

FRANCESCO ROSSELLI, RENAISSANCE CARTOGRAPHER EXTRAORDINAIRE

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Although Francesco di Lorenzo Rosselli was a well-known cartographer in (very) early 16th century Florence, he does not seem to be recognized as the truly gifted innovator he actually was. He is principally recognized for drawing the first *printed* map to show the New World, in about 1506, but this was really only a small cartographic advance, as hand-drawn world maps had been showing the New World for several years, beginning with Juan de la Cosa in 1500, and by the printed versions of Martin Waldseemüller's first world map of 1505. Rosselli was, however, the author of at least four world maps, each in a different cartographic pro-

jection, of the classic Ptolemaic projection and showed the known world in a Mid-East-centered quadrant of the northern hemisphere. He utilized the 'apron' format, widely promulgated in the mid-1400s, as translations of the second-century Roman text of Ptolemy's classic *Geographia* became available.

Ptolemy was remarkable in Roman times, not only appreciating that the Earth was a globe but for proposing no less than six different projections of the curvature of the Earthly globe to the flat surface of the page (*Fig. 2*). These were the cylindrical ('Mercator') projection, the 'Ptolemaic' conical projection, the 'stereographic' projection to a tangent plane,



Figure 1. 19th-century reproduction of 'A View of Florence' (known as the 'Della Catena (Chain Map)') by Francesco Rosselli (1470s).

jection, of numerous local maps of Central Europe, the Balkans, Italy, Hungary, and Palestine, and of town plans of Rome, Florence, Pisa, and Constantinople. He has also been recognized (Brockhaus, 1911) as the painter of a compelling bird's-eye view of his hometown of Florence (*Fig. 1*), viewed from a hillside at lower right by an evocative sketching artist.

Rosselli was born in Florence in about 1447 and first worked in Siena as a miniaturist. By 1470, he had returned to Florence and established a workshop for the woodcutting and engraving of maps and various pictorial modalities in his house at the Costa San Giorgio, just inside the city walls in the foreground of the further bank of the river in Figure 1. He later expanded these premises by adding a bookstore and becoming the first bookseller in history to sell his own local and world maps, as well as those of others. His first maps were

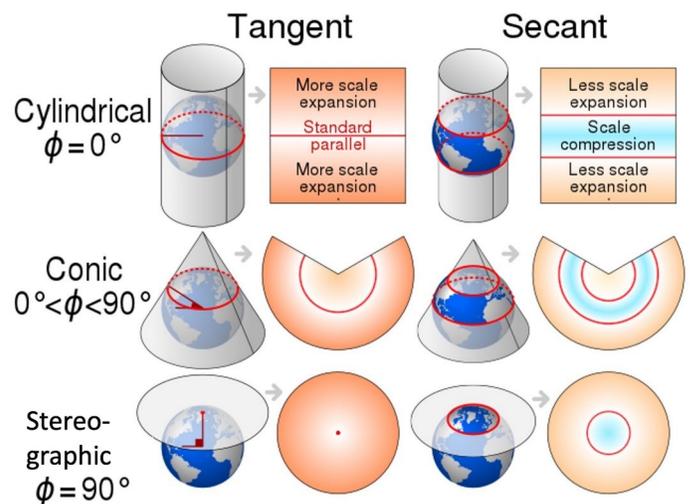


Figure 2. The three spatial mappings from Ptolemy's *Geographia* (from NASA / CMG Lee).



Figure 3. The first full conical projection of the globe, by Giovanni Contarini and Francesco Rosselli (1506, British Library, London).

and the 'Secant' versions of each. However, the Renaissance cartographer had to reconstruct the actual geographic configurations from Ptolemy's textual descriptions, a complex and challenging task.

As one of the most remarkable proponents of this effort, Rosselli collaborated with Giovanni Contarini to generate the first complete projection of the northern hemisphere in the Ptolemaic conical format, dated 1506 (*Fig. 3*; *see Fig. 2*), though still geographically incomplete.

Rosselli's best-known map is the oval planisphere, usually dated to ~1508 (Almagià, 1951). However, before analyzing this map, it is important to note the recent realization of a second world map on the reverse of the same sheet, in a completely different format, known as his Universal Marine Map. This was actually the first complete cylindrical projection in history (*see Fig. 2, top row*) and is depicted with partial self-repeats on either side to illustrate how the map wraps into a cylinder. (*Fig. 4*) This projection's unique strength is that distances along a constant heading project as straight lines on the map. These are drawn through the ring of 16 compass roses around the lines center, as in portolan navi-

gational charts. These lines are of particular value for marine navigation, such they are arranged so that many of them are located on land rather than in the oceans.

It is important to note that this projection is an accurate precursor of the well-known Mercator projection, formalized by Gerhard Mercator in 1569, about six decades later. One might propose that Mercator's projection be renamed the "Rosselli-Mercator" projection, in view of Rosselli's precedence!

As noted above, Rosselli's best-known world map is his oval planisphere (*Fig. 5*), complete with a dozen wind-heads in the clouds around the perimeter, notable in several important respects. One is the shading

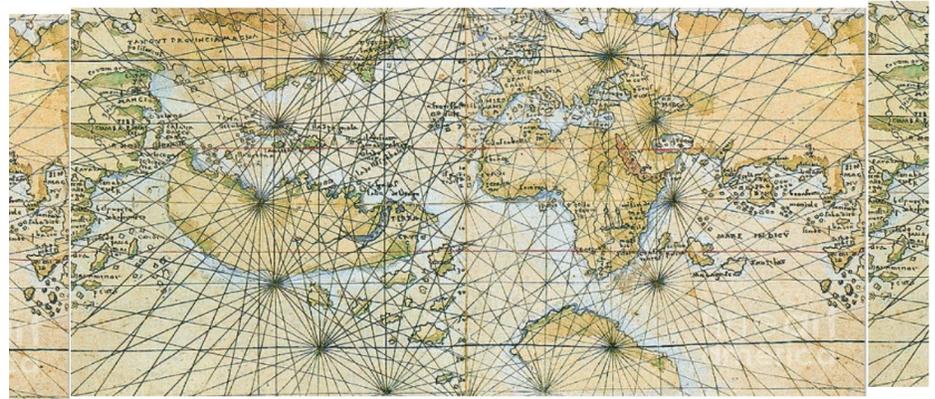


Figure 4. 'Universal Marine (World Sea) Map' by Francesco Rosselli (~1504, Greenwich Museum, London).

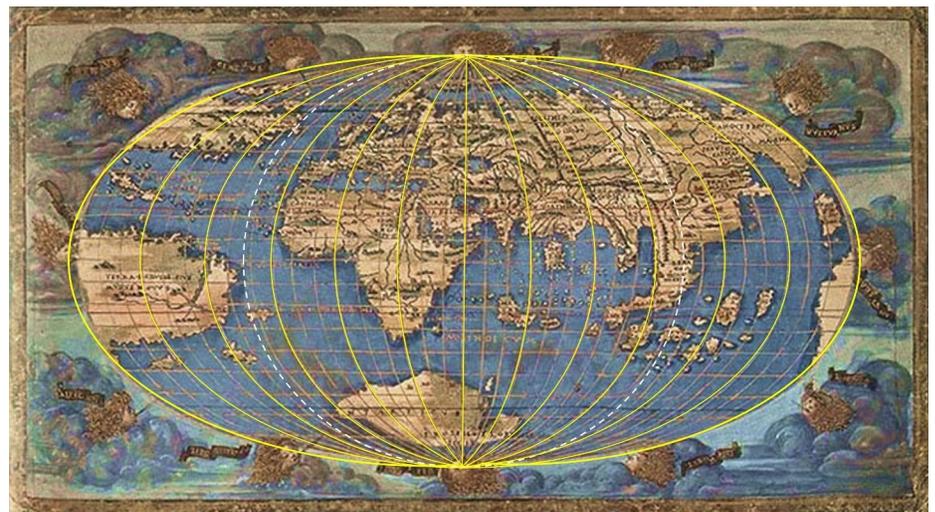


Figure 5. 'Oval Planisphere' by Francesco Rosselli (~1503, Greenwich Museum, London) with overlaid best-fitting elliptical segments, which had to be done separately for the left and right halves of the projection in order to obtain approximate fits.

around the continents, which gives them a unique, three-dimensional appearance. Another is that it is the first world map projected in oval format, representing a novel solution to the problem of projecting a spherical globe onto a flat plan¹. While the central region approximates a conventional projection of one side of the spherical globe (white dashed circle), the expansion of the invisible far side into elliptical wings was Rosselli's own novel concept. It was not formally developed into the accurate elliptical projection until Mollweide (1805), but Rosselli clearly anticipates this concept centuries earlier (Heawood, 1923), as can be seen from the yellow elliptical curves overlaid here on his projection (Fig. 5).

It should be appreciated, moreover, that it is very challenging to construct a set of nested geometrical ellipses in this form since the only feasible method is to use two pins and a loose loop of string (held taut by the stylus point). There is no known procedure that provides for equal spacing of the intersections of the different-sized ellipses with the equator, which is evidently the backbone of this projection. The easier approach, utilizing a 'racetrack' oval, was not introduced until 1520 by Pietro Coppo. It would seem that Rosselli must have derived his quasi-elliptical meridian curves visually. In view of its originality at this early date, therefore, this projection deserves recognition as the 'Rosselli-Mollweide elliptical projection'.

In terms of their geography, it is evident that both of Rosselli's conjoint projections (Figs 4 and 5) are based on similar information, with the 15th-century Ptolemaic truncation of India and enlarged Sri Lanka and an incomplete South America separated from the vestigial Maritime provinces in the north, which are attached to an extended Asian landmass. The traditional dating of 1508 may be suspect, as these maps both lack the notable extension of South America north into a part of Central America, as featured in Waldseemüller's grand planisphere of 1507. As a purveyor of maps from his bookstore in Florence, Rosselli should certainly have been familiar with this distinctive feature. Thus, the inclusion of the Caribbean islands from Columbus' voyages of the 1490s, but not the Central American spur, supports an earlier dating of this conjoint pair of maps from Waldseemüller 1503-4².

In summary, it seems clear that Francesco Rosselli should receive greater recognition as the first cartographer to employ the three known major projections of the globe—the conical, the cylindrical, and the elliptical, and moreover to do so in complete form. This is noted by his inclusion in the table of about 80 different projections listed on the Wikipedia page:

https://en.wikipedia.org/wiki/List_of_map_projections.

Although only his cartographic contributions have been included here, Rosselli should also be recognized for his extensive skills as a manuscript illuminator, a groundbreaking

bookseller at the dawn of printed books, an innovative painter of urban scenes, and a popular engraver of powerful images of prophets and sybils that may well have inspired those in Michelangelo's design of the Sistine Chapel. This broad variety of accomplishments makes Francesco Rosselli a true Renaissance man.

References

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Endnotes

¹ Leonardo da Vinci drew a diagram of an oval projection of the globe around this period, as discussed in relation to the Rosselli planispheres by Tyler (2021, in press). Given Rosselli's availability in his bookstore in Florence and da Vinci's longstanding interest in cartography, it seems inevitable that they would have met, and likely that Rosselli would have been a key source of da Vinci's extensive knowledge of cartographic projections.

² In contrast to the maps specified in Note 4, [where? **The 4th reference?**] the conjoint Rosselli maps still have the stunted Ptolemaic form for India, suggesting a revision of the dating from ~1508 to ~1503-4, before news of Vasco da Gama's re-mapping of India would have reached Florence, but after the Florence publication of Vespucci's description of the northern coast of South America that is featured on both maps.

A frequent contributor, **Dr. Tyler's** articles have also appeared in the Fall 2019, Spring 2021, and the Fall 2021 issues of *Calafia*.

