

# Historical Network Analysis

Christian Raffensperger

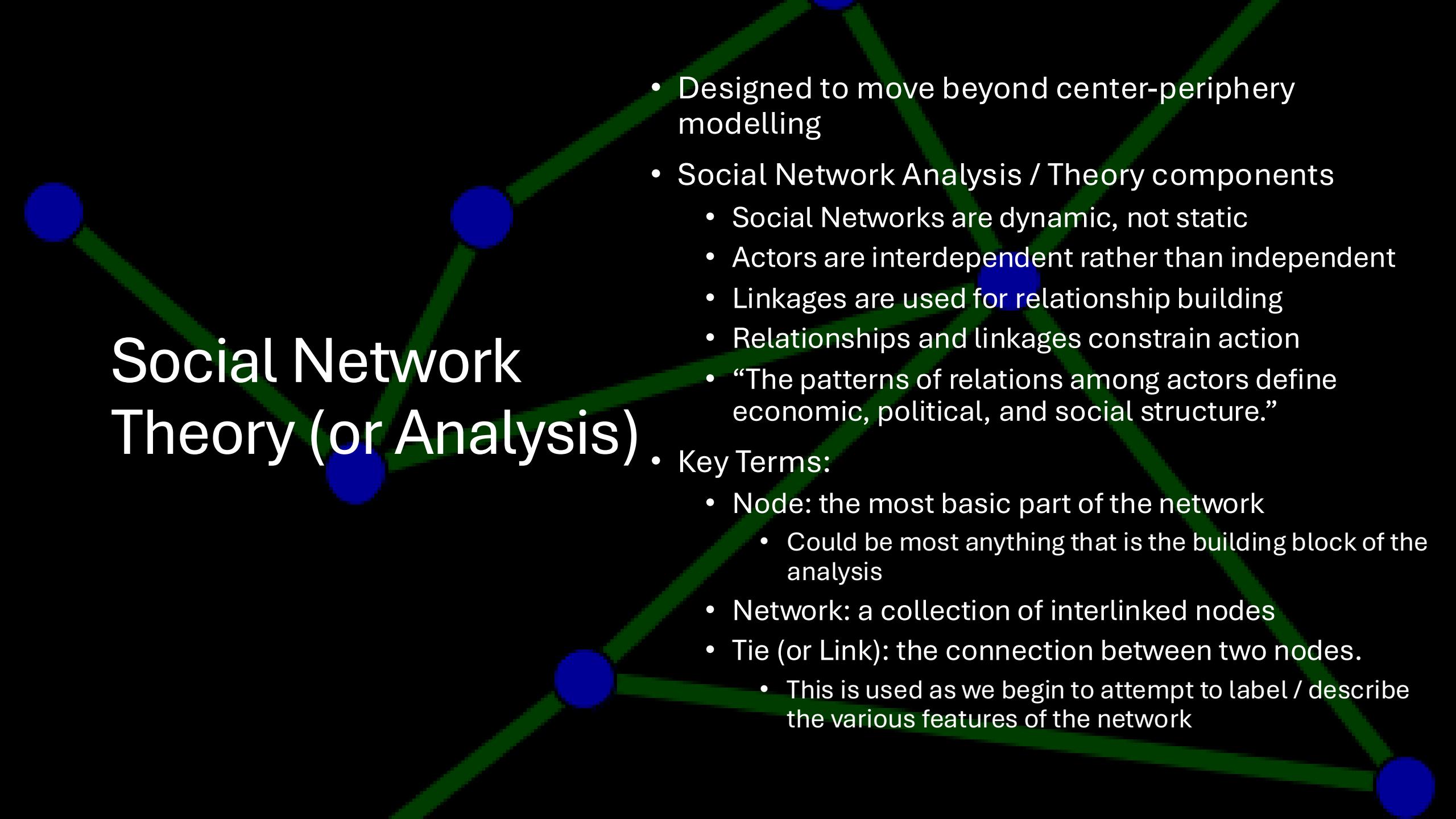
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Wittenberg University

# Why Networks?

- “Networks help to demonstrate how things fit together: people, places, events and ideas.”
  - John Hinks, “Beyond Metaphor: A Personal View of Historical Networks in the Book Trade,” 1.
- “Taking a network perspective means that the individual entities of research interest, such as technological innovations, objects, individual humans or communities, archaeological sites, and islands, are never studied in isolation. Instead, it is assumed that these entities are engaged in relationships that are fundamental to understanding their behaviour in the past.”
  - *The Connected Past*, 7.





# Social Network Theory (or Analysis)

- Designed to move beyond center-periphery modelling
- Social Network Analysis / Theory components
  - Social Networks are dynamic, not static
  - Actors are interdependent rather than independent
  - Linkages are used for relationship building
  - Relationships and linkages constrain action
  - “The patterns of relations among actors define economic, political, and social structure.”
- Key Terms:
  - Node: the most basic part of the network
    - Could be most anything that is the building block of the analysis
  - Network: a collection of interlinked nodes
  - Tie (or Link): the connection between two nodes.
    - This is used as we begin to attempt to label / describe the various features of the network

# “Robust Action and the Rise of the Medici”

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- The authors “coded a core network data set, which consists of information on” 9 types of relations between families
  - Marriage, Economic relations (4 types), Political relations (2 types), Friendship (2 types)
  - “Social network ties were constituents of, as well as backdrops to, Florentine political party formation.”
- This created two blockmodel figures to depict the data
  - “The structuralist research style embedded in blockmodeling aggregates actors into structurally equivalent sets, or ‘blocks,’ in accordance with their common external ties with outsiders, rather than in accordance with dense internal relations with each other”



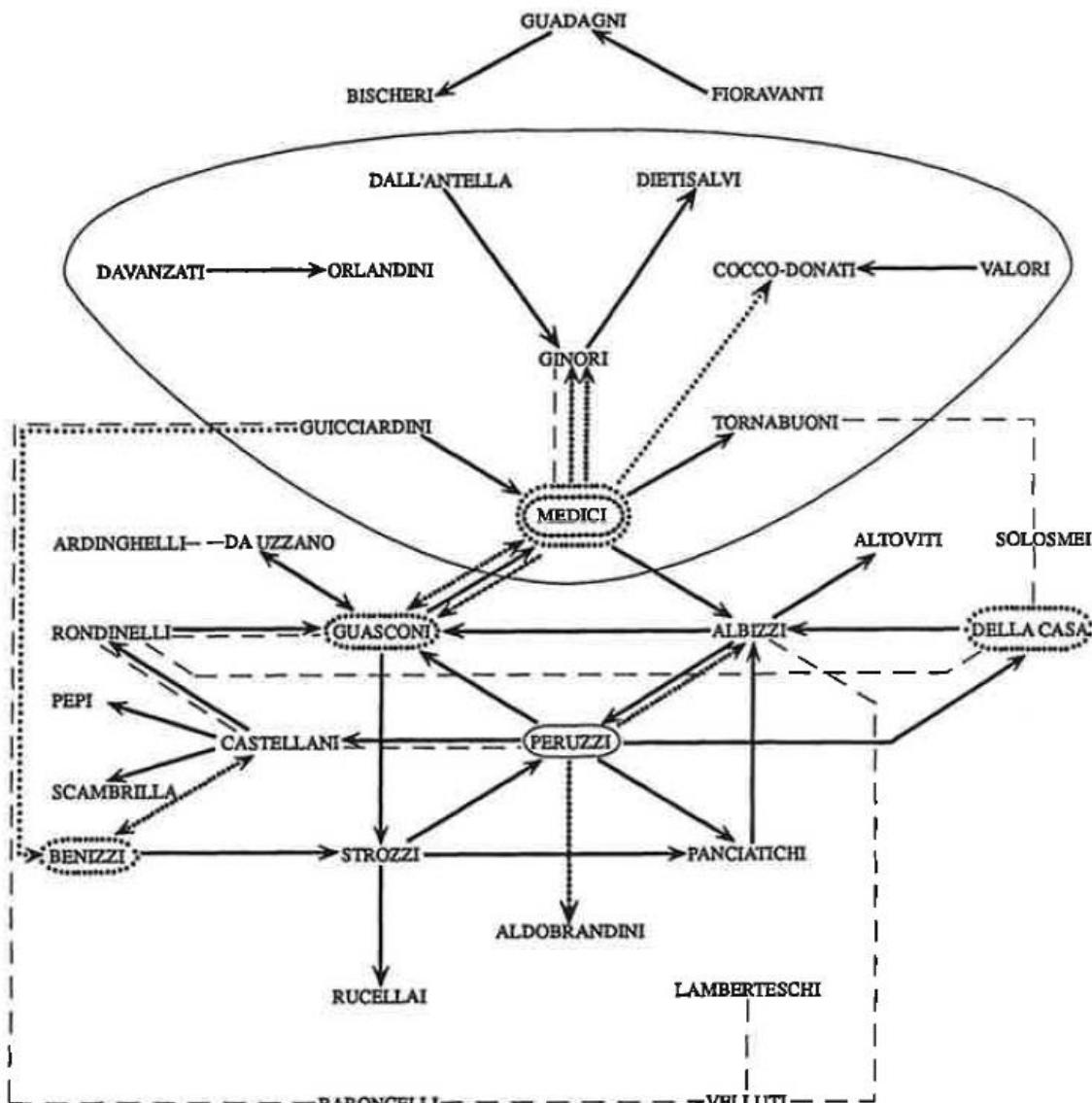


FIG. 2a.—Marriage and economic blockmodel structure (92 elite families)

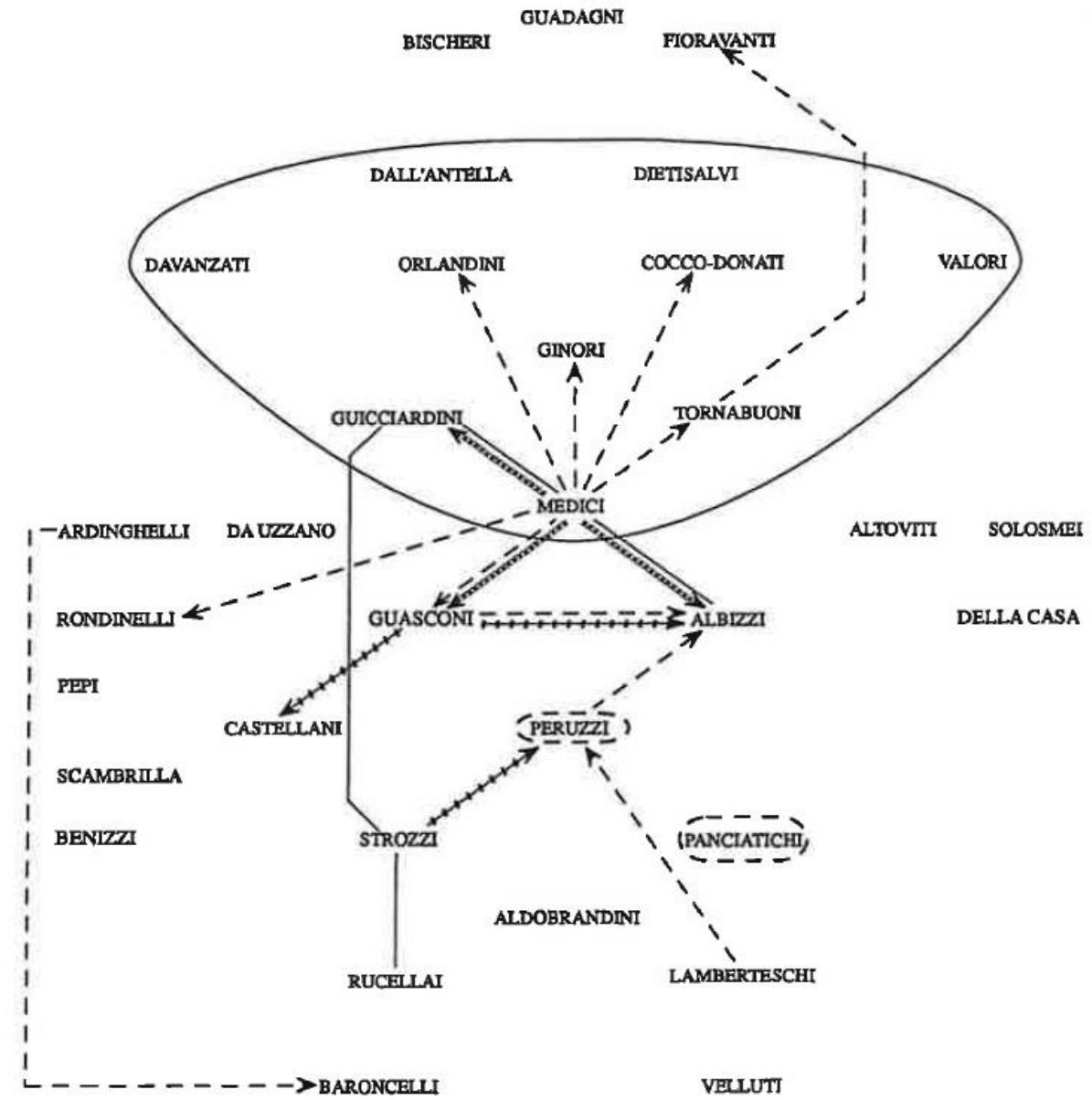
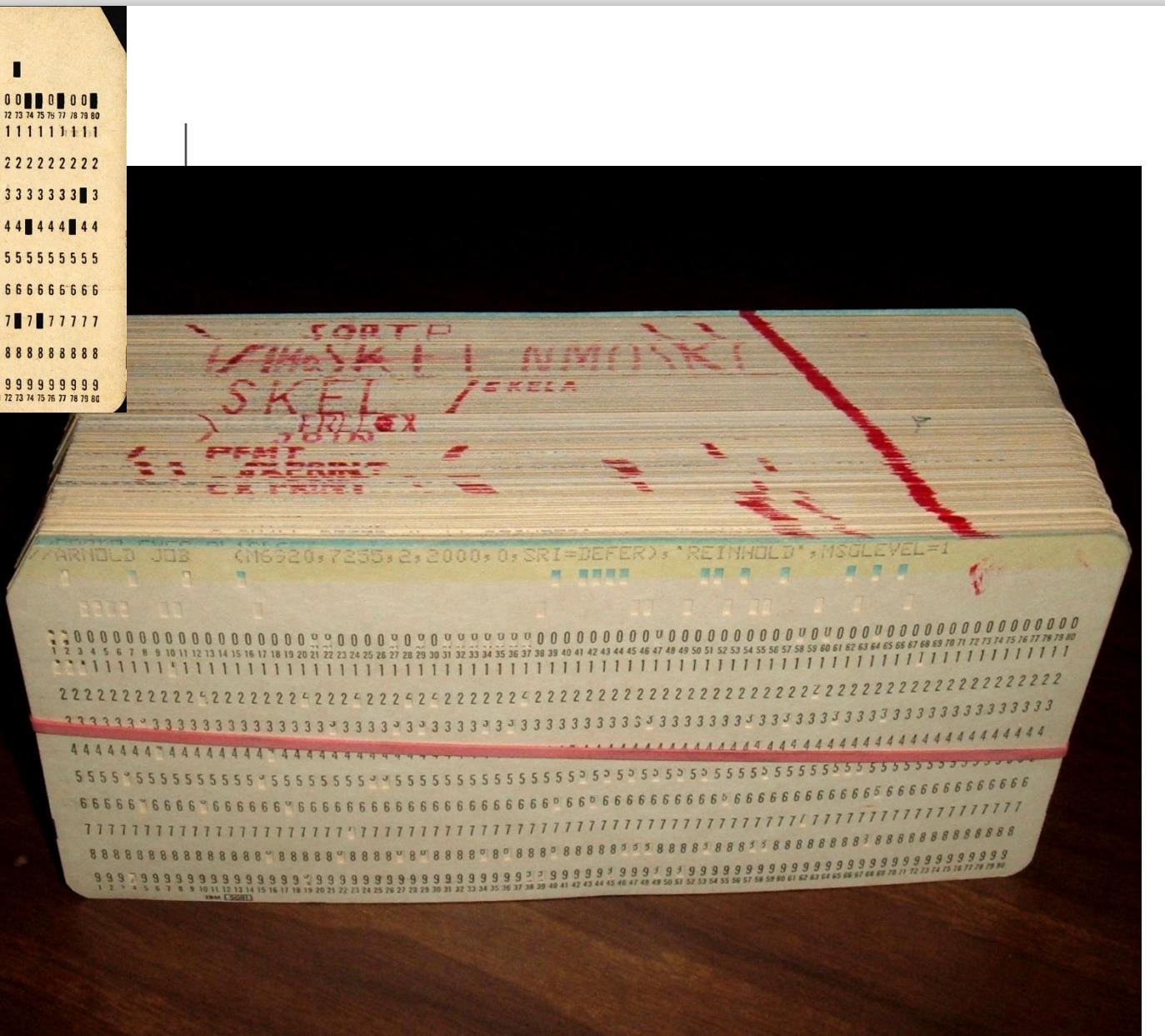
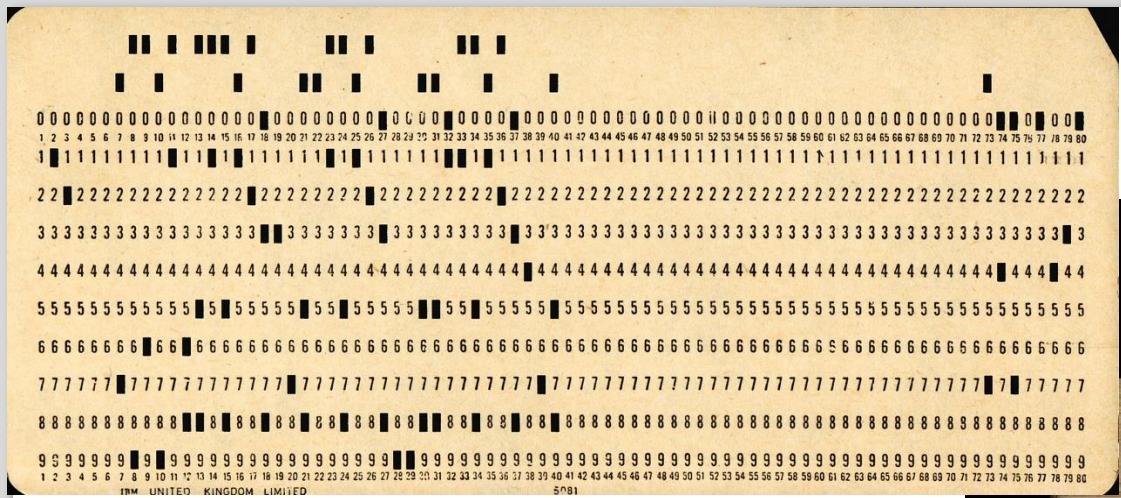


FIG. 2b.—“Political” and friendship blockmodel structure (92 elite families)



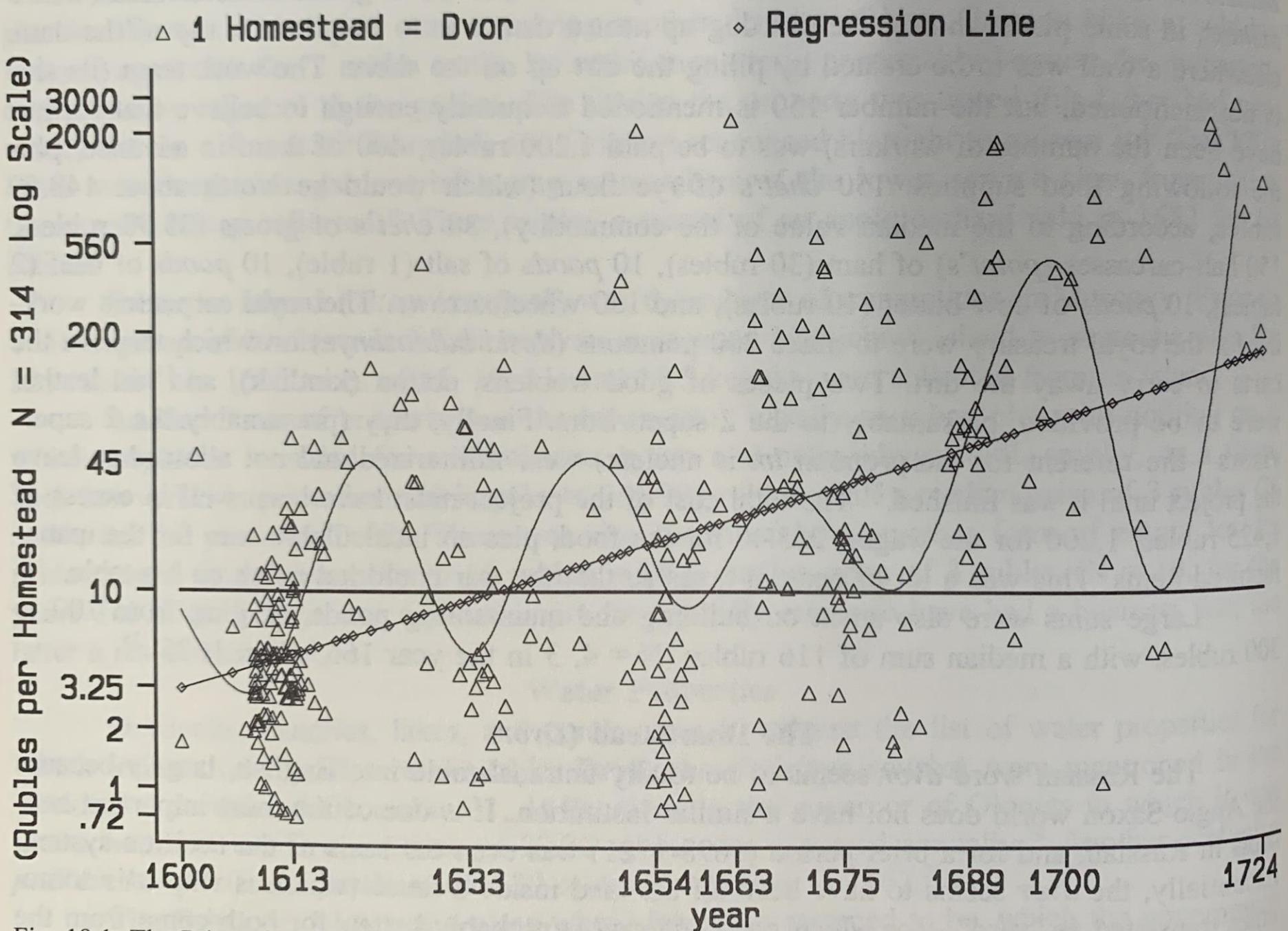


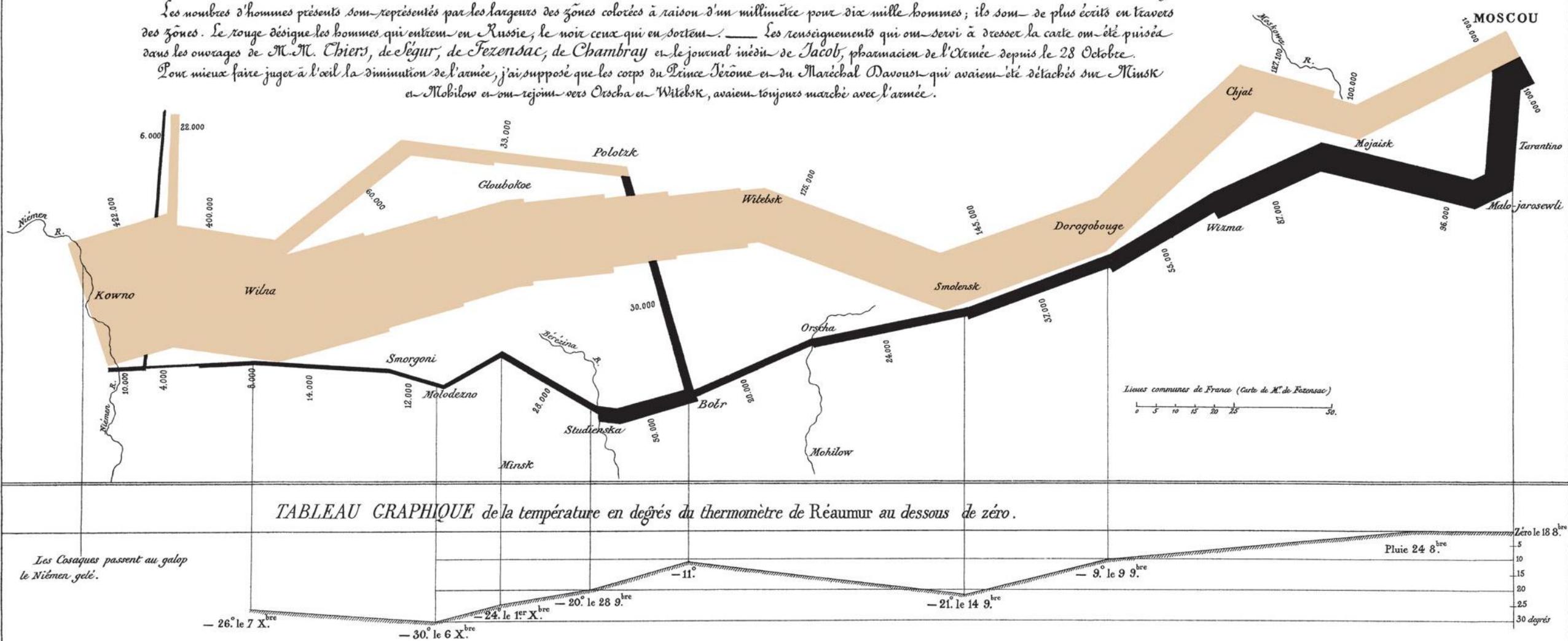
Fig. 19.1. The Price of a Homestead in Late Muscovy

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

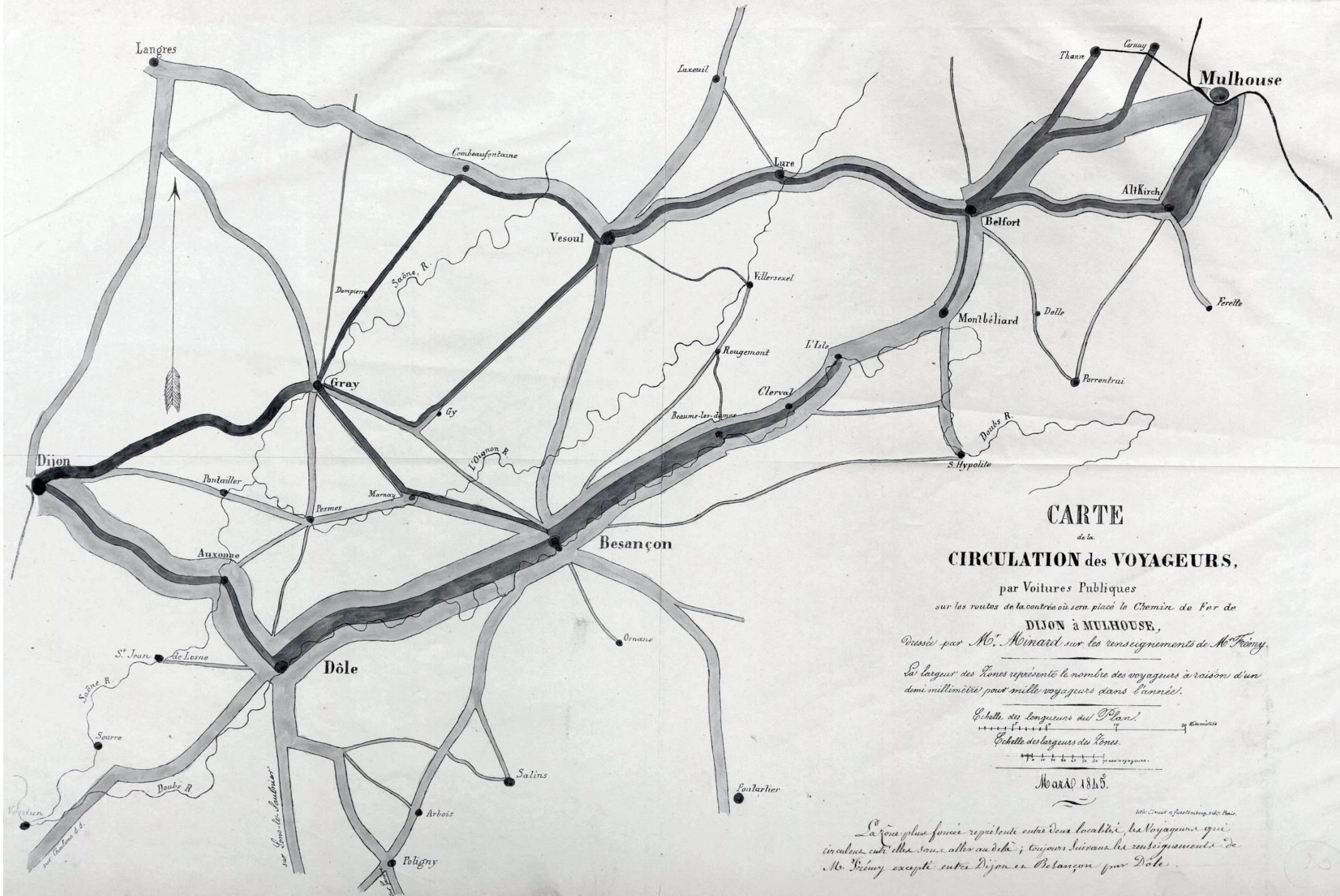
Dessinée par M. Minard, Inspecteur Général des Ponts et Chaussées en retraite  
Paris, le 20 Novembre 1869.

Les nombres d'hommes présents sont représentés par les largeurs 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 entrent en Russie, le noir ceux qui en sortent. — Les renseignements qui ont servi à dresser la carte ont été puisés dans les ouvrages de M.M. Chiers, de Séguir, 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 Davout qui avaient été détachés sur Minsk en Mohilow et se rejoignaient vers Orscha en Wilebsk, avaient toujours marché avec l'armée.



# Minard's map of Napoleon's March to Moscow



# *L'histoire croisée*

- “L’histoire croisée is a relational, interactive, and process-oriented approach that examines intersections, because objects and practices will change as a consequence of cultural contacts.”
- “Consequently, ‘the objects of research should not only be investigated in their relation to one another, but also through each other in terms of relations, interactions, and circulation’.”
- Werner and Zimmerman, “Penser l’histoire croisée: entre empirie et réflexivité,” *Annales. Histoire, Science Sociales* 57 (2003): 7-34.
  - See also “Beyond Comparison: Histoire croisée and the Challenge of Reflexivity,” *History and Theory: Studies in the Philosophy of History*, 45.1 (2006): 30-50.

Elina Gertsman and Barbara H. Rosenwein

## THE MIDDLE AGES IN 50 OBJECTS



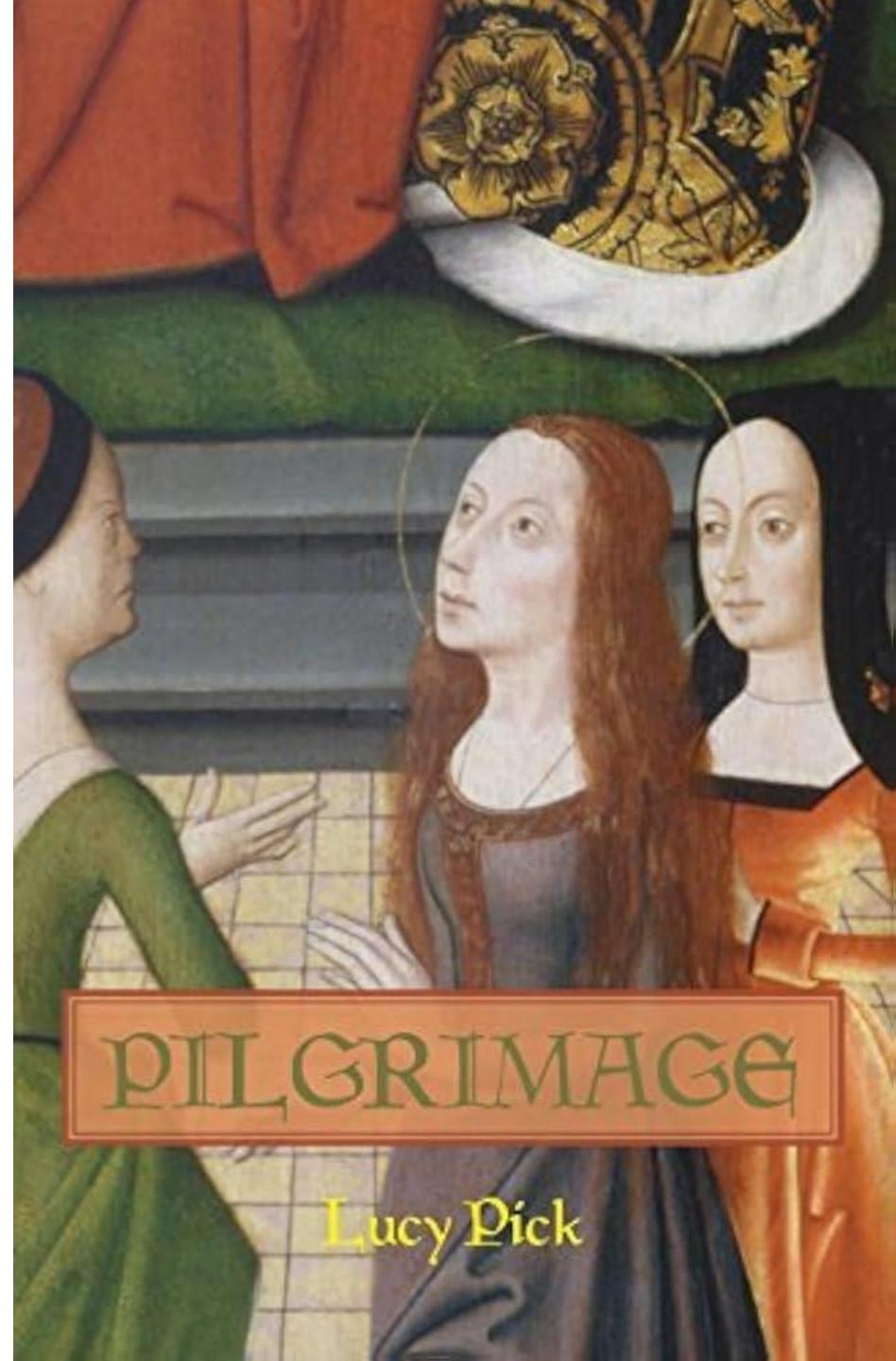


# Beryozovo Cup

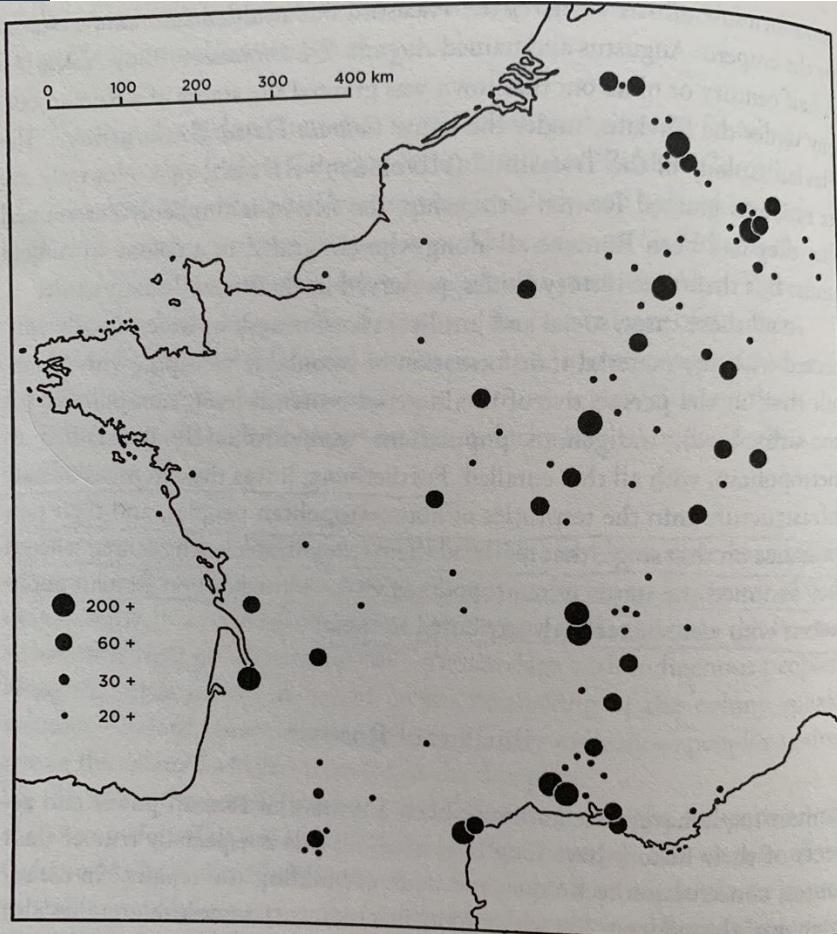
Alicia Walker, “The Beryozovo Cup: A Byzantine Object at the Crossroads of Twelfth-Century Eurasia” *The Medieval Globe* 3.2 (2017): 125-148.

# Roads as Networks

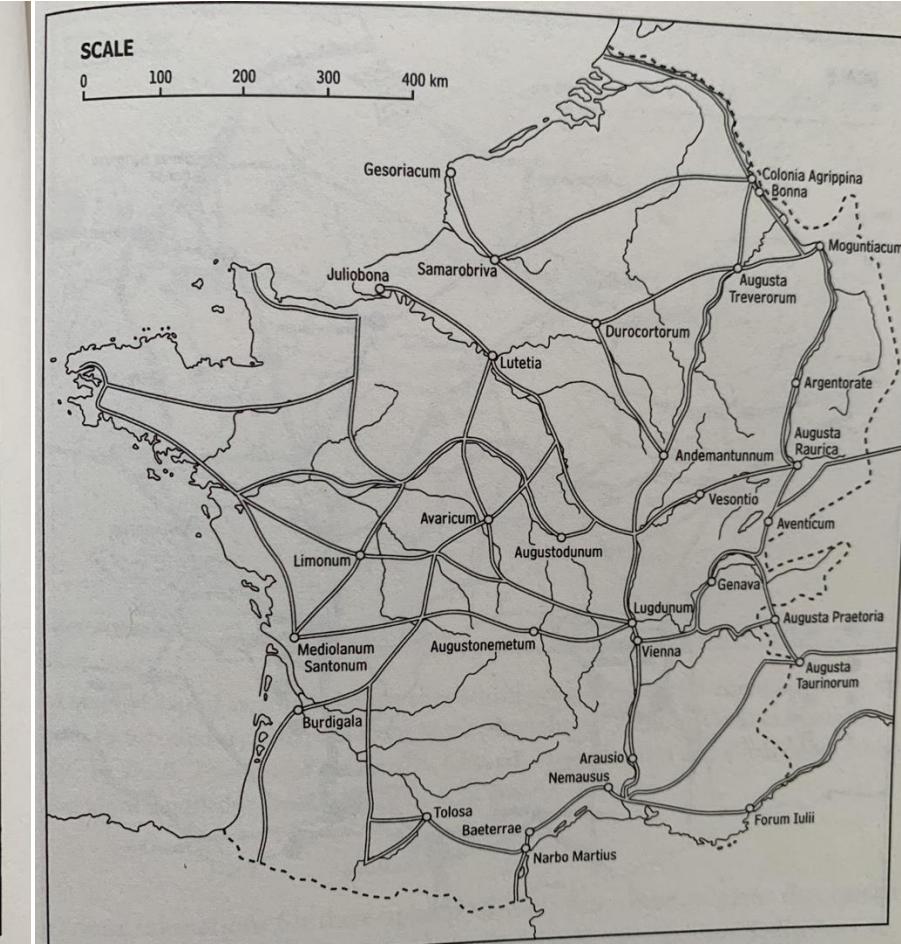
- “Roads, waterways, and other travel infrastructure are yet another interesting category of subjects for social network analysis, because they are physical and often surviving ‘hardware’ that makes visible the networks connecting people.”
- “Centuries-old pathways, Roman roads and newly created medieval trade routes were intensively used for the transportation of merchandise, merchants, funds, and workers: over land and along rivers, as well as over sea, and in volumes that according to some estimations were only surpassed after the construction of railways in the nineteenth century.”



# Woolf, *Becoming Roman*

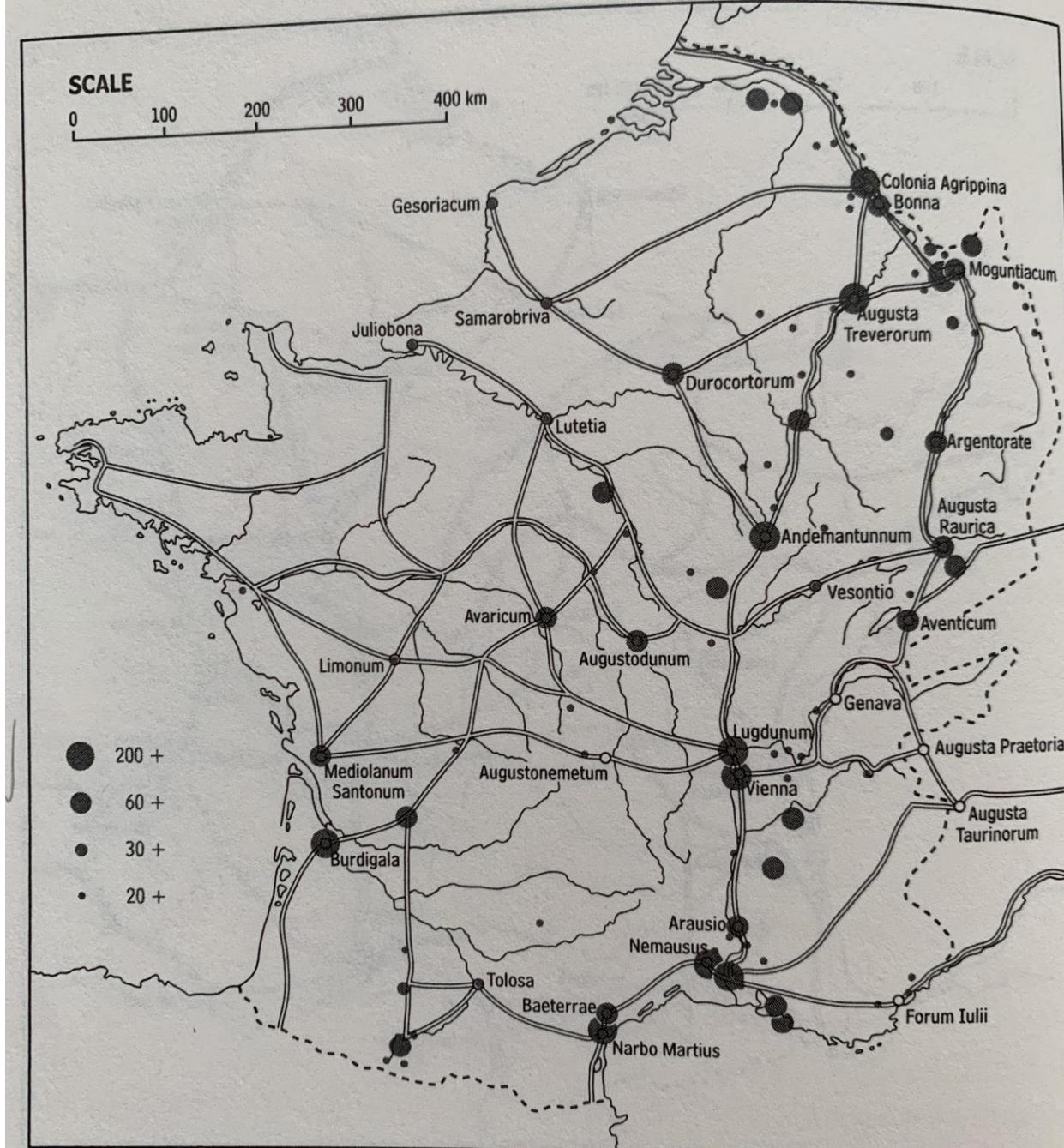


Map 4.1. Clusters of inscriptions, the size of the circle being proportionate to the number of inscriptions. Adapted from Greg Woolf, *Becoming Roman: The Origins of Provincial Civilization in Gaul* (Cambridge: Cambridge University Press, 1998), figure 4.5, p. 87.

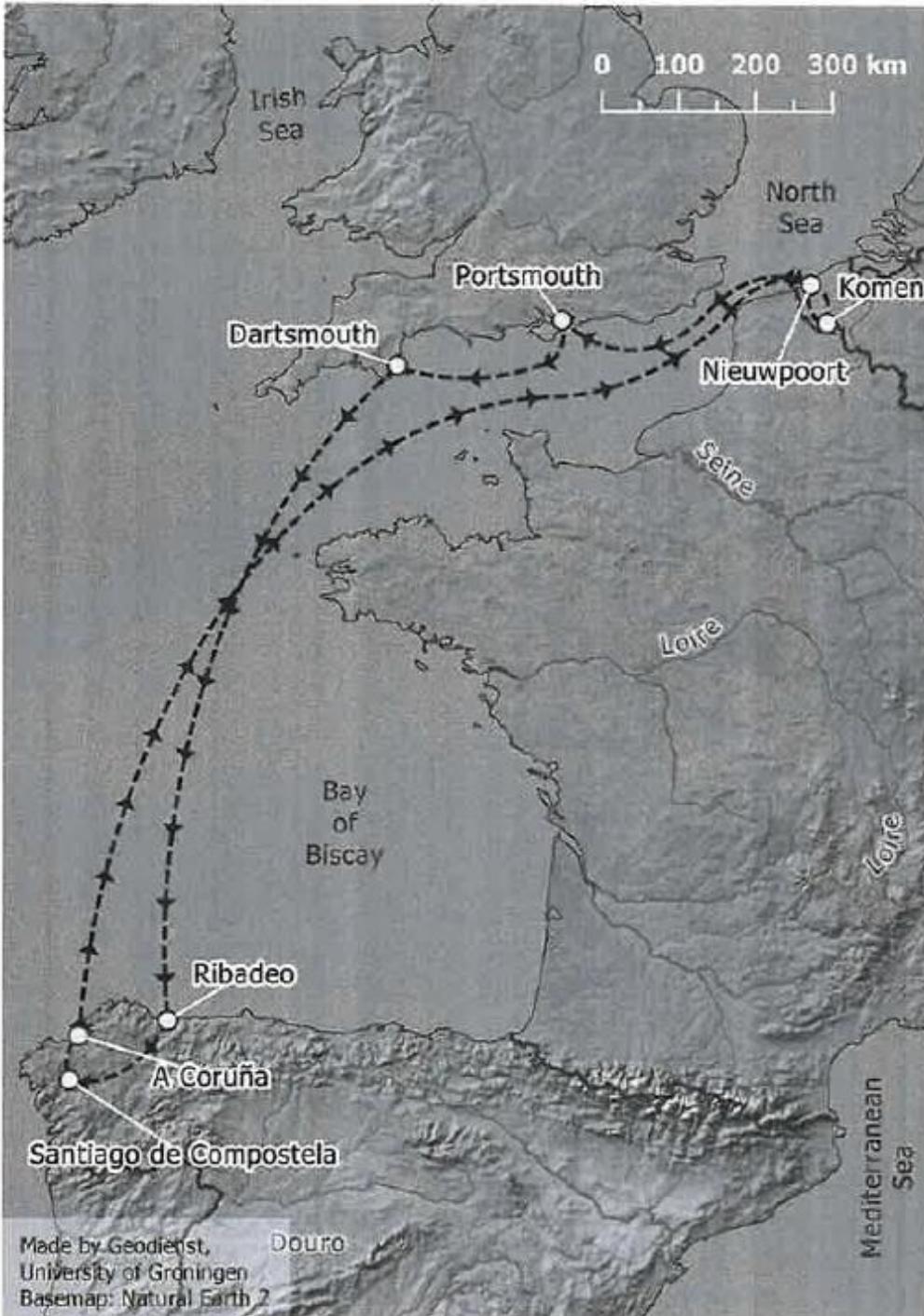
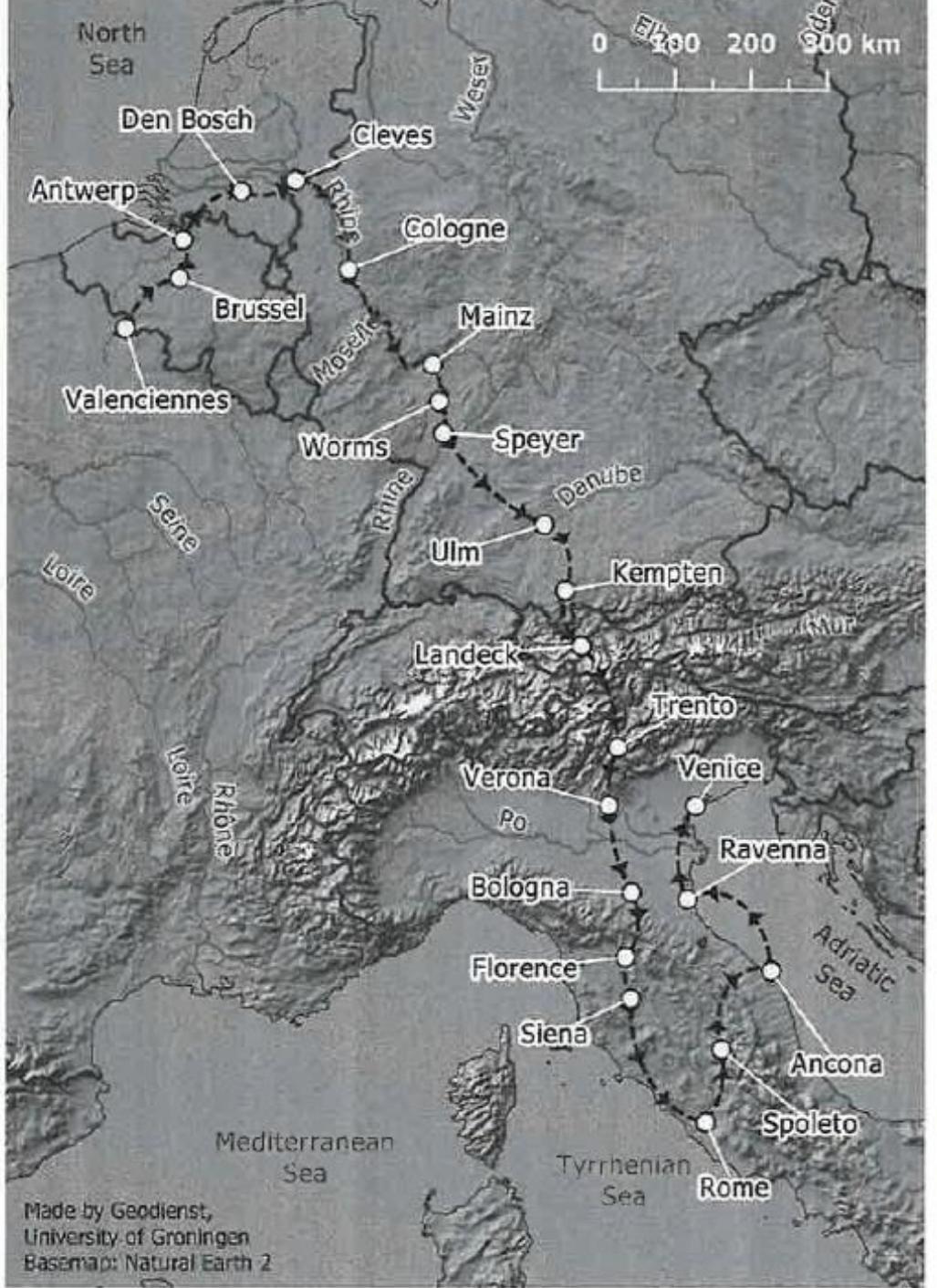


Map 4.2. Major roads of Roman Gaul. Adapted from Woolf, *Becoming Roman*, figure 4.6, p. 89.

# Ando, “Ambitions of Government”



Map 4.3. Clusters of inscriptions in Roman Gaul, overlaid on the road system. Pre  
pared by William R. Meissner, based on data from the *Archaeological Record*.



# VISUALIZING HISTORICAL NETWORKS

HOME

PROJECTS

ABOUT

Welcome to the Visualizing Historical Networks website. The projects featured here map the way people in the past interacted with each other and their surroundings. This site reflects the idea that the social networks of earlier times were not entirely unlike those of today and it endeavors to model and study them with contemporary tools.



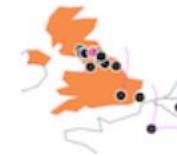
Inner Life of Empires



Cambridge Economists



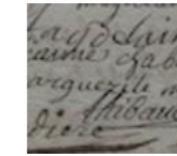
Pliny Letters



Vindolanda: A Visual History



Angoulême in 1764



A Marriage Contract in Angoulême



Atlantic History



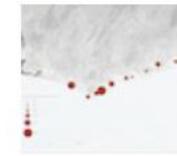
The Economy of Privilege



Society for the Diffusion of Useful Knowledge



Building Suburban Power



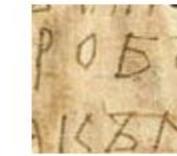
Royal African Company Networks



French Expatriates in Ottoman Egypt



Visualizing the History Project

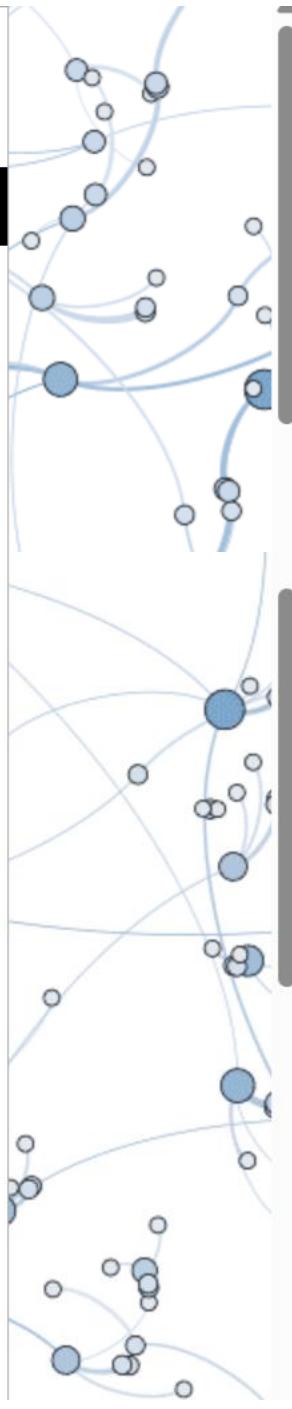


Birchbark Letters in Kyivan Rus'



Training Diplomats

<https://histecon.fas.harvard.edu/visualizing/index.html>





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# The Open Graph Viz Platform

Gephi is the leading visualization and exploration software for all kinds of graphs and networks. Gephi is open-source and free.

Runs on Windows, Mac OS X and Linux.

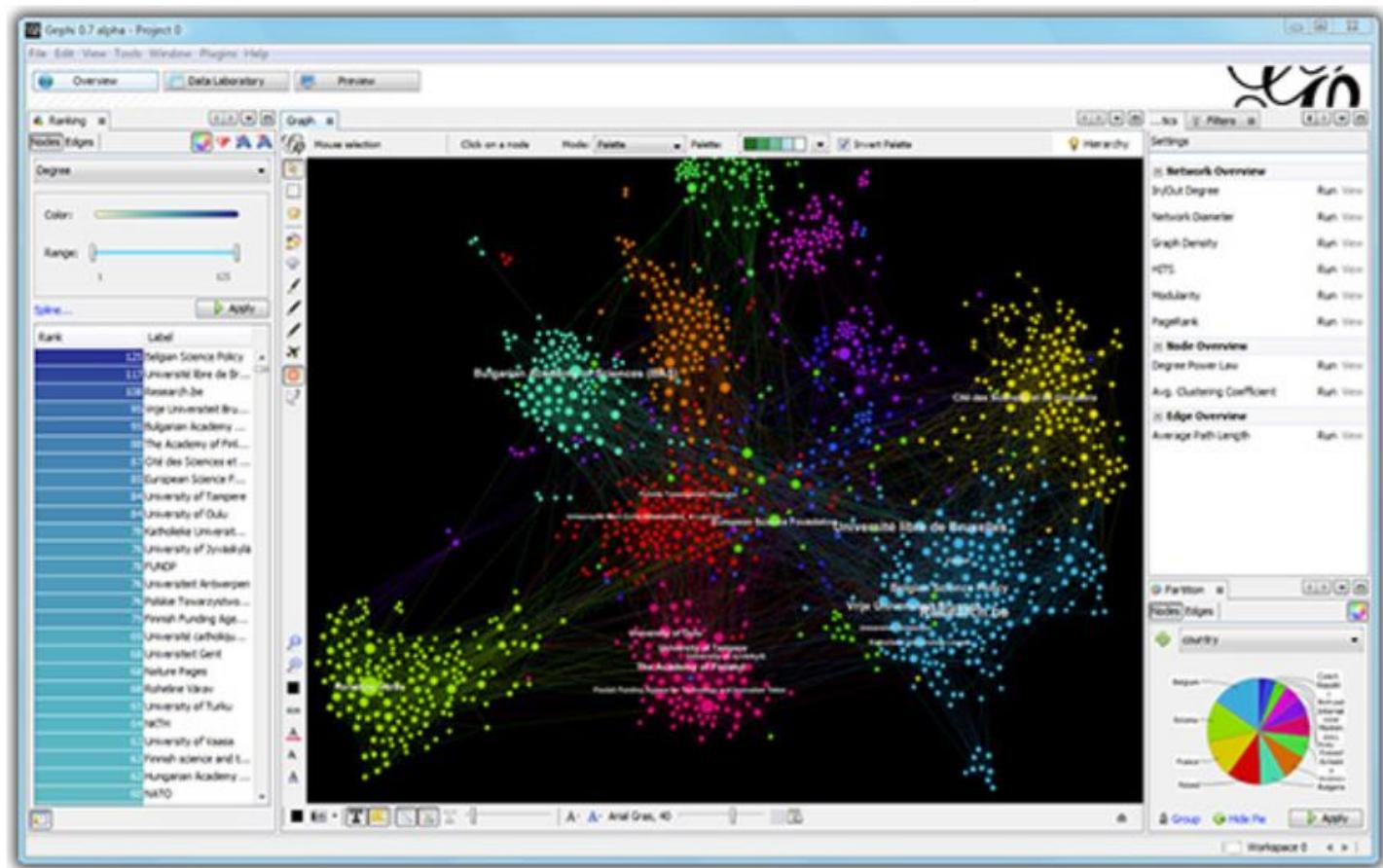
[Learn More on Gephi Platform »](#)



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# Digital Humanities @ Stanford

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## Animal City



What roles did animals play in nineteenth-century cities? What urban spaces did they inhabit and how did those spaces change over time?

[Between Canon and Corpus: The](#)

## French Revolution Digital Archive



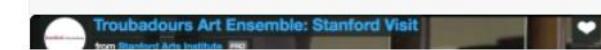
The French Revolution Digital Archive (FRDA) is the result of a multi-year collaboration between the Stanford University Libraries and the Bibliothèque nationale de France (BnF) to produce a digital version of the key research sources of the French Revolution and make them available to the international scholarly community.

## Palladio



Palladio is a platform for the exploration of historical data combining spatial, temporal and relational views at once.

## Performing Trobar



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Introduction

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Building

GE  
Geospatial

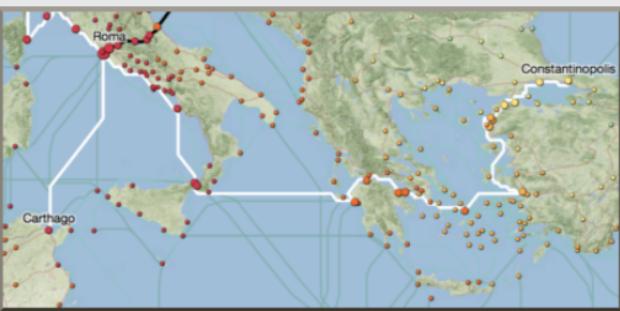
US  
Using

GA  
Gallery

NE  
Research

**S**panning one-ninth of the earth's circumference across three continents, the Roman Empire ruled a quarter of humanity through complex networks of political power, military domination and economic exchange. These extensive connections were sustained by premodern transportation and communication technologies that relied on energy generated by human and animal bodies, winds, and currents.

For the first time, ORBIS allows us to express Roman communication costs in terms of both time and expense. By simulating movement along the principal routes of the Roman road network, the main navigable rivers, and hundreds of sea routes in the Mediterranean, Black Sea and coastal Atlantic, this interactive model reconstructs the duration and financial cost of travel in antiquity.



Start exploring the Roman World

KINDRED BRITAIN

PEOPLE CONNECTIONS STORIES

Some Luminaries in Kindred Britain

Gender: Male, Color: CENTRALITY, ODNB, BIRTHDATE, INBREEDING, DEPTH, GENDER, Layout: TREE, PLOT, FORCE, PROFESSIONS, Relationship Types: Marriage, Lineage, Sibling

MAPPING THE REPUBLIC OF LETTERS

GEOGRAPHY

The Republic of Letters is a network of nearly 30,000 individuals — many of them iconic figures in British culture — connected through family relationships of blood, marriage, or affiliation. It is a vision of the nation's history as a giant family affair.

START → LEARN MORE →

EXPLORING THE SITE

Drag circles onto each other to connect people.

Charles Darwin  
1809–1882

Jane Austen  
1775–1817

Release to connect

VOLTAIRE

SENEMAN + FRANKLIN

HUMANITIES CENTER

FRANCESCO ALIGHIERI

GRAND TOUR

Mapping the Republic of Letters is a network visualization that maps the interconnected lives of nearly 30,000 individuals — many of them iconic figures in British culture — connected through family relationships of blood, marriage, or affiliation. It is a vision of the nation's history as a giant family affair. The visualization uses a network graph to show the relationships between people, with nodes representing individuals and edges representing their connections. The size of the nodes is proportional to the individual's centrality in the network. The color of the nodes represents various demographic and historical factors, such as gender, birthdate, and inbreeding. The layout of the network is based on a force-directed algorithm, which tries to position nodes in a way that reflects their connections. The visualization also includes a timeline at the bottom, showing the progression of history from 1770 to 1840. The visualization is a collaborative project between Stanford University and the British Library, and it is part of the Stanford Geospatial Network Model of the Roman World.

# BIRCHBARK LETTERS IN KYIVAN RUS'

Amelia Gardner-Thorpe

This project concerns 762 birchbark letters from several cities (*goroda/horoda*) in Kyivan Rus' dating between c.1100 and 1300. Kyivan Rus' was a loose federation of medieval East Slavic principalities, comprised of the lands of modern western Russia, Ukraine, and Belarus. Starting in the 9th century, Rus' expanded to include thirteen semi-independent principalities: Kyiv, Novgorod, Rostov-Suzdal' (later Vladimir-Suzdal'), Ryazan, Smolensk, Polatsk, Turaŭ, Murom, Siveria (or Sivershchyna), Chernihiv, Pereiaslav, Volyn', and Halyts. Overseen by the *Velykyy Knyaz'* (Grand Prince) of Kyiv, the Rus' lasted until the Mongols sacked Kyiv in 1240.

## BIRCHBARK LETTERS

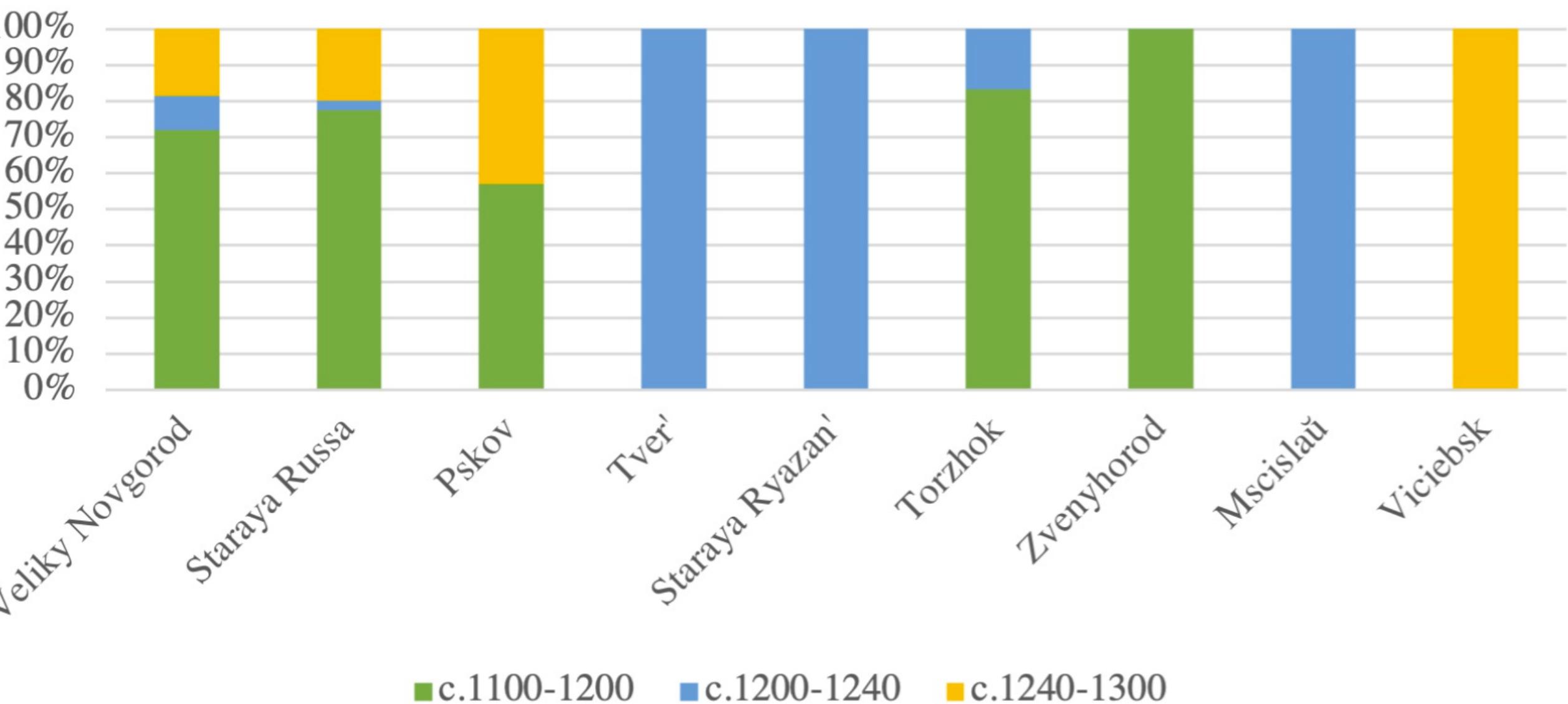


Birchbark letters are documents of personal, religious, administrative content written on birch bark (known as *bereste*) with styluses. Compared to parchment, birch bark was more pliable and less expensive, and used for liturgical books, "high" literature, and paper, which was first imported into Rus' in the fourteenth century. Birch bark was free and widely available. Most of these letters are written in Old East Slavic, and the Old Novgorodian dialect preserves some orthographical features. However, fifty-six letters were written in other languages: Old Church Slavonic, Greek, Latin, Lombardian, and Proto-Baltic-Finnish. Owing to the fragility of birch bark, these letters require linguistic reconstruction.

The first birchbark letter was discovered in Veliky Novgorod, west Russia, in 1951 by Nina Fedorovna Akulova.



# The Distribution of Birchbark Letters, c.1100-1300 (763 total, Aug. 2022)





## <oo>→<rg> Rusian genealogy

Maintained by: Christian Raffensperger ([craffensperger@wittenberg.edu](mailto:craffensperger@wittenberg.edu)) and David J. Birnbaum ([djbritt@gmail.com](mailto:djbritt@gmail.com))



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## Introduction

Genealogies have been constructed and used for hundreds of years to help families understand their ancestry and more recently to help scholars understand the relationships between medieval people and families. The Rusian genealogical database offers an update on this traditional discipline. The research underlying this database is new and is built on the primary sources in Old East Slavic, Latin, Greek, and Old Norse, as well as a thorough reading and understanding of the modern secondary literature. That information is then accessed through an XML database that allows the user to search through the variety of information presented here, including parentage, regnal dates, place of rule, and other data points. The end result is the most accurate genealogy of Rus' yet developed, presented in an accessible and intuitive way for use by scholars, students, and others.

