Cartographies of Time: A History of the Timeline

by Daniel Rosenberg and Anthony Grafton

It's hard to think of timelines as having an origin – they're so familiar, so intuitive to us today. But the timeline as we know it is barely 250 years old. In order to develop the modern 'timeline,' chronologers had to confront both conceptual and technological obstacles. Centuries of slow development were needed to pare down the representation of time to the deceptively simple form we use today: the line.

"Addressing the problem of chronology…means going back to the line, to understand its ubiquity, flexibility, and force. In representations of time, lines appear virtually everywhere, in texts and images and devices. Sometimes, as in the timelines found in history books, the presence of the line couldn't be more obvious. But in other instances, it is more subtle. On an analog clock, for example, the hour and minute hands trace lines through space; though these lines are circular, they are lines nonetheless. As the linguist George Lakoff and the philosopher Mark Johnson have argued, the linear metaphor is even at work in the digital clock, though no line is actually visible. In this device, the line is present as an 'intermediate metaphor': to understand the meaning of the numbers, the viewer translates them into imagined points on a line.

*"Our idea of time is so wrapped up with the metaphor of the line that taking them apart seems virtually impossible. According to the literary critic W.J.T. Mitchell, '**The fact is that spatial form is the perceptual basis of our notion of time, that we literally cannot 'tell time' without the mediation of space**.'*

"We speak of 'long' and 'short' times, of 'intervals' (literally, 'spaces between'), of 'before' and 'after' – all implicit metaphors which depend upon a mental picture of time as a linear continuum"

Authors Daniel Rosenberg and Anthony Grafton provide a detailed, comprehensive look at the development of graphical representations of time. Many different permutations of the line cover the pages of their book, from circles to vectors to broken, jagged lines. *Cartographies of Time* goes beyond a simple history of chronology, however; it is an excellent primer in the tools and tricks of mapmaking. It is incredibly valuable to see what has and hasn't worked in the past, what innovations were game-changers and which were dead ends.

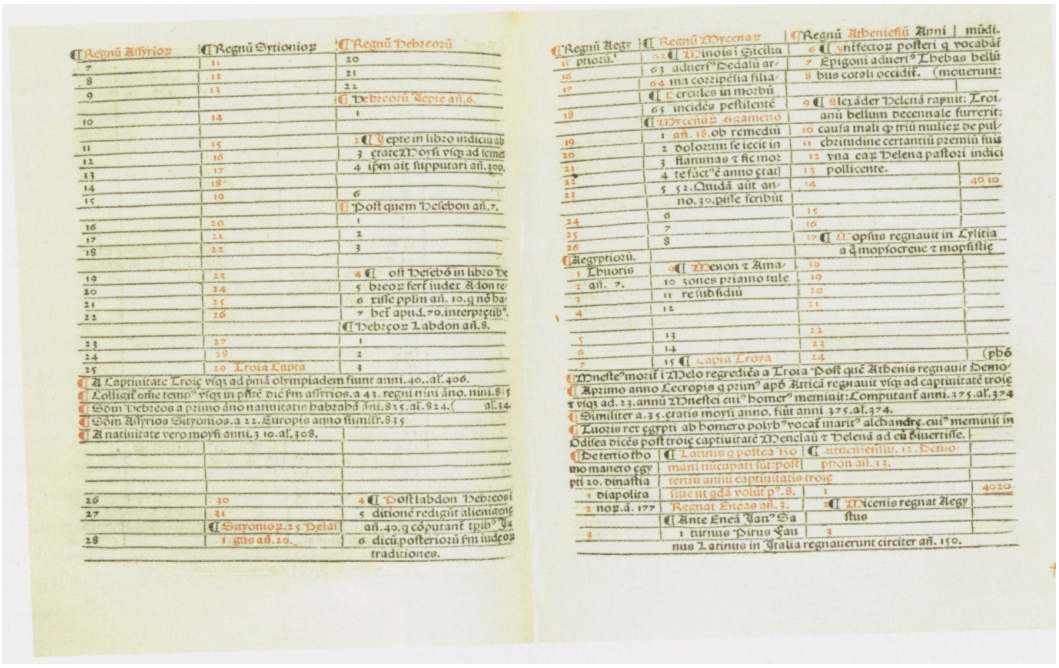
Chronology's beginnings can be found in documents called ***annals***, the most rudimentary format for recording time. The ***Annals of St. Gall*** is one famous example of this kind of manuscript. It "records events in the Frankish kingdoms during the eighth, ninth, and tenth centuries in chronological order with dates in a left hand column and events on the right." They're not much to look at: visual organization was not a priority. Frankly, organization as a whole is lacking in these types of chronologies. Here's the section for the years 709 to 734:

709. Hard winter. Duke Gottfried died.
710. Hard year and deficient in crops.
711.
712. Flood everywhere.
713.
714. Pippin, mayor of the palace died.
715.
716.
717.
718. Charles defeated the Saxon with great destruction.
719.
720. Charles fought against the Saxons.
721. Theudo drove the Saracens out of Aquitaine.
722. Great crops.
723.
724.
725. Saracens came for the first time.
730.
731. Blessed Bede, the presbyter, died.
732. Charles fought against the Saracens at Poitiers on Saturday.
733.
734.

This clearly displays a relationship between the numbers (years) and entries (events) but it's lacking a lot of important information. "The annals make no distinction between natural occurrences and human acts; they give no indication of cause and effect; no entry is given more priority than another." There's no breakdown of time below the level of years, and there's no discernable narrative whatsoever.

The other medieval chronological form was the ***table***. It would eventually outlast the annals, due to the advantages of its basic visual organization system. The exemplary chronological table is found in the 4th century ***Chronicle*** of Eusebius. Eusebius developed a matrix to "organize and reconcile chronologies drawn from historical sources from all over the world. To clearly present the relations between Jewish, pagan, and Christian histories, Eusebius laid out their chronologies in parallel columns." This structure evolved just as the bound book was replacing the scroll, and the neat tables were perfectly suited to that format.

"Until the mid-eighteenth century, the Eusebian model – a simple matrix with kingdoms listed across the top of the page and years listed down the left- or right-hand columns – was dominant."



The table was great! It could organize any kind and quantity of data, deal with different cultural conceptions of time, was easy to produce, and provided easy access to data with the 15th century addition of the ***index***. The only visual conventions were the black lines that formed the matrix, and red ink for important entries.

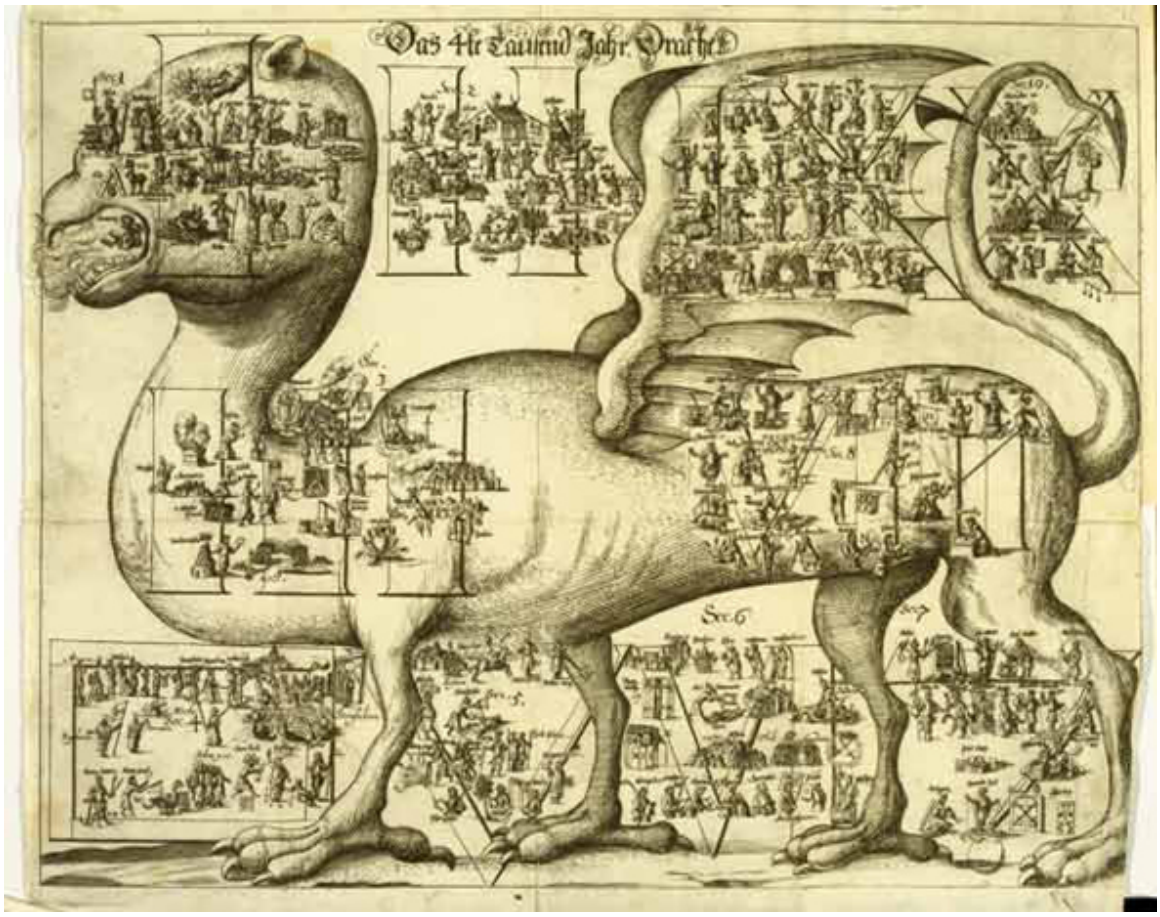
In the 15th century, the major chronological goal was to create a chart that showed all of history, starting with Genesis and Creation and ending in the present day. There was a kind of backwards time-keeping here, as astronomical knowledge of eclipses and comets made many think they could "trace Creation back to the beginnings, dating the Creation of the world to the day and hour."

This pursuit would go on for an unbelievably long time, lasting up until the 19th century.

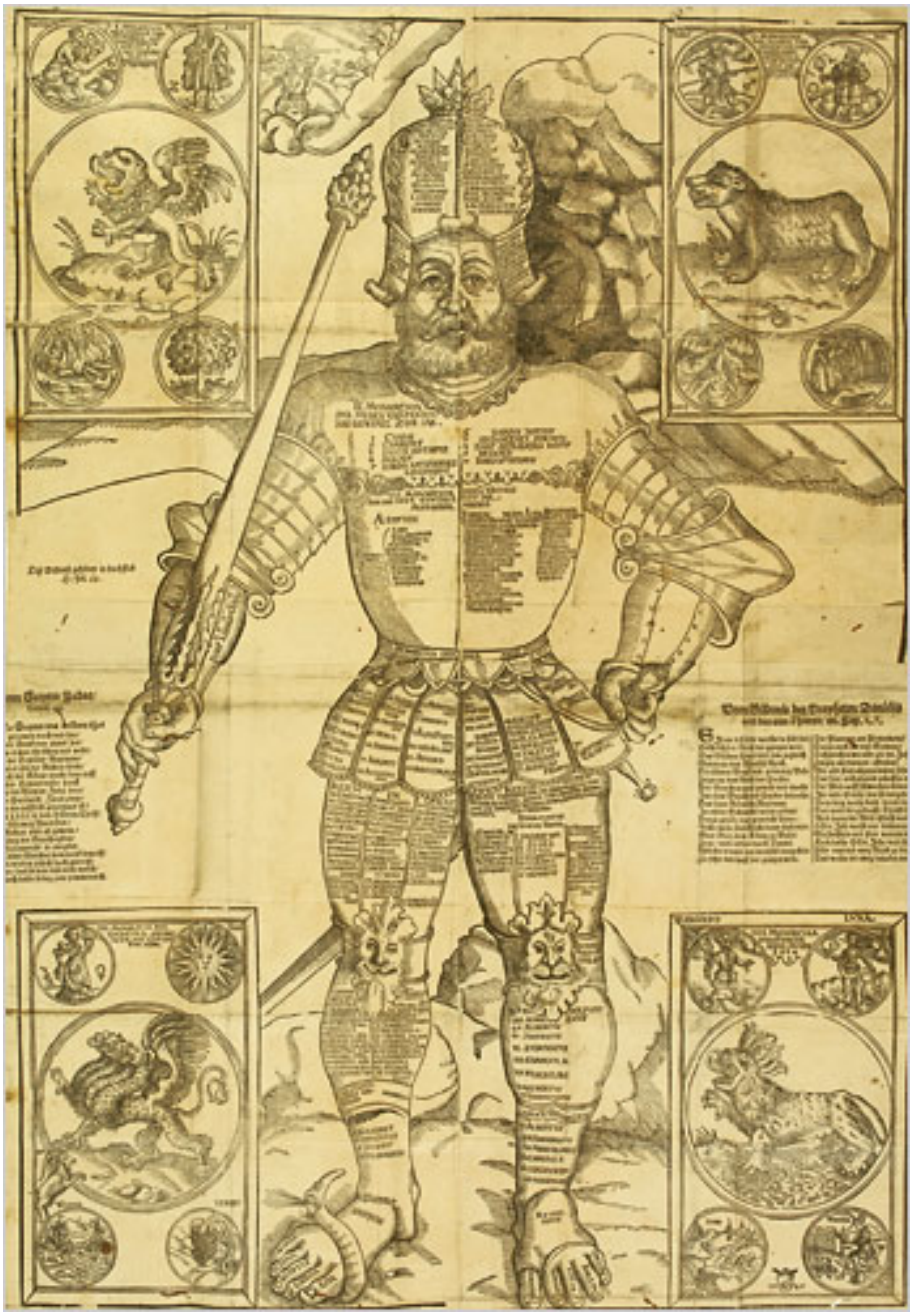
The 16th and 17th centuries comprised a time of graphical transitions.

*"It took longer than might have been expected for chronologers to progress from creating tables that **contained** information…to charts that **expressed** information graphically."*

Especially memorable are the allegorical time-maps that were popular at the time. They're non-linear (which is probably why they never quite caught on), somewhat confusing, and incredibly striking.



They were popular as mnemonics – the location on the allegorical figure corresponded with some characteristic of the information -- below, Darius of Persia is placed under the lungs on the statue of David because under his rule the Jews could breathe freely.

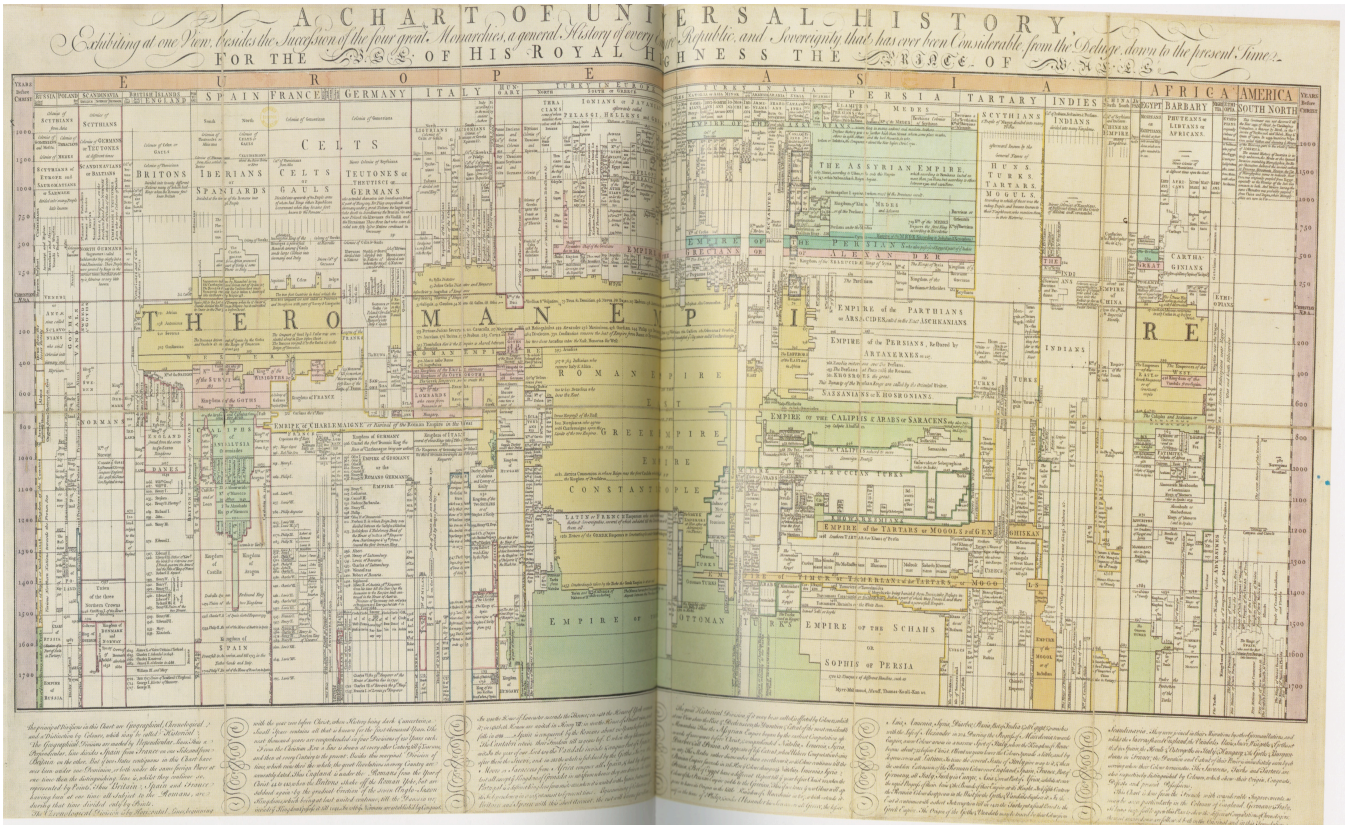


At the end of the 17th century, however, change began to come. New engraving techniques made it possible to print larger, more detailed illustrations. The emphasis shifted entirely from type to engraving.

The ***synoptic*** chart became the main chronological pursuit of the 18th century: a chart that "displays all its data on a single continuous plane, visible all at once," rather than a many-paged manuscript. The big problem that chronologers grappled with was ***visual simplicity***: how to concentrate all the information of a Eusebian table into a format that was easy and pleasing to look at.

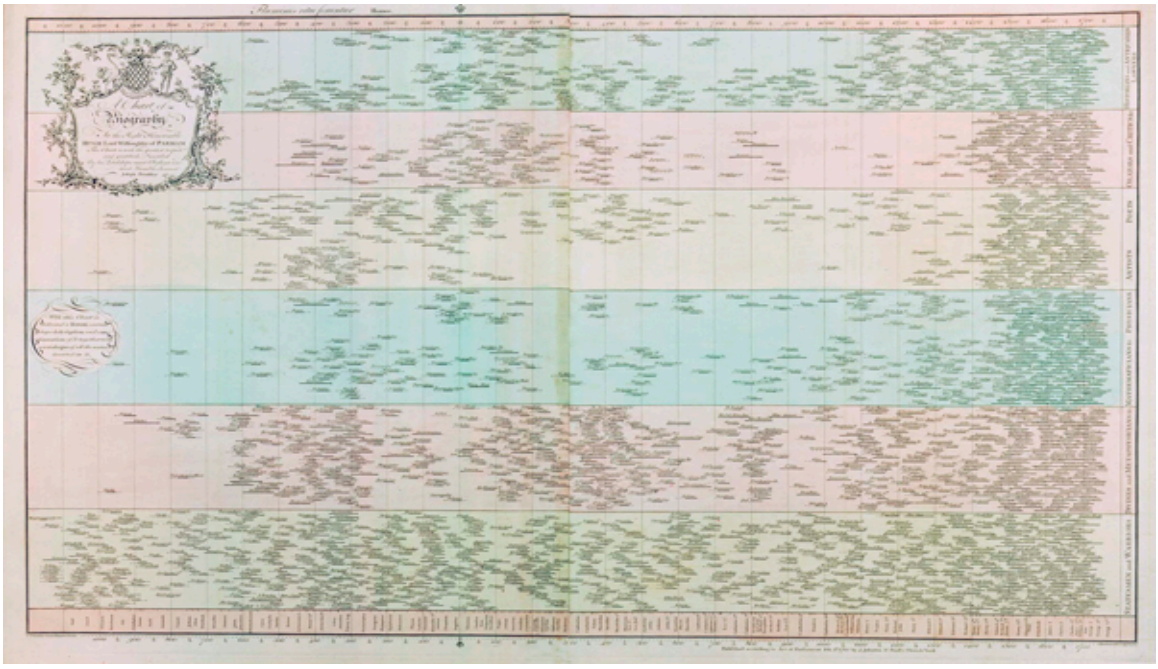
There was a new emphasis on the visual, and use of more carefully precise allegories. This included a suppression of text and the increasing use of symbols. For the first time, "regularization and measurement" was a concern in the creation of time charts.

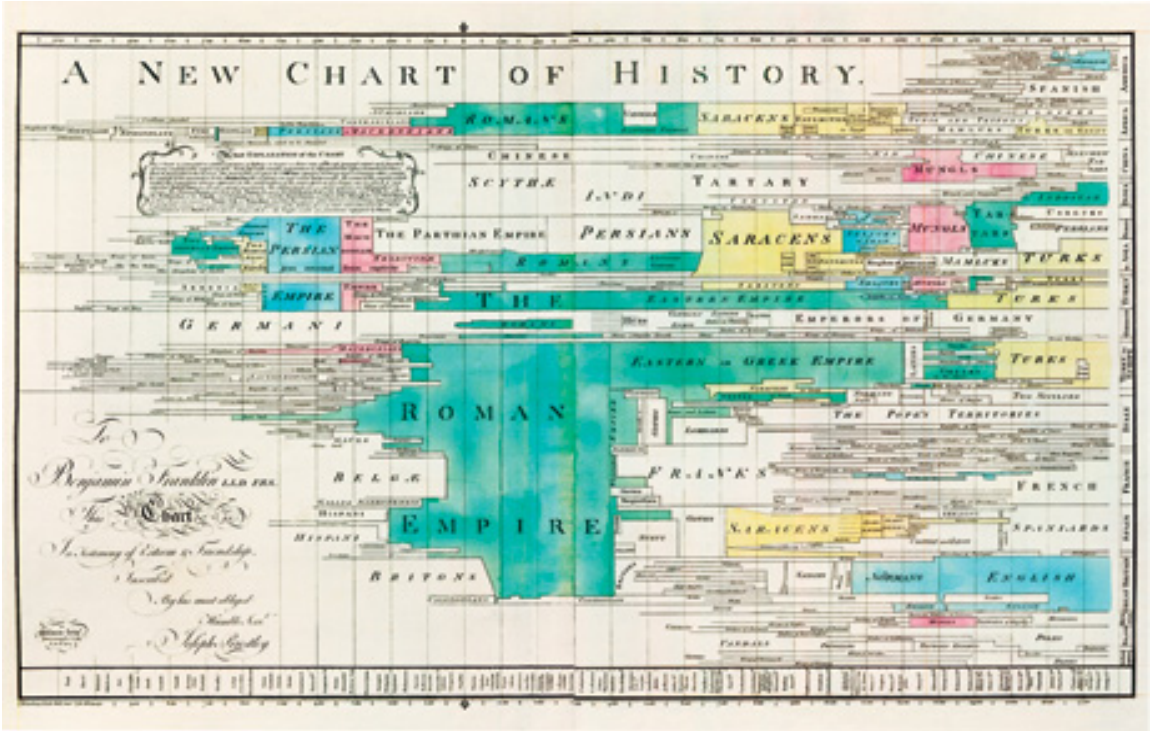
Thomas Jefferys released his ***Chart of Universal History*** in the 1750s, and it introduced a new era of graphic representation of time. Jefferys "did not divide his data into discrete, indexed cells but made the space of the chart a continuous field."



"The older form directs our attention to the historical content of a given time/space; Jeffery's new approach directs it to the ***temporal boundaries of historical entities and events****. Jeffery's chart not only gives dates, it shows them in a highly intuitive format."*

Joseph Priestley's 1765 ***Chart of Biography*** (and its companion piece, *A New Chart of History*) was directly influenced by Jeffery's work, and was possibly the most influential timeline of the eighteenth century. It had the first "complete and fully theorized visual vocabulary for a time map, and was the first to compete with the matrix as a normative structure for representing regular chronology"





Its uniformity of scale allows a reader to *see* history in action without *reading*. "Dates run horizontally at a regular pace along the top and bottom margins. More than two thousand tiny lines show the lives of famous men."

"The chart functions as a graphical representation of history without a single name being mentioned…it is the black line under each name which is to be attended to: the names are only added because there was no other method of signifying what lives the lines stand for."

The big turning point had come.

"***After Priestley, most readers simply assumed the analogy between historical time and graphic space. The issue was no longer how to justify the analogy but how to implement it."***

In the 19th century, the timeline extended to many new applications and older figures reemerged to compete with the linear style. Objectivity became an obsession brought on by the advent of photography. The focus on Biblical time and Creation lessened.

Uniformity of scale became a usual characteristic of chronographic space, and William Playfair's line graphs showing statistical progression over time began to expand the field of chronology into new disciplines and applications.

The conventionalization of the line led to challenges to its ubiquity. Some influential timelines took the line and radically changed it, adapting it to new time maps that were even more conceptually sophisticated.

Minard's map of Napoleon's long retreat from Russia features a broken line, a new permutation of a firmly established tool. It "may be more accurate than Priestley's not because it carries more or better historical detail but because it reads in the complex, sometimes paradoxical way in which a real story is told."