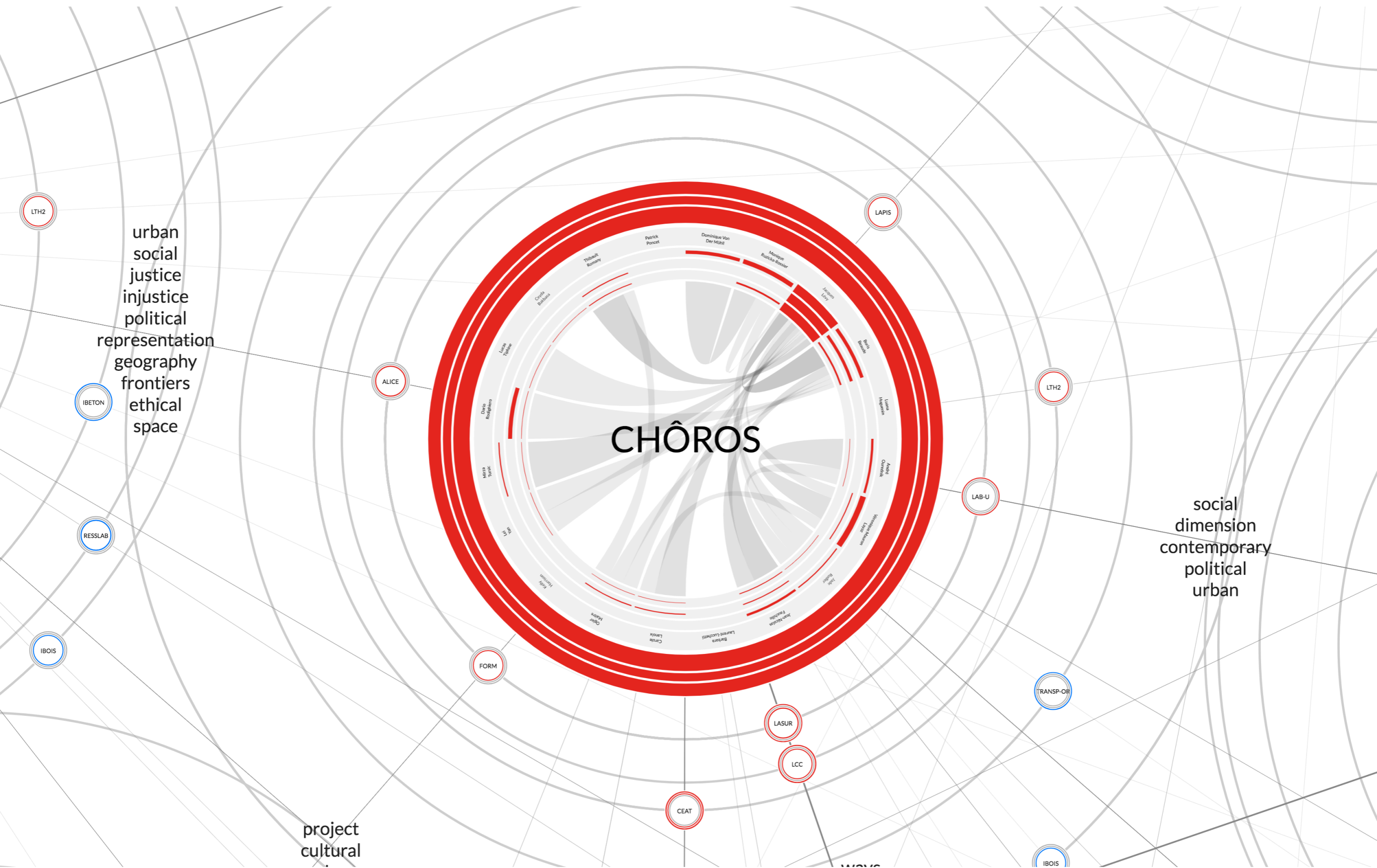
A Problem of Centrality



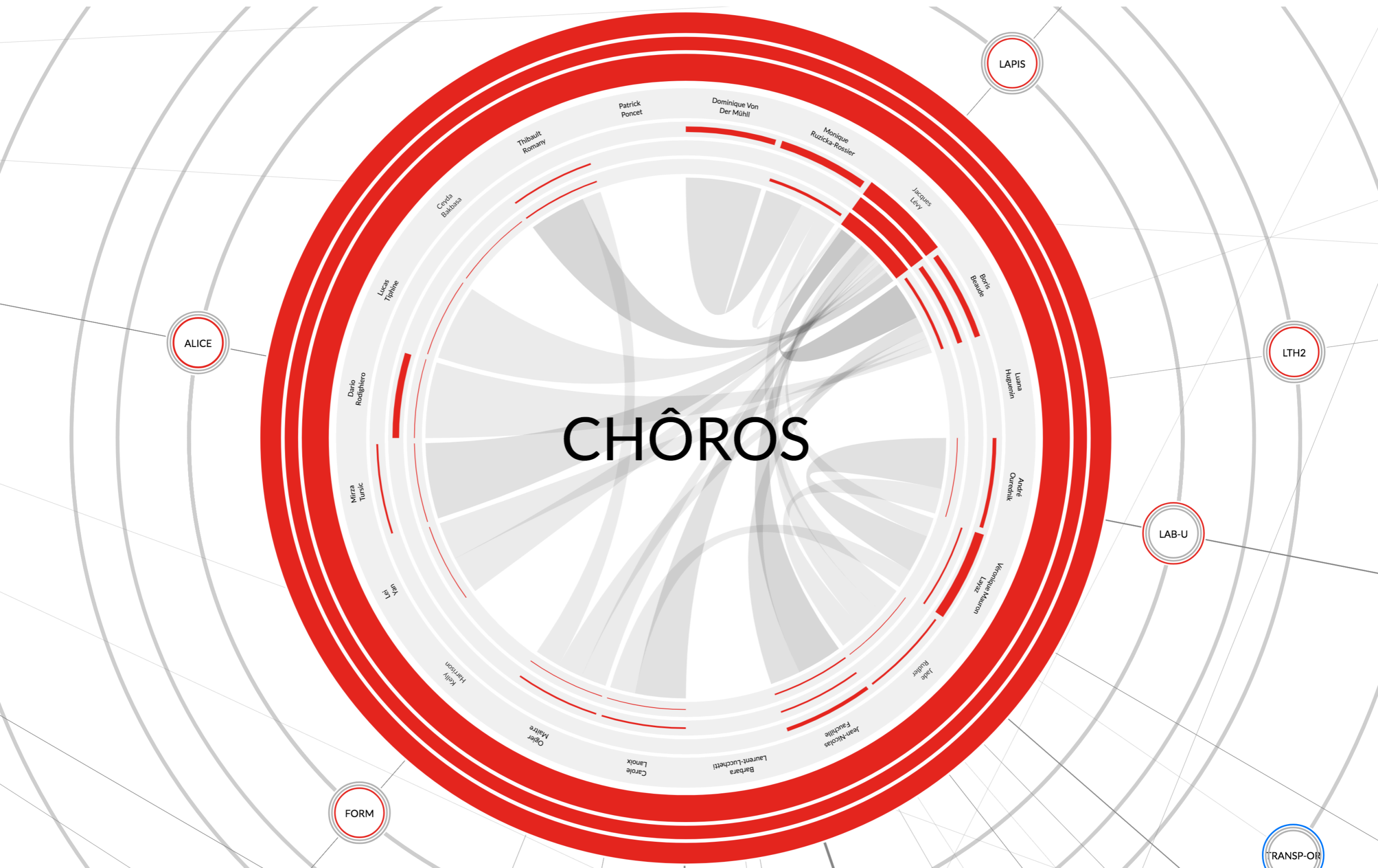
Rodighiero, Dario, Frédéric Kaplan, and Boris Beaude. 2018. "Mapping Affinities in Academic Organizations."



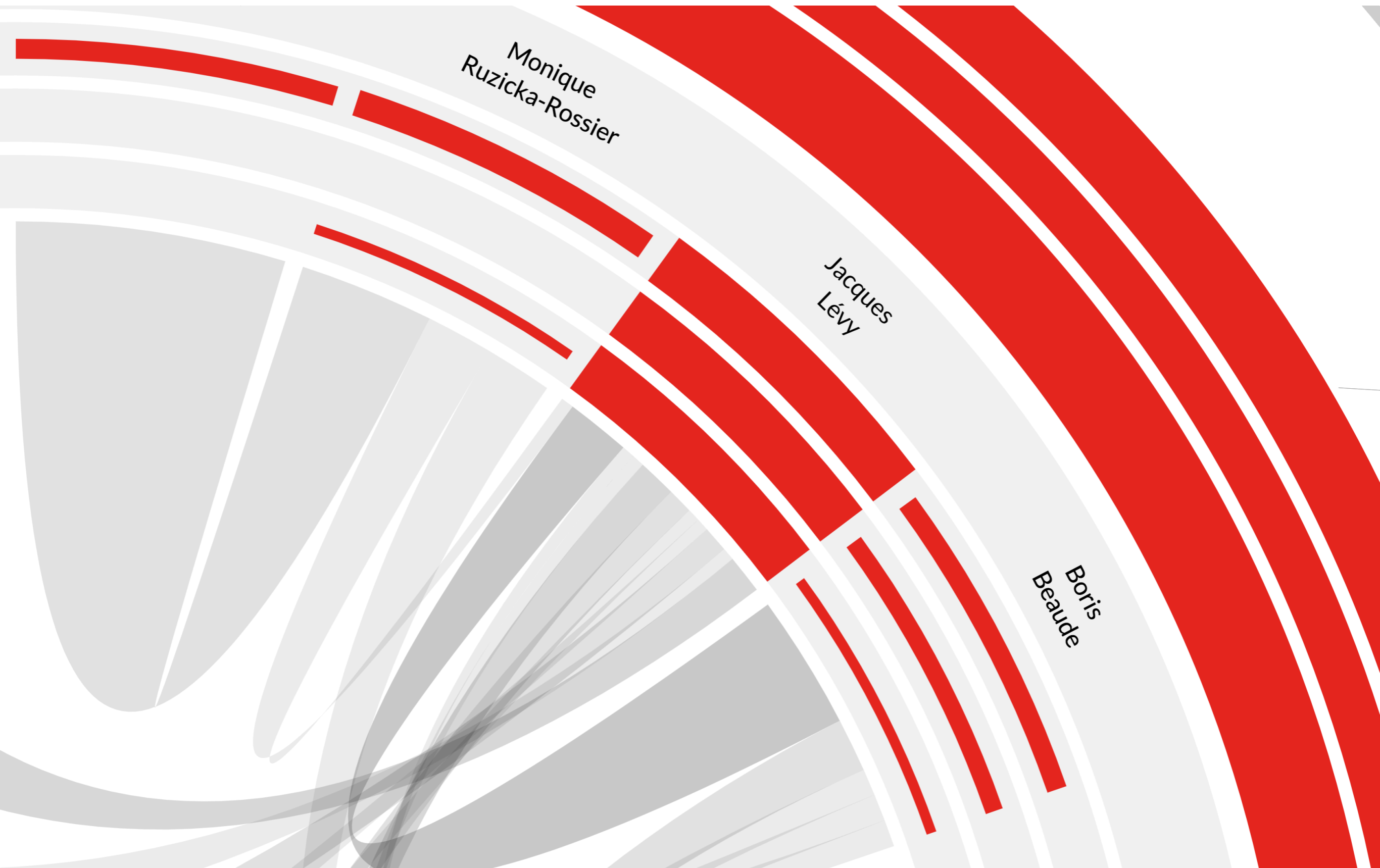
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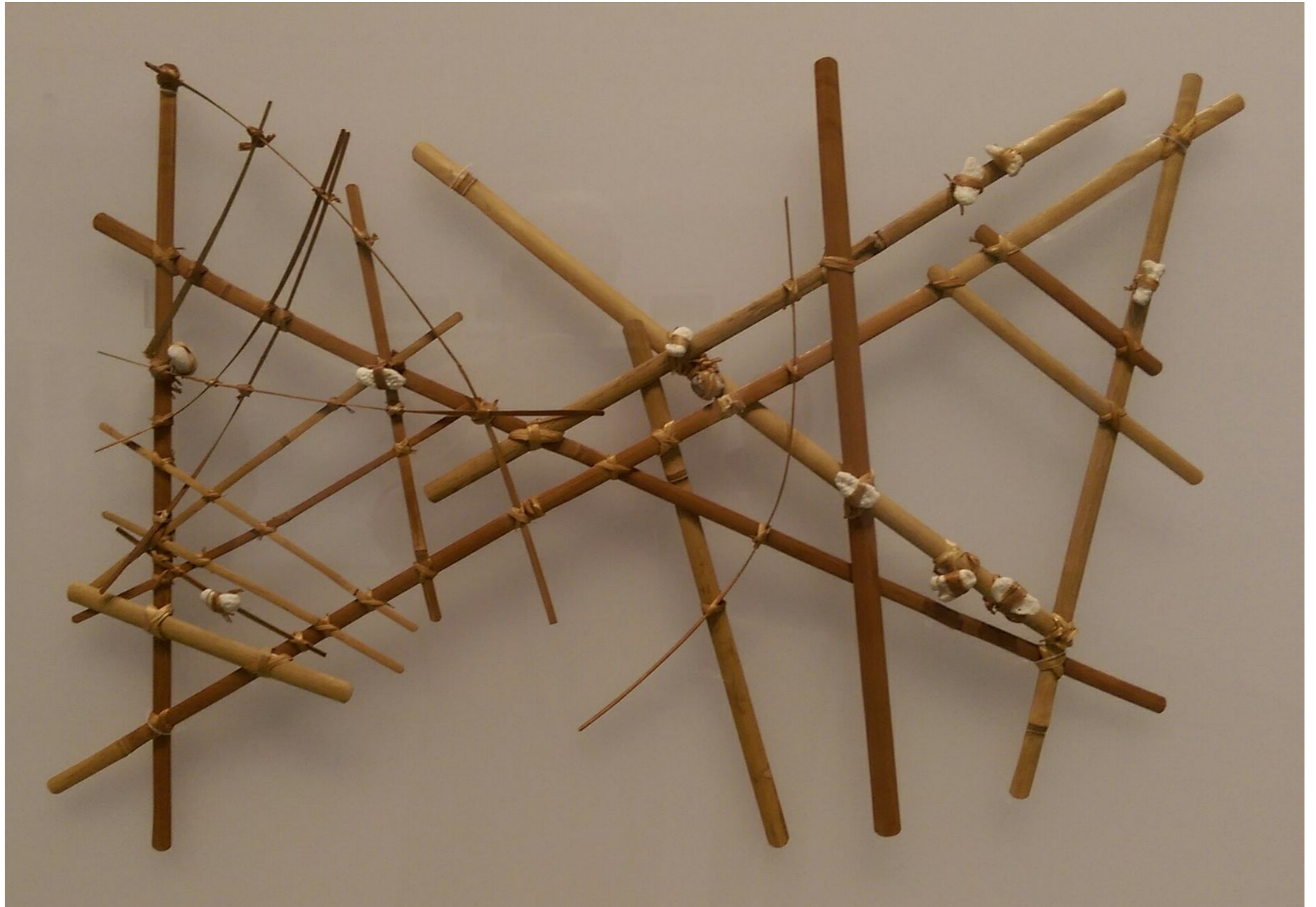
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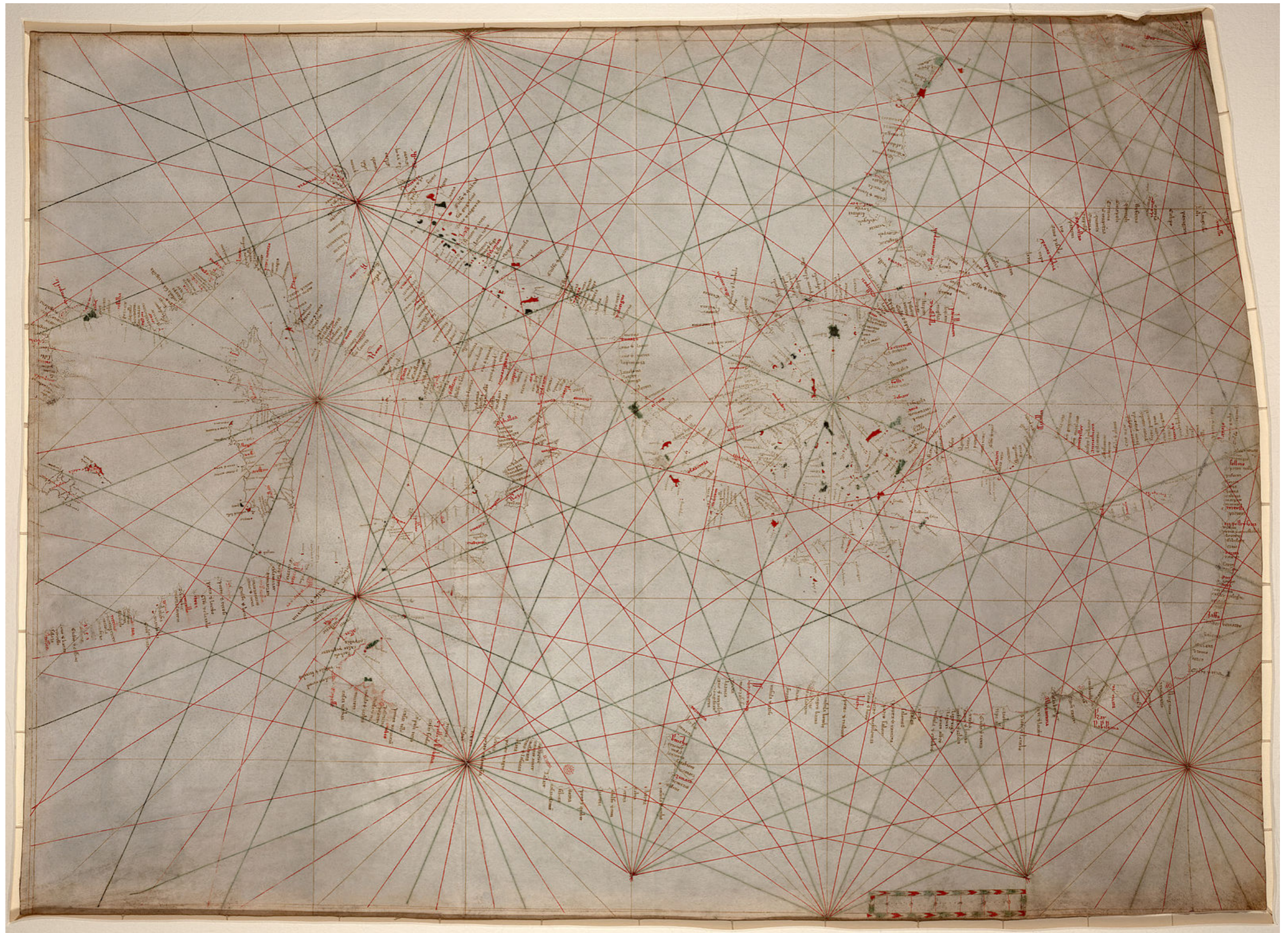
Readers are happy
at the center of the network

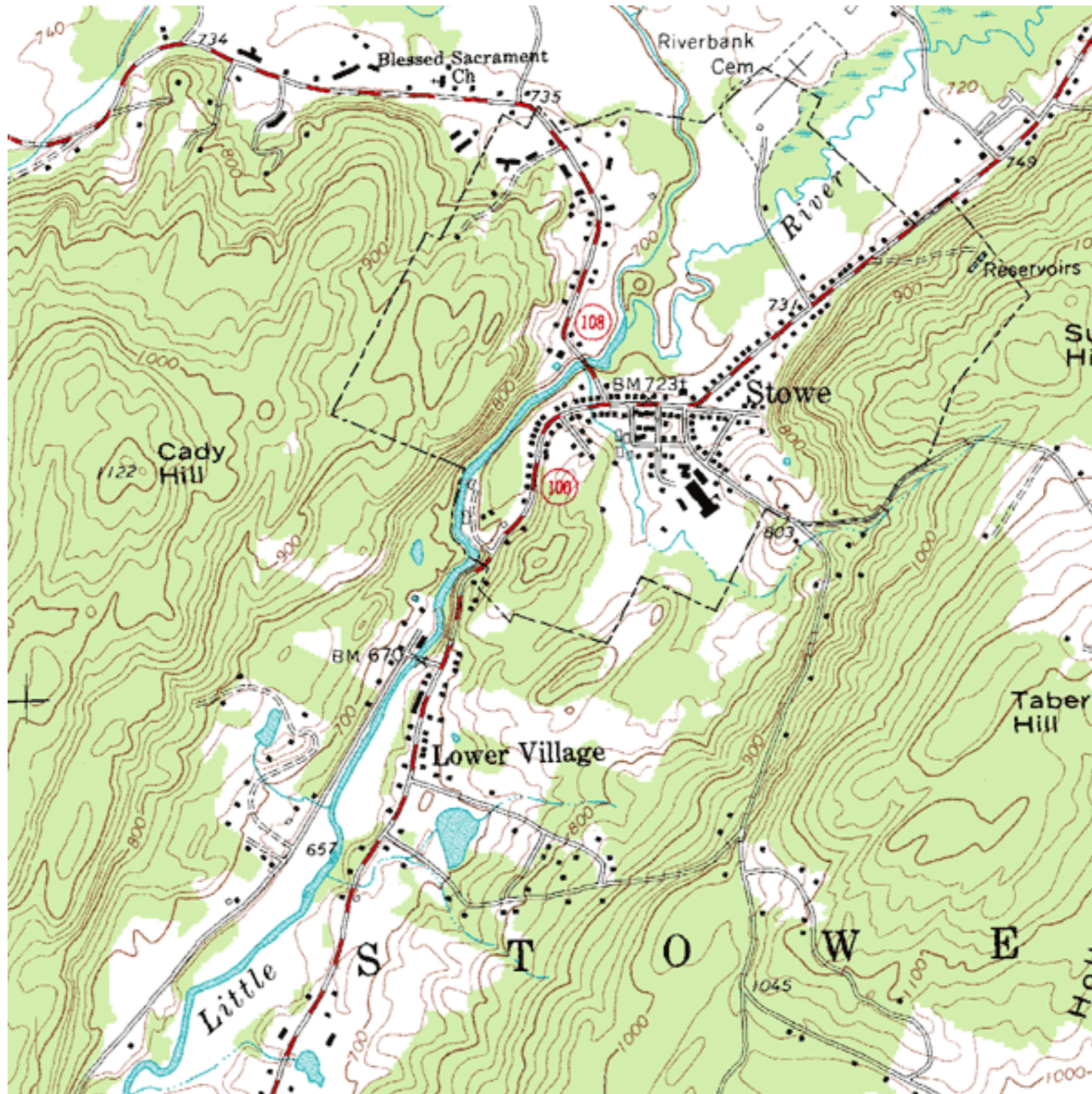
Cartography and Data Visualization



https://en.wikipedia.org/wiki/Marshall_Islands_stick_chart







Carte Figurative des pertes successives en hommes de l'Armée Française dans la campagne de Russie 1812-1813.

Dressée par M. Minard, Inspecteur Général des Ponts et Chaussées en retraite. Paris, le 20 Novembre 1869.

Les nombres d'hommes présents sont représentés par les larges des zones colorées à raison d'un millimètre pour dix mille hommes; ils sont de plus écrits en travers des zones. Le rouge désigne les hommes qui ont été en Russie, le noir ceux qui en sont sortis. Les renseignements qui ont servi à dresser la carte ont été puisés dans les ouvrages de M. M. Chiers, de Ségur, de Fezensac, de Chambray et le journal inédit de Jacob, pharmacien de l'Armée depuis le 28 Octobre.

Pour mieux faire juger à l'œil la diminution de l'armée, j'ai supposé que les corps du Prince Jérôme et du Maréchal Davoust qui avaient été détachés sur Minsk et Mohilow et ont rejoint vers Orscha et Witebsk, avaient toujours marché avec l'armée.

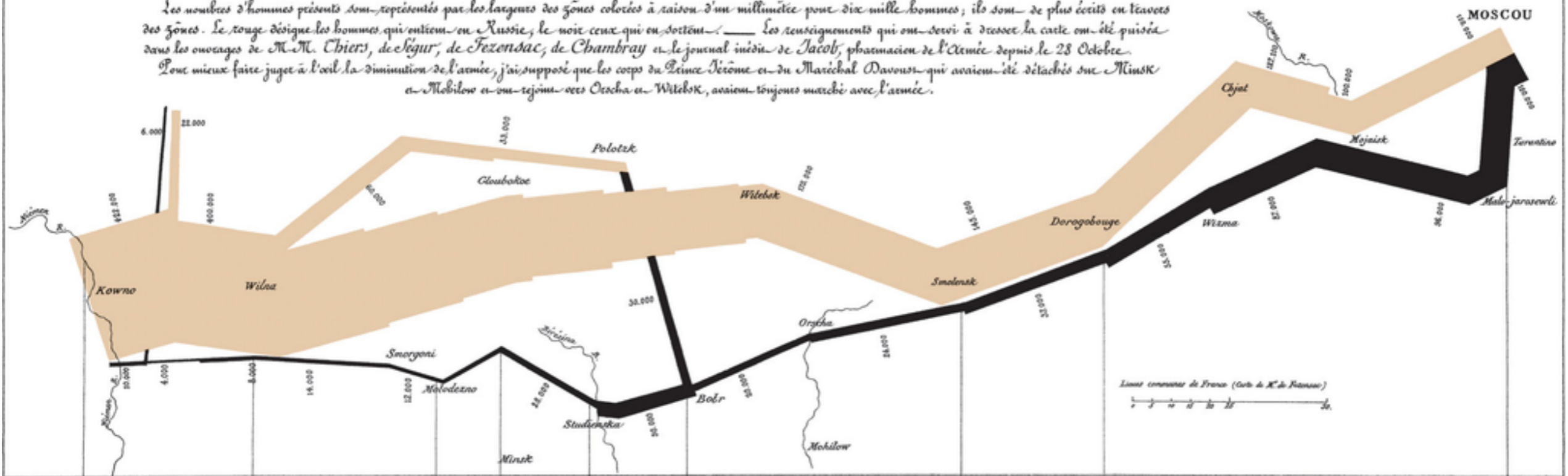
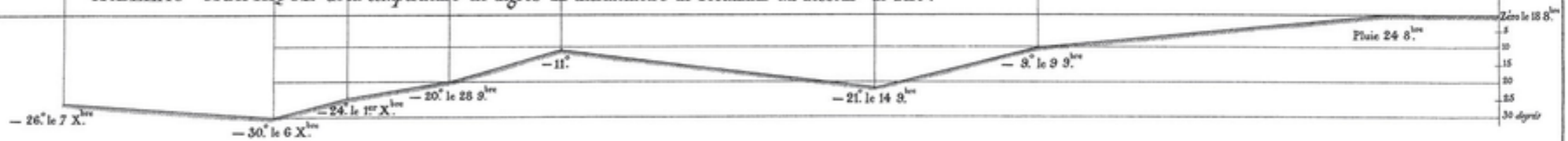


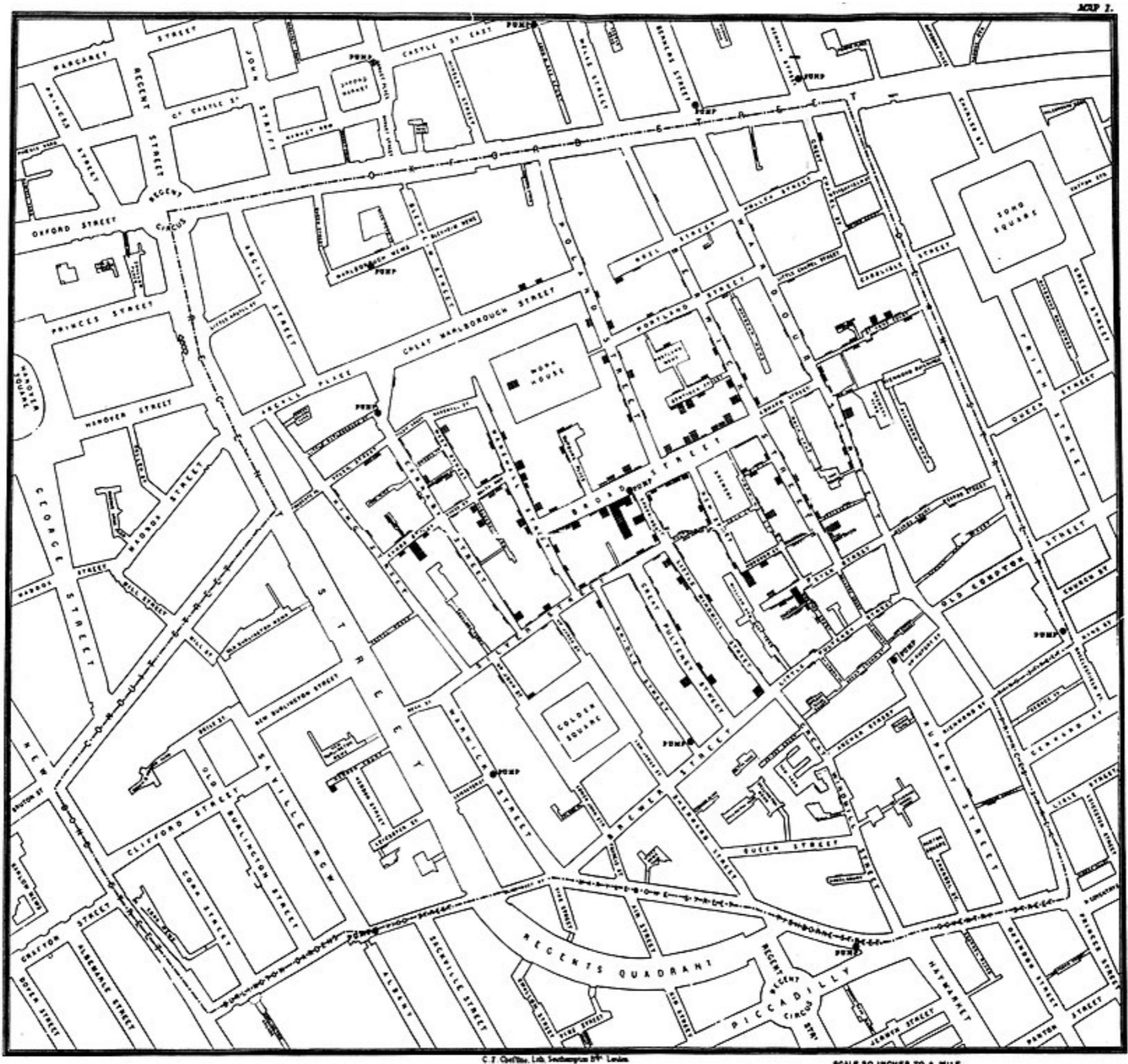
TABLEAU GRAPHIQUE de la température en degrés du thermomètre de Réaumur au dessous de zéro.

Les Cosaques passent au galop le Niémen gelé.



Anal. par Regnier, t. Par. J^o Marie St O^o à Paris.

Imp. Lit. Regnier et Desobles.



C. J. Ogilby, Lib. Southampton St. London

SCALE 20 INCHES TO A MILE.

<https://en.wikipedia.org/wiki/File:Snow-cholera-map-1.jpg>

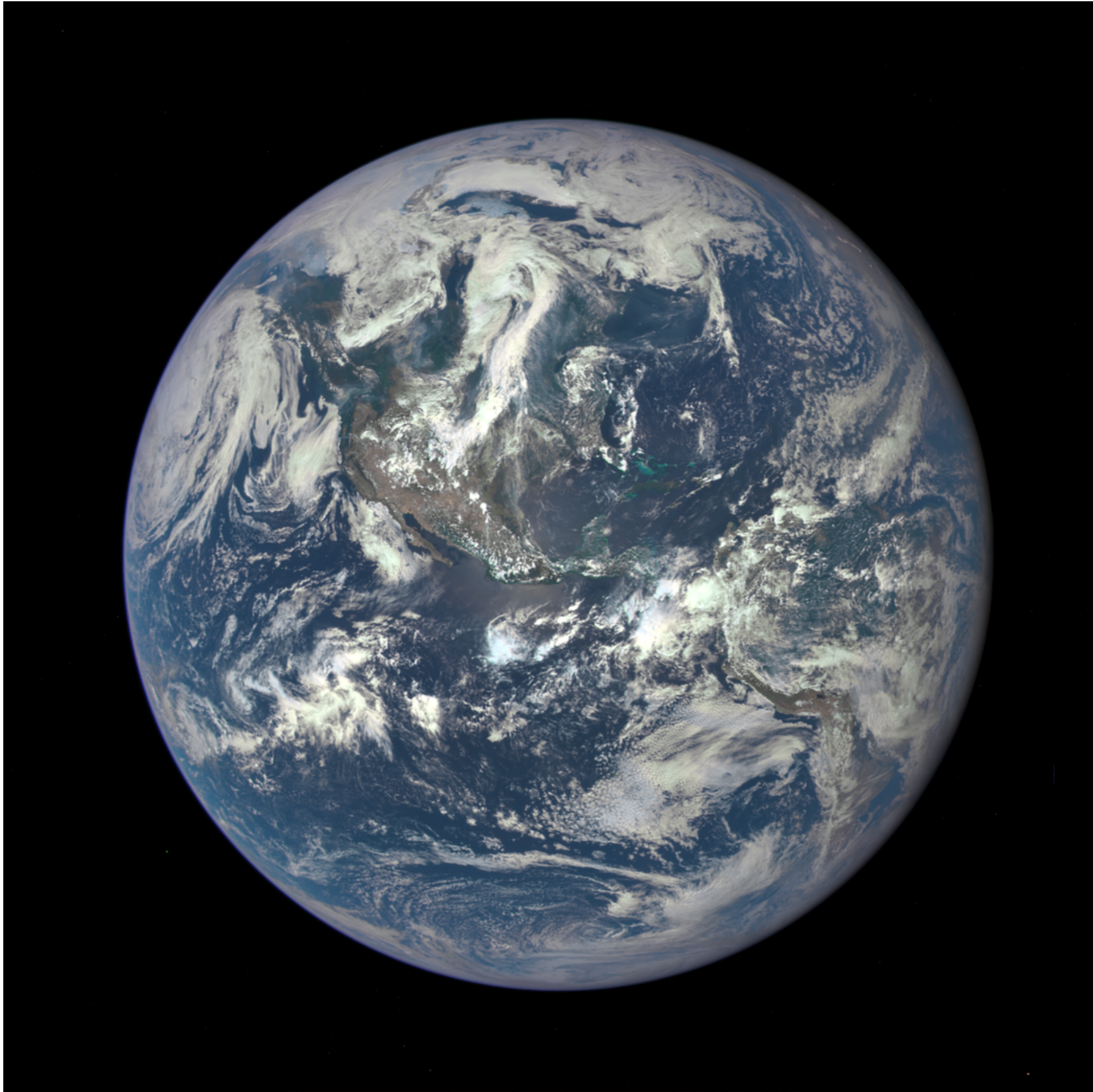


https://it.wikipedia.org/wiki/Harry_Beck#/media/File:Beckmap1.jpg

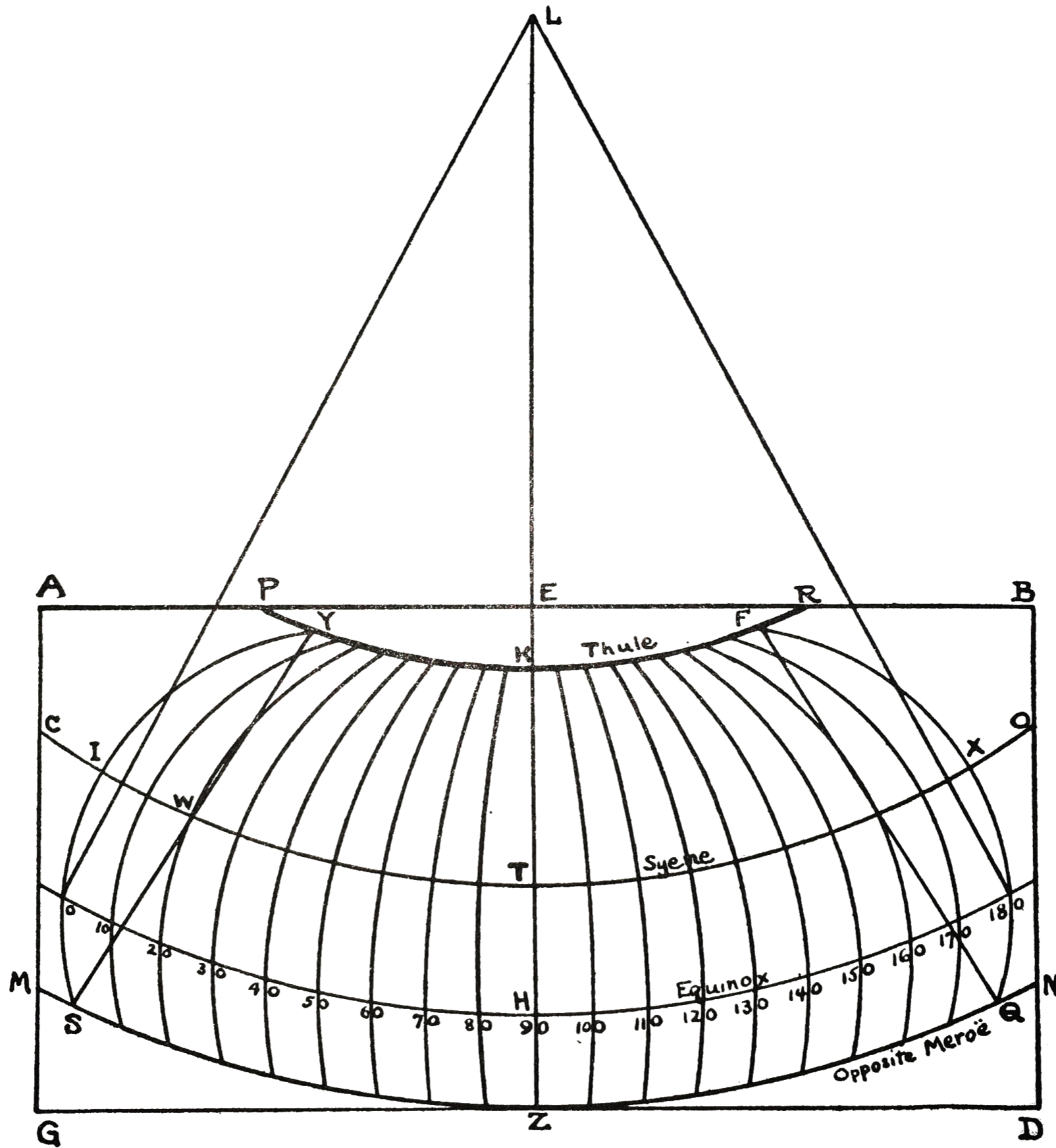


Maps and Visualization
are framed on a flat surface

Projecting on Continuous Surface



<https://www.nasa.gov/image-feature/nasa-captures-epic-earth-image>



Ptolemy, Claudius. 1932. "Geography of Claudius Ptolemy." New York: New York Public Library.



Physical Map of the World, February 2016

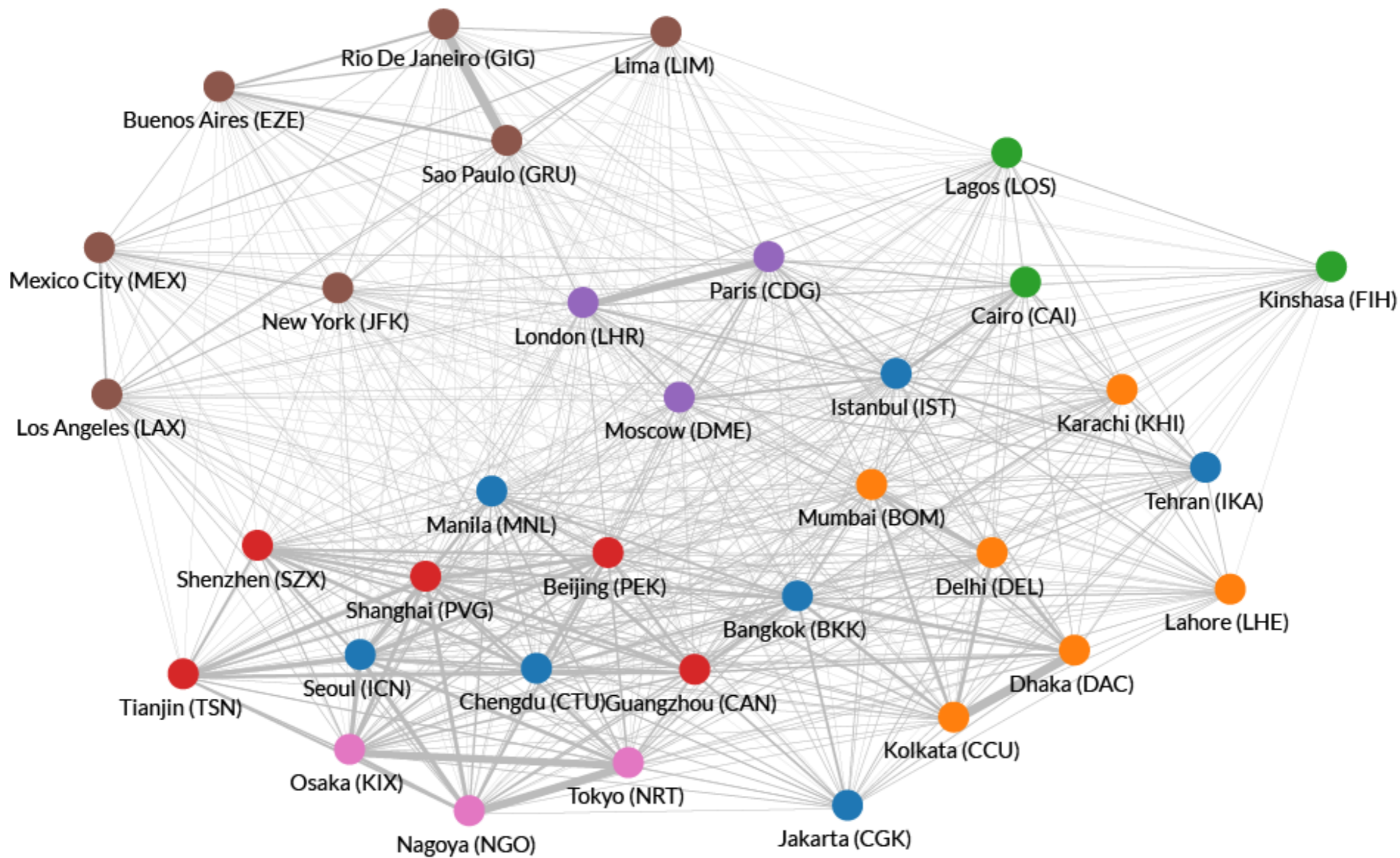
AUSTRALIA Independent state
Borneo Dependency or area of special sovereignty
Island / Island group
★ Capital

Scale 1:12,000,000
Millions of miles
Created with ESRI ArcGIS 10.2.2

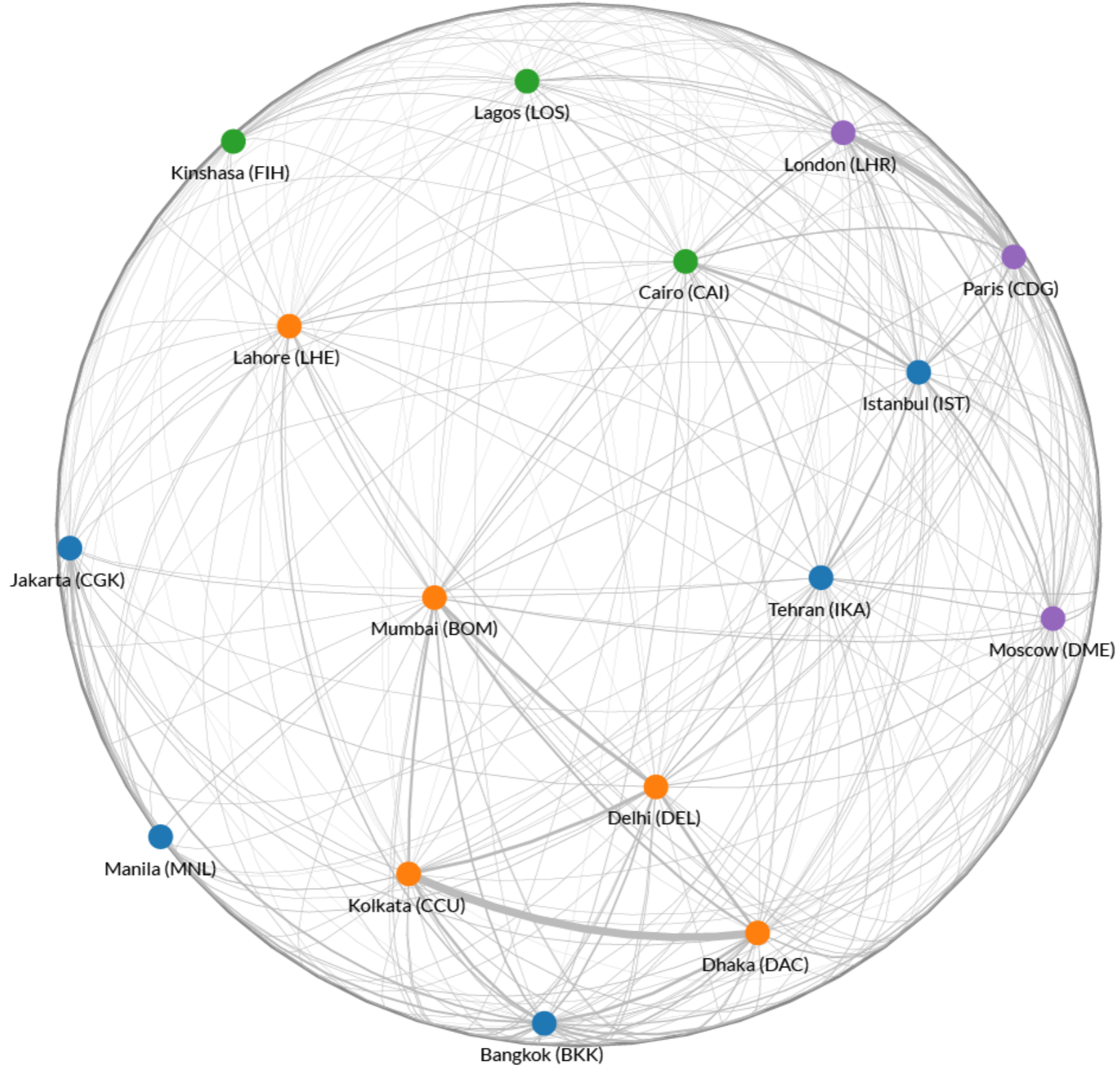


February 2016

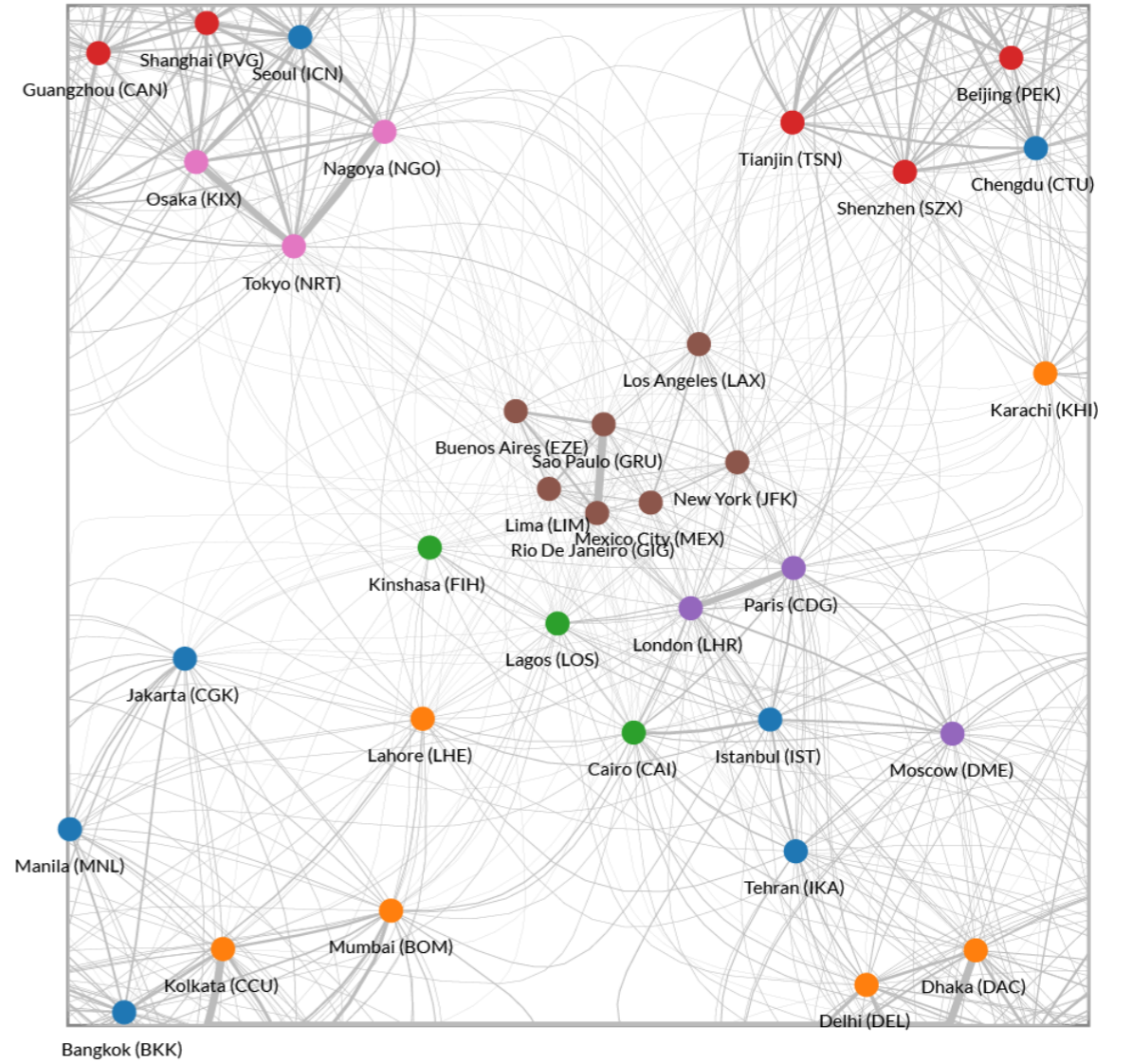
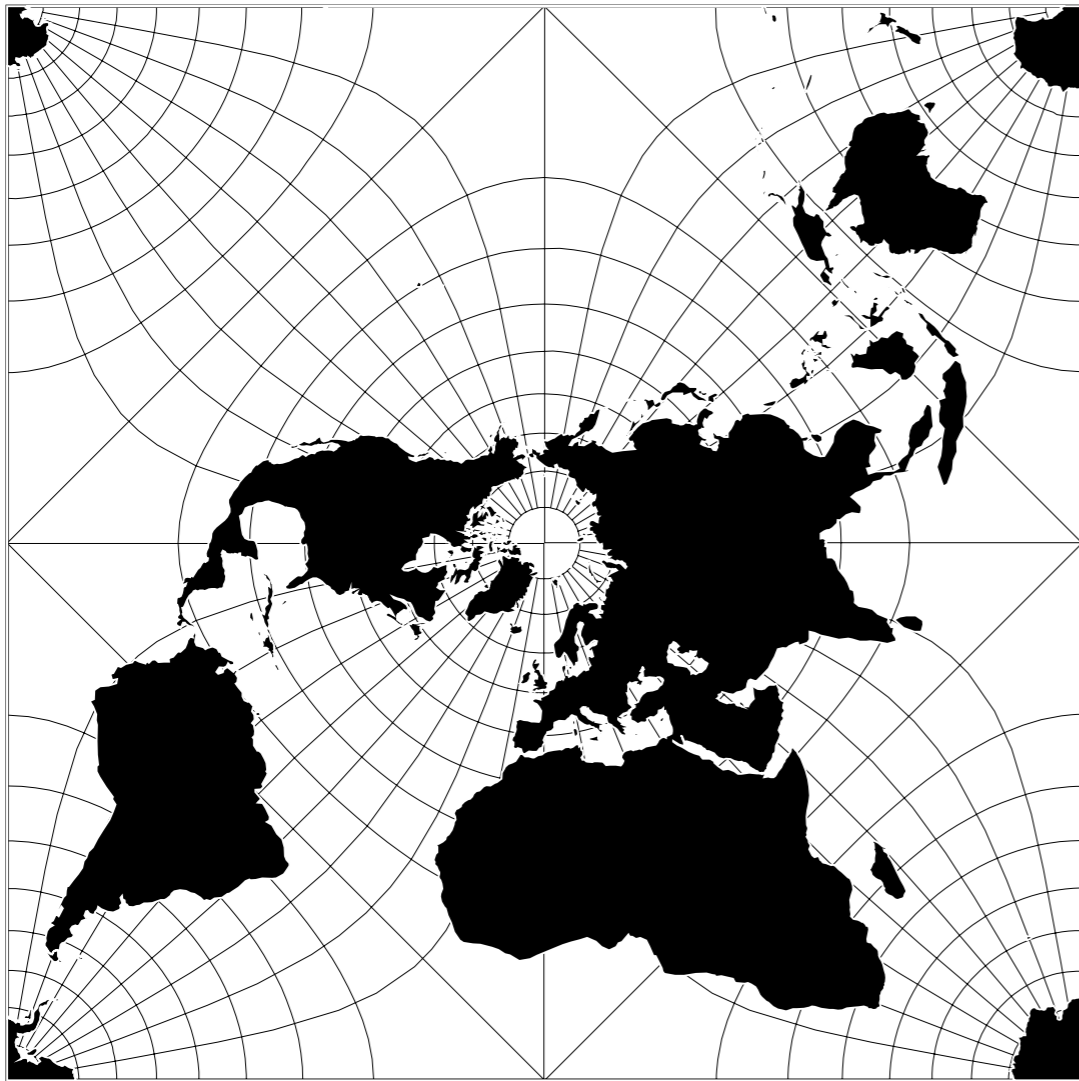
**Applying Globe Projection
to Network Visualizations,
the Case Study**



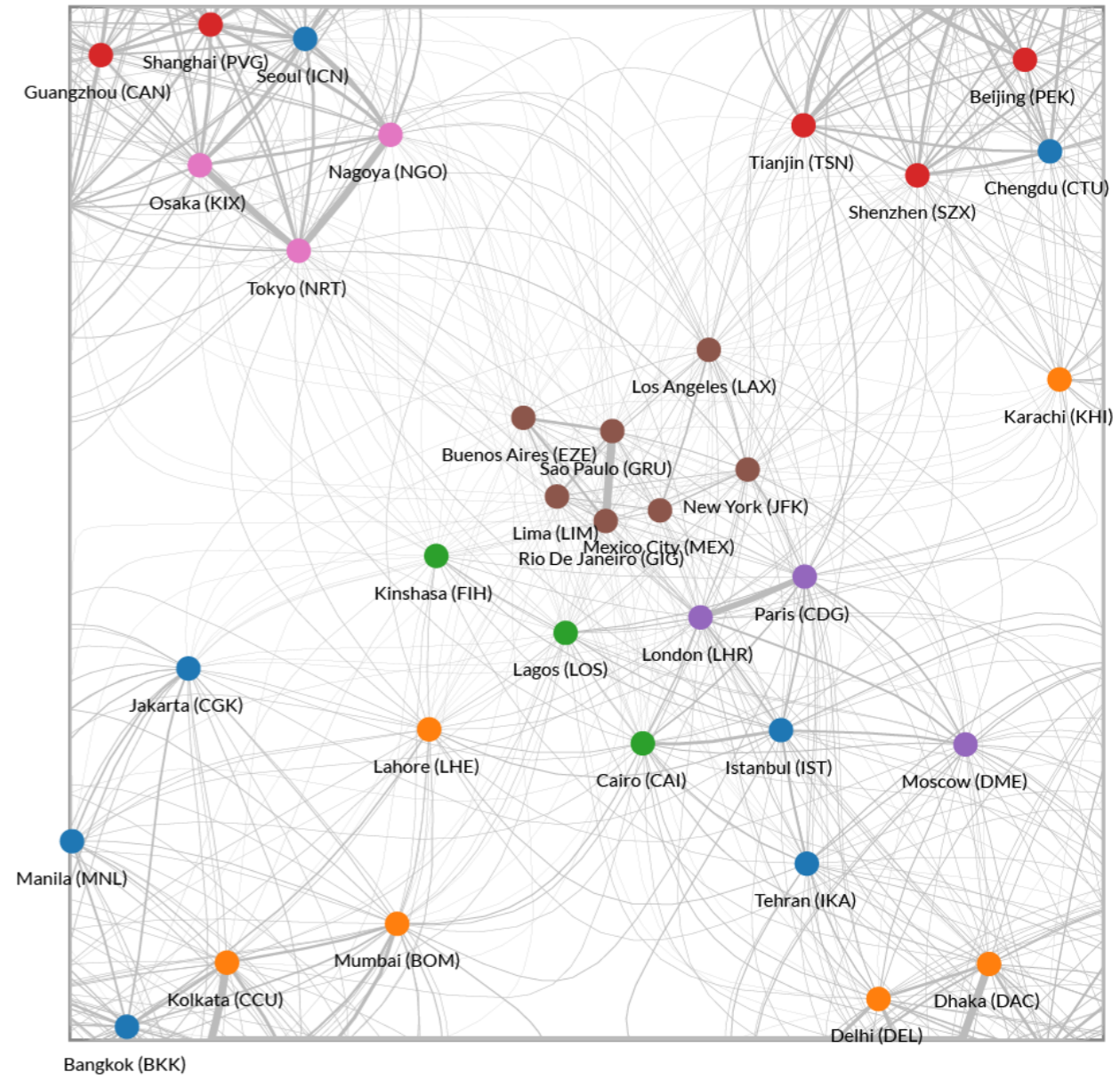
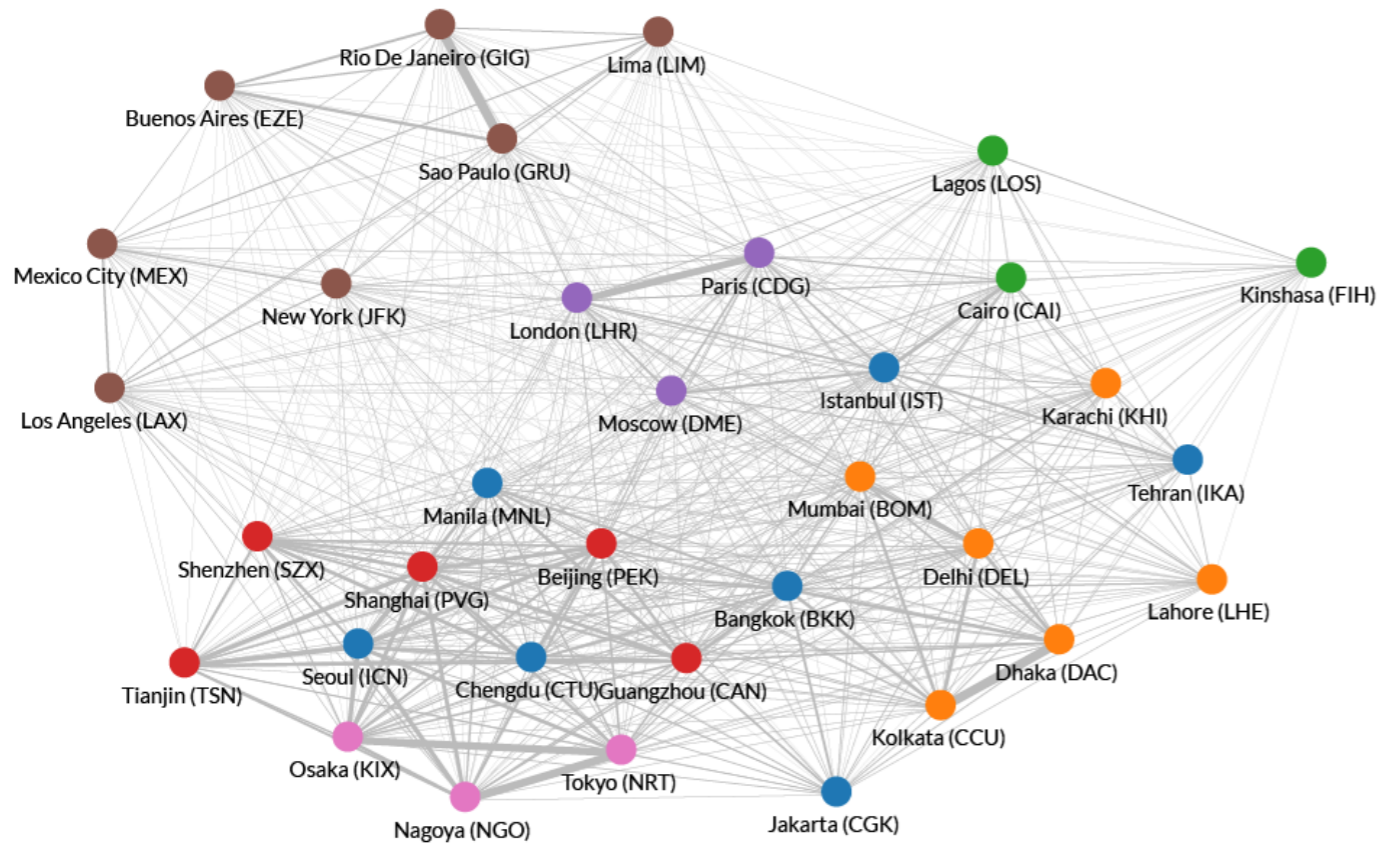
Travel distance between cities with more than 10 million inhabitants



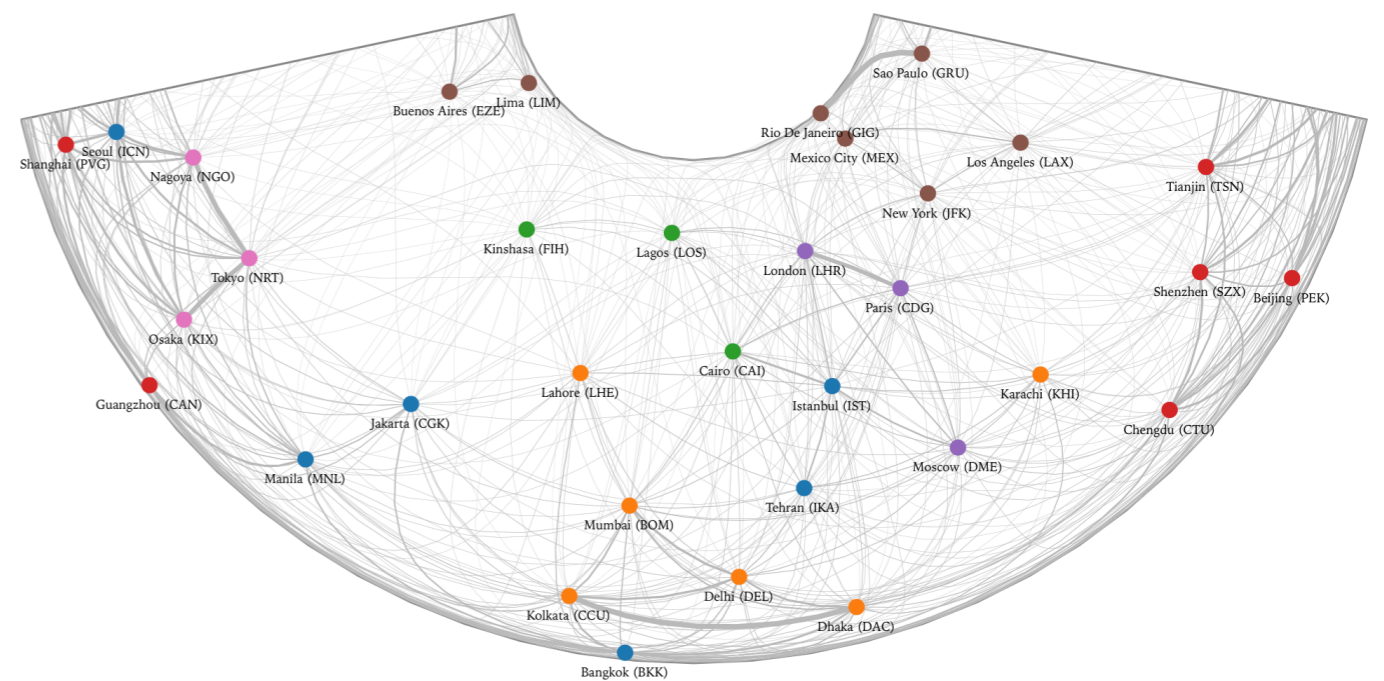
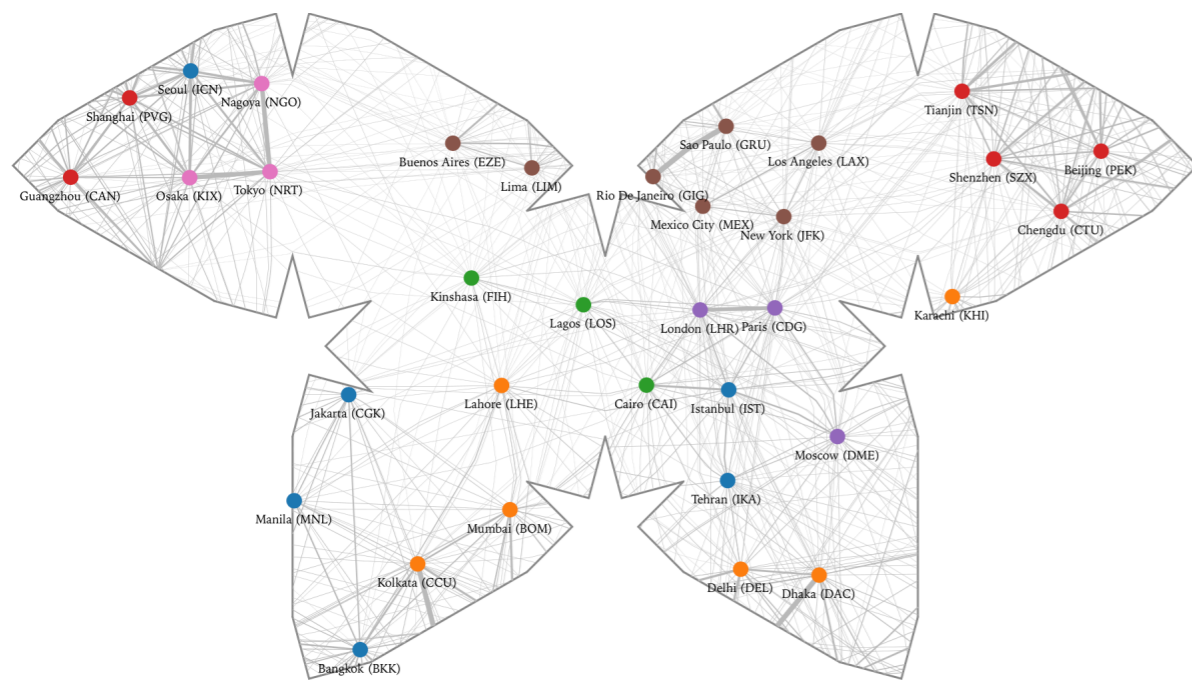
A Spherical Mapping of the Network



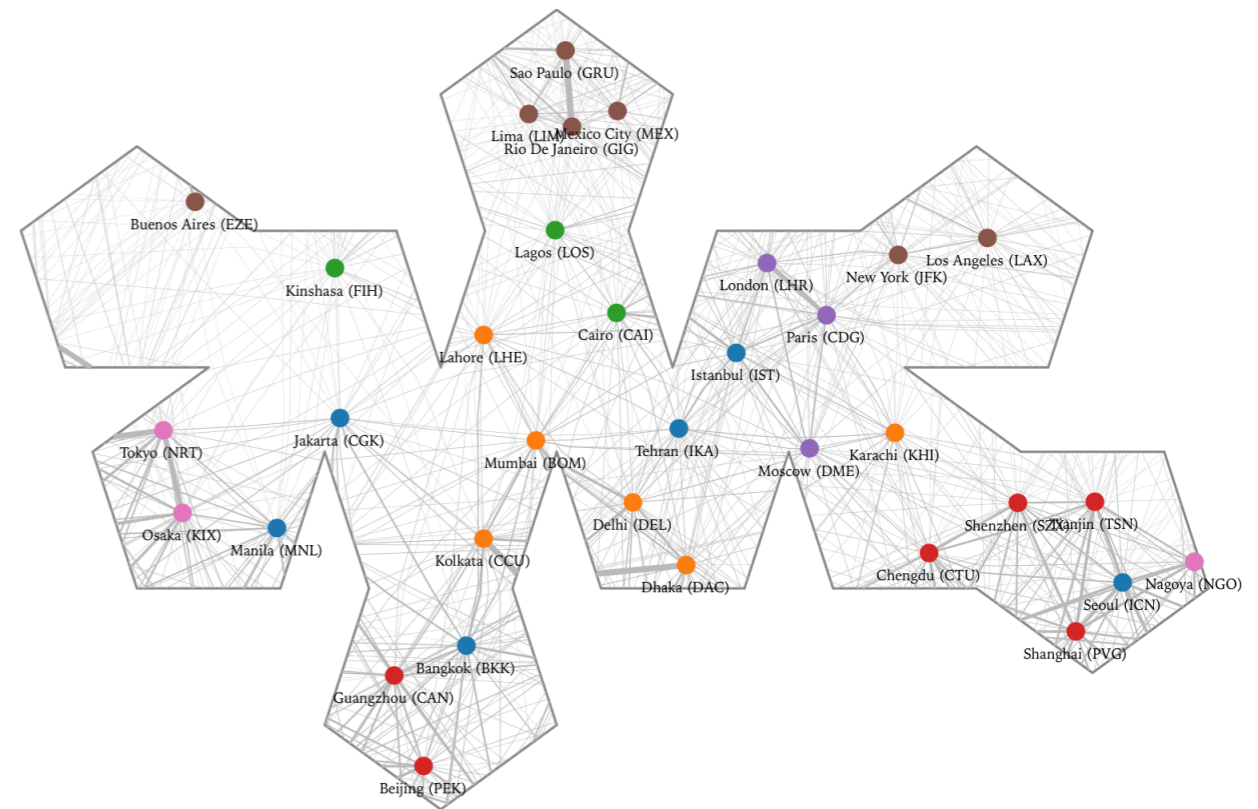
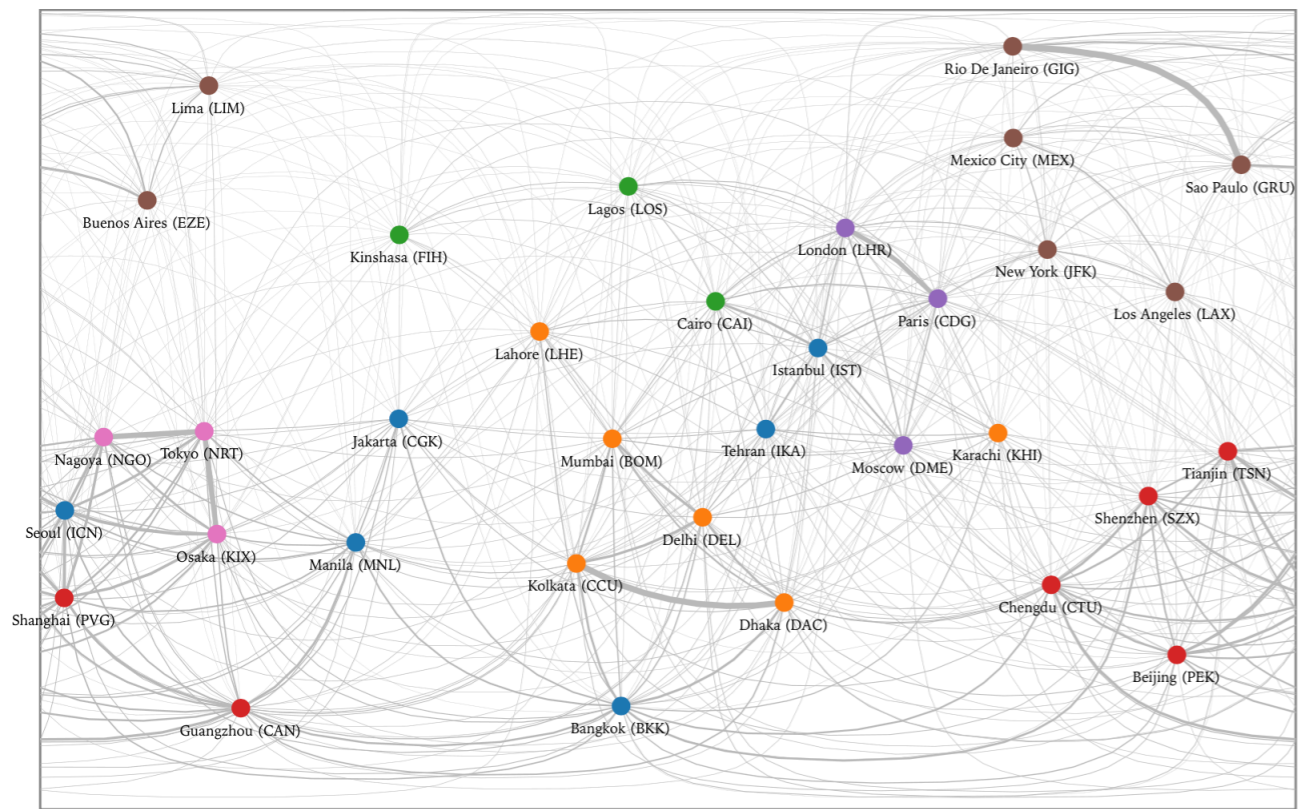
Charles Peirce's Quincuncial



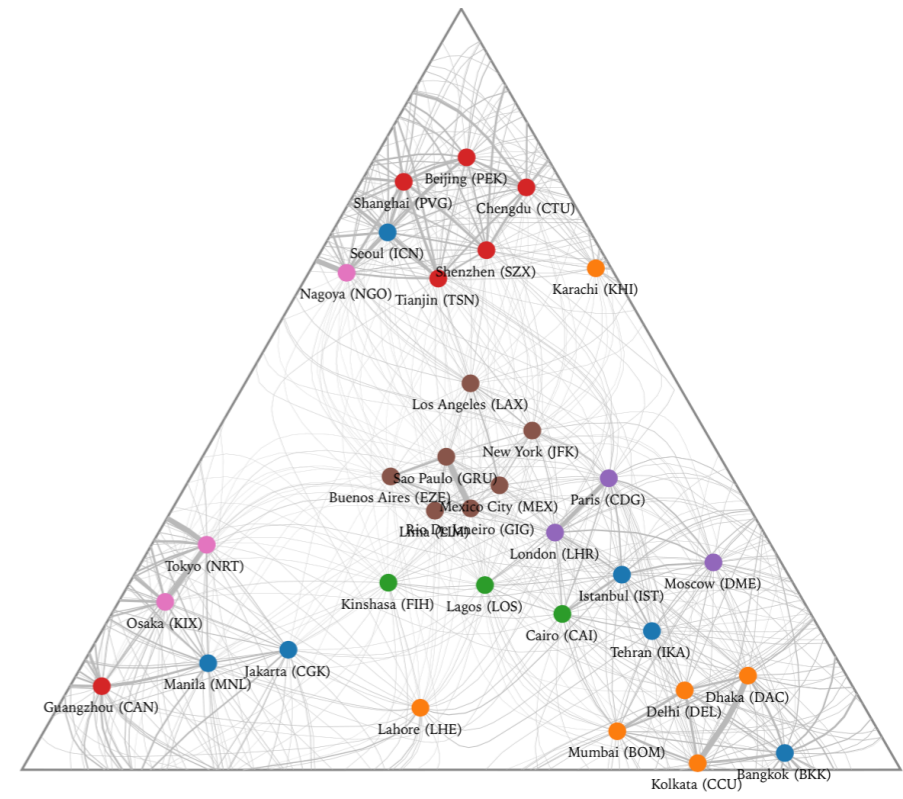
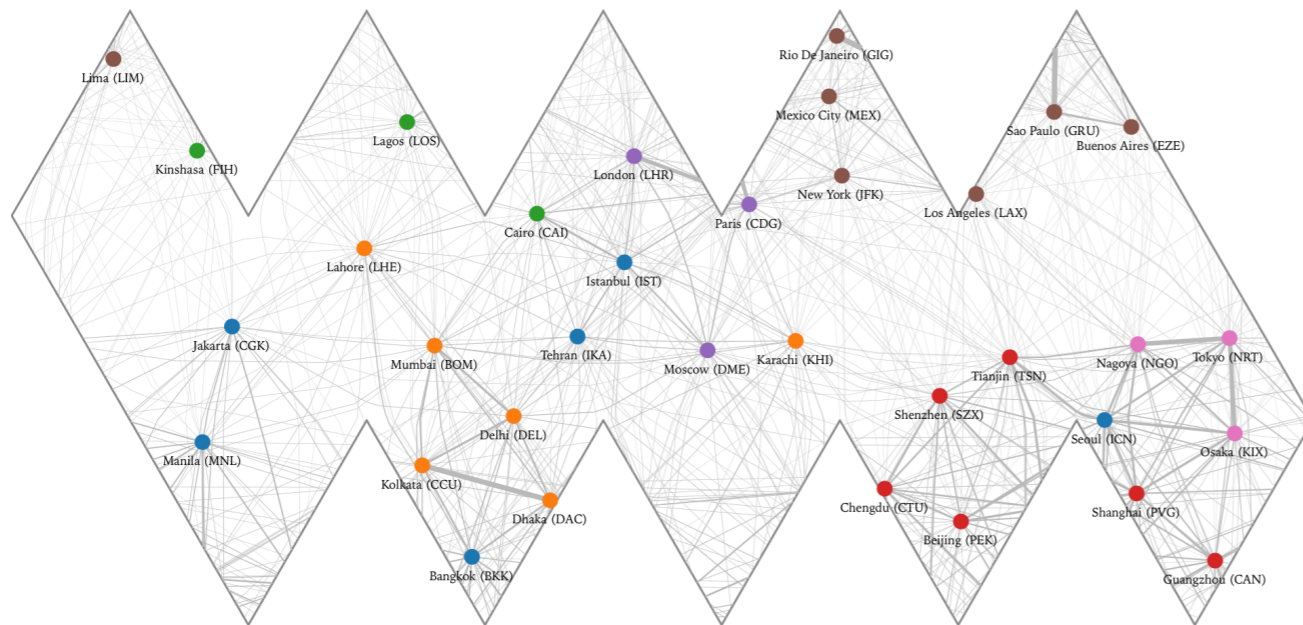
Charles Peirce's Quincuncial



Butterfly (Watterman) and conic equal-area



Cylindrical stereographic and dodecahedral



Icosahedral and Lee's tetrahedral

Observable

Conclusion