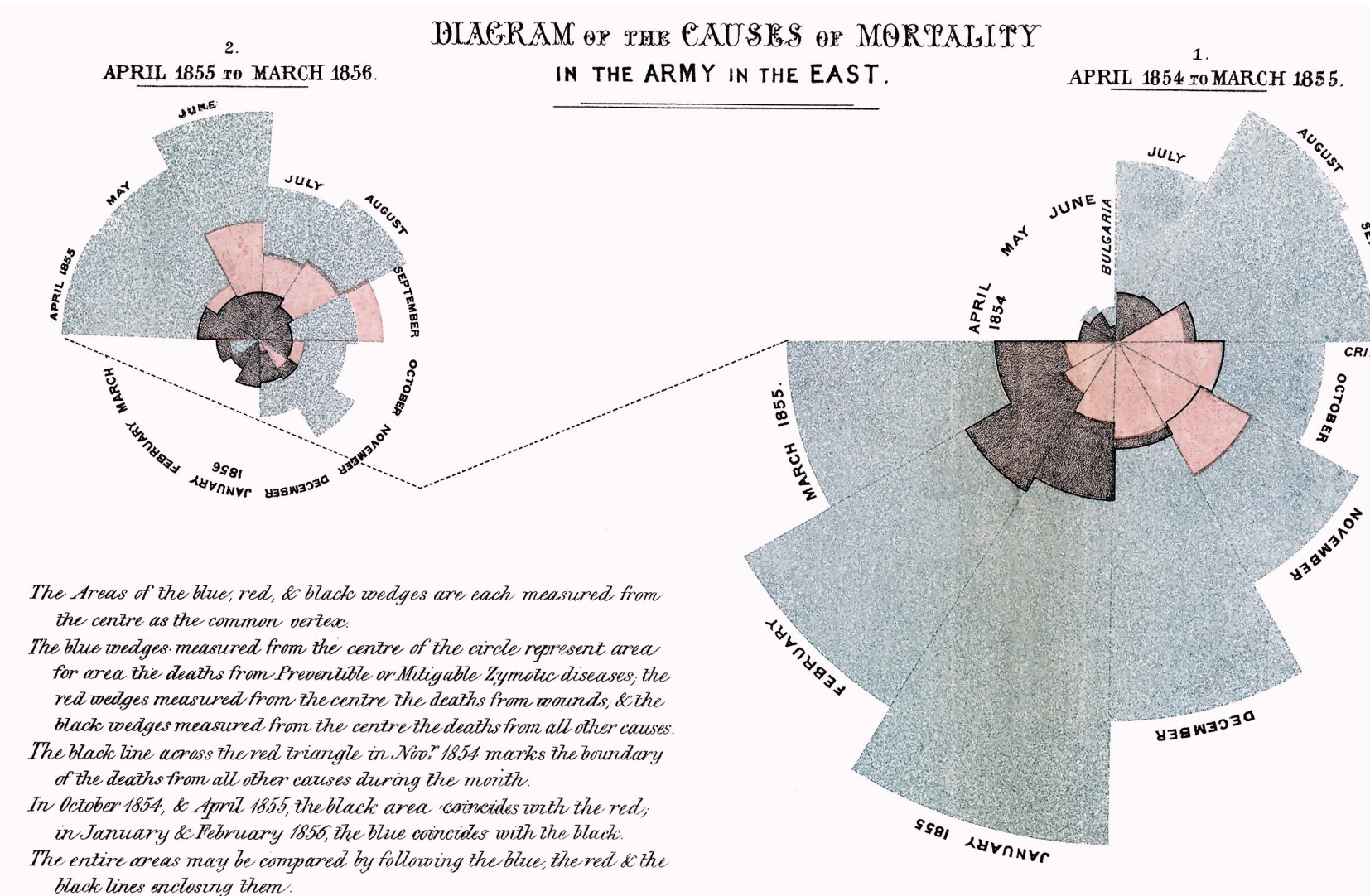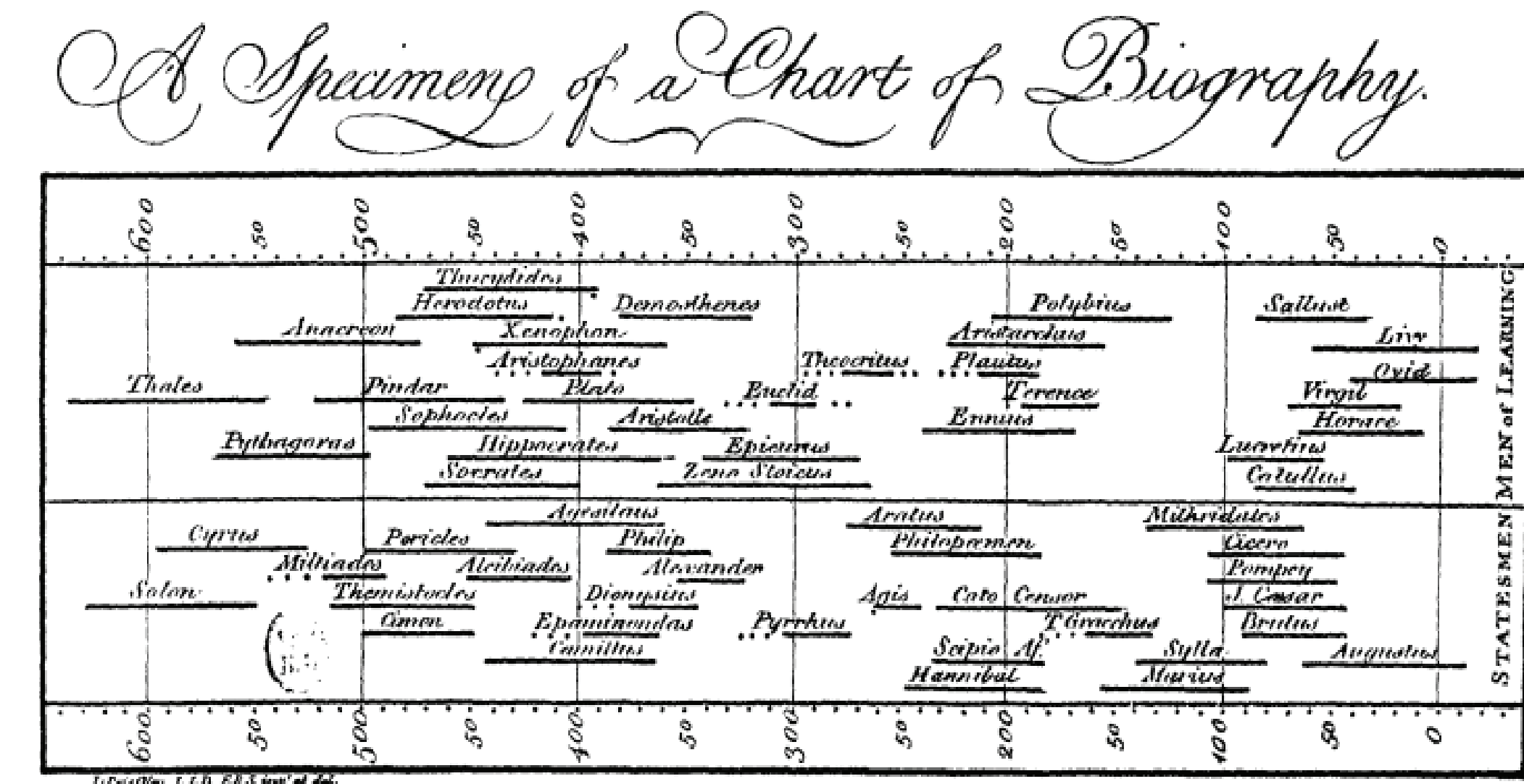# Illustrative Data Graphic Style Elements

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Nightingale's visualization of causes of mortality in the Army in the East, published 1858. [Public domain.]


Priestly's visualization of historical birth and death dates, published in 1765. [Public domain.]

The well-known historic hand-made visualizations that were created in the 18th and 19th centuries by artists such as Charles Joseph Minard, William Playfair, Joseph Priestley, and Florence Nightingale have long been a great source of inspiration for contemporary visualization work. We present a set of straight-forward techniques for the precise ink rendering of lines, hatching patterns, and hatched portraits that we employed in a personal data graphics poster inspired by these 18th and 19th century visualizations.
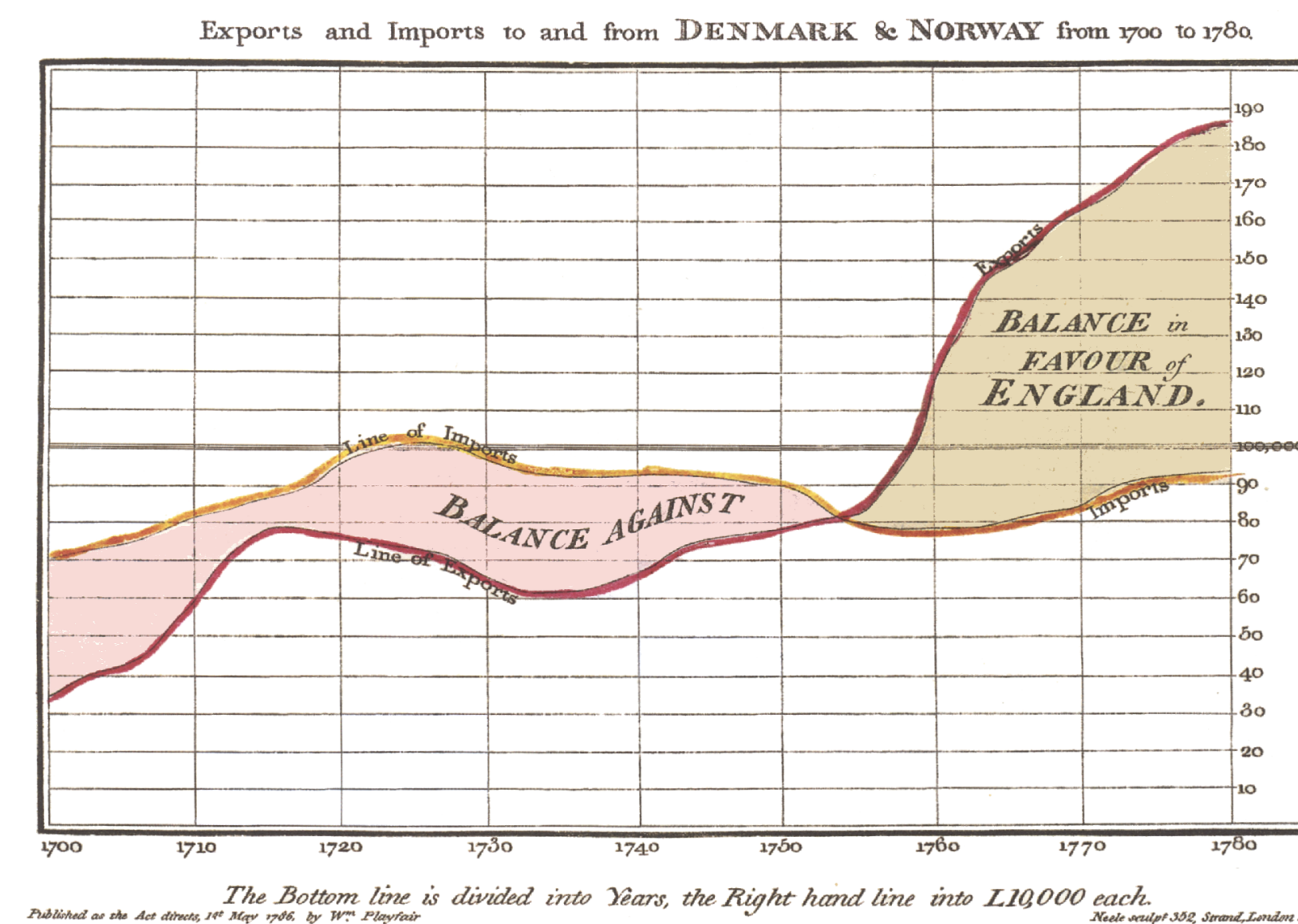

Playfair's visualization of 18th century British imports and exports. [Public domain.]
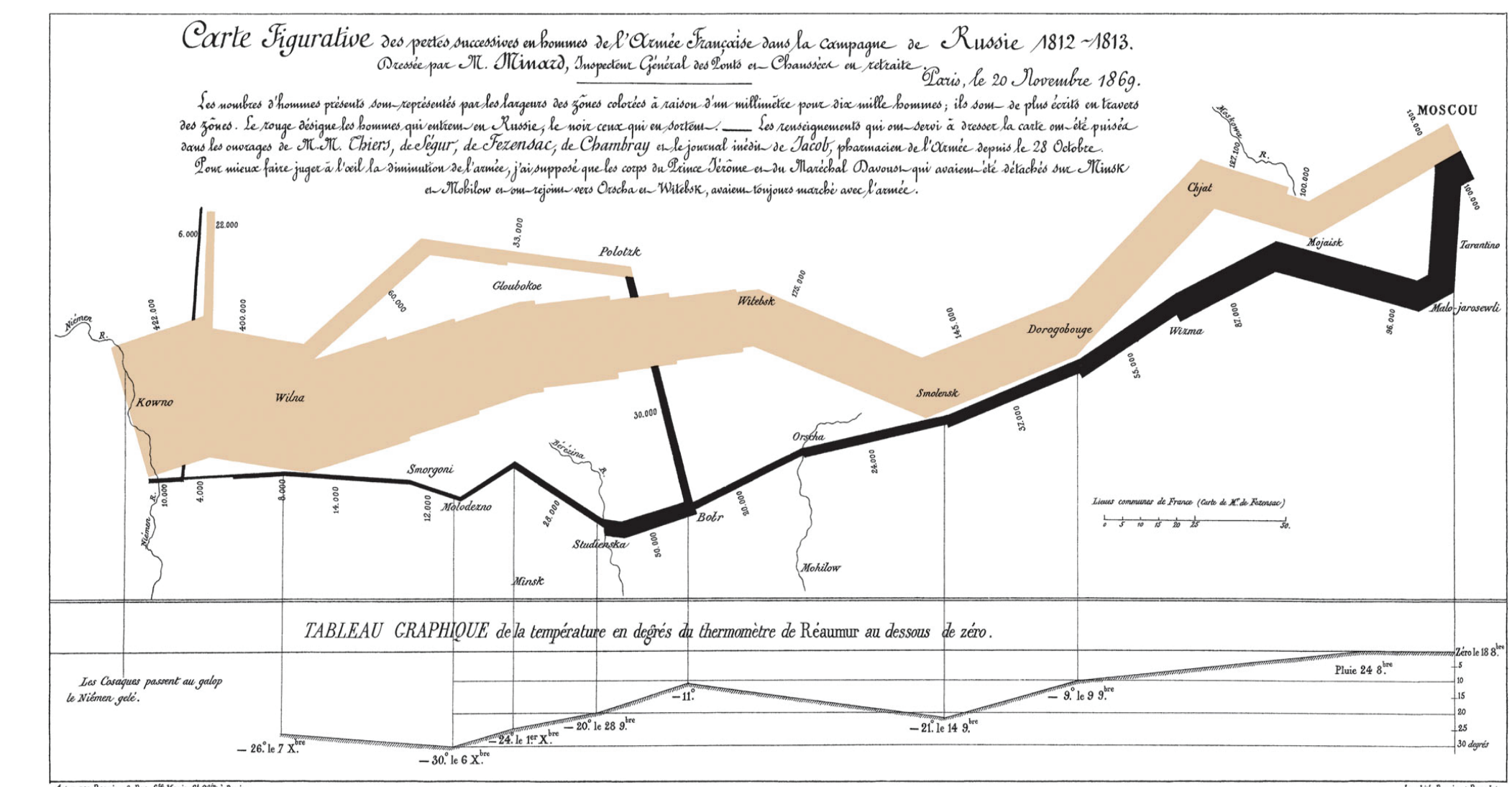
Minard's visualization of Napoleon's 1812 Russian campaign, published in 1869. [Public domain.]

Our inking technique attempts to emulate the ink lines created by a pen as it is moved over paper. The specific inspiration for the rendering style comes from the font AntiquarianScribe, which we use here and in the personal data graphics poster we created. This font imitates the writing style used by the 18th century cartographer Henri Abraham Chatelain and exhibits many of the characteristics of ink lines that we aimed to replicate.
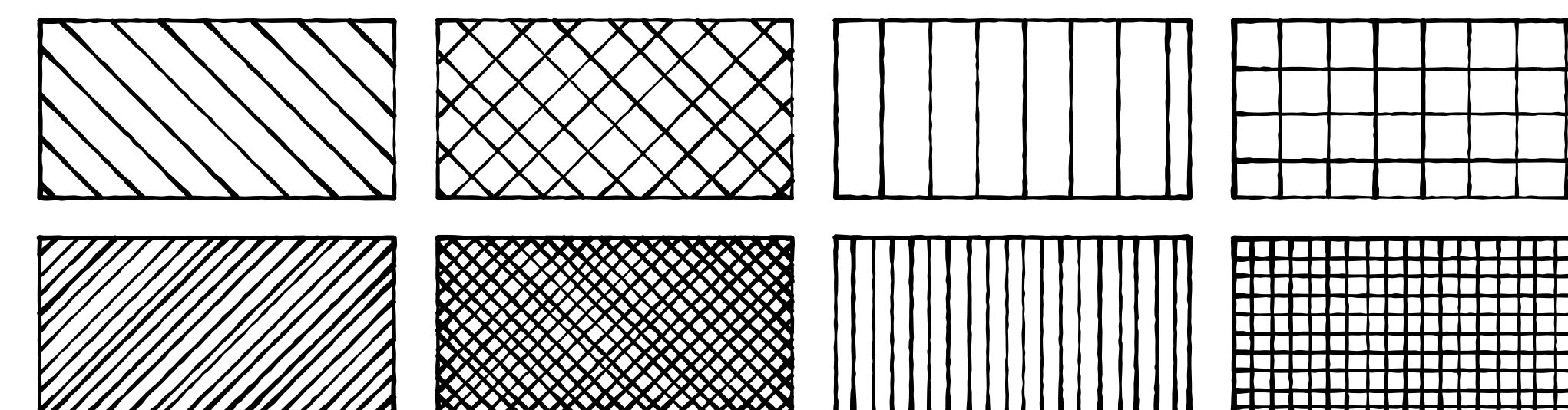
Hatching patterns were often used by the creators of traditional illustrations to shade and differentiate regions. To simulate this effect we extended our inking class to provide 2D hatching patterns that can be used as fills. We use the inking class to render individual strokes and provide parametric control over the widths, spacing, and variation between the strokes.

To approximate the appearance of these strokes, we implemented an inked line renderer that manipulates the outline of a horizontal line shape. We add horizontal and vertical random offsets to the 2D position of the first and last control points. We also vary the line width over the course of a line to simulate a slow start when drawing (thicker line), a faster middle section (thinner line), and a slow ending (thicker line again).

We also produce hatched portraits based on black-and-white silhouettes created manually from photographs. We apply two layers of 2D hatching, one with thick beige lines in the background and a second one, at a 90° angle, with thinner black lines in the foreground. Each line of the hatching is clipped to only cover the black part of the source portrait. We apply some random over-shooting (10%) so that short lines only exhibit little variation while longer lines exhibit more randomness.

Angled lines are created by rotating the horizontal line, while curved paths are realized by drawing lines along Bezier segments as a polyline with a sufficient number of sub-segments.
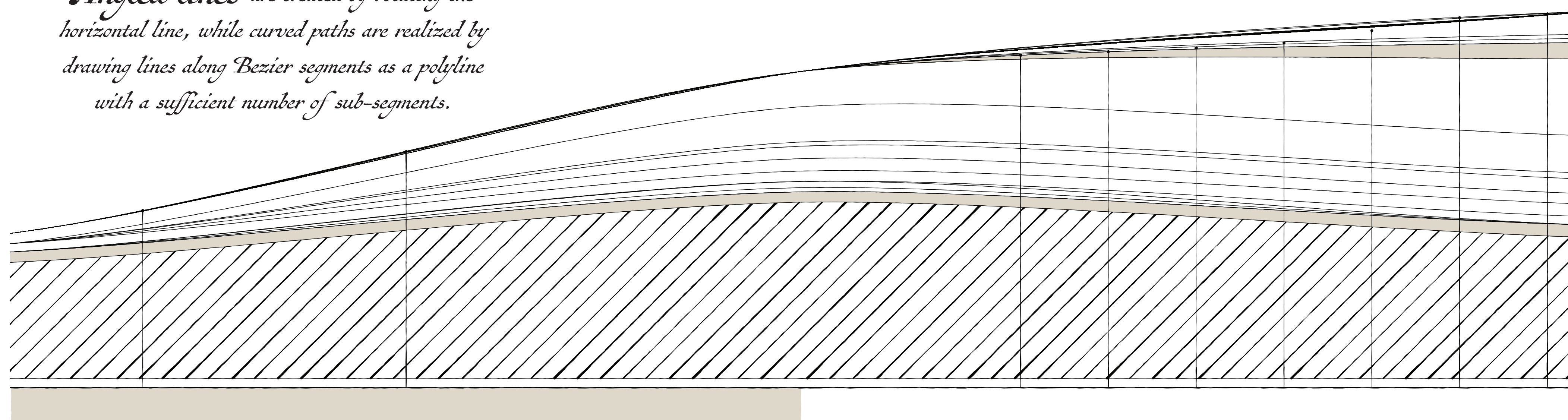
Black-and-White Silhouette

Two-Color Hatched Portrait

Additional Hatched Portraits