Dario Rodighiero

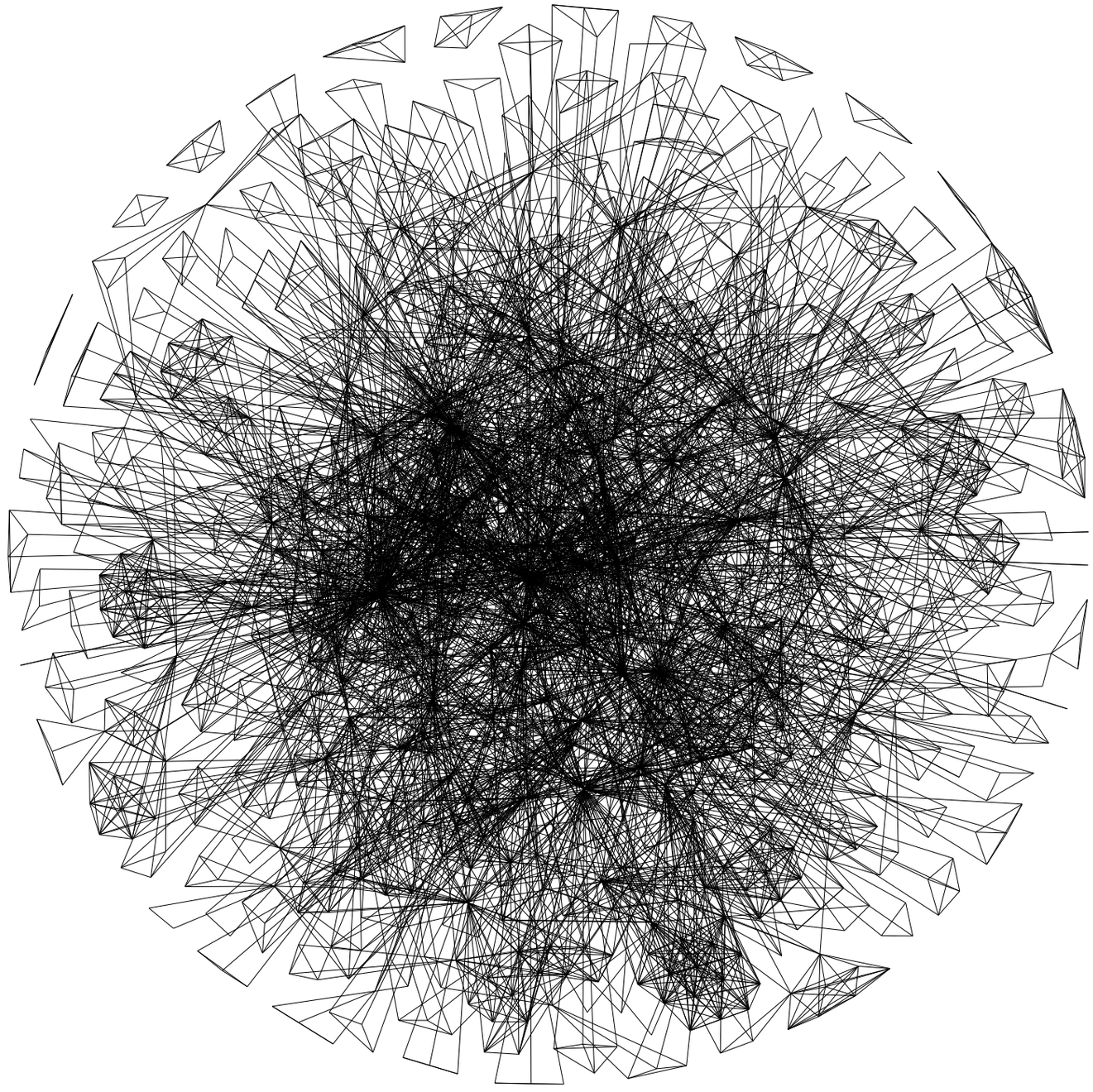
Representing Scientific Communities

First Lecture – Design Study

CERN, Geneva 14 March 2016

EPFL, The Rolex Learning Center

Physics Research Students, Cavendish Laboratory, Cambridge (June 1952).
James Watson and Francis Crick are standing in the first row, sixth and seventh from left, respectively.

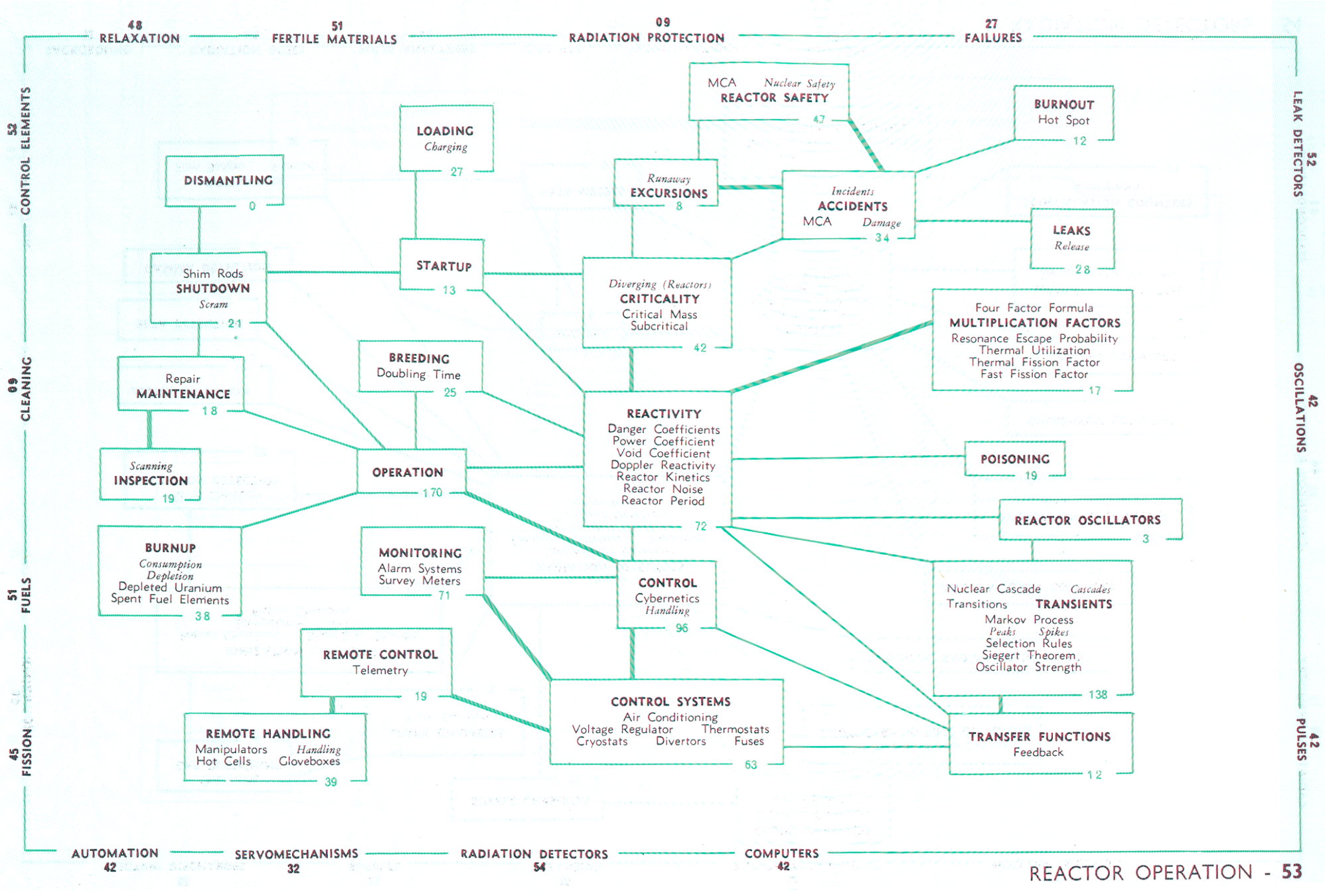


Rodighiero, Dario. 2015. 'Representing the Digital Humanities Community: Unveiling The Social Network Visualization of an International Conference'. Parsons Journal of Information Mapping VII (2). *http://pjim.newschool.edu/issues/2015/02/.*

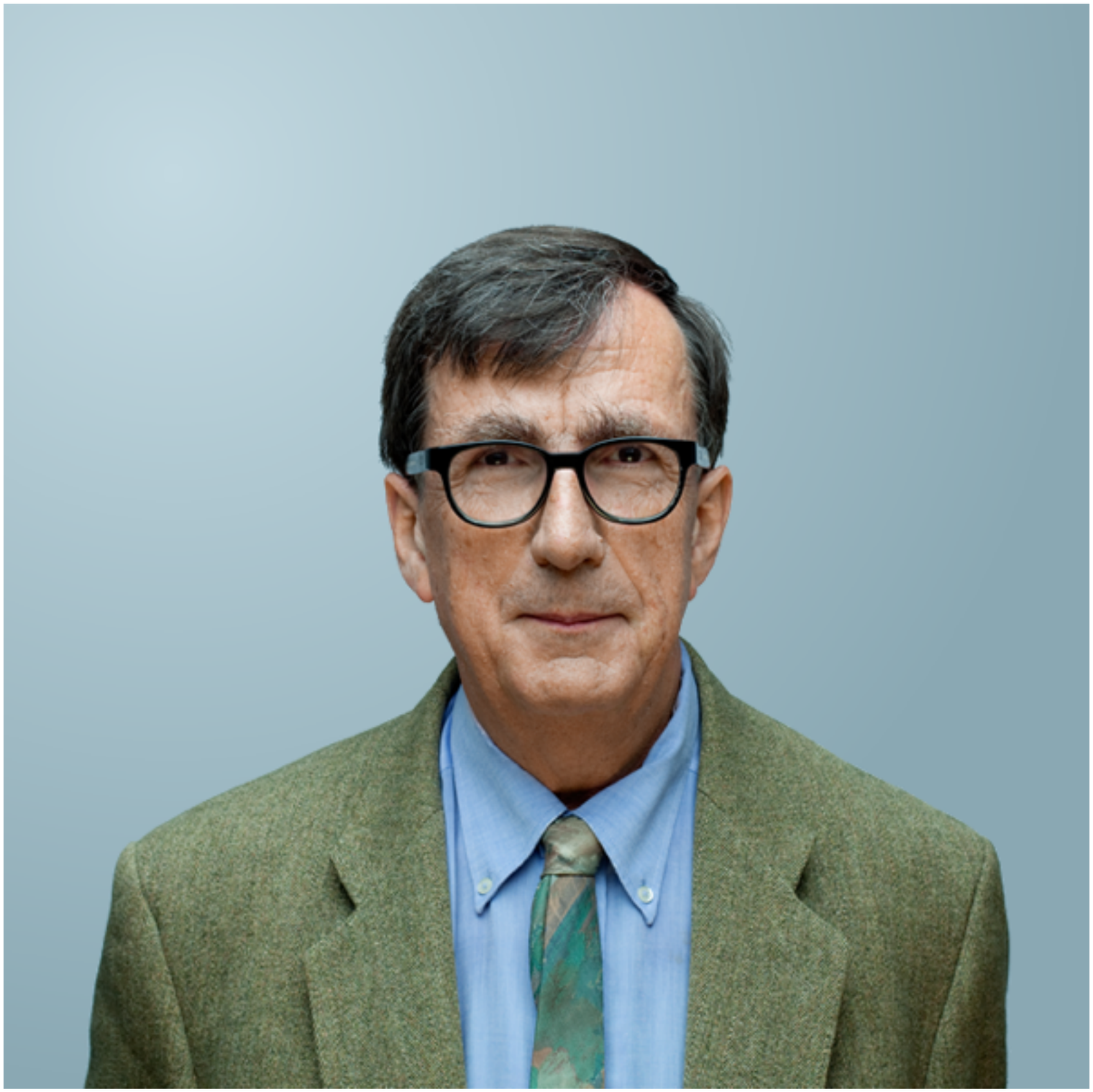
Today

- Background
- Scholar Representations in History
- Data Visualization, an Introduction
- Organization Visualizations
- Definition of Affinity
- Data & Terrain

Background



Thesaurus EURATOM



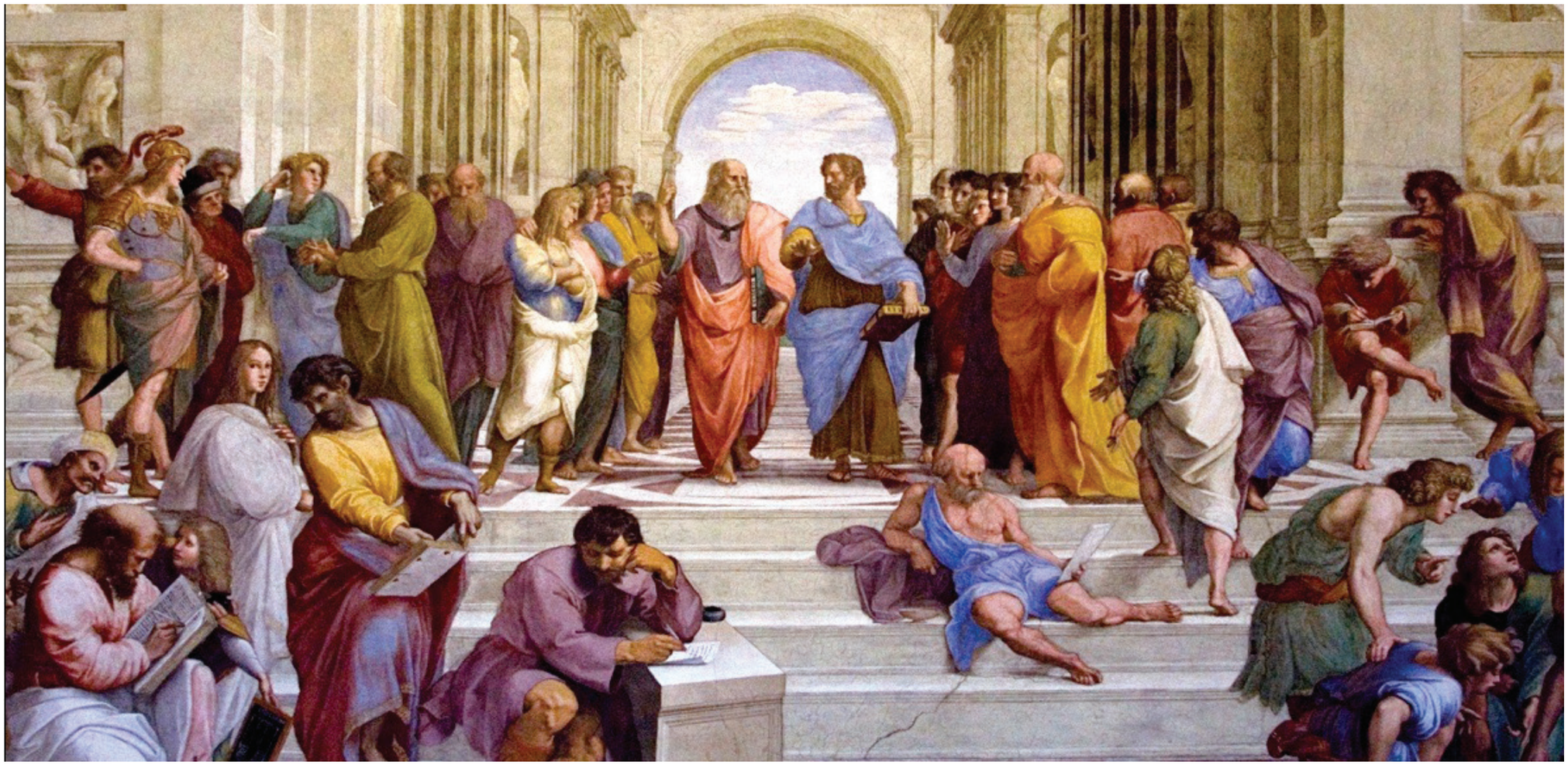
Bruno Latour, photo by Armin Link

The DHLAB in 2014

Cristoforo Sabbadino, Pianta de Venetia, 1557
© Archivio di Stato di Venezia / Hillary Sanctuary

Scholar Representations in History

“I am looking at eyes that looked at the Emperor”
Barthes, Roland. 1981. Camera Lucida: Reflections on Photography. 1st American ed. New York: Hill and Wang. p. 3



The School of Athens is one of the most famous frescoes by the Italian Renaissance artist Raphael. It was painted between 1509 and 1511.

The School of Athens, Raphael's cartoon.

Rembrandt 1632, The Anatomy Lesson of Dr. Nicolaes Tulp

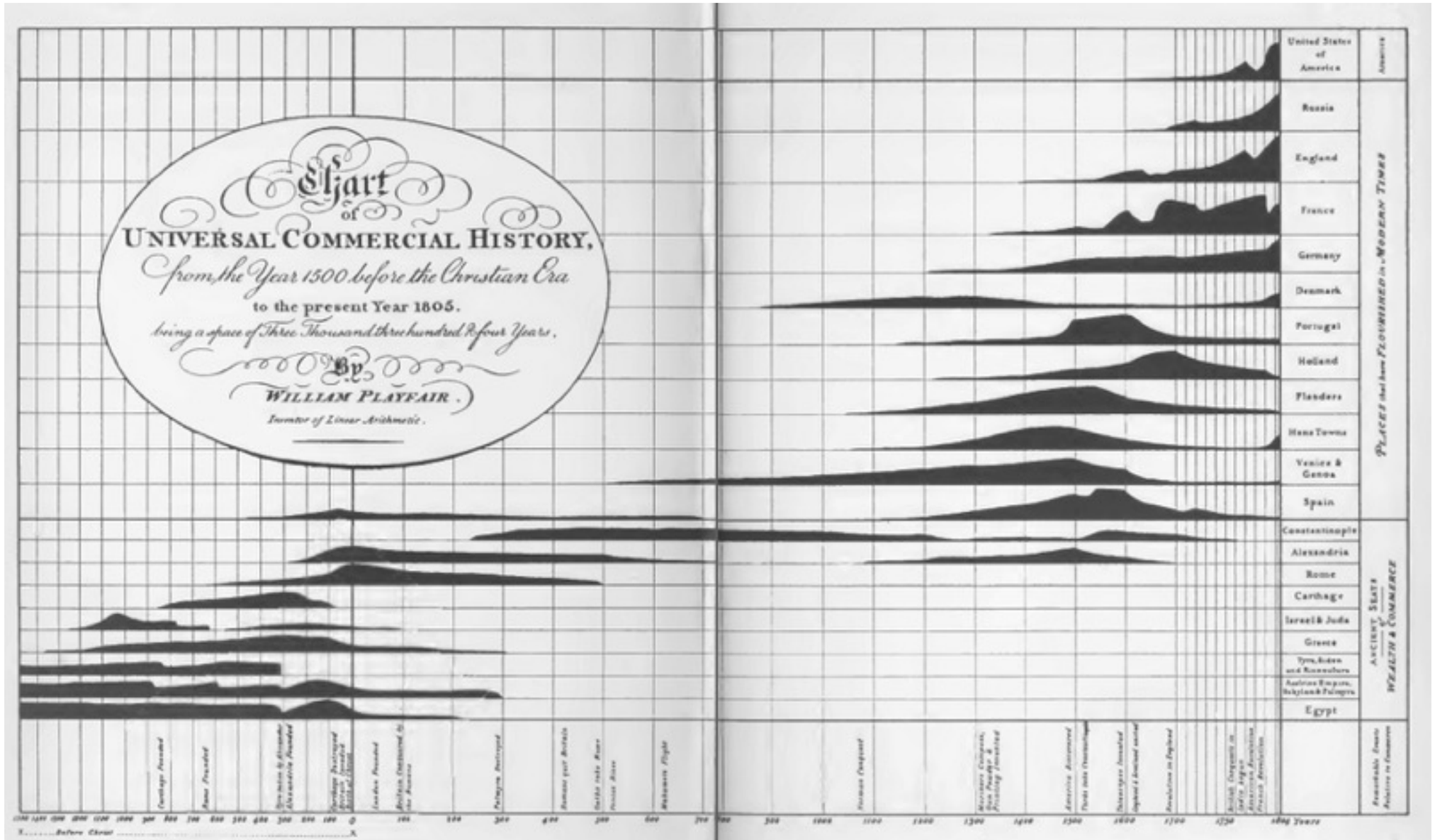
Oil canvas by Johannes Dünz (1696), Burgerbibliothek Bern.
Scholars in Action: The Practice of Knowledge and the Figure of the Savant in the 18th Century. p. 257

Sébastien Leclerc I, L'Académie des Sciences et des Beaux-Arts, 1698

Diorama displaying scientific workings of a Masonic lodge (c. 1750), Martin Engelbrecht (Augsburg). CEDOM Brussels. Scholars in Action: The Practice of Knowledge and the Figure of the Savant in the 18th Century. p. 441

Chymie, Laboratoire et Table des Rapports.

Data Visualization



From Frontispiece of Book by WILLIAM PLAYFAIR, An Inquiry Into the Permanent Causes of the Decline and Fall of Powerful and Wealthy Nations, London. 1805.

1759-1823 William Playfair

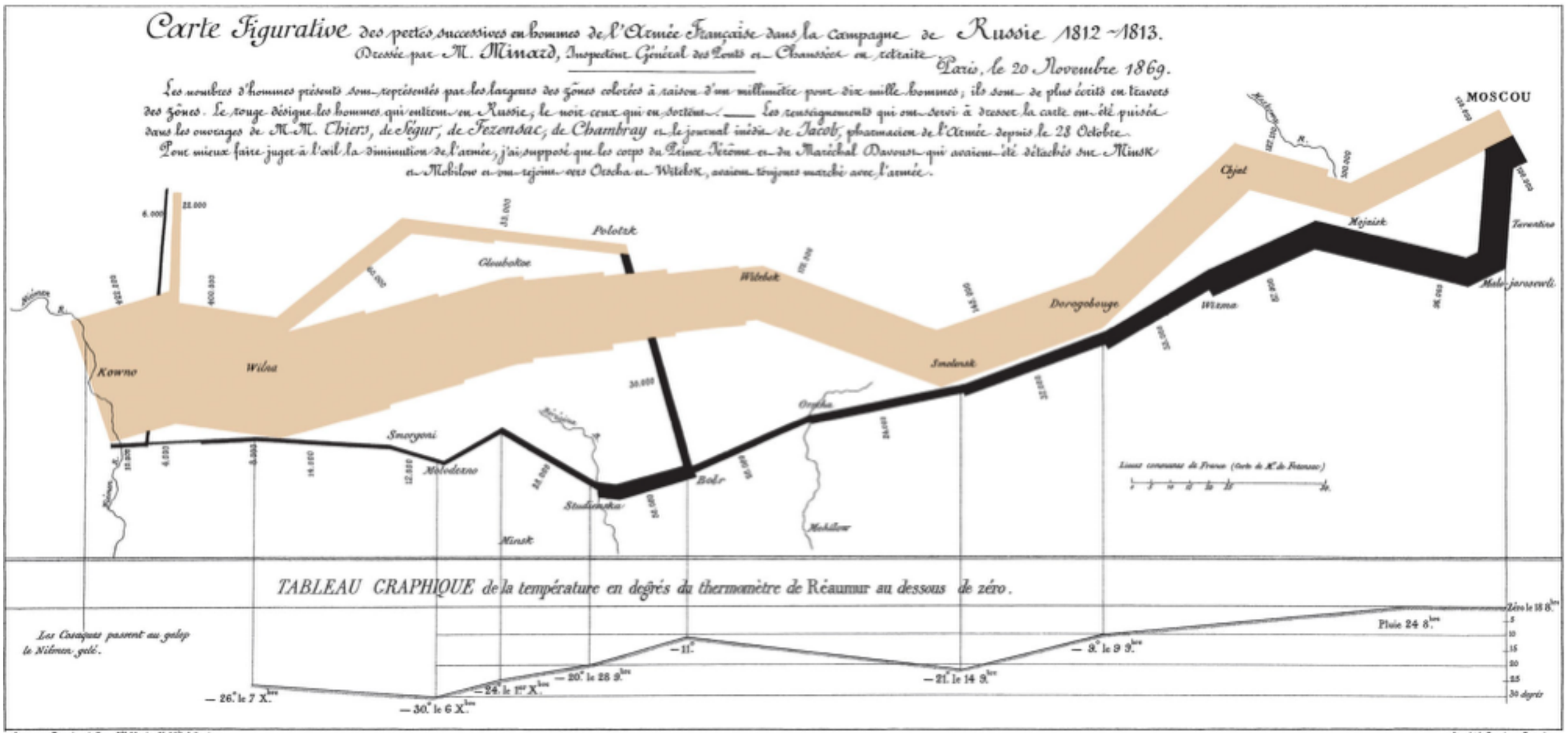
Carte Figurative des pertes successives en hommes de l'Armée Française dans la campagne de Russie 1812-1813.

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 largeurs des zônes colorées à raison d'un millimètre pour dix mille hommes; ils sont de plus écrits en travers des zônes. 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. Thiers, de Ségur, de Fezensac, de Chambray et le journal inédit de Jacob, pharmacien de l'Armée depuis le 28 Octobre.

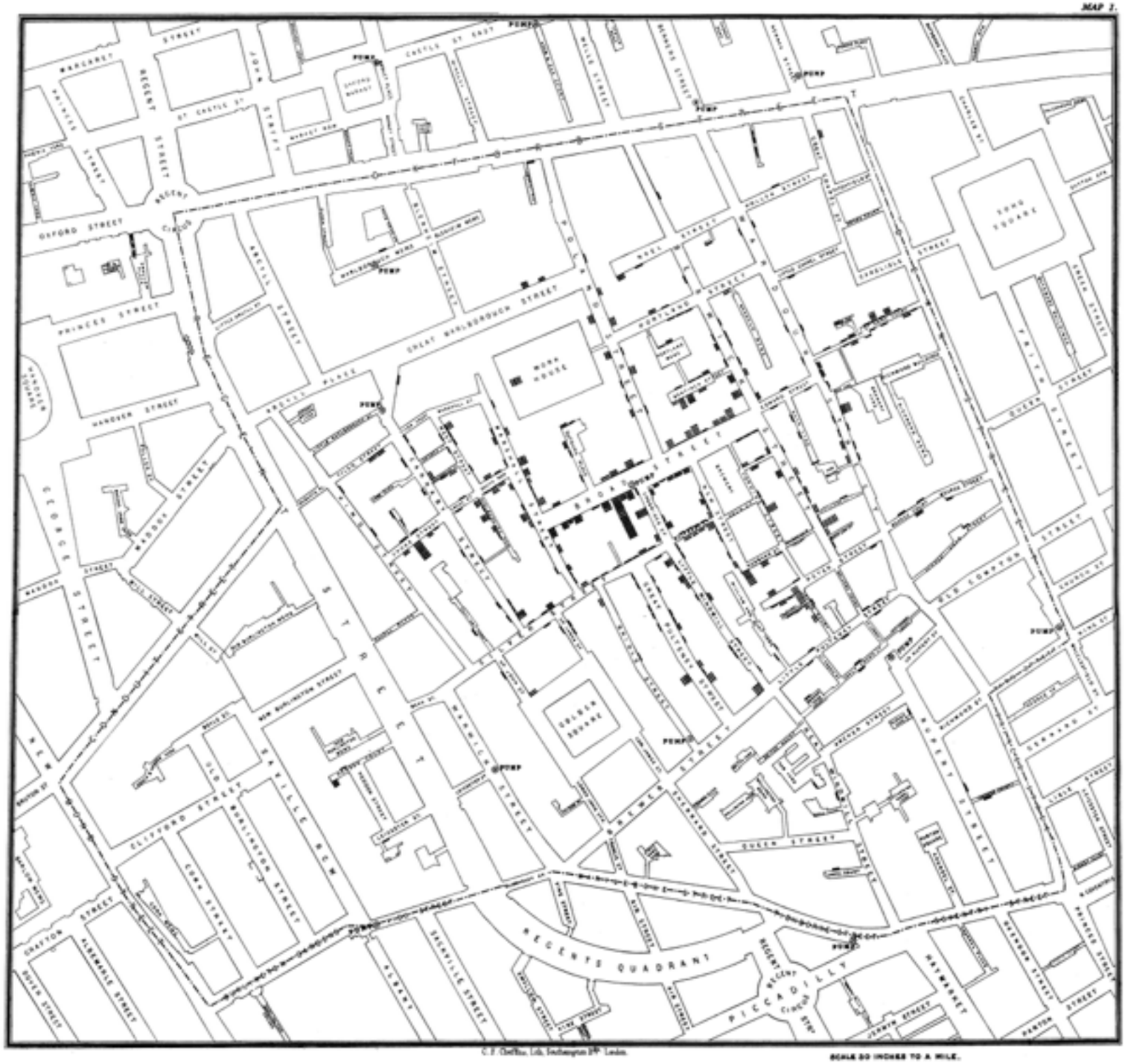
Pour mieux faire juger à l'œil la diminution de l'armée, j'ai supposé que les corps du Prince Jérôme et du Maréchal Davout qui avaient été détachés sur Minsk et Mobilow et qui rejoignaient vers Orscha et Witebsk, avaient toujours marché avec l'armée.



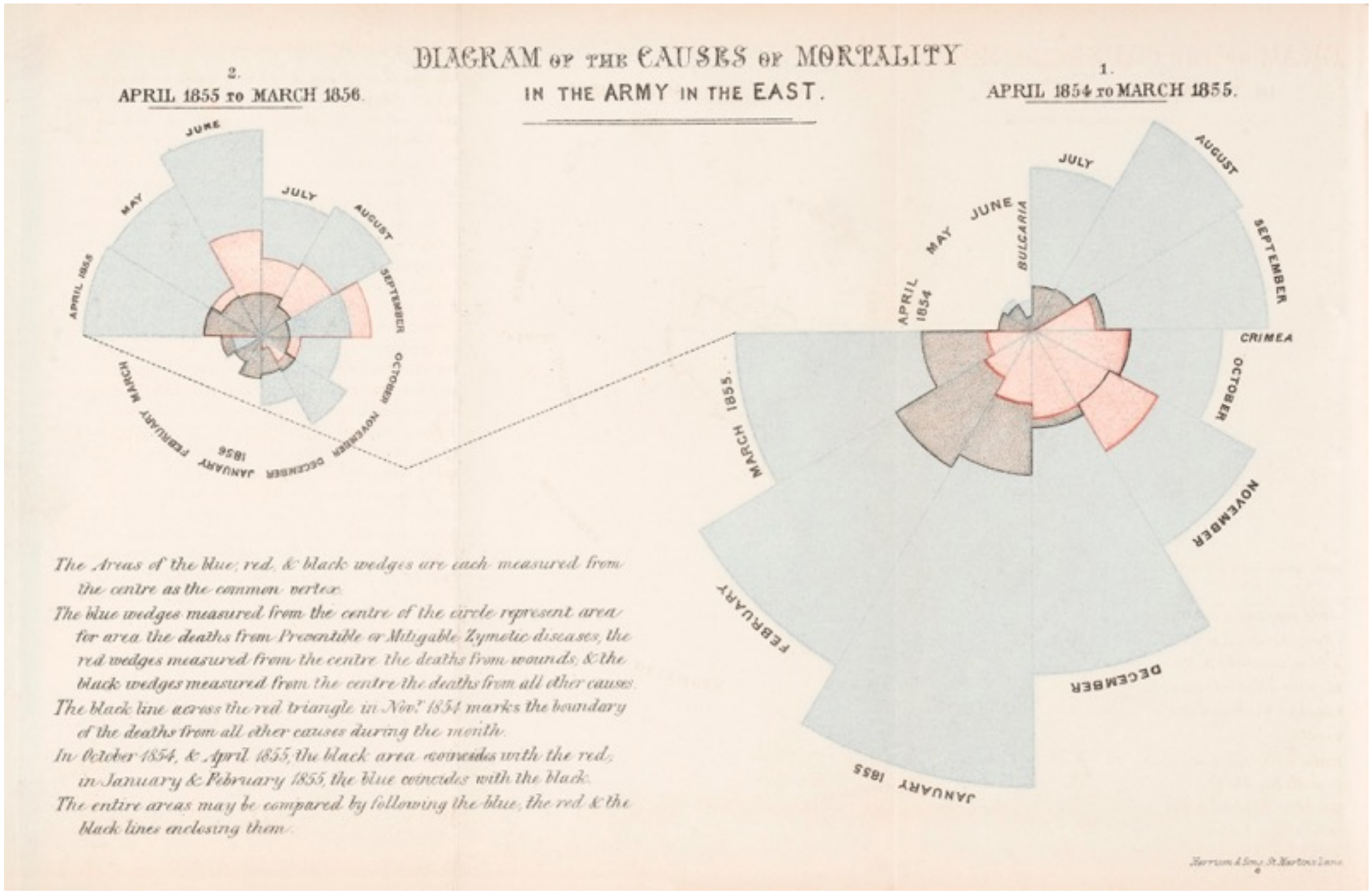
Autog. par Regnier, 8. Pas. St.te Marie St. Gilles à Paris.

Imp. Lith. Regnier et Dourdet.

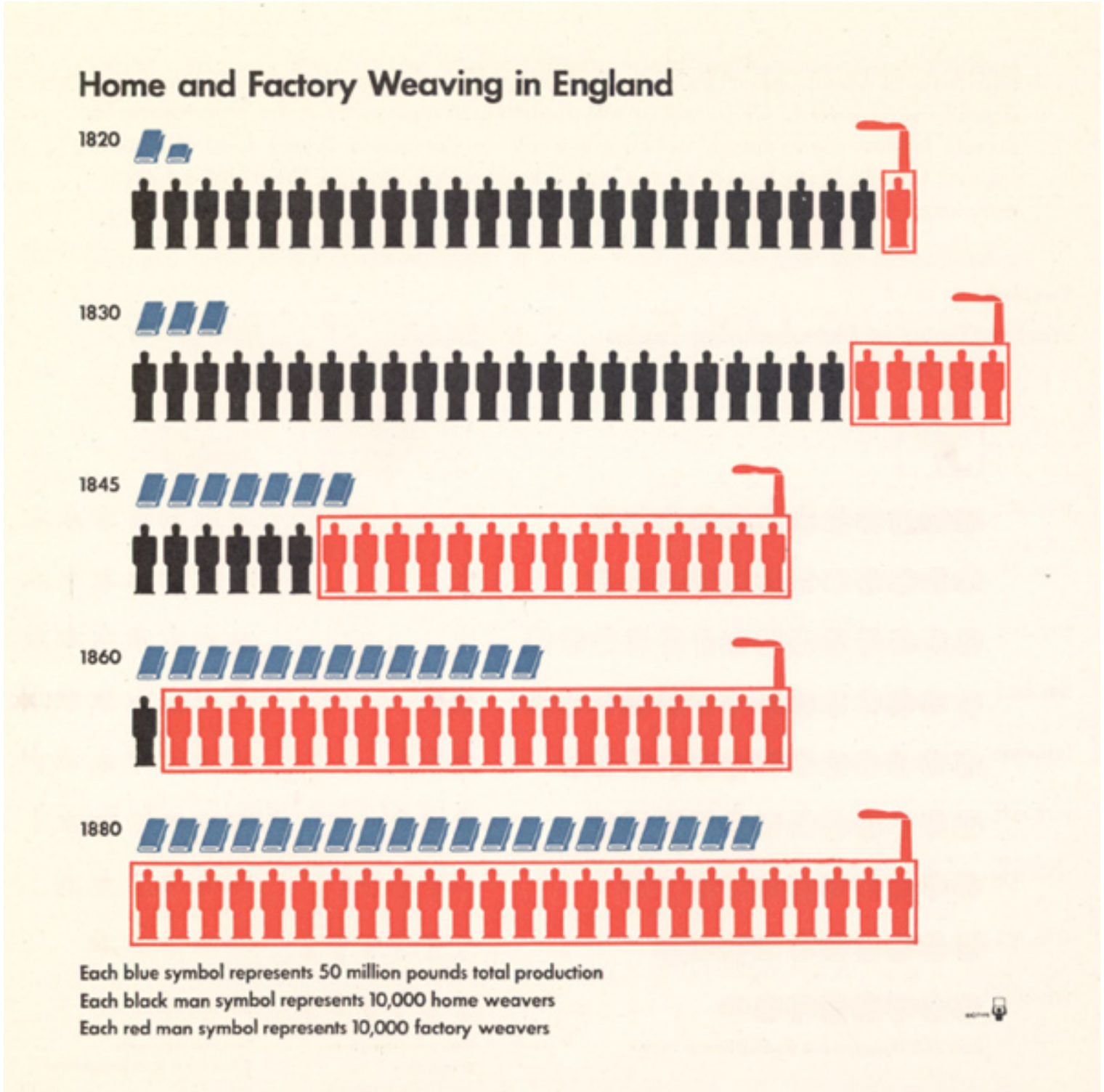
1781-1870 Charles Joseph Minard



1813-1858 John Snow



1820-1910 Florence Nightingale



1882-1945 Otto Neurath

Edward Tufte

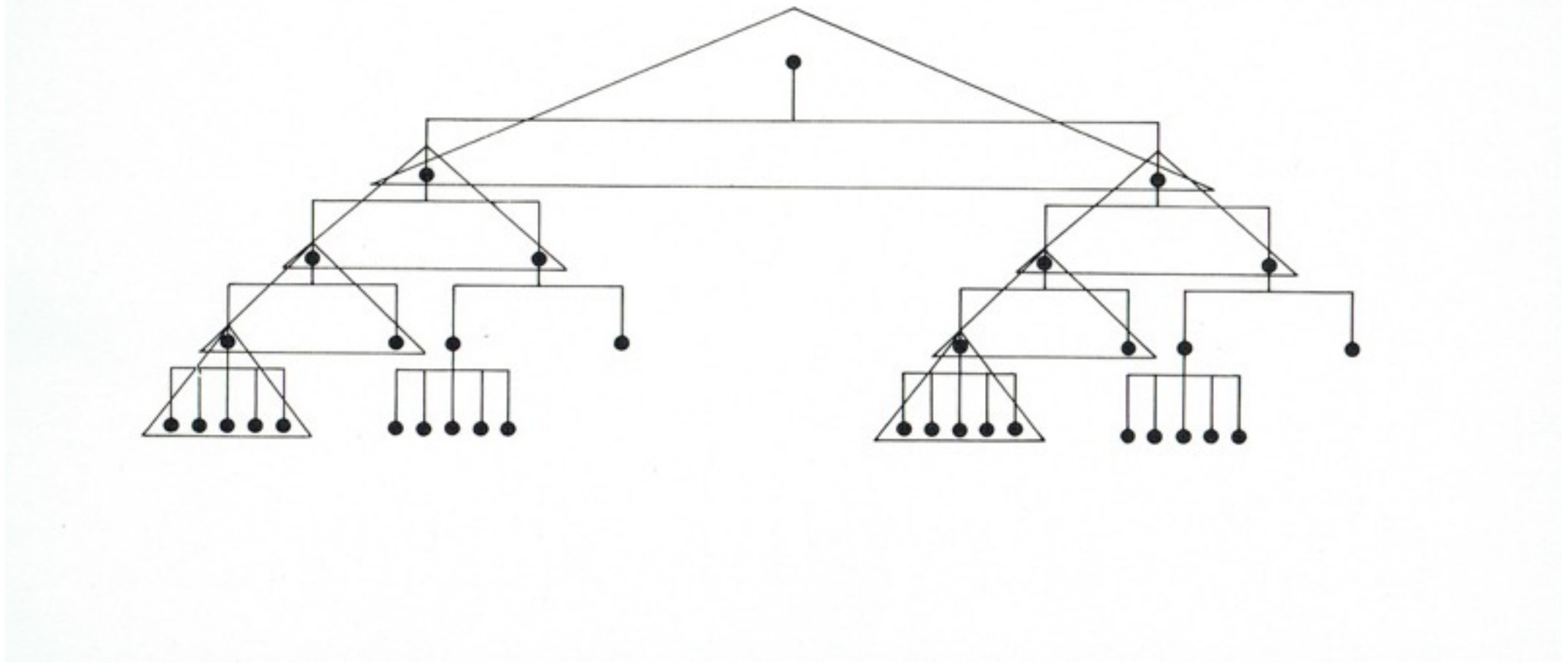
*Visualization appeared in 1883 to depict the formation of **mental images** of things "not actually present in sight."*

*Visualization slowly mutated from the human psychological processes to the larger terrain of **rendering practices** by machines, scientific instrumentation, and numeric measures.*

*Visualizations now **make new relationships appear** and produce new objects and spaces for action and speculation.*

Halpern, Orit. 2014. Beautiful Data: A History of Vision and Reason since 1945. Experimental Futures. Durham: Duke University Press. p. 21

Organizations Visualizations



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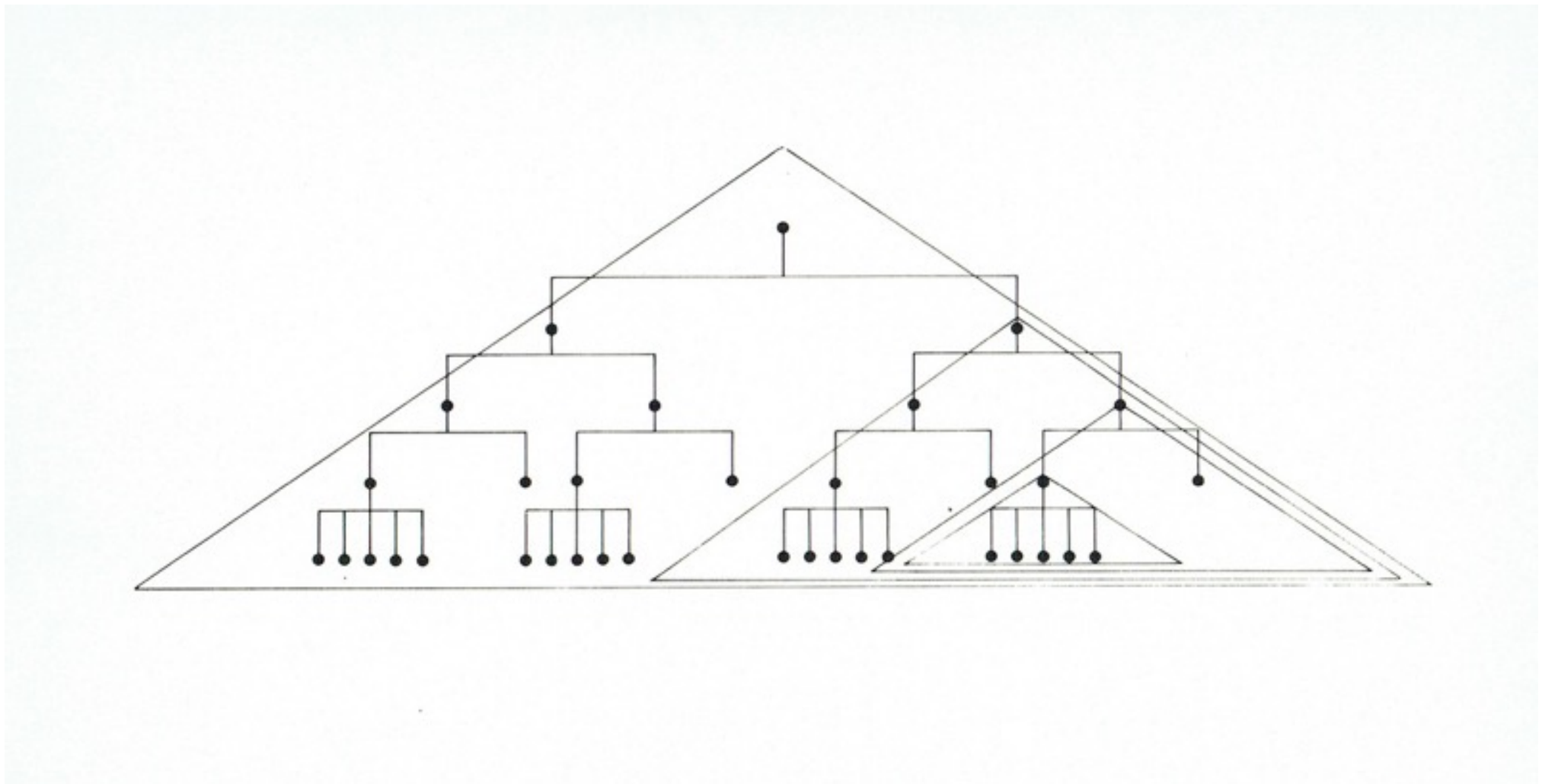
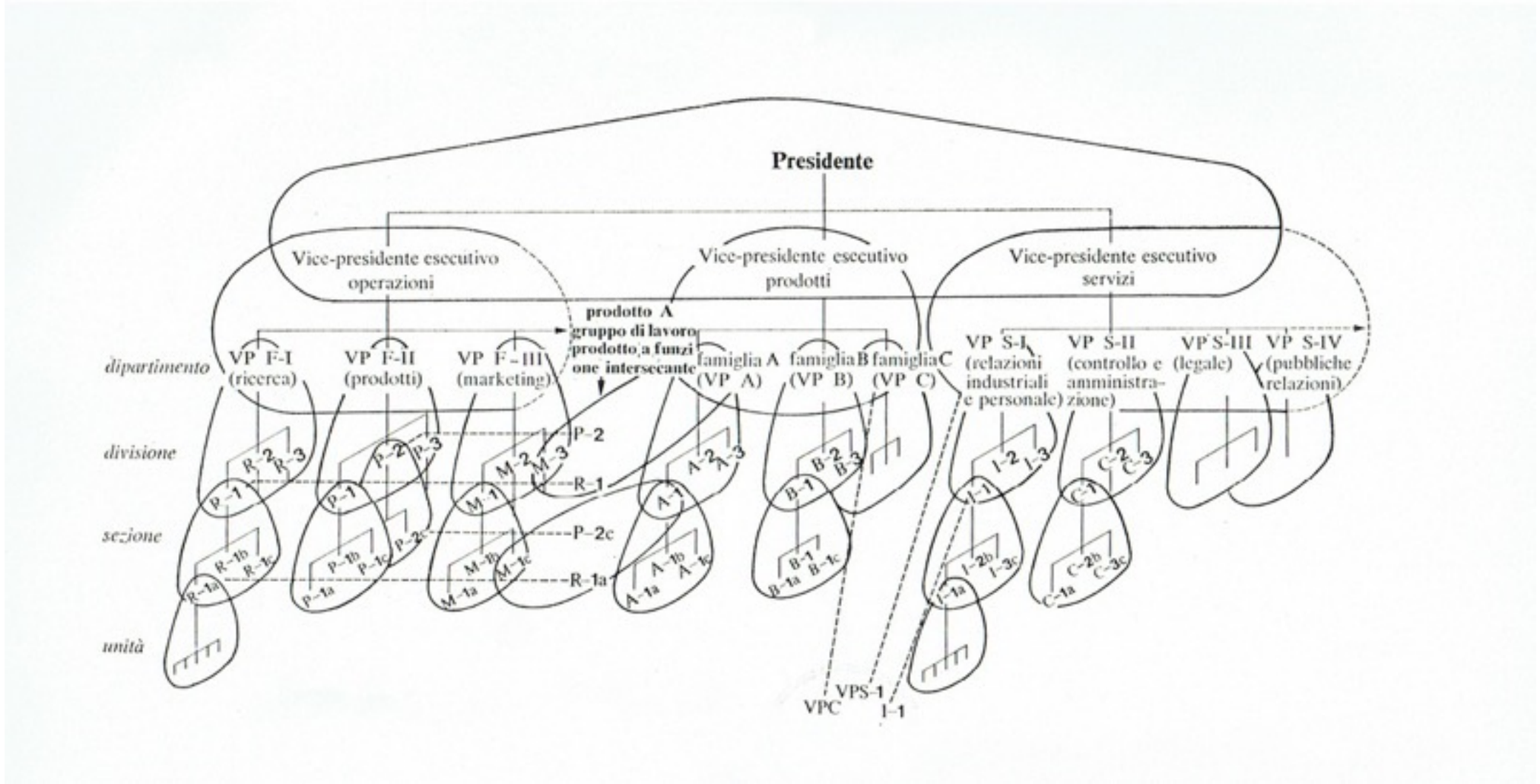
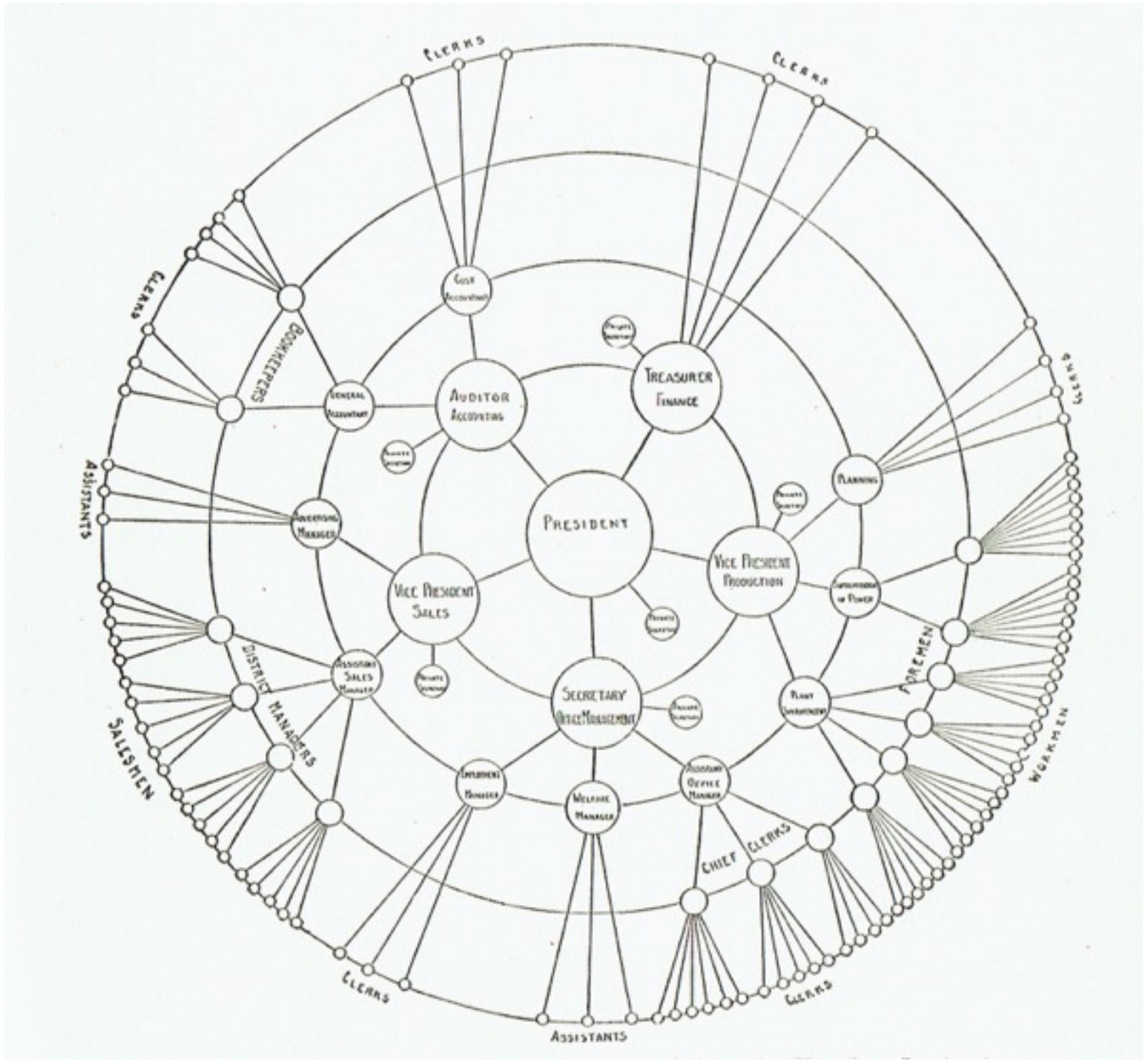


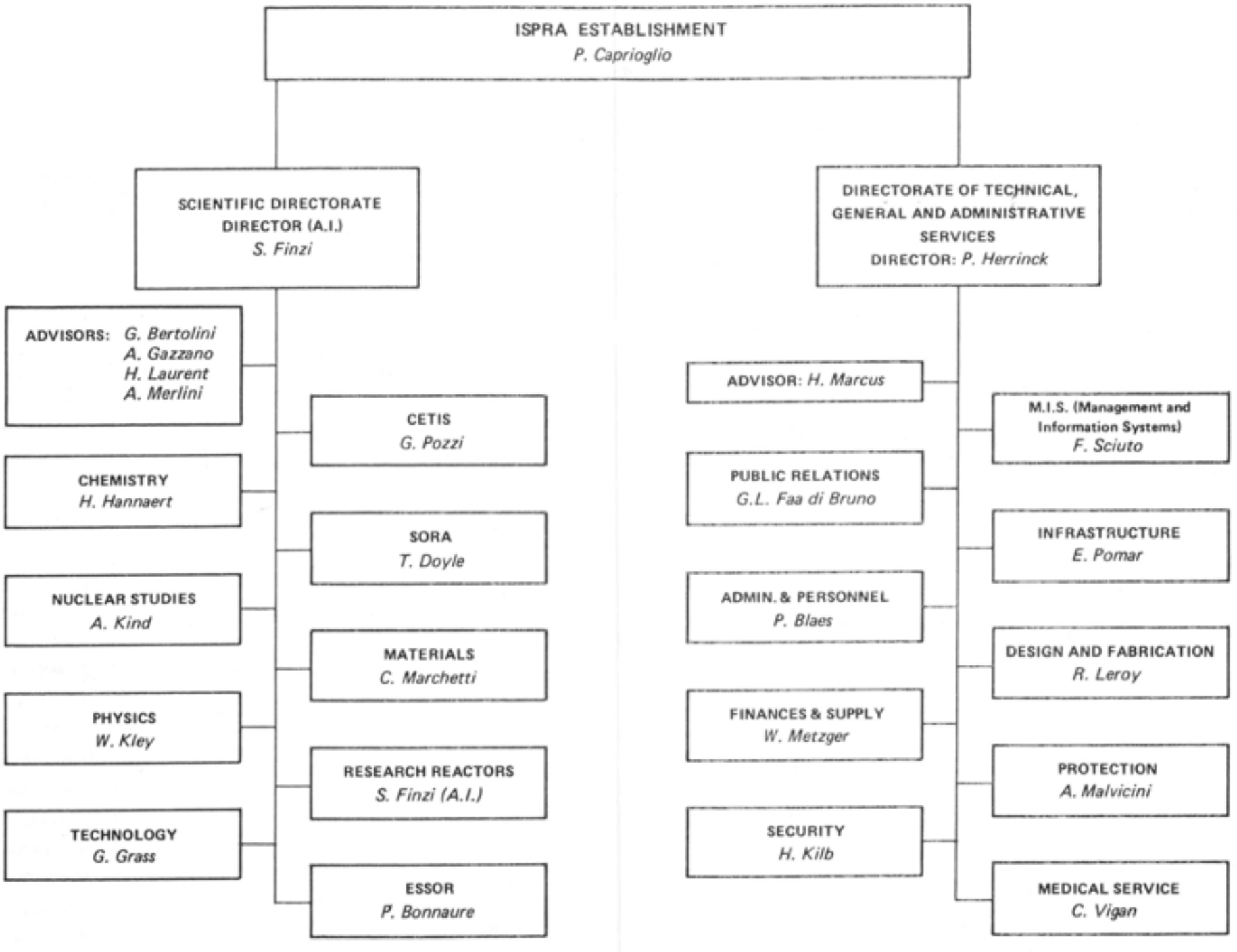
Coda, Vittorio. 1977. Progettazione Delle Strutture Organizzative: Modelli Di Analisi. 2nd ed. Milano: Franco Angeli.



Coda, Vittorio. 1977. Progettazione Delle Strutture Organizzative: Modelli Di Analisi. 2nd ed. Milano: Franco Angeli.



Smith, William Henry. 1924. Graphic Statistics in Management. vii, 360 p. New York: McGraw-Hill. — Fig. 74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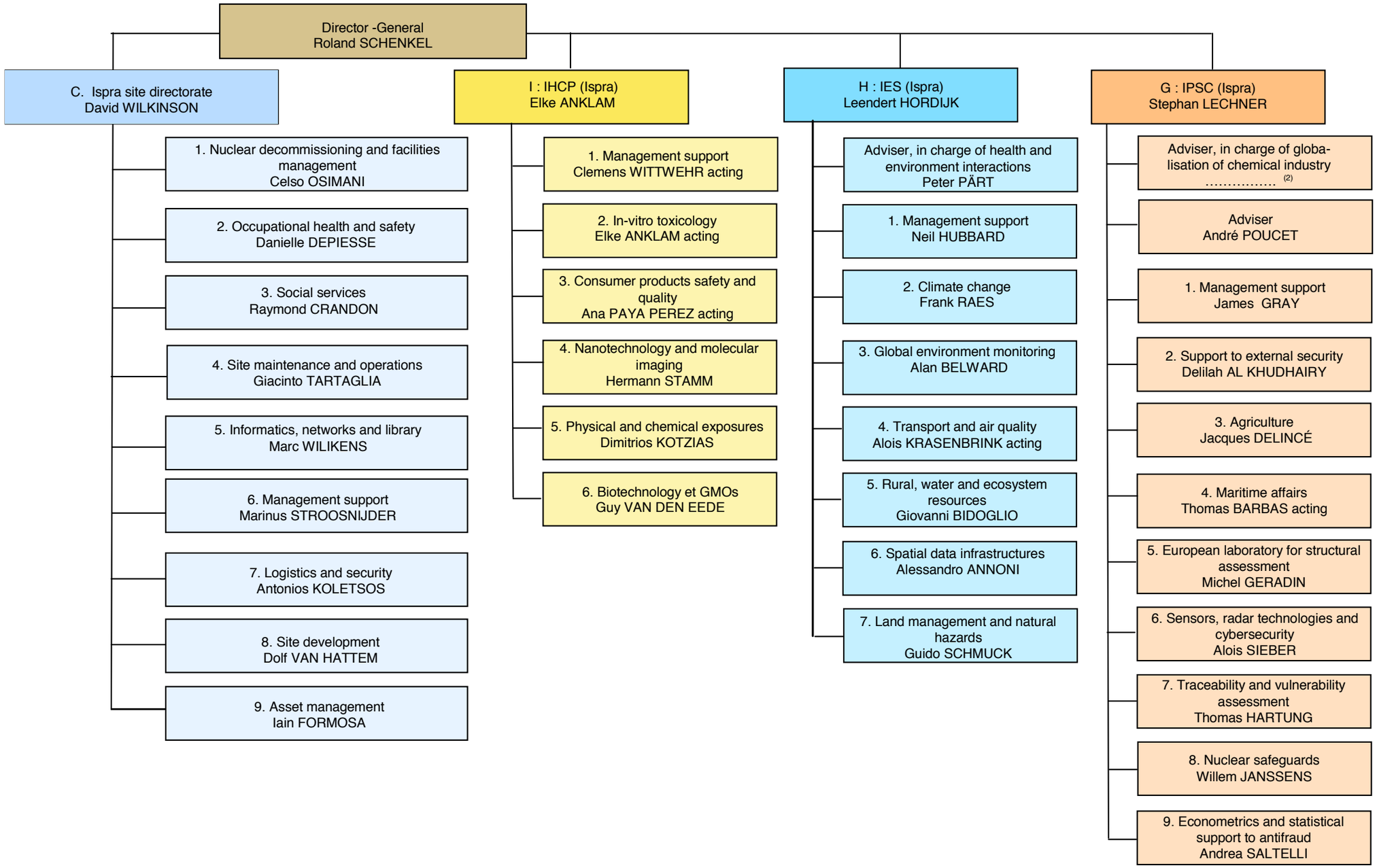
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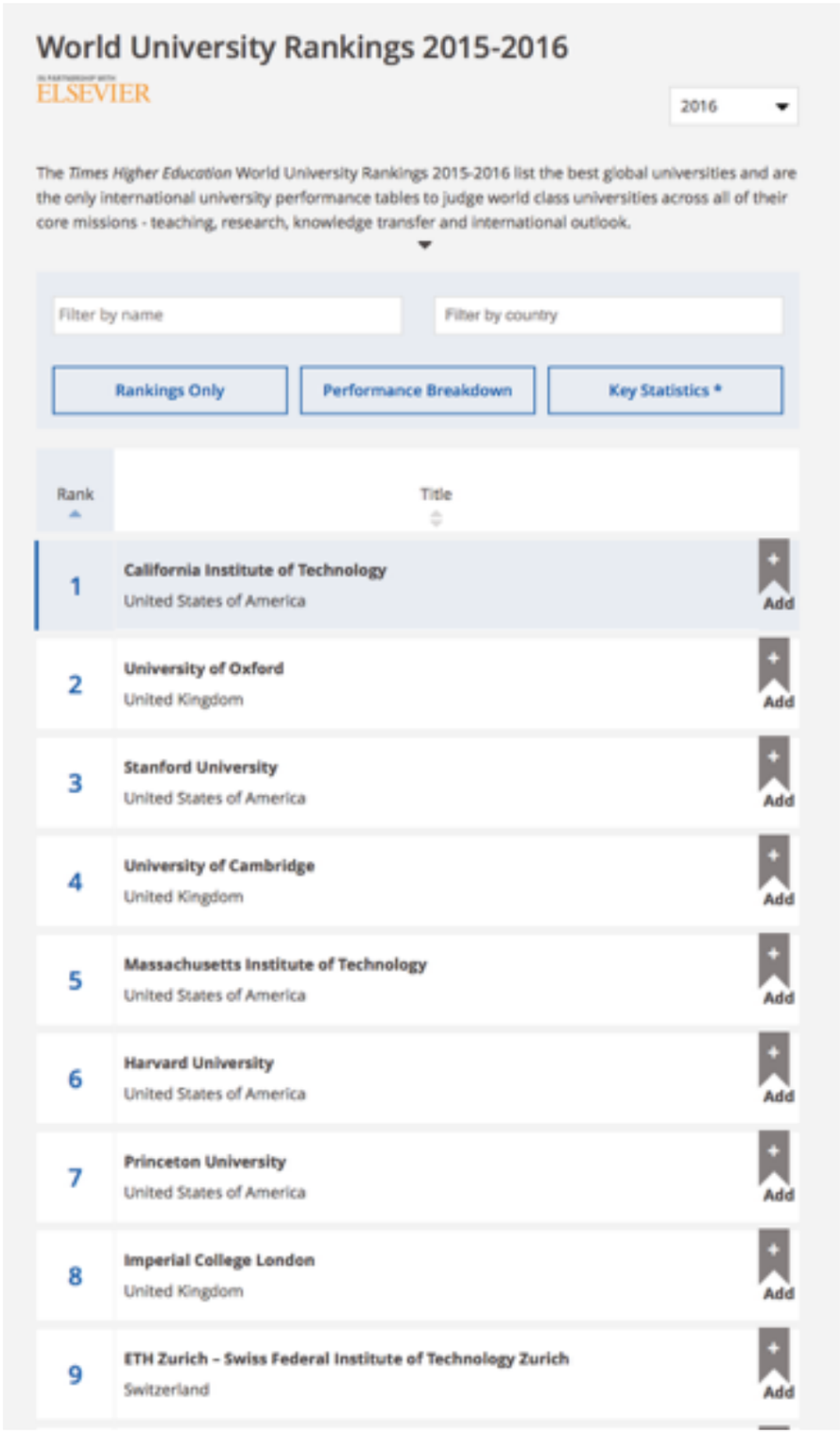
Andrea SALTELLI

2. Rankings

Eco, Umberto. 2009. Vertigine della lista. [Milan, Italy]: Bompiani.



Times Higher Education

INSTITUTIONAL SCORES

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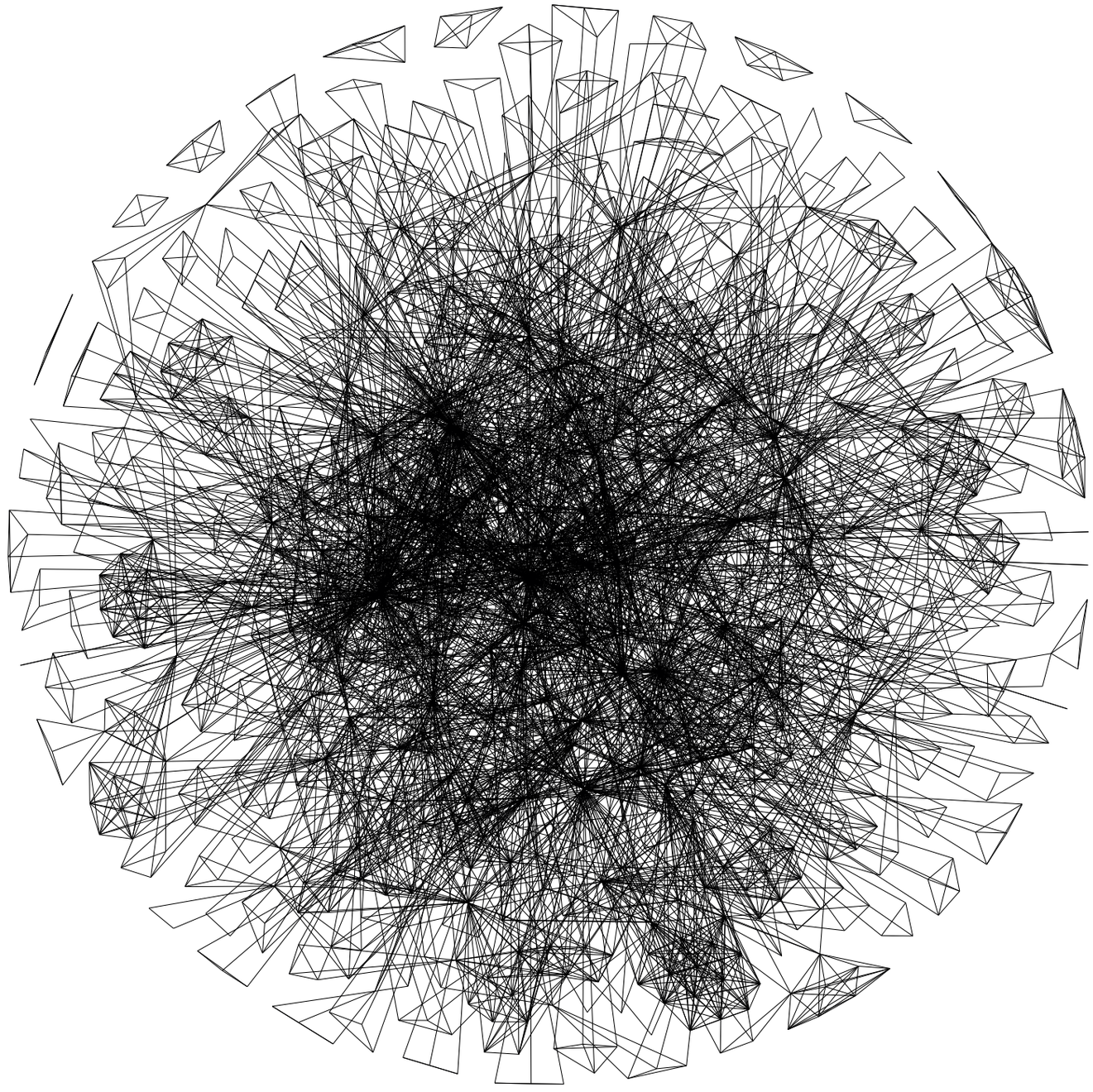
Rice University	USA	1339	36.2%
National Renewable Energy Laboratory	USA	906	34.2%
Washington University in Saint Louis	USA	818	33.7%
Stanford Linear Accelerator Center	USA	553	32.3%
University of Pennsylvania	USA	1286	31.7%
University of California, Santa Barbara	USA	2193	30.8%
Lawrence Berkeley National Laboratory	USA	2683	29.1%
Northwestern University, Evanston	USA	2745	28.7%
Yale University	USA	763	27.9%
Radboud University Nijmegen	NLD	548	27.6%
Australian Research Council	AUS	1826	27.6%

Mapping Scientific Excellence, Web application and data visualization designed and produced by Moritz Stefaner and Studio NAND (2005-2011)

FIRST NAME	LAST NAME	CATEGORY	PRIMARY AFFILIATION	SECONDARY AFFILIATIONS
A Harvey	Millar	Plant & Animal Science	Univ Western Australia, Australia	
A John	Camm	Clinical Medicine	St Georges Univ London, UK	
A John	Rush	Psychiatry/Psychology	Univ Texas SW Med Ctr Dallas, USA	
A Keith	Dunker	Biology & Biochemistry	Indiana Univ Sch Med, USA	
A Michael	Lincoff	Clinical Medicine	Cleveland Clin Fdn, USA	
A Paul	Alivisatos	Chemistry	Univ Calif Berkeley, USA	Lawrence Berkeley Natl Lab, USA
A Paul	Alivisatos	Materials Science	Univ Calif Berkeley, USA	Lawrence Berkeley Natl Lab, USA
A Paul	Alivisatos	Physics	Univ Calif Berkeley, USA	Lawrence Berkeley Natl Lab, USA
A Riitta	Torronen	Agricultural Sciences	Univ East Finland, Finland	
A Stephen K	Hashmi	Chemistry	Heidelberg Univ, Germany	King Abdulaziz Univ, Saudi Arabia

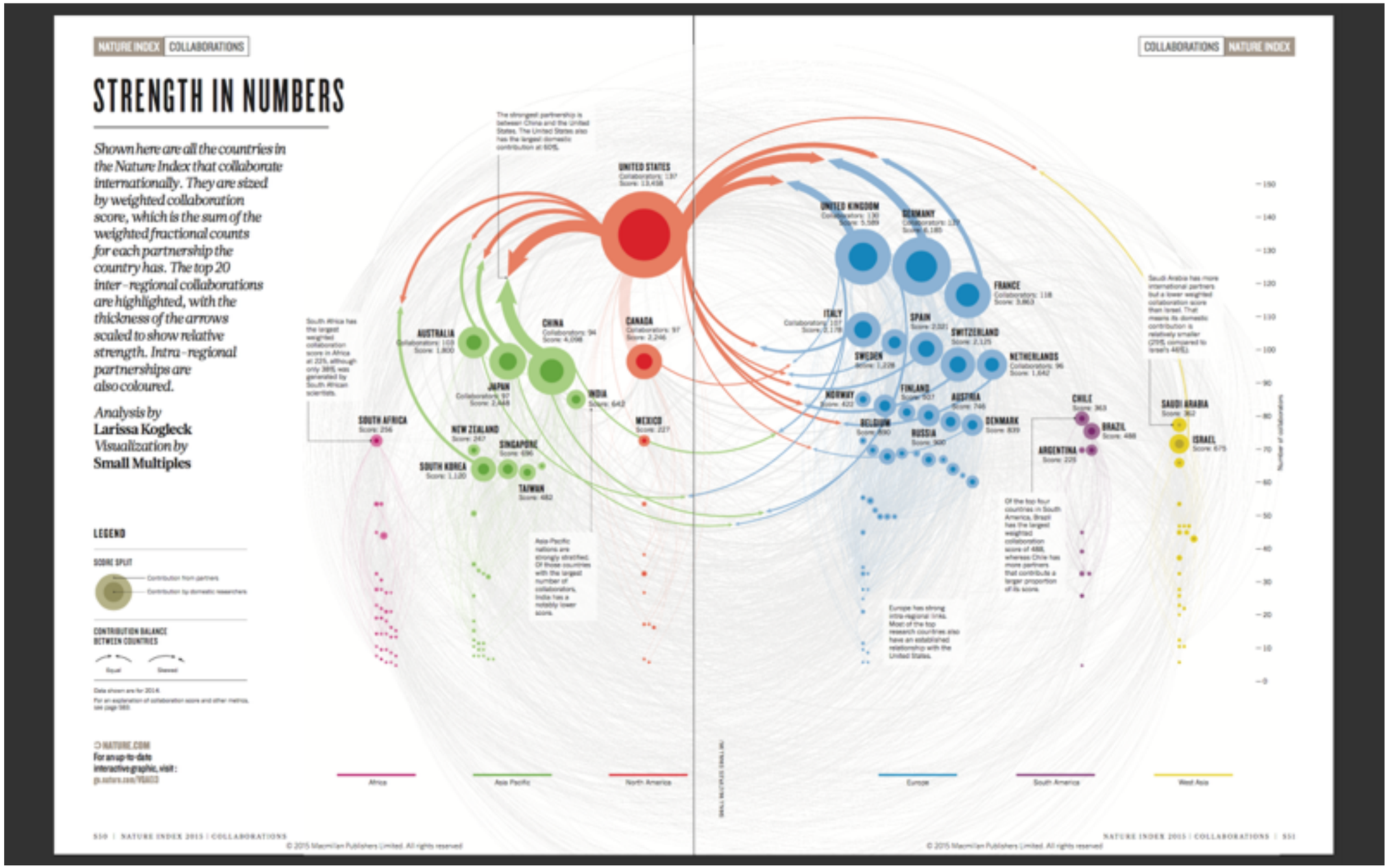
High Cited researcher 2015, Thomson Reuters

3. Networks



Digital Humanities 2014, Lausanne

Max Planck Society, with Moritz Stefaner visual design (2012)



'Strength in Numbers'. 2015. Nature 527 (7577): S50–51.

King's College website

Affinities

Virtual affinities and actual affinities

Direct affinities:

- writing a paper together

- teaching at the same course

- searching funds together

- preparing a proposal together

- submitting a common panel or workshop

- being connected on social networks

Indirect affinities:

Biographical

- publishing in the same journal

- publishing for the same editor

- sharing publications metadata

- being enrolled in the same institution

- having attended the same university

- having the same nationality

Indirect affinities:

Professional

- having the same skills

- talking the same languages

- having the same university degree

- belonging to the same society (i.e. ACM)

- sharing the same students

Indirect affinities:

Geographical

- working in the same laboratory

- belonging to the same faculty

- belonging to the same section

- belonging to the same institute

- having the office on the same floor

- having the office on the same building

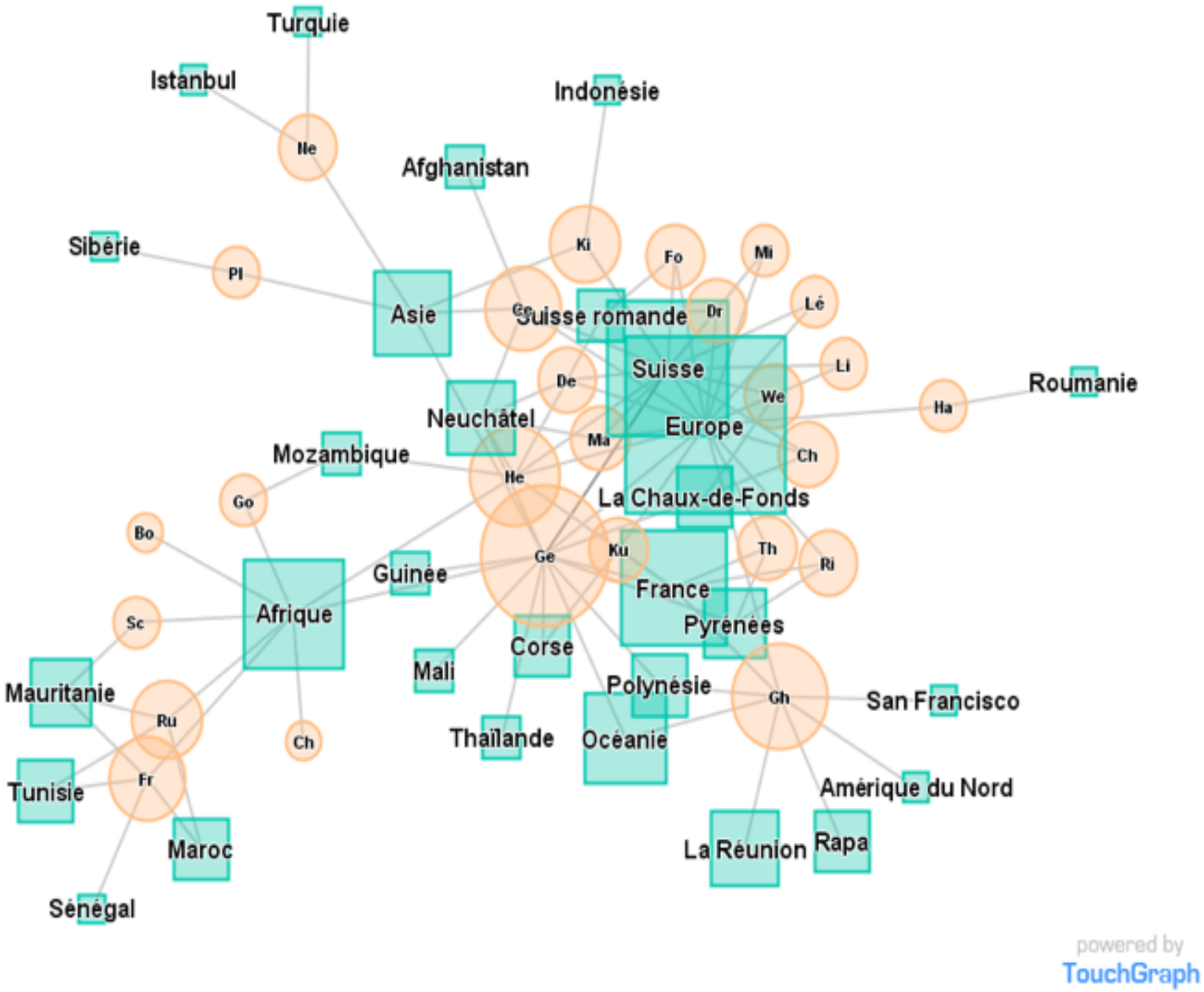
Direct / Indirect affinities:

- attending the same committee

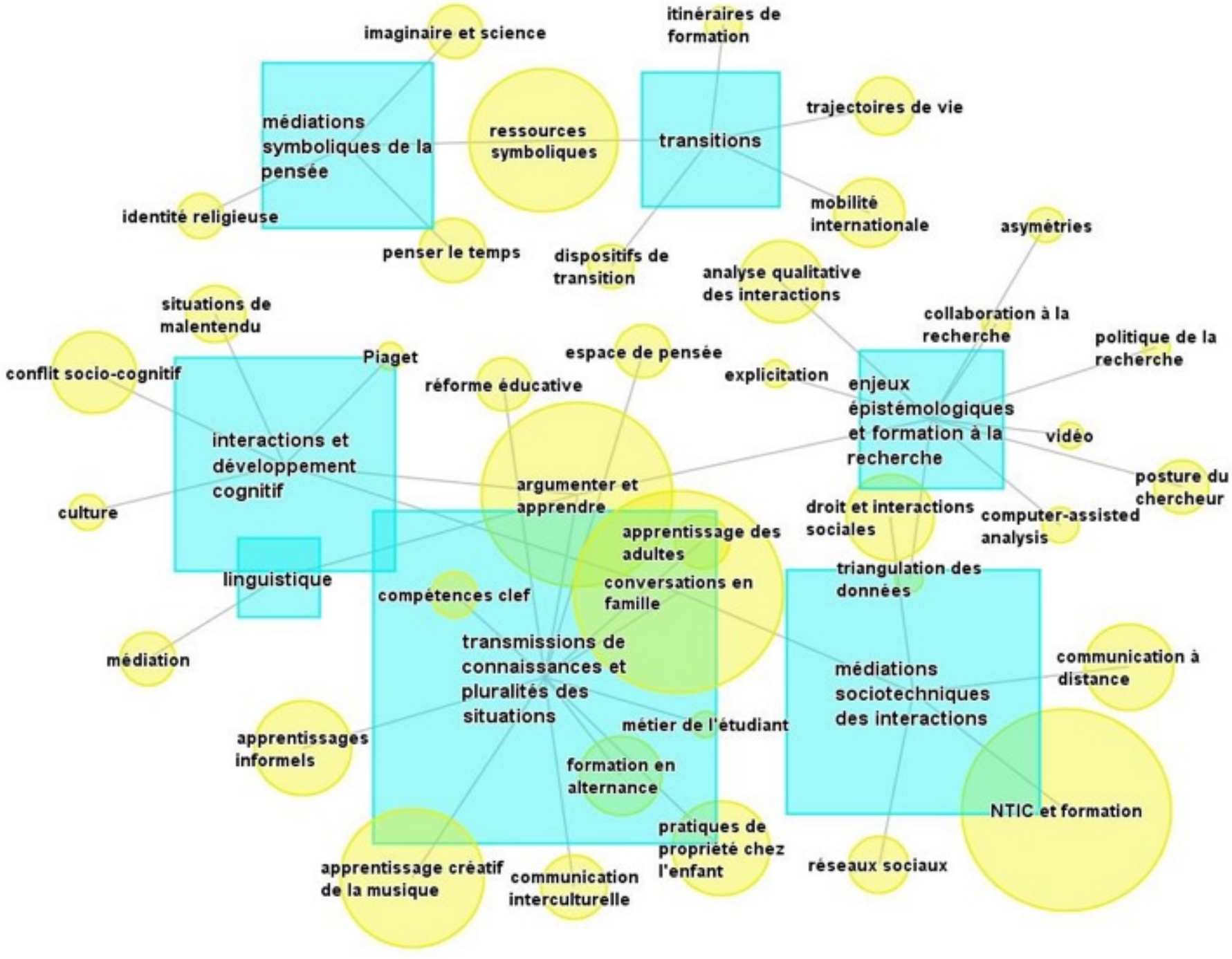
- attending the same commission

- attending the same conference

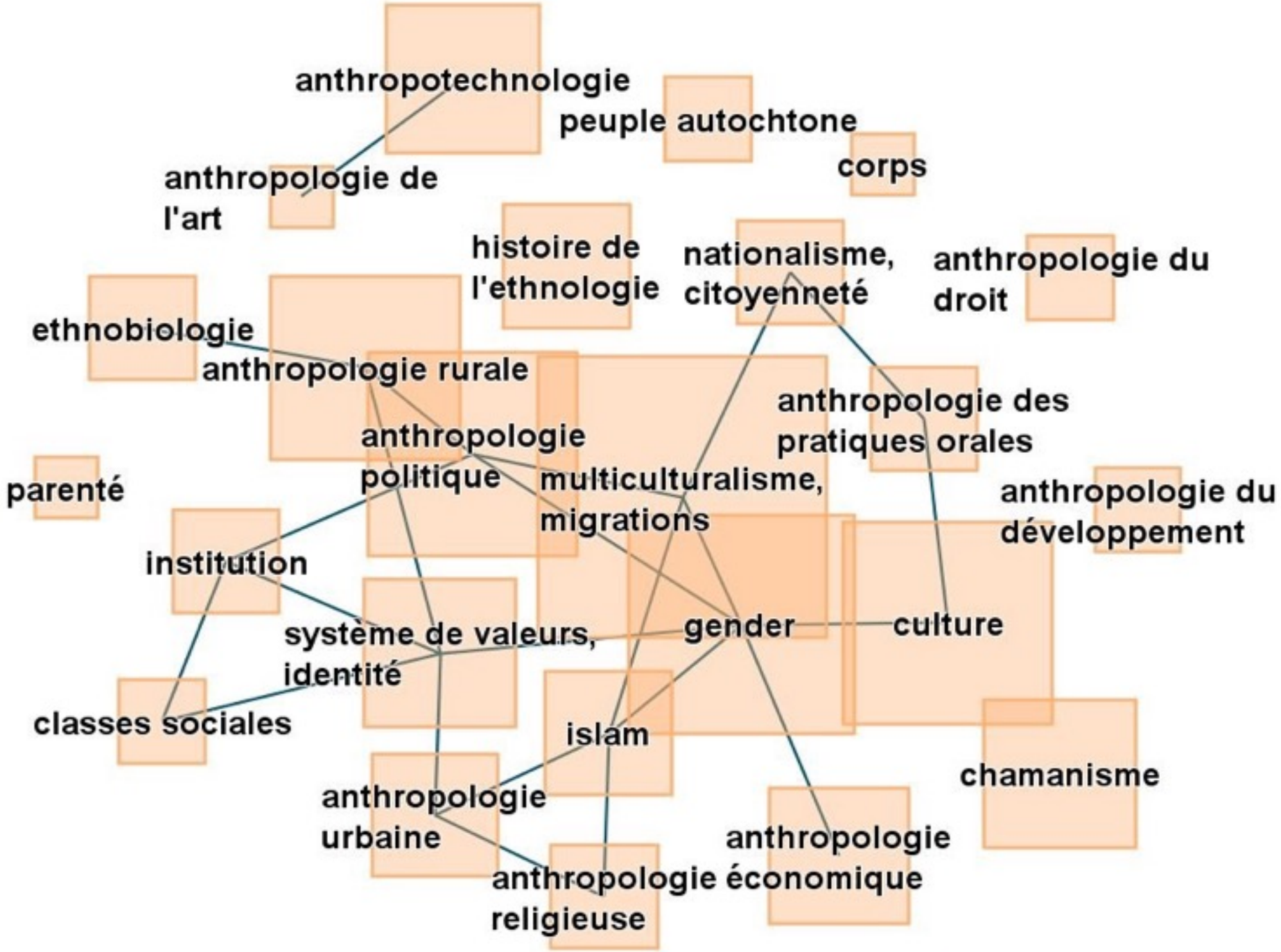
- attending the same talk



Jean-François Perret, Thomas Kadelbach, Joanna Domingos
Les chercheurs et leurs lieux (terrains) de recherche (institut d'ethnologie)



Jean-François Perret, Thomas Kadelbach, Joanna Domingos
Thèmes et domaines par mots-clés (*Institut de psychologie*)



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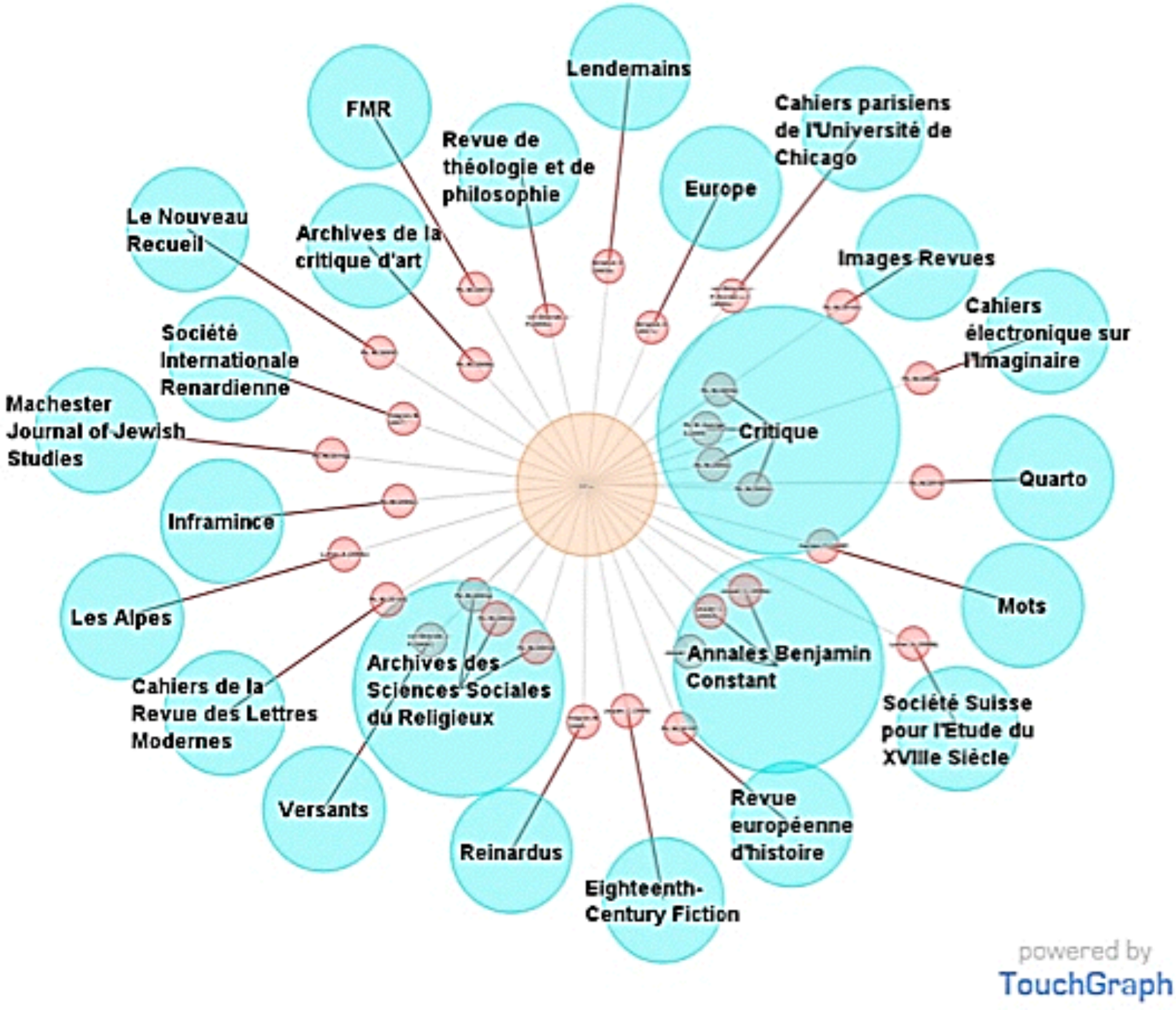
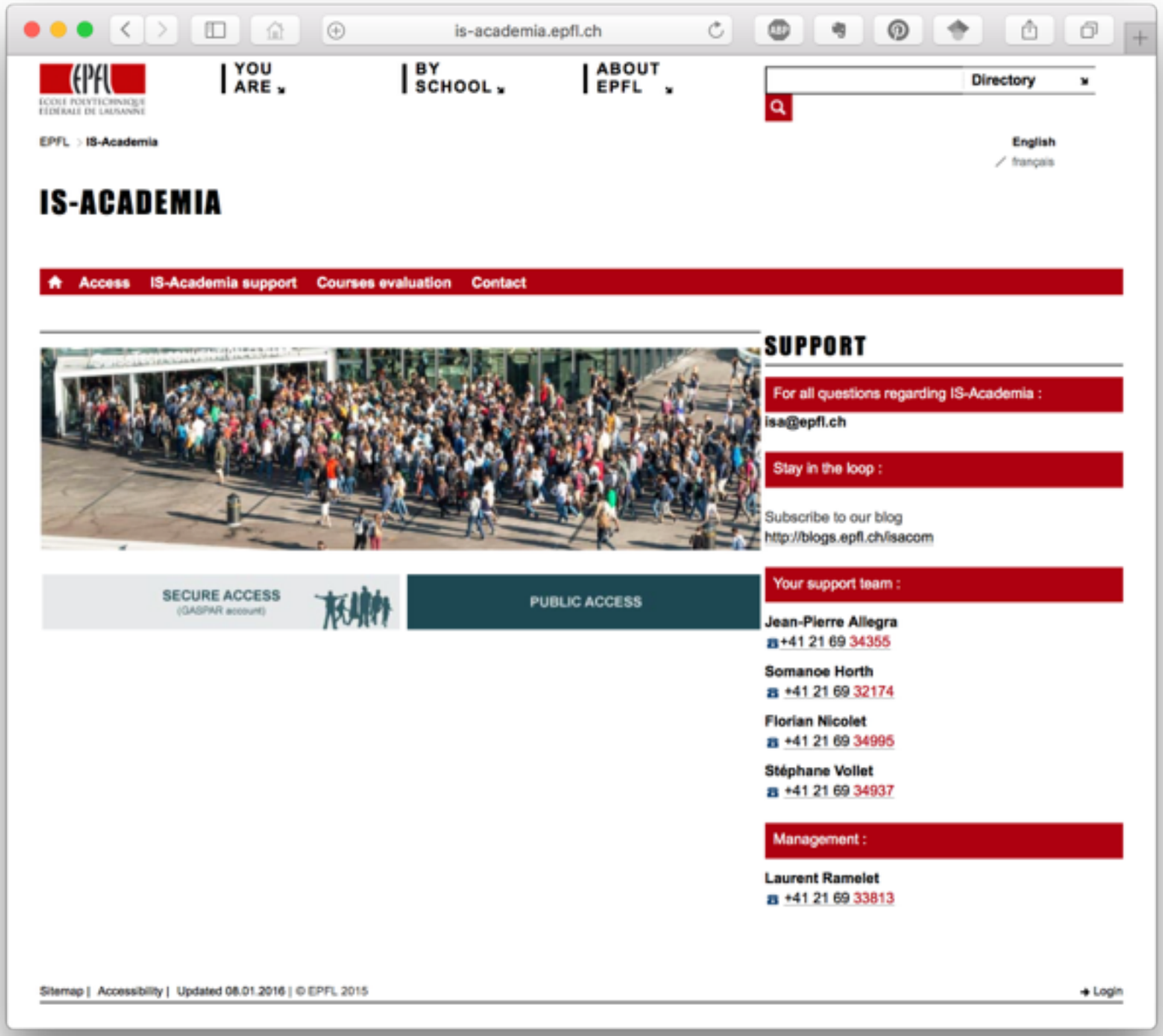


Jean-François Perret, Thomas Kadelbach, Joanna Domingos
Lieux de publications (*revues*) (*Institut de littérature française*)

- Reality is a complex system
- Current visualizations simplify such complexity
- However, we need more sophisticated visualizations
- But to do that, we need data

Data & Terrain

EPFL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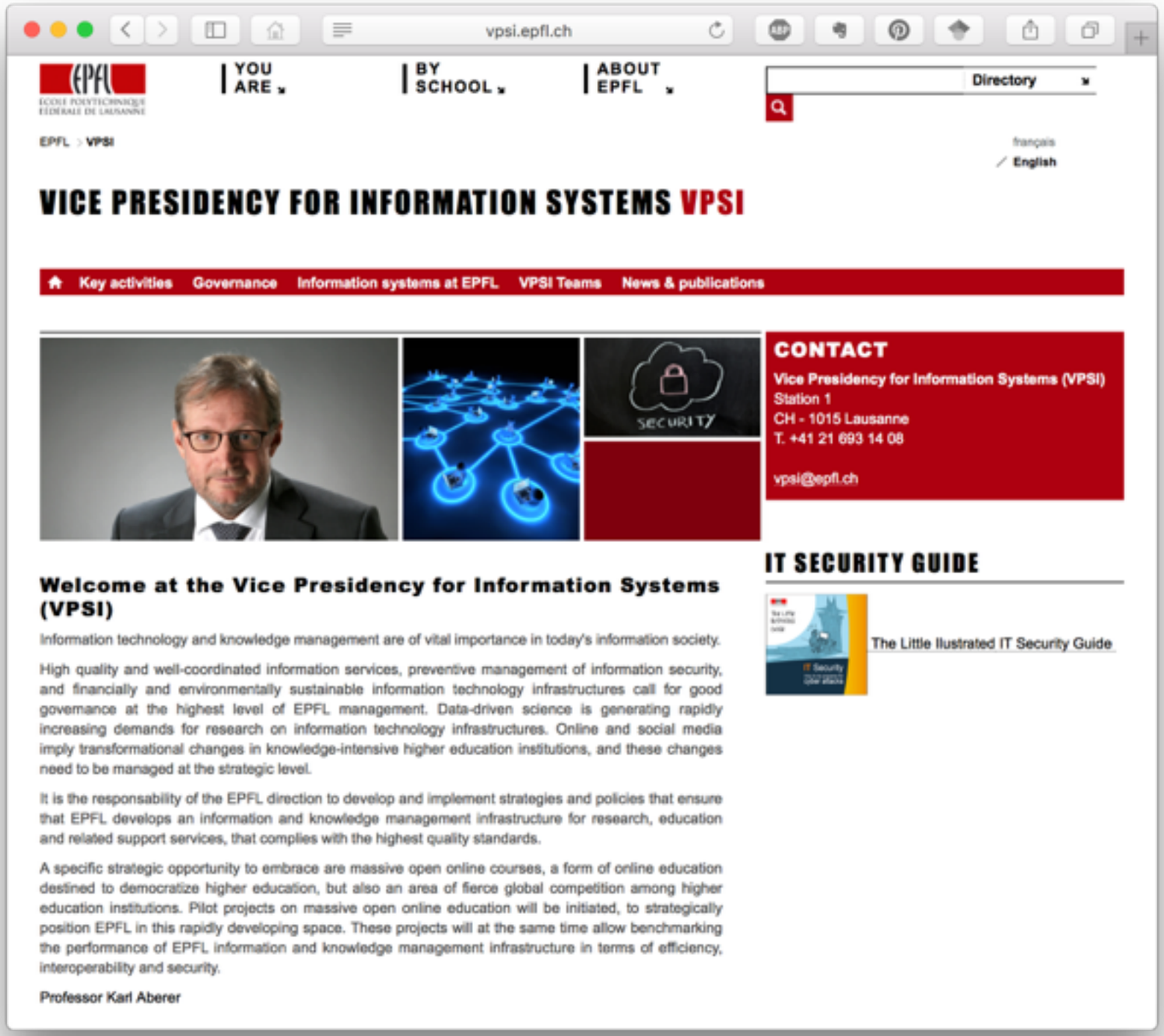
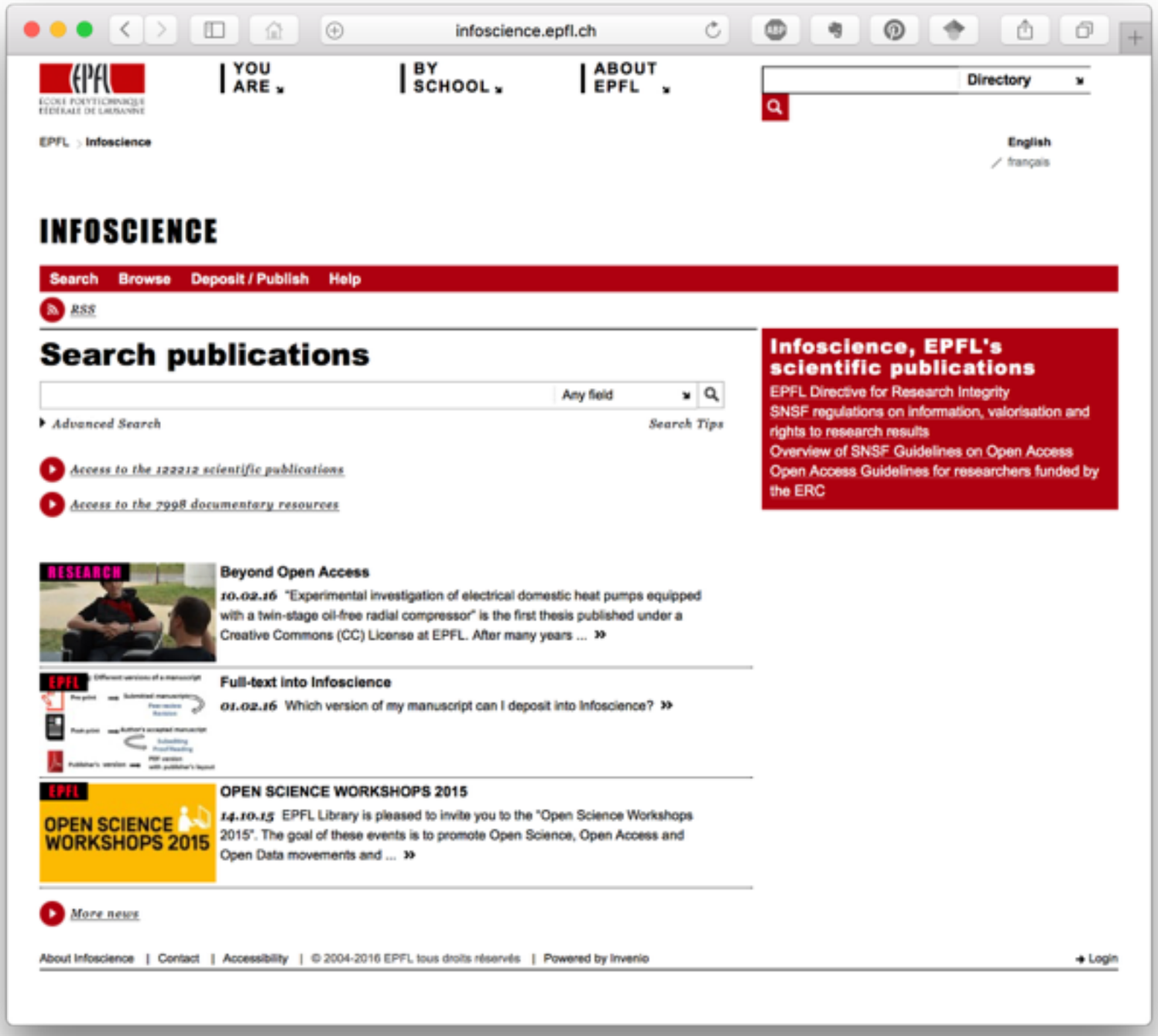
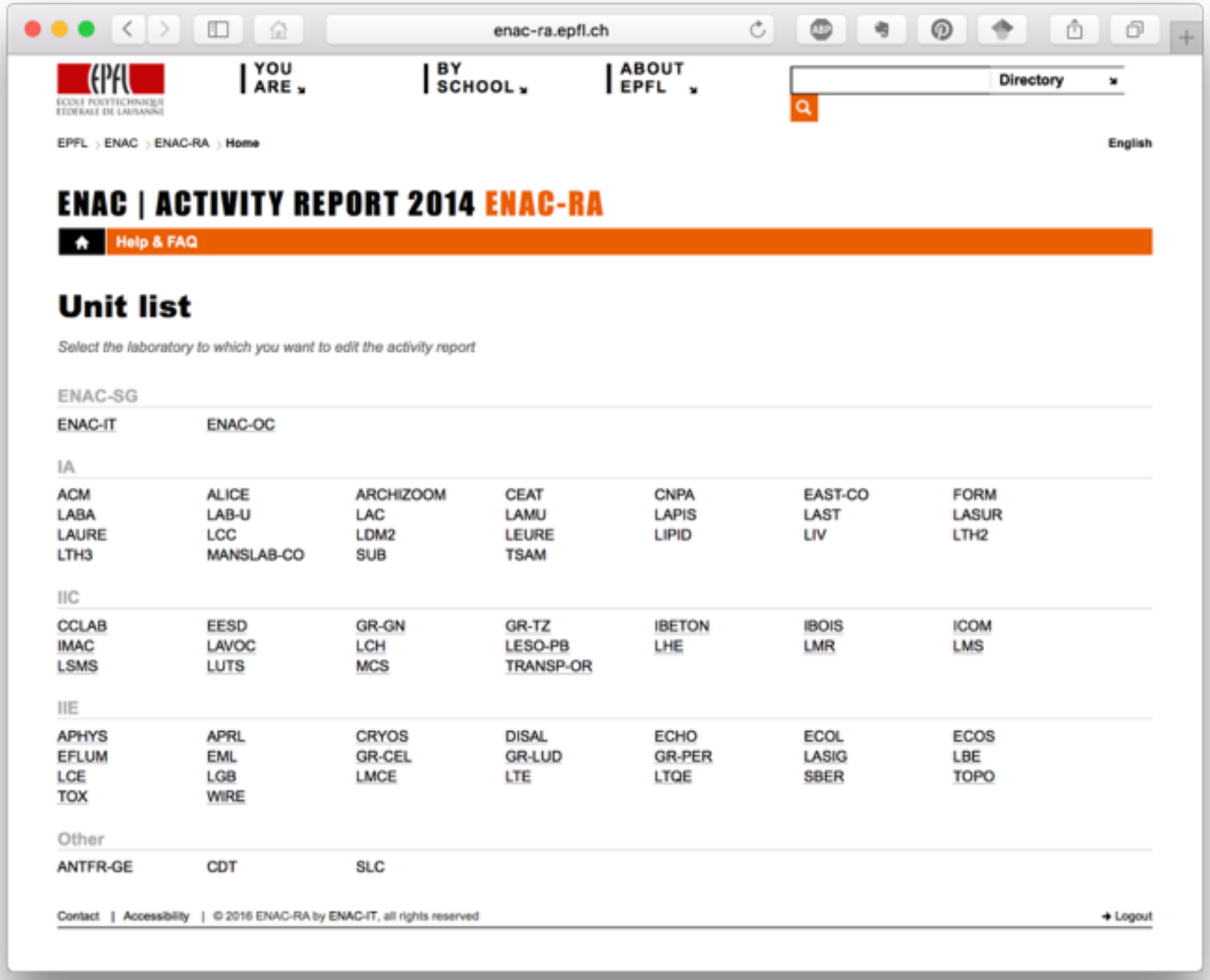


Information Systems



Infoscience

ENAC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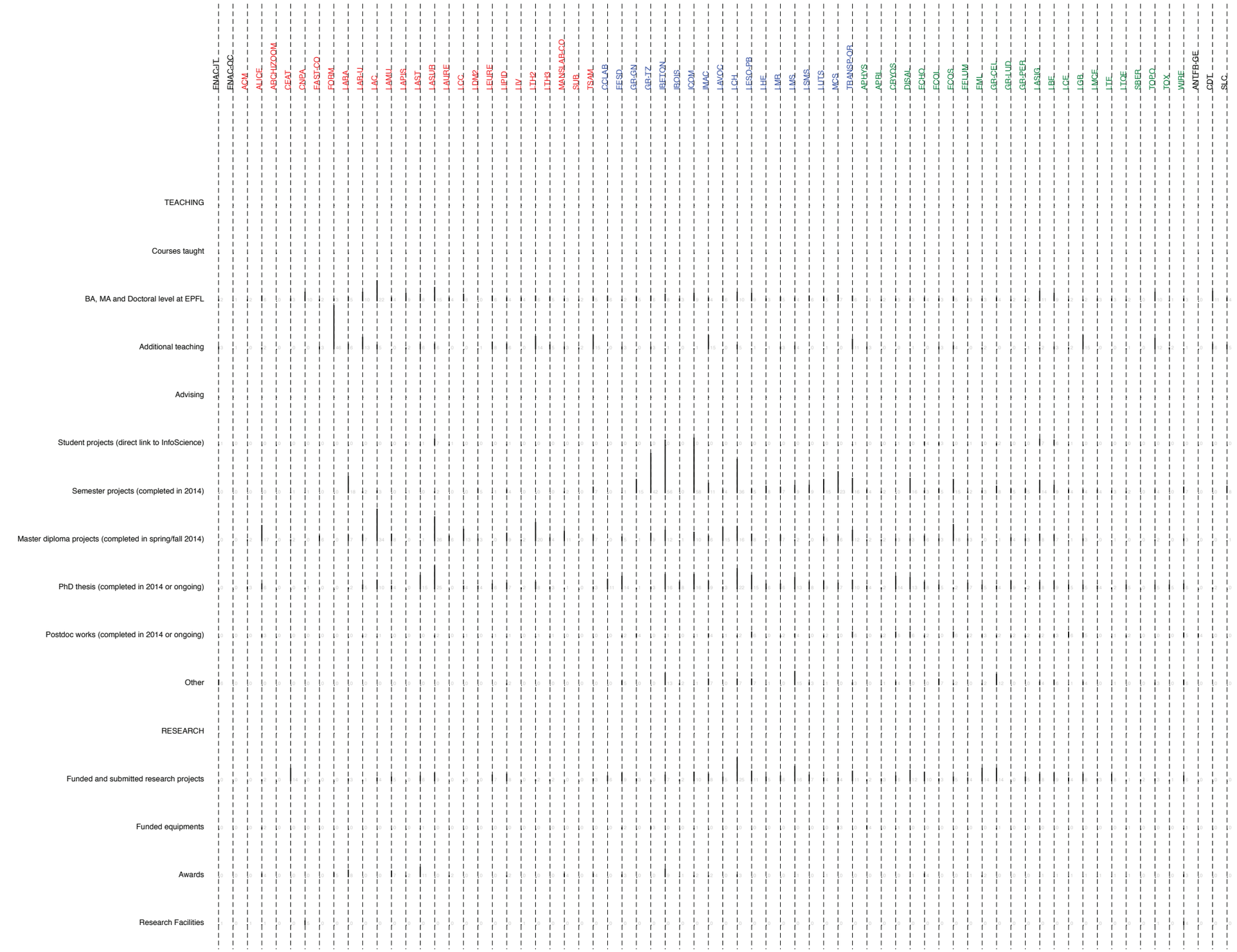
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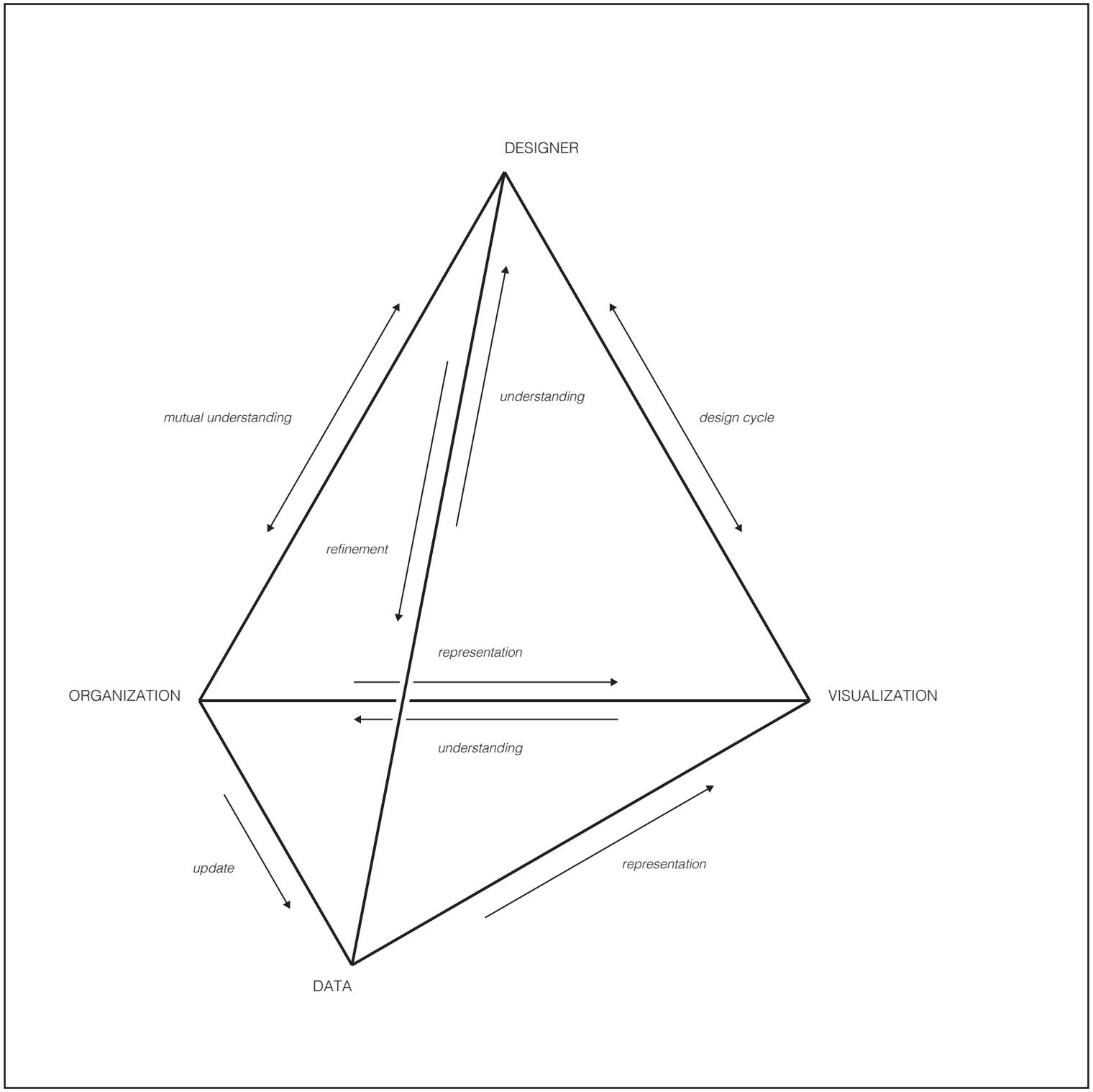
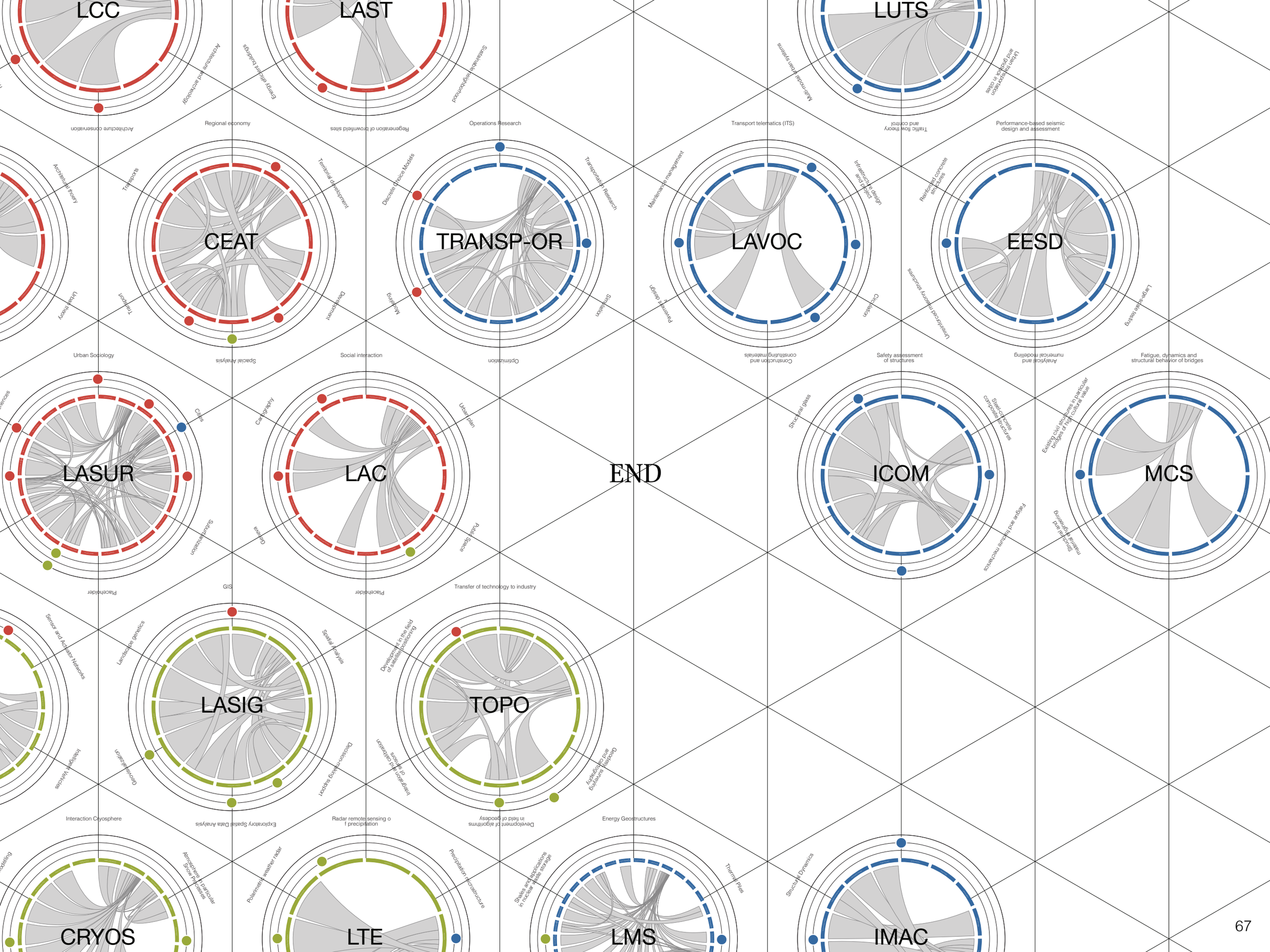
Awards
Research Facilities


DESIGNER
mutual understanding
understanding
design cycle
refinement
representation
ORGANIZATION
VISUALIZATION
understanding
update
representation
DATA

Tomorrow

- The design process
- Attempts toward to final map
- The final design
- Ways of use
- Materialization (poster and large-size decal)
- Next steps


LCC
LAST
LUTS
CEAT
TRANSP-OR
LAVOC
EESD
LASUR
LAC
END
ICOM
MCS
LASIG
TOPO
CRYOS
LTE
LMS
IMAC
Architecture conservation
Regional economy
Regeneration of brownfield sites
Operations Research
Transport telematics (ITS)
Traffic flow theory and control
Performance-based seismic design and assessment
Urban Sociology
Spacial Analysis
Social interaction
Optimization
Construction and constituting materials
Safety assessment of structures
Analytical and numerical modelling
Fatigue, dynamics and structural behavior of bridges
Placeholder
GIS
Placeholder
Transfer of technology to industry
Interaction Cryosphere
Exploratory Spatial Data Analysis
Radar remote sensing o f precipitation
Development of algorithms in field of geodesy
Energy Geostructures