

CMPU 187 · Introduction to Digital Humanities

Maps

7 May 2021



Looking

1984

2020



1984

2020





Mapping

On Exactitude in Science

Jorge Luis Borges, *Collected Fictions*, translated by Andrew Hurley.

...In that Empire, the Art of Cartography attained such Perfection that the map of a single Province occupied the entirety of a City, and the map of the Empire, the entirety of a Province. In time, those Unconscionable Maps no longer satisfied, and the Cartographers Guilds struck a Map of the Empire whose size was that of the Empire, and which coincided point for point with it. The following Generations, who were not so fond of the Study of Cartography as their Forebears had been, saw that that vast Map was Useless, and not without some Pitilessness was it, that they delivered it up to the Inclemencies of Sun and Winters. In the Deserts of the West, still today, there are Tattered Ruins of that Map, inhabited by Animals and Beggars; in all the Land there is no other Relic of the Disciplines of Geography.

—Suarez Miranda, *Viajes de varones prudentes*, Libro IV, Cap. XLV, Lerida, 1658

Maps are models.

The only true model is one that has a full, one-to-one correspondence with reality.

All other models are wrong.

But some are useful.

In 1854, there was an outbreak of cholera in central London:

The most terrible outbreak of cholera which ever occurred in this kingdom, is probably that which took place in Broad Street, Golden Square, and adjoining streets, a few weeks ago. Within two hundred and fifty yards of the spot where Cambridge Street joins Broad Street, there were upwards of five hundred fatal attacks of cholera in ten days. The mortality in this limited area probably equals any that was ever caused in this country, even by the plague; and it was much more sudden, as the greater number of cases terminated in a few hours. The mortality would undoubtedly have been much greater had it not been for the flight of the population. Persons in furnished lodgings left first, then other lodgers went away, leaving their furniture to be sent for. . . . Many houses were closed altogether owing to the death of the proprietors; and, in a great number of instances, the tradesmen who remained had sent away their families; so that in less than six days from the commencement of the outbreak, the most afflicted streets were deserted by more than three-quarters of their inhabitants.²

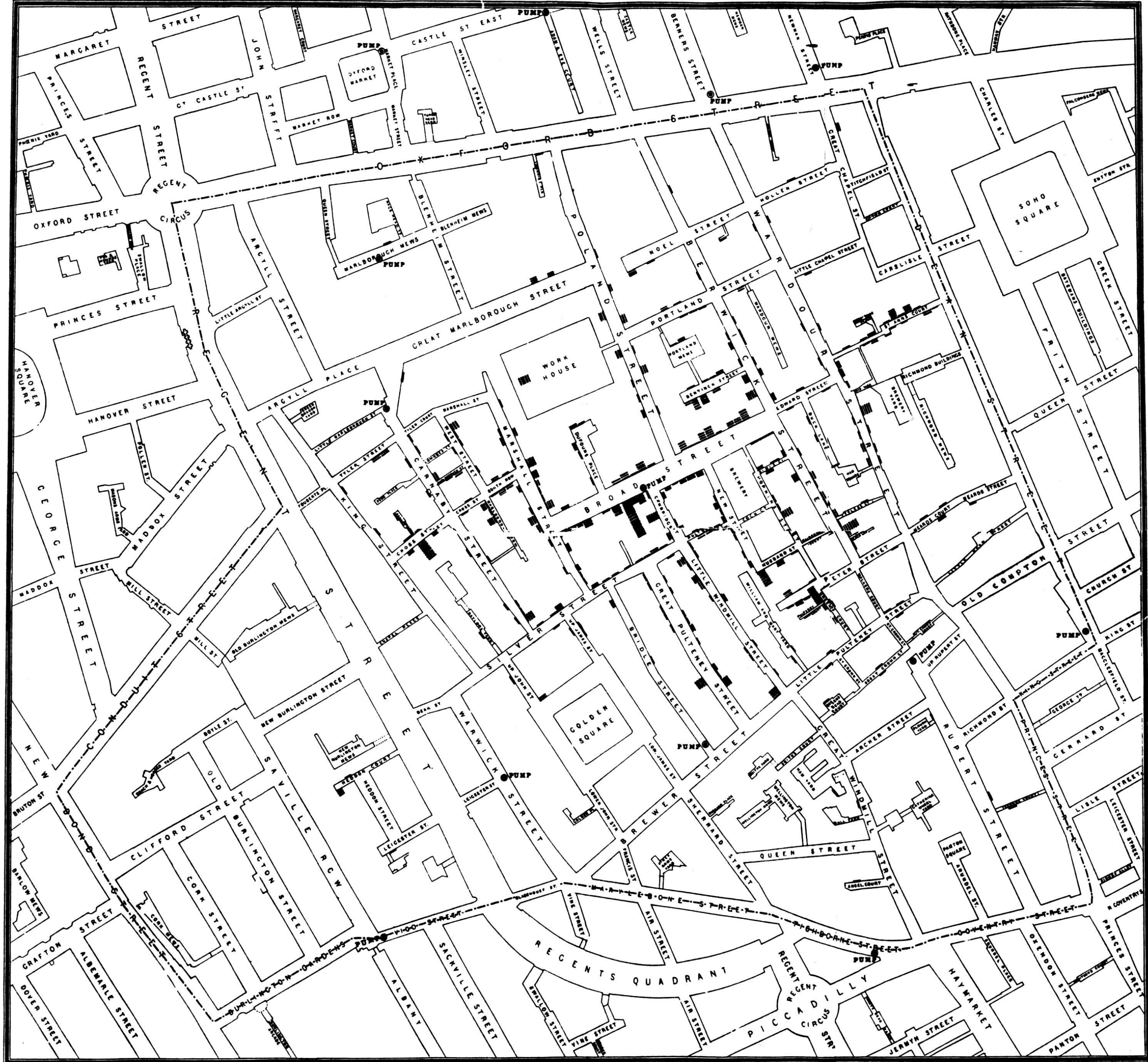
John Snow, *On the Mode of Communication of Cholera*, 1855

The outbreak began on the evening of 31 August 1854.

Snow, who investigated earlier epidemics, suspected the water from a community pump-well at Broad and Cambridge Streets was contaminated.

However, he couldn't reach any definitive conclusion from looking at the water.

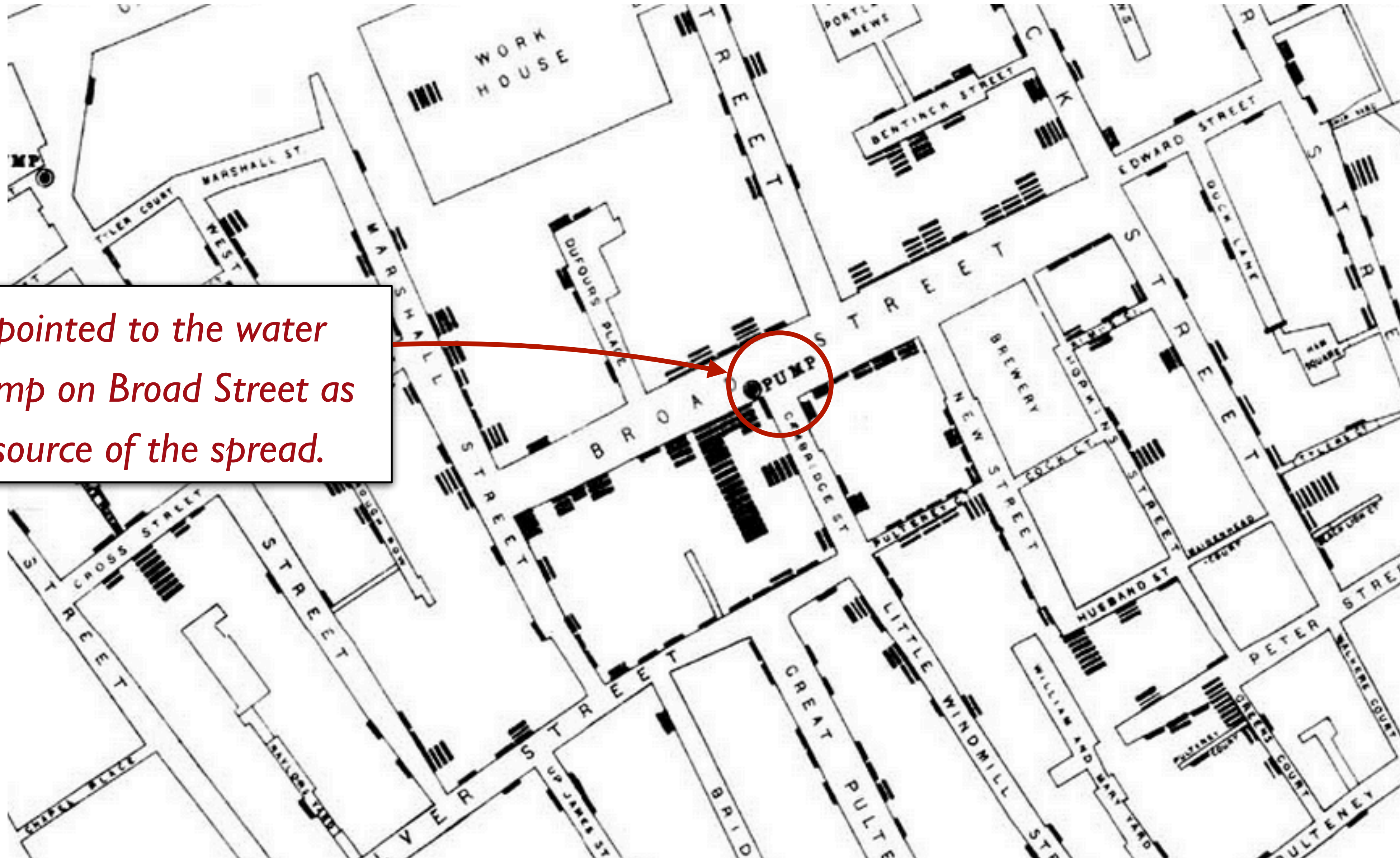
He obtained a list of 83 cholera deaths from the General Register Office and plotted them on a map.



On proceeding to the spot, I found that nearly all of the deaths had taken place within a short distance of the pump. There were only ten deaths in houses situated decidedly nearer to another street pump. In five of these cases the families of the deceased persons informed me that they always sent to the pump in Broad Street, as they preferred the water to that of the pump which was nearer. In three other cases, the deceased were children who went to school near the pump in Broad Street. Two of them were known to drink the water; and the parents of the third think it probable that it did so. The other two deaths, beyond the district which this pump supplies, represent only the amount of mortality from cholera that was occurring before the irruption took place.

With regard to the deaths occurring in the locality belonging to the pump, there were sixty-one instances in which I was informed that the deceased persons used to drink the pump-water from Broad Street, either constantly or occasionally. In six instances I could get no information, owing to the death or departure of every one connected with the deceased individuals; and in six cases I was informed that the deceased persons did not drink the pump-water before their illness.⁴

John Snow, *On the
Mode of
Communication of
Cholera*, 1855



This map pointed to the water from a pump on Broad Street as the likely source of the spread.

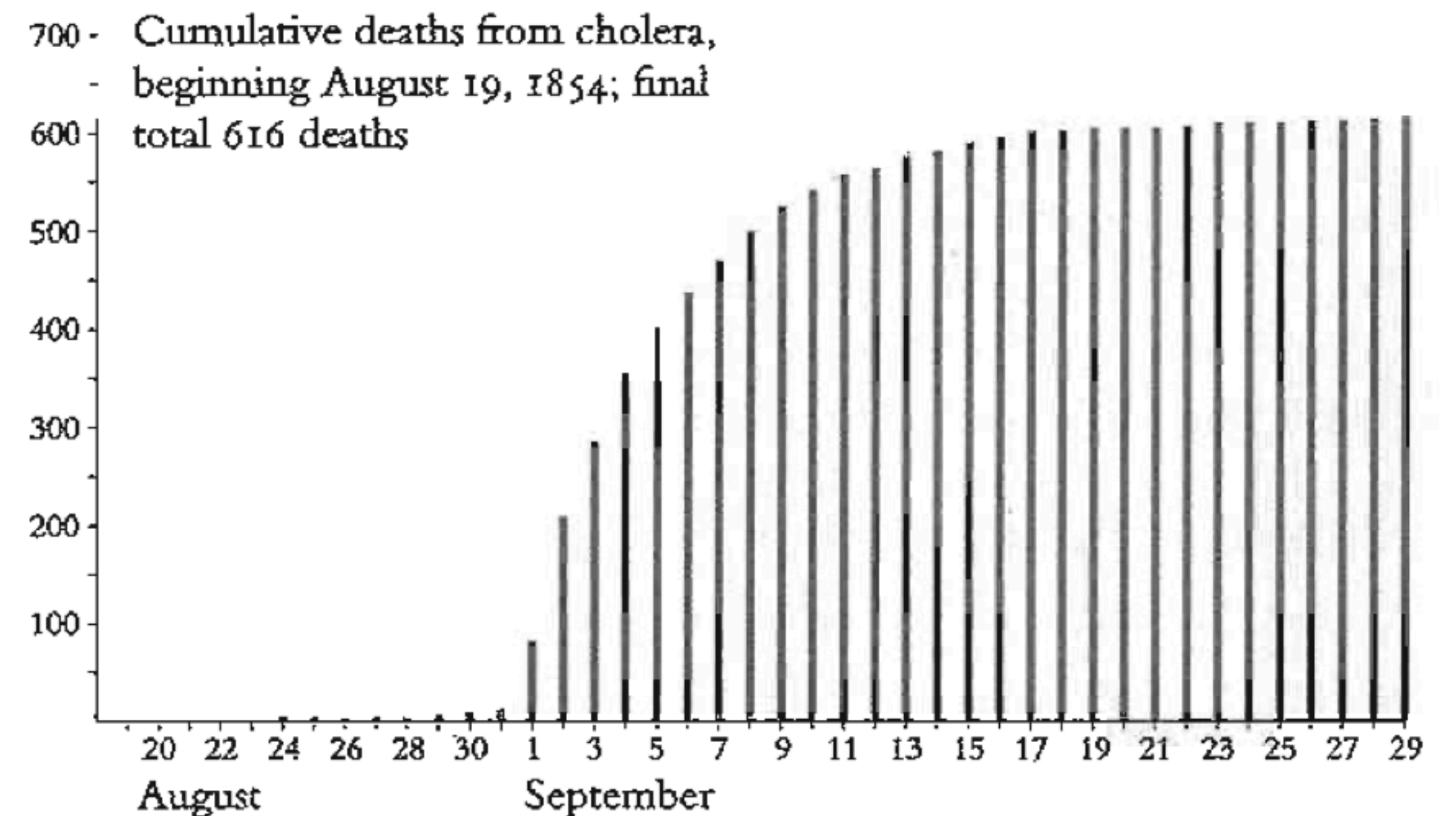
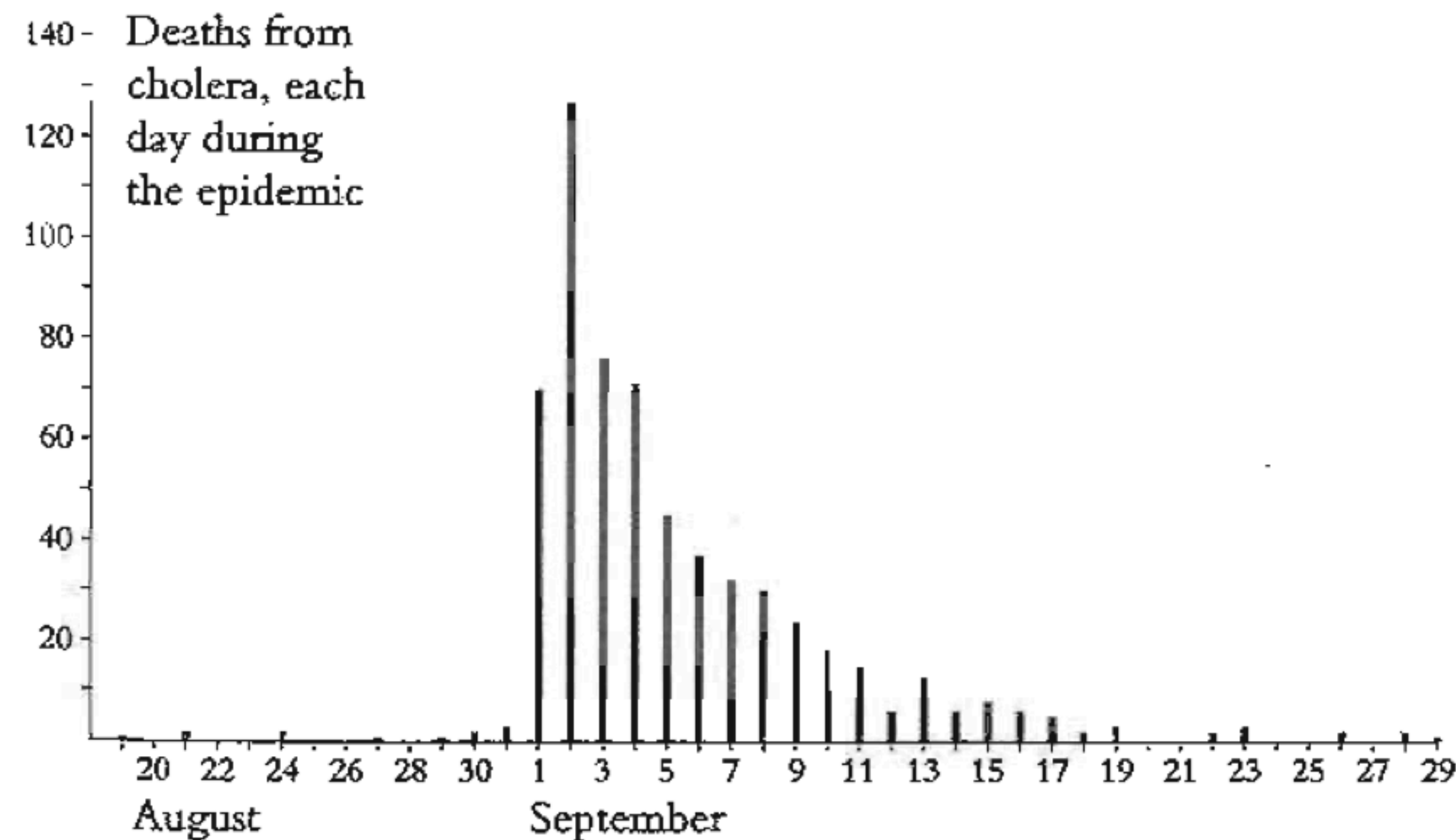
It was time to act.

Snow described his findings to the Board of Guardians of St James's Parish, who were responsible for the water supply.

The Board ordered the pump-handle be removed immediately, and the epidemic soon ended.

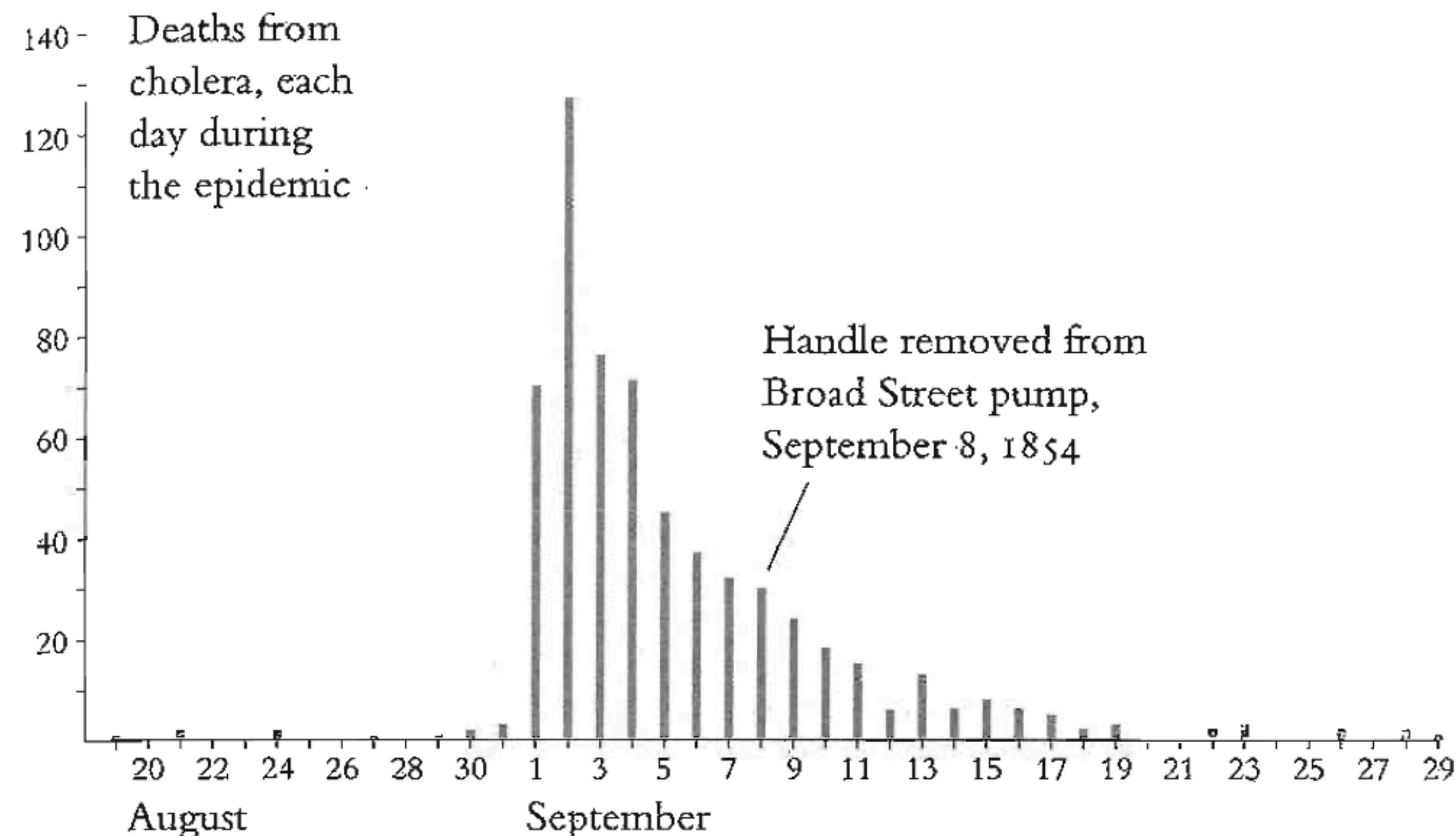
The original data Snow obtained listed the victims' names and described their circumstances, in order by date of death.

The obvious visualization would be a time series – a display of the progress of the epidemic, either daily or cumulative:

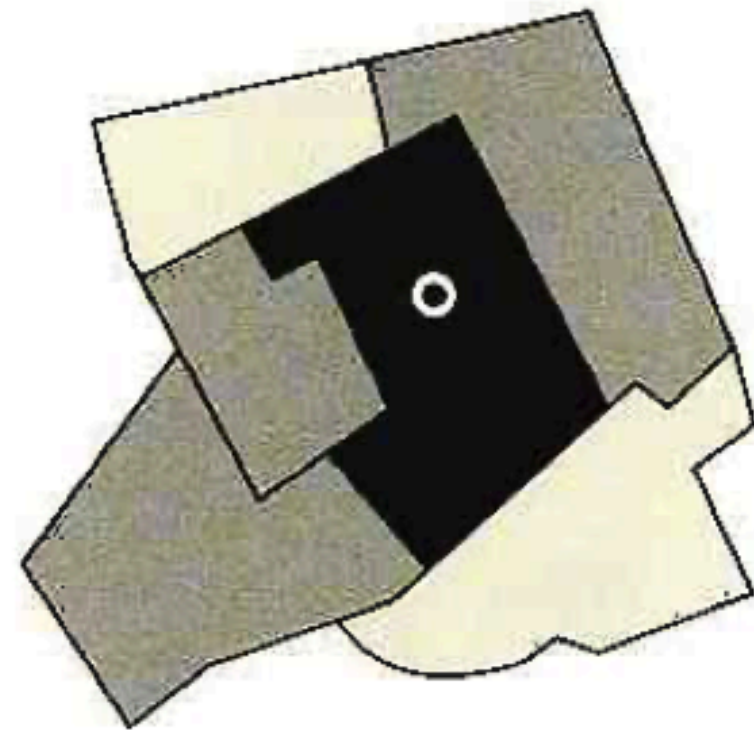


These visualizations would have been practically useless in discovering a strategy for stopping the epidemic.

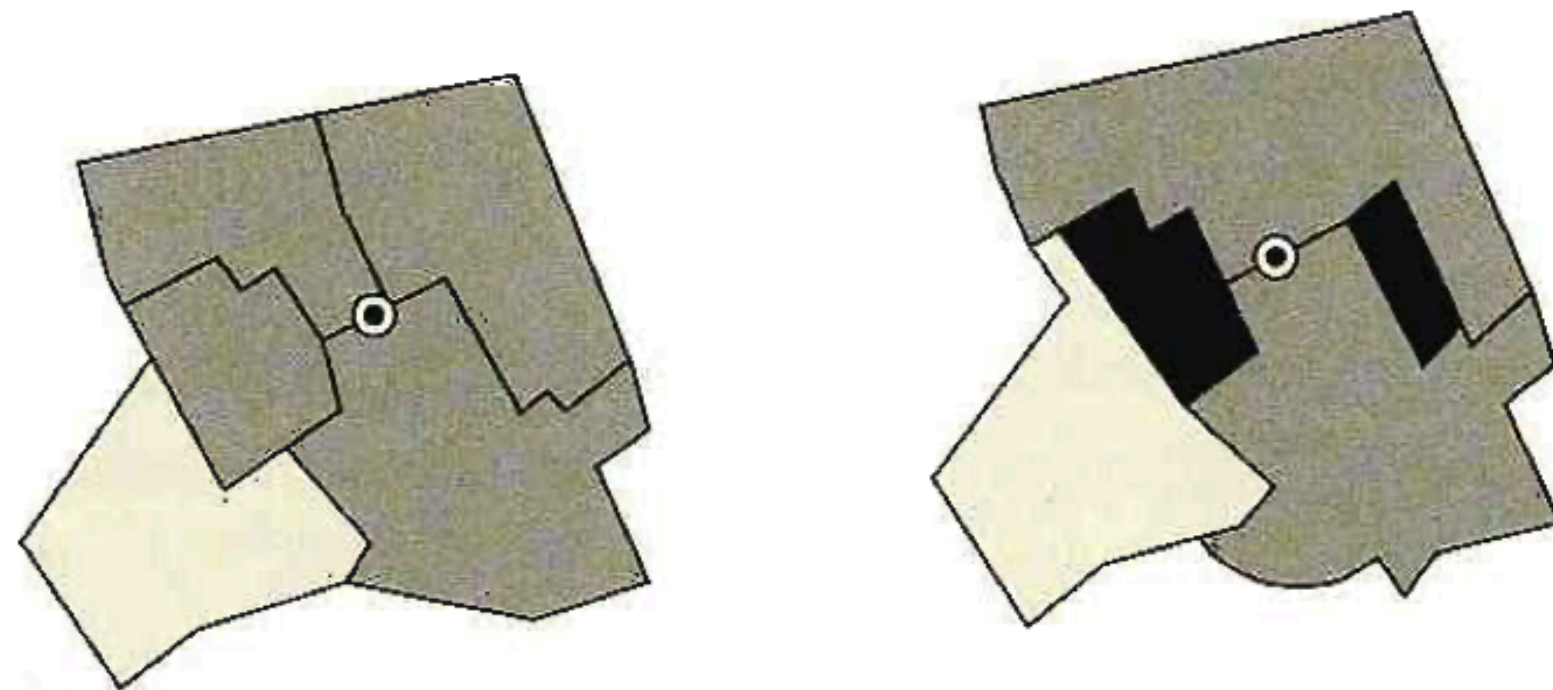
They can, however, show that removing the pump handle may have been done too late to “save the day”. The epidemic was already in decline:



A clearer picture of the outbreak might have been gained by aggregating the data rather than plotting individual deaths:



But different choices of boundaries could hide the center of the outbreak entirely:



Mark Monmonier,
*How to Lies with
Maps*, 1991



Mapping terms to know

Geocoding is the process of determining machine-readable location coordinates from a plain-language street address.

Usually this means we're looking for latitude and longitude, e.g.,

124 Raymond Avenue, Poughkeepsie, NY 12604

→ 41.68628, -73.89746



Depiction of the
Ecumene, using
Ptolemy'
gazetteer of
coordinates

Johannes
Schnitzer, 1482



A *basemap* is an image and/or data that forms the background setting for a map.

Tiling a map is a way to render it more quickly at different zoom levels.

Rather than serve out one giant image, a map server divides a map into many different image files (*tiles*) that are joined together seamlessly.

A *layer* is a graphic representation of data, geocoded and “layered” on top of a basemap.

A *projection* is a method used to represent the three-dimensional surface of the Earth on a two-dimensional plane.

Cylindrical

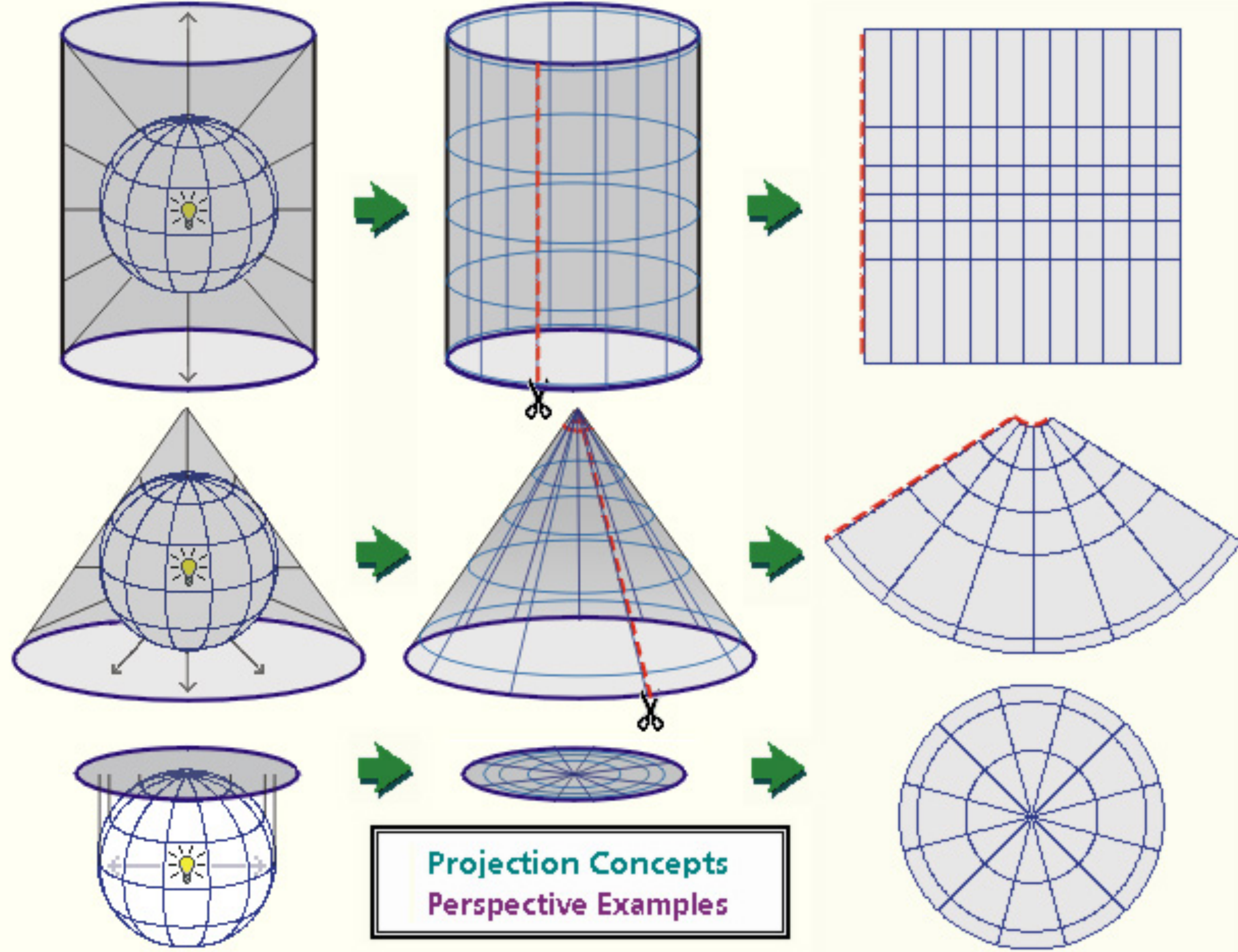
Mercator

Conical

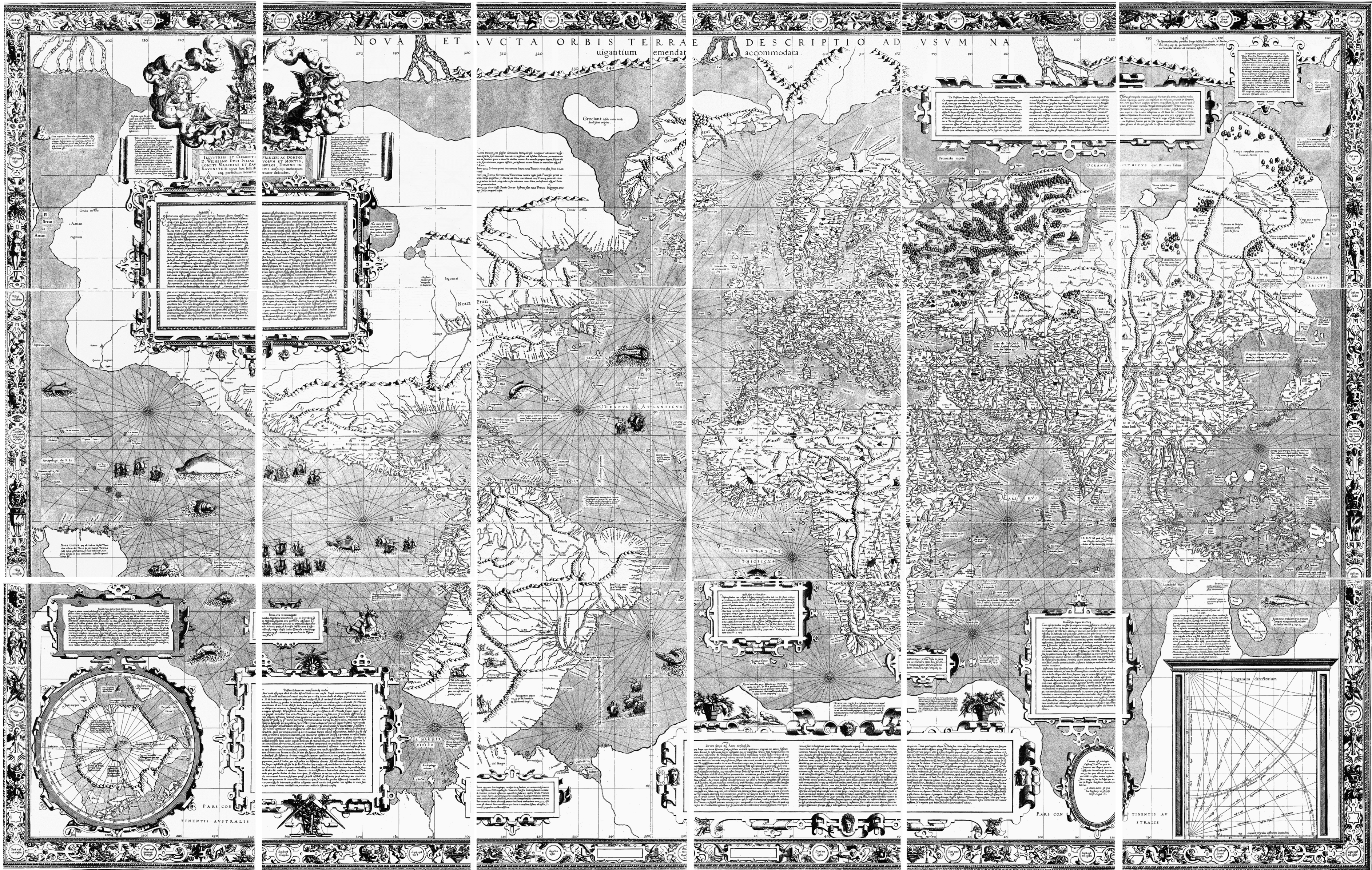
Perspective Conic

Planar

Orthographic

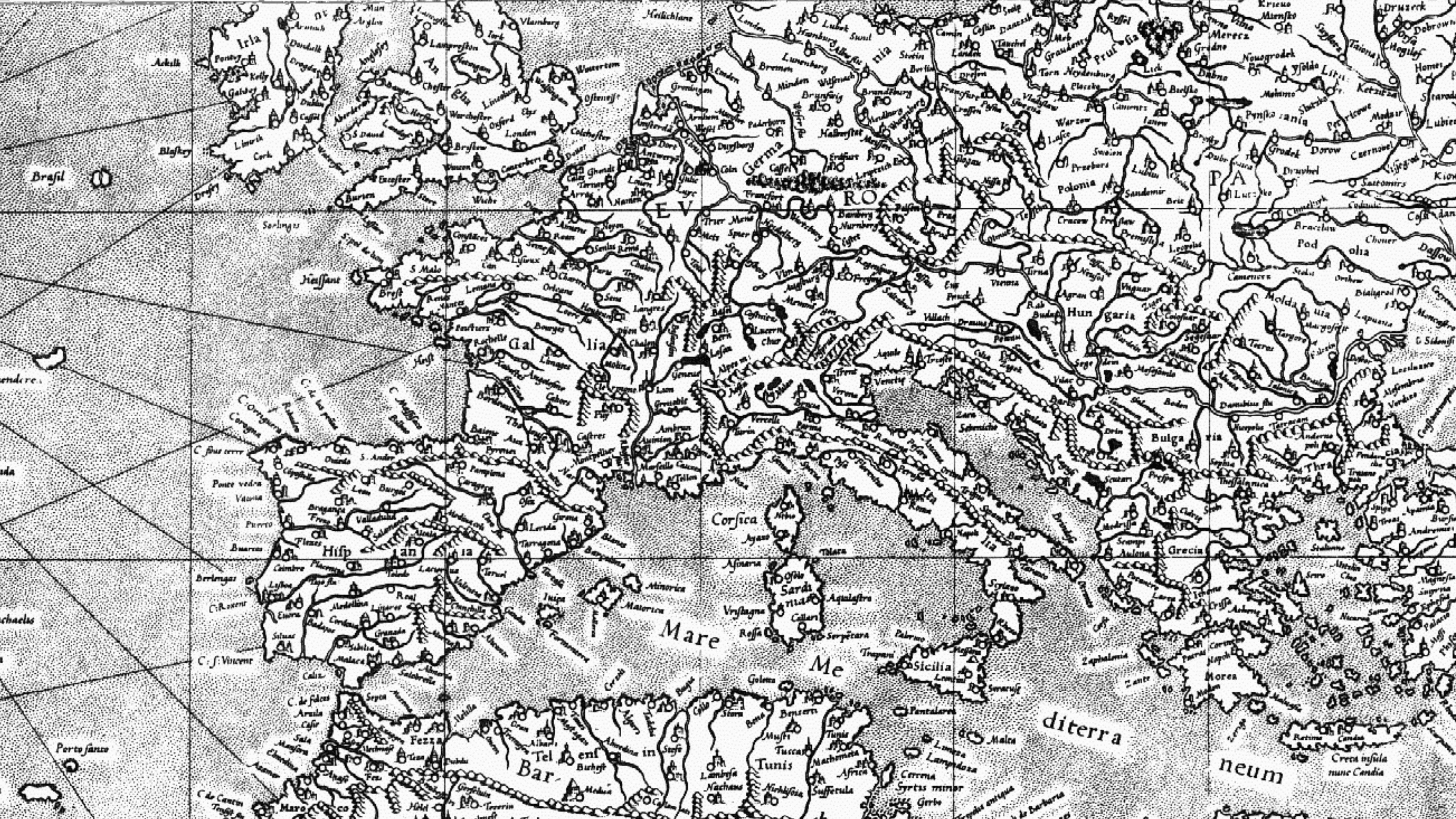


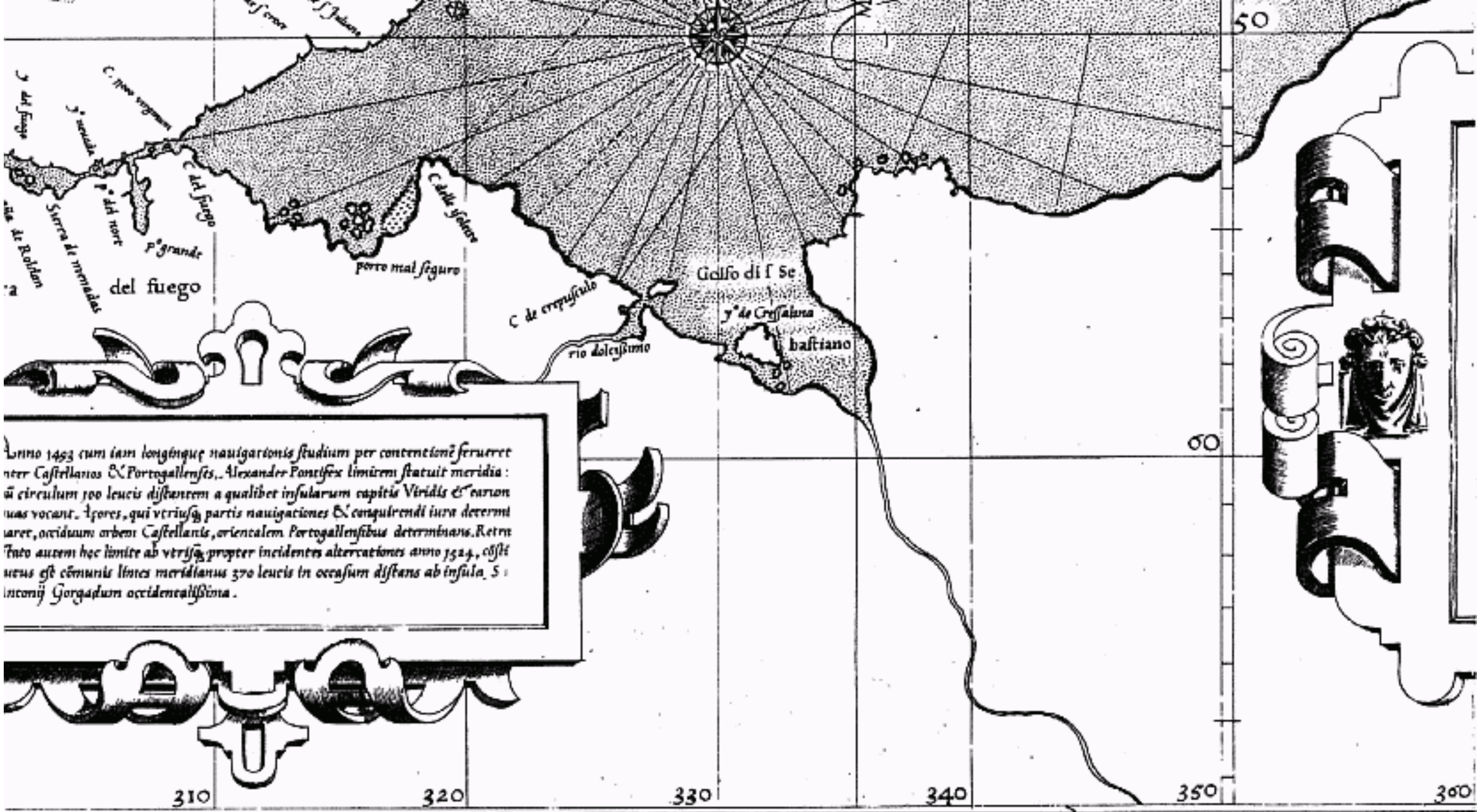
Projection Concepts
Perspective Examples



Gerardus Mercator,
1569

(Basel map copy)



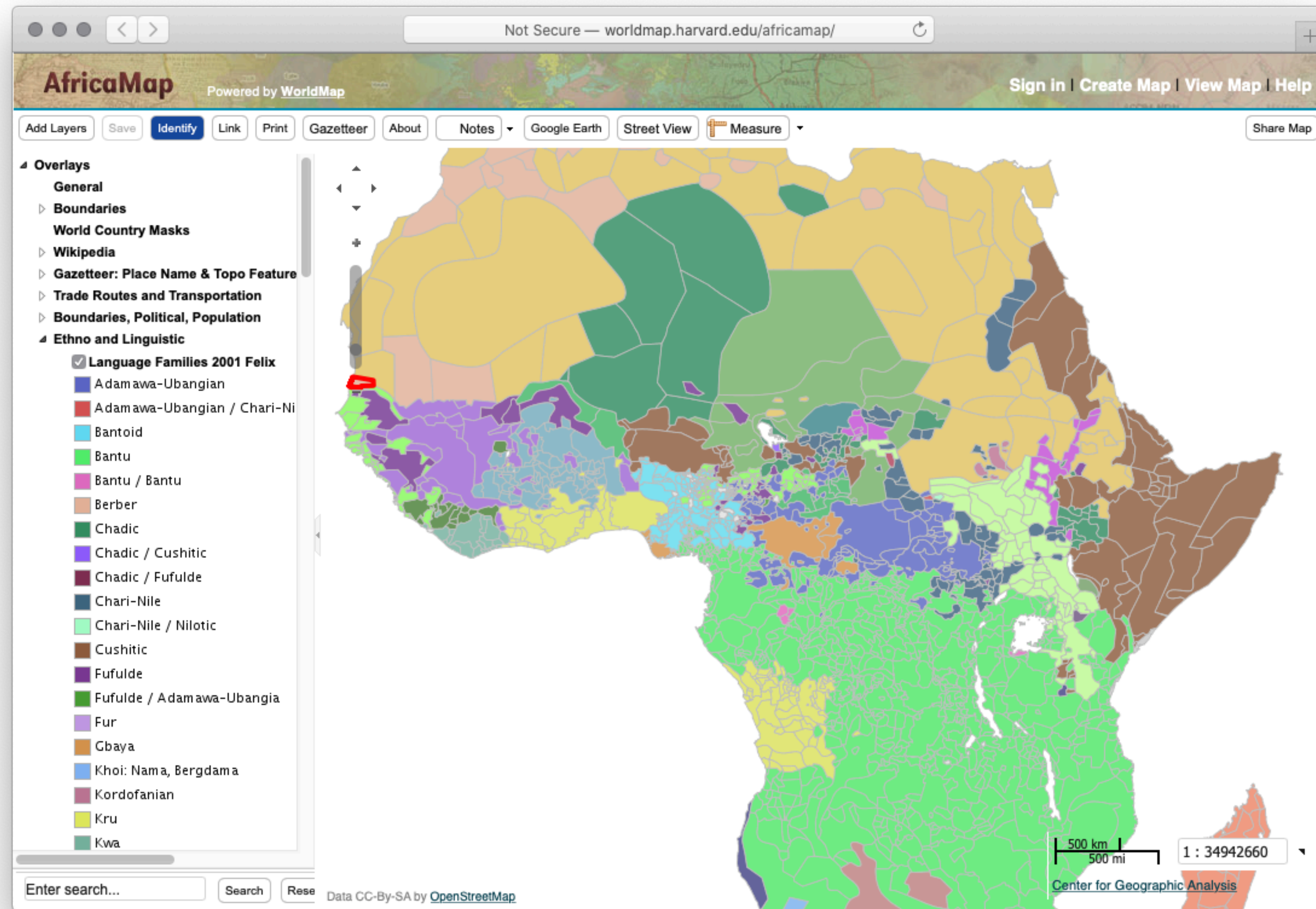


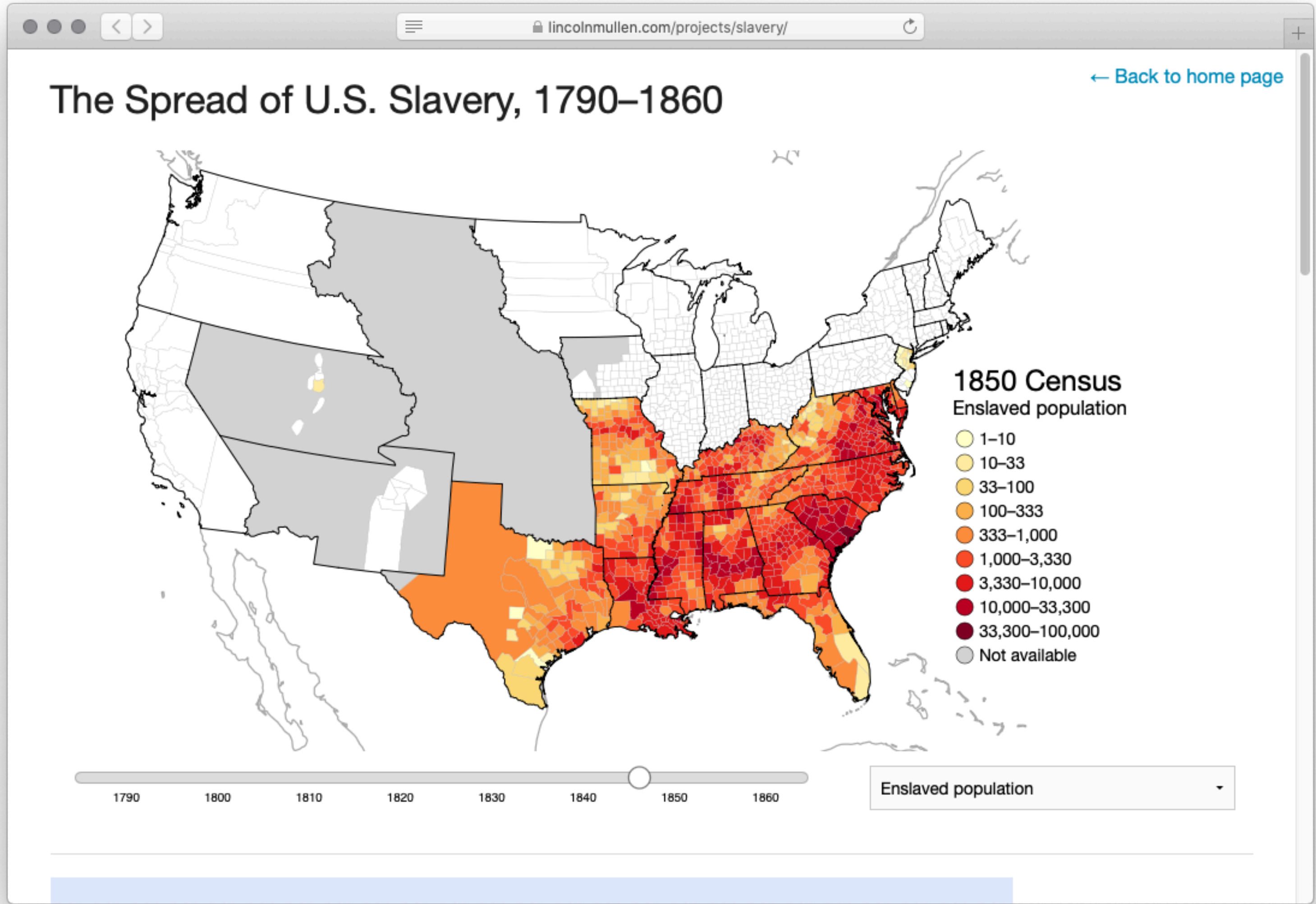
Assigning geographic coordinates to an image is called *georeferencing* it.

Often, we georeference old maps so they can serve as basemaps in GIS software.

A *shapefile* is a file format, developed by ESRI but in wide use, that contains geographic data as points, lines, and polygons.

Projects





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MAP of
EARLY MODERN
LONDON

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THE AGAS MAP

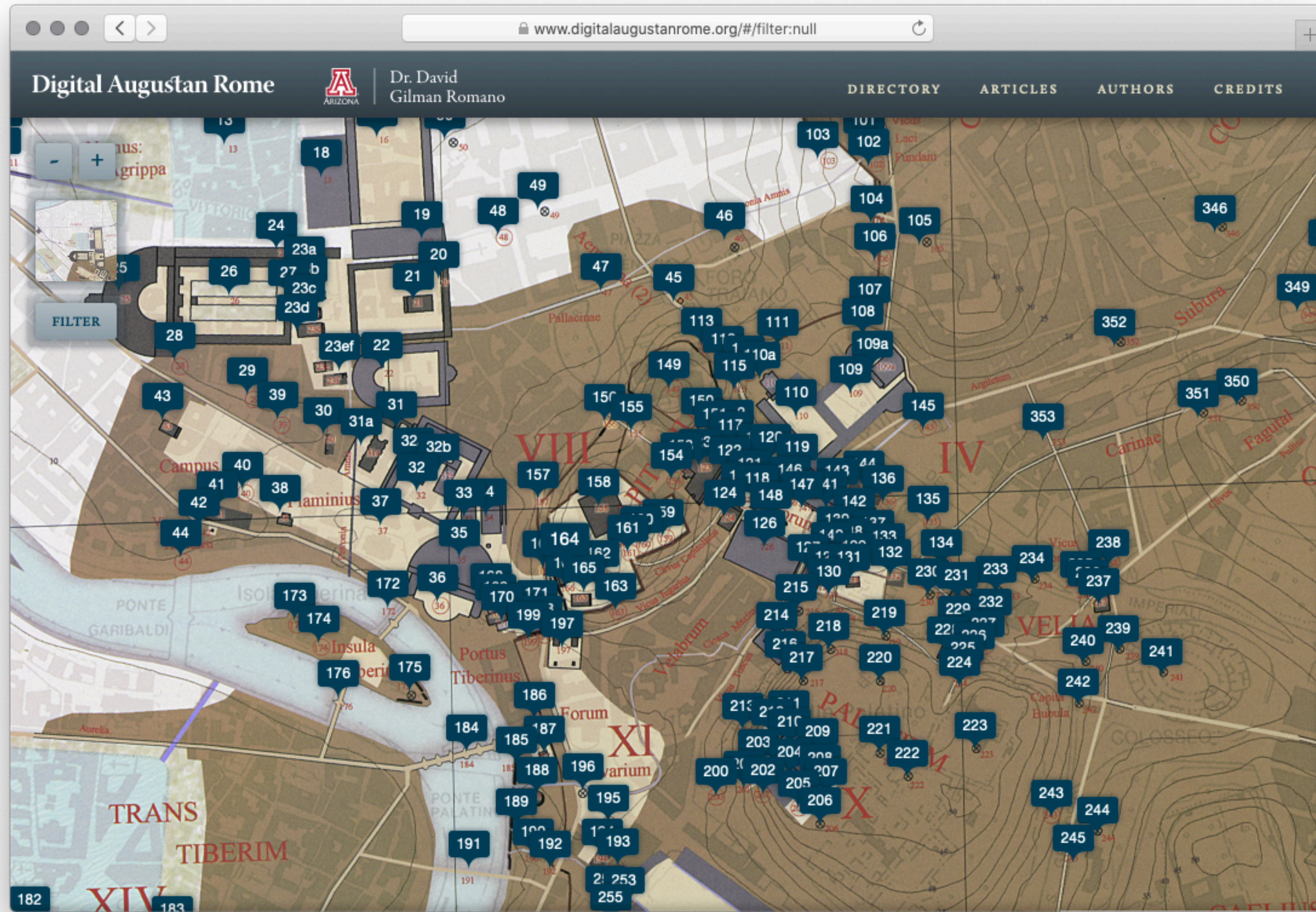
List documents mentioning The Agas Map

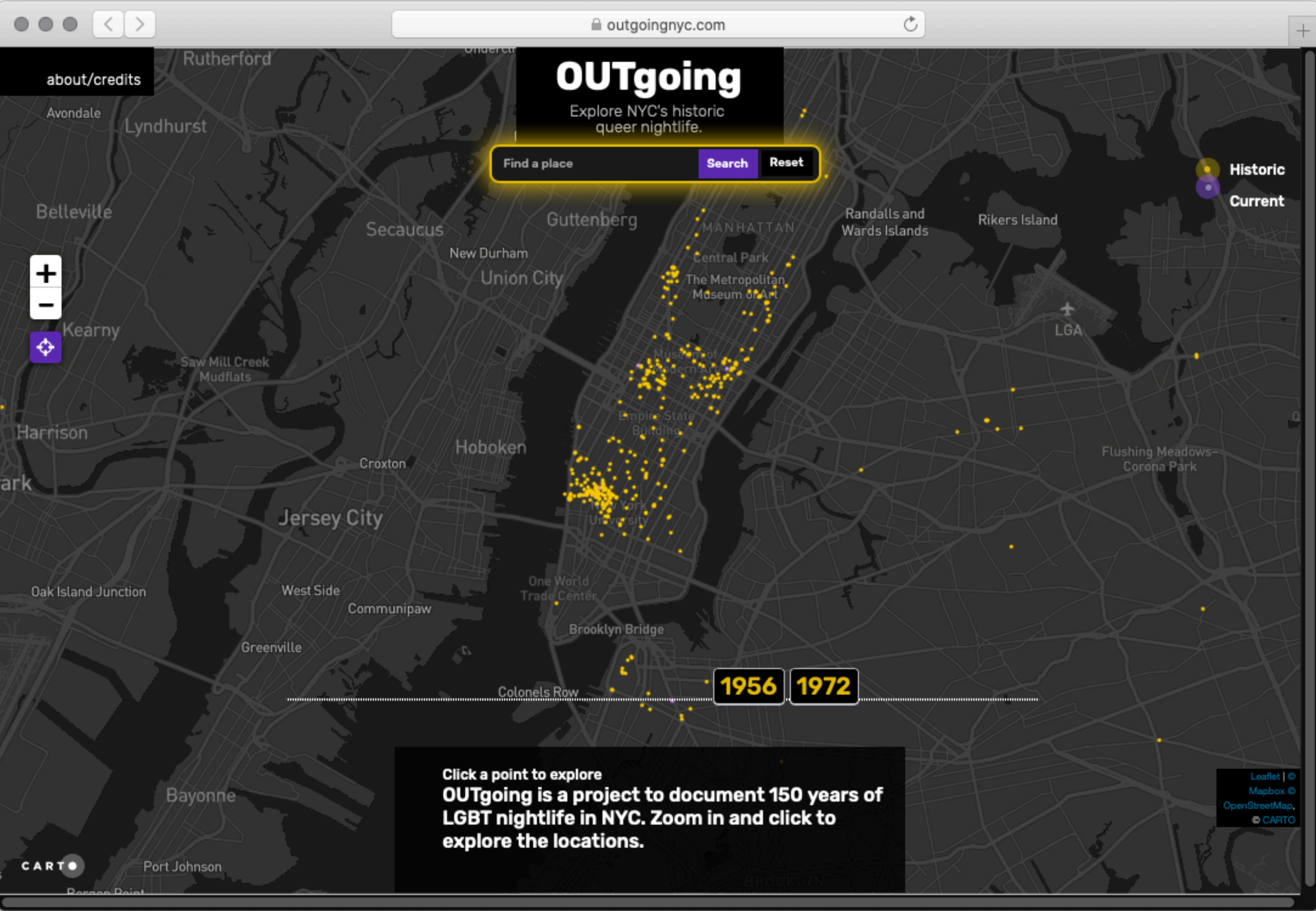
WHAT IS THE AGAS MAP?

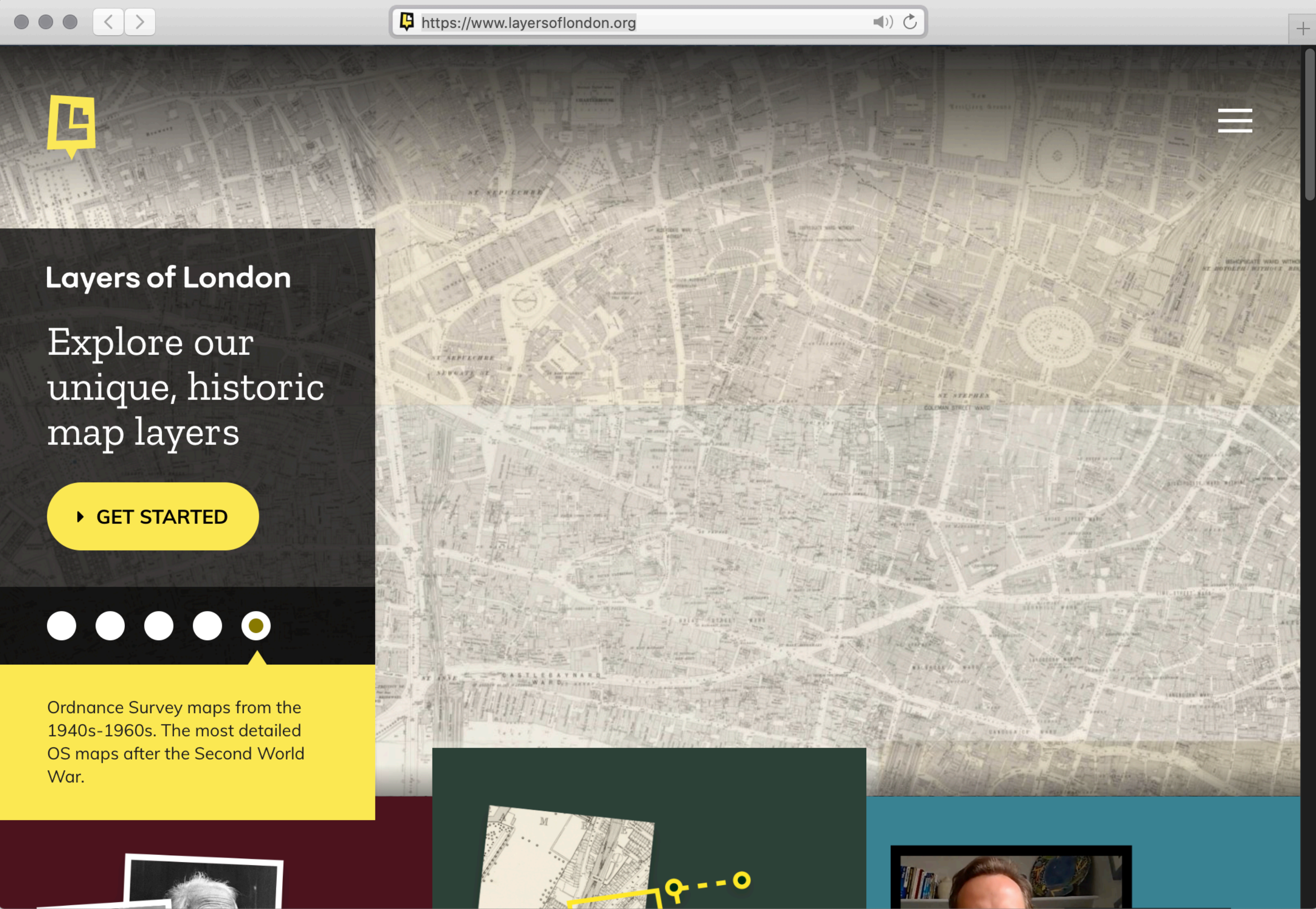
Civitas Londinum is a bird's-eye view of [London](#) first printed from woodblocks in about [1561](#). Widely known as the “[Agas](#) map,” from a spurious attribution to surveyor [Ralph Agas](#) (c.1540-1621), the map offers a richly detailed view both of the buildings and streets of the city and of its environment. No copies survive from [1561](#), but a modified version was printed in [1633](#). In the later version of the map, the Stuart coat of arms replaces the Elizabethan arms, and the [Royal Exchange](#), which opened in [1571](#), occupies the triangle created by the convergence of [Threadneedle](#) and [Cornhill](#) Streets.

View the full map.



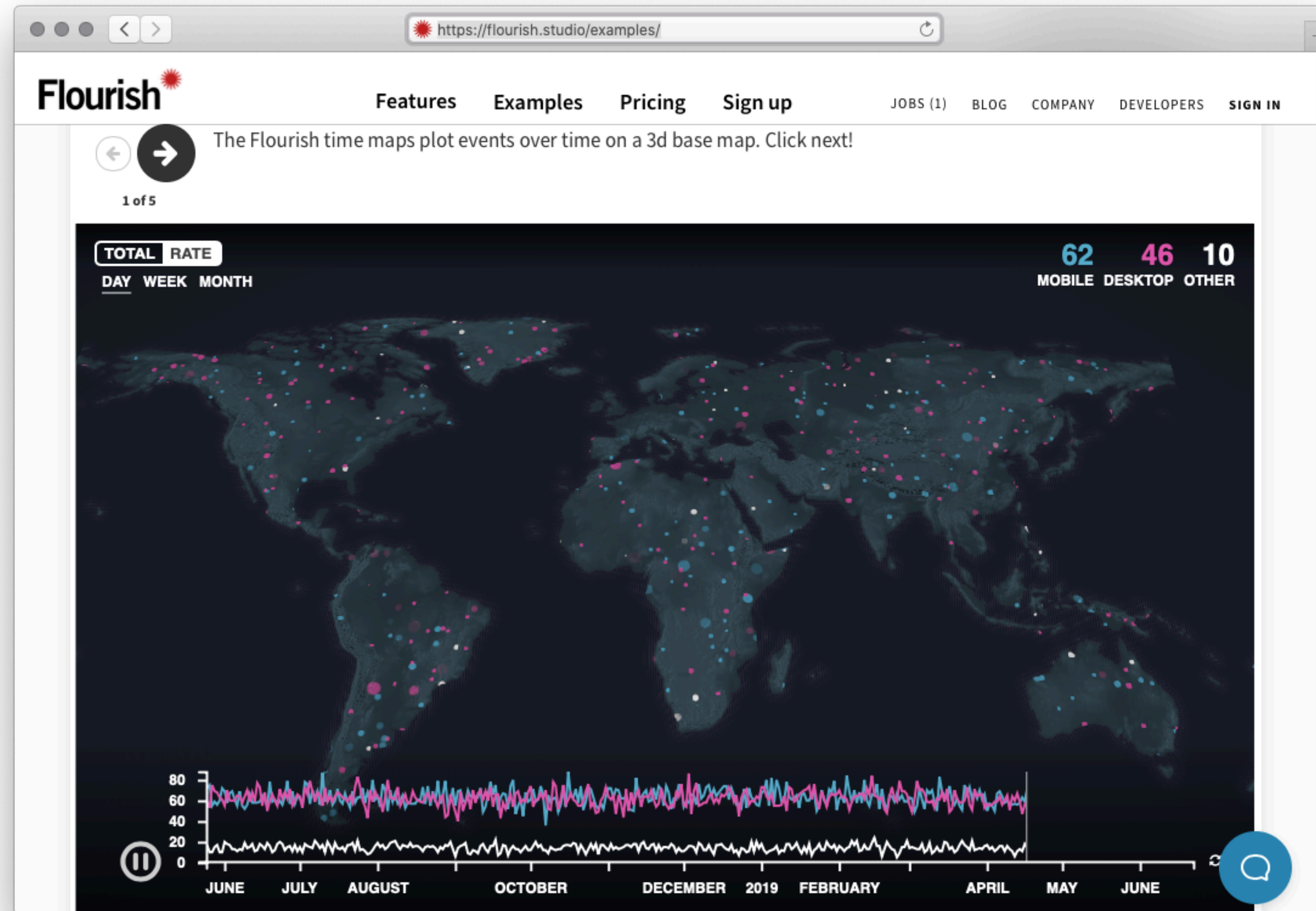






Mapping tools

Flourish



Palladio

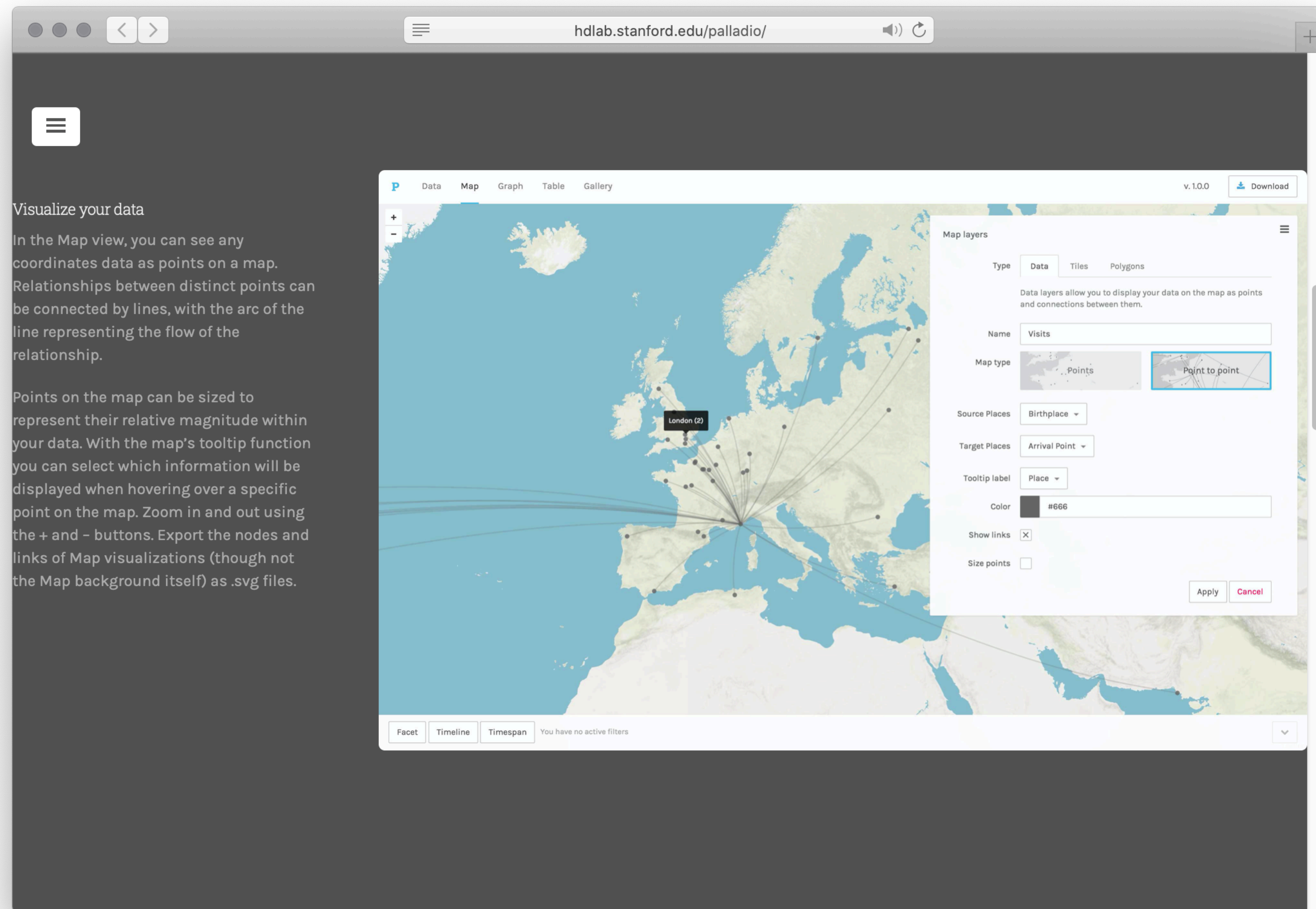
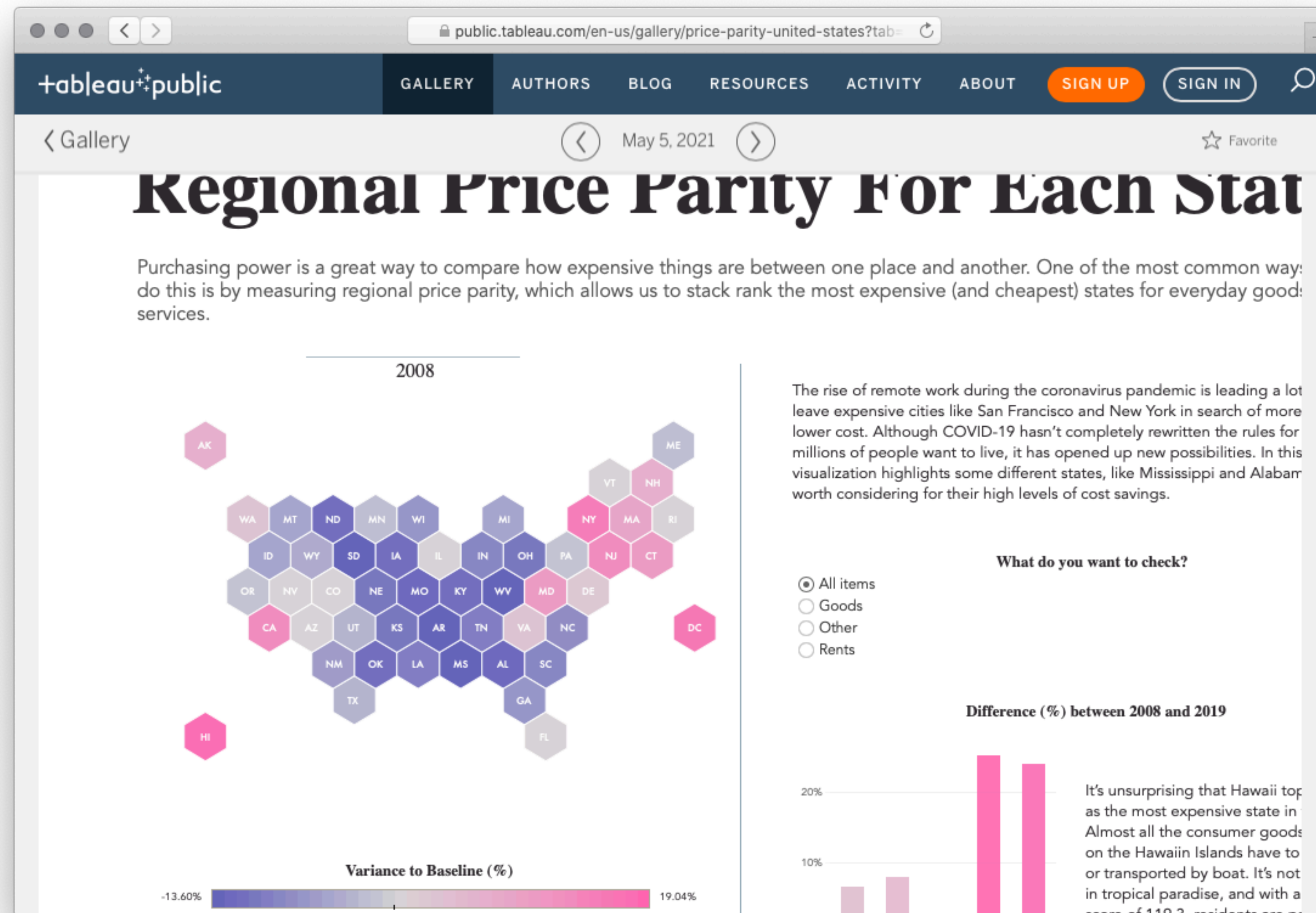


Tableau (Public)



Let's try it out

First we need some data. There's a lot of data out there with geographic information.

Some is already geocoded; others you'll need to run through a geocoder like geocode.localfocus.nl – or rely on Tableau's geocoding.

The [Survey of Scottish Witchcraft](#) gives us information about people accused of witchcraft in Scotland in the late 16th through mid-18th centuries.

You need to register for the data, but – shh – [here's a CSV file](#).

More resources

Basemaps

Stanford University map collection

Many have WMSes available

For historic maps, search for “Rumsey”

NYPL maps

Click on a map then “export” to view the WMS URL

data.gov.uk

