CONTRIBUTIONS TO MAP HISTORY

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Contents

EARLY HISTORIES OF GEODESY

How scholars who measured the size of the earth wrote about the history of that endeavor, before 1720 and the debate over the spheroidal shape of the earth

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https://www.mappingasprocess.net/blog/2020/7/20/early-histories-of-geodesy

I have been rather self-indulgent as I write The Map: Concepts and Histories *and now need to reframe and rethink it in order to keep it down to size. So here's a chunk on a subject I happen rather to like, but that I have to admit is not essential for the final work.*

Note: I use "geodesy" to refer strictly to the measurement of the size and shape of the earth, as restricted by the French in the eighteenth-century (Alembert 1757); some would instead use "higher geodesy" in distinction to the simpler practices of common land surveying.

update 20 June 2021: *I've inserted some biographical dates etc.*

In his *The Story of Maps*, Lloyd Brown (1949, 290) claimed that each early modern account of a new geodetic survey had been prefaced by a "careful review" of all previous geodetic measurements since the Ancient Greeks. Based on my early work on nineteenth-century geodesy this seemed very much to be the case (see, e.g., Airy 1845). But in researching the entry on geodetic surveying in the long eighteenth century for *Cartography in the European Enlightenment*, I read all the accounts by the (mostly) French and some British geodesists and found few had such introductions (all identified in Edney 2019a). Brown greatly exaggerated the historical sensibilities of practicing geodesists. Only in the accounts of the very earliest geodetic surveys, from 1617 to 1720, did geodesists seek to validate their work by appealing to the antiquity of geodesy. Thereafter, geodesists limited their introductory "historical" narratives to detailing the execution of their own particular surveys, to demonstrate the quality of their instruments and techniques, to lay out the conditions under which the work was carried out, and to explain how problems had been overcome, all to attest to the quality and validity of the survey (Delambre 1798, vi).

An initial, loose historical discourse concerning past measurements of the earth's size developed among seventeenth-century geodesists as they sought validation both from the evident antiquity of geodesy as an endeavor and from the progress that they had made in their own work vis-à-vis that of their predecessors.

The first geodetic surveyors in the early modern era were full of the novelty of their own achievements and barely referenced Eratosthenes' calculation of the earth's size, in the second half of the third century BCE, or the first geodetic survey by the Caliph al-Ma'Mūn's astronomers, in the 830s

CE. Moreover, they referenced those early works only to justify their own methods of measuring the length of an arc of the meridian directly along the earth's surface, whether with rods (Fernel 1528, sigs. B.ii recto–B.iii verso) or perambulator (Norwood 1637, [ix–xii], 1–4).

Other early geodesists, who pioneered the use of triangulation to measure arc lengths indirectly, deployed more coherent histories of geodesy to explain that their work was nonetheless part of an ancient and therefore an inherently intellectually valuable concern, one that spoke to the very nature of humanity. As Jacques Cassini [II, 1677–1756] would later explain at length:

> Nothing was more important for [ancient] Geography than to know the size of the Earth, and nothing seemed more difficult to undertake. For how is it possible to measure this vast expanse of continents, the surface of which is covered with an infinity of mountains which render it uneven, and which is intersected in so many ways by rivers and lakes and by the seas that surround it on all sides. Pliny, therefore, admired the boldness of the human spirit to dare to attempt such difficult things, and one would never have succeeded in doing so, if one had not tried to determine the whole circuit of the Earth by the measure of one of its parts, which one was able to do on the supposition that its figure was spherical. (Cassini 1720, 12; see also Cassini 1719, 245)*

The first geodesist to use triangulation in a geodetic survey, Willibrord Snellius [Snel van Royen, 1580–1626], overtly adopted the mantle of ancient authority by calling his account, *Eratosthenes Batavus* ("Dutch Eratosthenes"). Snellius (1617, 1–16) and later Jean Picard [1620–1682] (1671, 3–6) emphasized their predecessors' limitations and inaccuracies, both in measuring the length of a meridional arc directly and in not following a true north-south line. Snellius and Picard both used their historical summaries to establish how much better were their own triangulations and instruments.

The earth's shape and size were both obviously important to geographers. Many recounted the various shapes postulated by ancient philosophers and the eventual proof of the earth's sphericity in the fourth century (e.g., Morden 1702, 1–15; Costard 1767, 1: 205). The earth's size was a crucial parameter in converting itinerary distances into differences of latitude and longitude, and so histories of geography also identified the various sizes proffered by ancient and medieval authorities. Jean Baptiste Bourguinon d'Anville [1697–1782] (1759, 82–100) thus undertook a detailed account of Eratosthenes' geodetic calculations in an attempt to determine an equivalency in contemporary units for the *stade*, the ancient Greek unit for expressing linear extent, and the Egyptian *schoenus*, for use in his analytical mapping of the ancient past (also Anville 1769).

* Rien n'étoit plus important pour la Geographie que de connoître la grandeur de la Terre, & rien ne paroissoit plus difficile à entreprendre. Car comment mesurer cette vaste étenduë de continents, dont la surface est couverte d'une infinité des Montagnes qui le rendent inégale, & qui est entrecoupée en tant de manieres par les Rivieres, les Lacs & les Mers qui l'environnent de toutes partes. Aussi Pline admiroit la hardiesse de l'esprit humain d'oser tenter des choses si difficiles, & l'on n'auroit jamais pû y réüssir, si l'on n'avoit essayé de déterminer tout le circuit de la Terre par la mesure d'une de ses parties, ce qu'on a fait, en suppossant que sa figure étoit Spherique.

It was in this context that Giovanni Battista Riccioli SJ [1598–1671] prepared comprehensive accounts of geodetic work as part of his attempted reform of geography and charting. He identified three methodological categories of geodetic determinations: measurements of the length of an arc of a meridian, whether by calculation or by measurement; calculations that combined itineraries and marine voyages with astronomical determinations of longitude; and measurements of the geometrical relationships between widely spaced objects on the earth's surface, the arena in which Riccioli was himself active (see Edney and Dew 2019, 435–36). He outlined the different determinations of the size of the spherical earth that had been made in each category and provided a table of linear measures in order to permit comparisons between the different results (Riccioli 1661, 136–82; Riccioli 1672, 130–75). But in reconciling historical and contemporary measures for the earth's size, and then in defining the latitude and longitude of no less than 2,200 locations, Riccioli was not particularly critical in his assessment of early units of measure and made many assumptions (Edney 2019b, 481–82).

Riccioli's analytical flexibility gave way before a wave of new concerns stemming from the realization that the earth is not perfectly spherical. Astronomers had of course been interested since antiquity in the earth's size, because it provided the basic yardstick for determining distances from the earth to the moon, sun, the planets, and the fixed stars. The wide variation in the earth's size postulated in antiquity was nonetheless of little significance. Astronomers did not need to know the earth's size in absolute terms for the geometrical methods they employed to determine the shapes and the *relative* sizes of the orbits of the planets and comets (Delambre 1814, 3: 512). Cosmographers were free to make their calculations of the sizes of the spheres with whichever size of the earth they deemed most appropriate (Van Helden 1985, 4–8, 24, 30–31, 34). The early modern surveys of the earth's size, from Fernel through Picard were all geared towards making better maps and sea charts.

This situation changed with Isaac Newton and his *Philosophiæ naturalis principia mathematica* (1999 [1689]). Newton argued—as several other scholars were beginning to appreciate (Edney and Dew 2019)—that the earth is not actually spherical. His calculations suggested that the earth is flattened at the poles as a consequence of gravitational attraction acting within a rotating fluid. But when Cassini II completed the triangulation of the Paris meridian in 1718 and compared the lengths of the degree at either end, he concluded that the earth is actually elongated (squeezed at the equator). In presenting these results, Cassini II used the historical introduction to justify geodetic endeavors as a singular, essential, and ancient form of scientific inquiry (Cassini 1719, 245–48; Cassini 1720, 12–21), but he went further and reassessed the seventeenth-century measurements according to how well they fit his model of an elongated earth. This reassessment entailed a detailed review of their observations and calculations, especially those by Picard, and the recalculation of those portions of the work that appeared, with hindsight, to be problematic (Cassini, 1720, 255–306).*

The intense debate sparked by Cassini II's empirical disagreement with Newton's (and Christiaan Huygens') mathematical models of the earth effectively ended the use of historical sentiments within

* Cassini II's essays have also given me my band name: "Les partisans de la terre elongée."

further accounts of particular geodetic surveys. The new quest to establish the earth's figure and to precisely refine its parameters engendered many innovative technological and observational improvements. Geodesists were all concerned in their published accounts to establish the value and worth of their surveys by carefully evaluating their new instruments and procedures, not by self-conscious references to ancient forebears. In 1784, William Roy [1726–1790] experimented with different technologies for baseline measurement exemplified the new rhetoric of instrumentation (Roy 1785; see Widmalm 1990; Bennett 2006). The one exception was the French account of the triangulation undertaken in the 1780s to determine the precise longitudinal difference between the observatories at Greenwich and Paris, which briefly reflected on the glorious achievements of French science by recounting the debate over the earth's shape and the heroic geodetic surveys undertaken for its resolution (Cassini et al. 1789, ii–viii).* Nor would historical commentaries be reintroduced into accounts of particular geodetic surveys in the nineteenth century.

This did not mean that histories of geodesy ceased to be written after 1720. Rather, a second effect of Newton's *Principia* redirected the subject to histories of mathematics and astronomy. The issue, as Airy (1845) would explain at length, was that Newton's celestial mechanics required the orbits of the planets to be calculated in absolute terms. (If gravitational attraction is to be defined, in part, by the inverse of the square of the distance between two objects, then that distance must be known absolutely.) Astronomers began to include historical accounts of geodetic measurements, generally ignoring the measurements made before 1670 as being hopelessly inadequate, as a preface to offering new calculations of the earth's size and shape based on later measurements. But that is another story that remains part of *The Map: Concepts and Histories*.

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* Nationalistic pride also accounted for Jérôme Lalande's (1789) brief account of Fernel's pioneering measurement. This essay prompted a metrological debate in Britain over Fernel's work half a century later (De Morgan 1841; Galloway 1842; De Morgan 1842a, 1842b).

stade qui servoit à le composer; Discussion de la mesure de la terre par Ératosthène, servant à confirmer la mesure du schène Égyptien, donnée dans le mémoire précédent." *Mémoires de littérature, tirés des registres de l'Académie royale des Inscriptions et Belles-Lettres* 26: 46–100.

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HERE BE DRAGONS ...

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Here be dragons / *Hic sunt dracones*

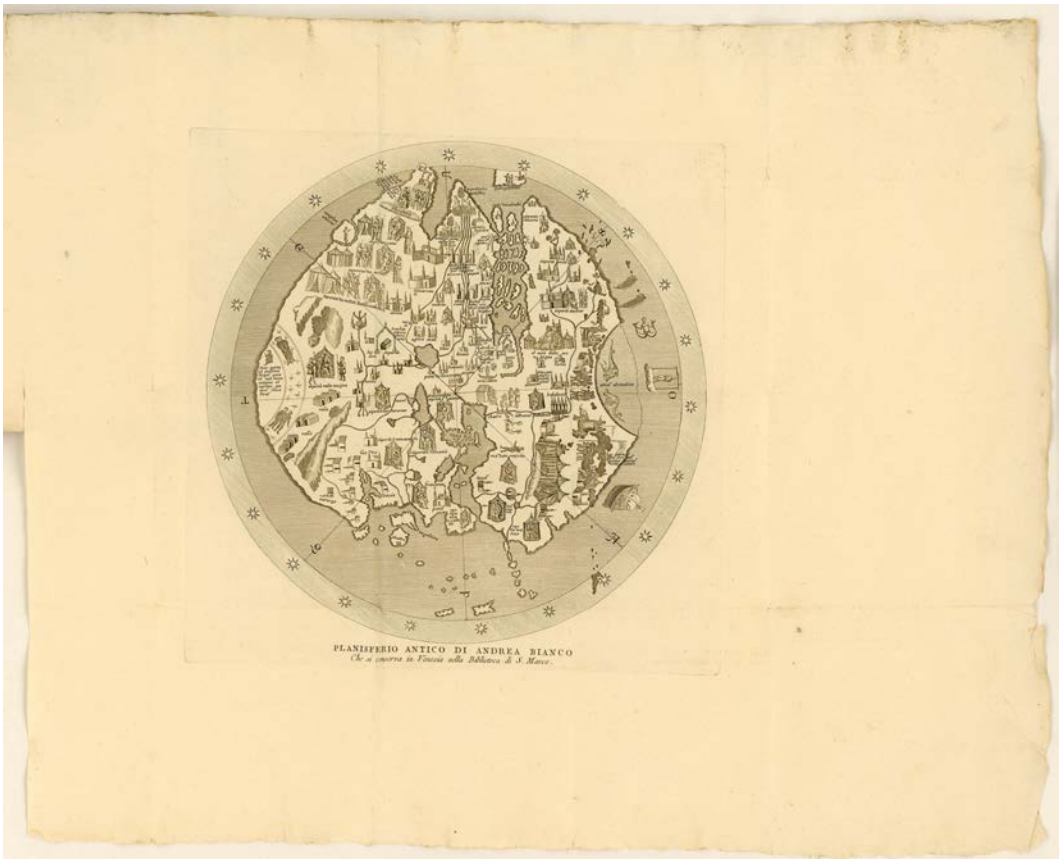
The famously evocative phrase—redolent of mystery and adventure, the danger and fear of the unknown, and the perilous task of knowing—appears in, and was perhaps popularized by, the Dorothy L. Sayers' story, "The Learned Adventure of the Dragon's Head," in *Lord Peter Views the Body* (London: Gollancz, 1928); a character refers to having seen "*hic dracones*" on an old map. Did such a map exist? Robinson Meyer (2013) gave this information in an essay in *The Atlantic*, in which she also wrote that the phrase *Hic sunt dracones* appeared on the so-called Lenox Globe, engraved in silver in about 1510:

Detail of the Golden Chersonese on the Lenox globe (ca. 1510). The phrase is at upper right. New York Public Library. Click on image to see in high resolution.

Benjamin Franklin De Costa, in one of the earliest accounts of the Lenox globe, read the inscription in quite different terms:

> In this region, near the equatorial line, is seen "Hc Svnt Dracones," or here are the Dagroians, described by Marco Polo as living in the Kingdom of "Dagroian." (De Costa 1879, 129, citing Marco Polo B. II. c. 14, "Ramusio's ed.")

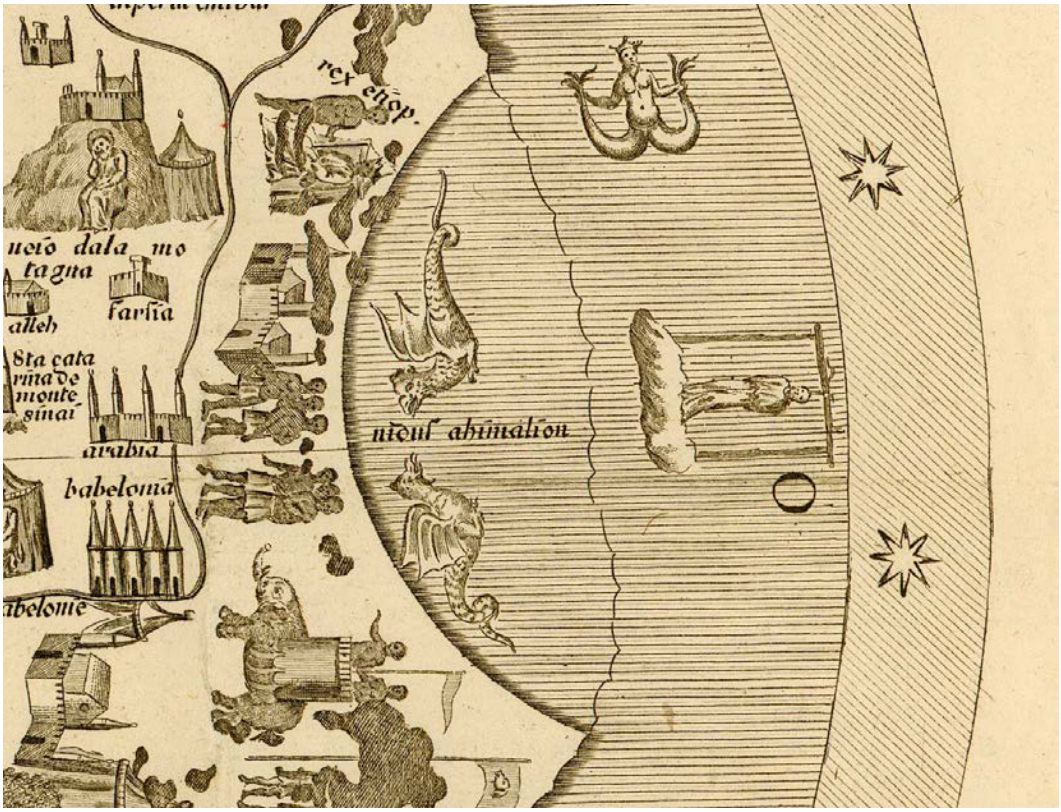
That the phrase was neither commonly used on early maps, nor perhaps did not actually refer to dragons, does not mean that dragons themselves did not appear on maps. For example, there are a couple of dragons on a *mappamundi* in a 1436 atlas by the Venetian mariner, Andrea Bianco (Biblioteca Nazionale Marciana, MS. Fondo Ant. It. Z.76).* While the atlas has been displayed and was previously available to view via www.internetculturale.it, it seems to be currently unavailable, so I cannot show the original. So here is the 1783 facsimile by Vincenzio Antonio Formaleoni, entire:



Planisferio antico di Andrea Bianco, in Formaleoni (1783, 2: between 40–41). Image from John Carter Brown Library, Providence, R.I. (H788 F723e). Click on map to see in high resolution.

* This *mappamundi* is famous today as the primary source for that well-known fake, the "Vinland Map."

And here is the detail of the dragons, placed off southern Africa:



These dragons have posed a bit of a quandary for map historians in the twentieth century, but a valid explanation was perhaps offered by one of the pioneers of map history in the mid-nineteenth century.

Formaleoni's facsimile made Bianco's map well-known to many other scholars in the early nineteenth century. The Danish emigré Conrad Malte-Brun described the map extensively, working from the facsimile. Bianco's *mappamundi*, he wrote, delineated

> The three parts of the ancient world [that] form a great continent divided in two unequal portions by the Mediterranean Sea and by the Indian Ocean, which runs from east to west and contains a great number of islands. Africa extends from west to east parallel to Europe and Asia; eastern Ethiopia and the kingdom of Prester John extend to its southern extremity. It is still the Africa of the ancients, ending north of the equator; the deep gulf that the sea forms on the side of Guinea is not marked. On this same map, Bianco placed two dragons, with these words: *Nidus Abimalion*. Asia is just as badly represented. … (Malte-Brun 1810–29, 1: 425, my translation)

Malte-Brun misread the inscription about the dragons; it actually reads *Nidus Ahamalion*, with an 'h' not a 'b', and is untranslatable. Formaleoni's (1783, 2:63) own description of the location as (among other things) a "nest of winged dragons" ("nido di dragoni alati") was taken by R. A. Skelton (1965, 118 n. 29) as being intended as a direct translation; Skelton preferred to think of this obscure phrase as having originated in "a scribal corruption of *sinus ethiopicus*," but did not suggest a reason for the dragons.

An alternative explanation for the dragons, although not the Latin, was provided by the viscount of Santarém. In discussing the map in still greater detail than Malte-Brun—he reproduced all of Malte-Brun's commentary and then listed and commented on all of the maps toponyms—Santarém suggested that the well-drawn dragons off the south coast are the two unsleeping dragons that guard the orchard of the Hesperides, which legend placed at the furthest reach of Africa (Santarém 1849–52, 3: 393 n. 1). I have no idea of Santarém was correct, but the argument is appealing.

Now, if only someone can just explain the image of a hanged man to the south of the dragons.

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THE VENETIAN DISCOVERY OF THE NEW WORLD BEFORE COLUMBUS?

The 1783 Arguments of Vincenzio Antonio Formaleoni

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Here's another little blip that I've had to cut out of The Map: Concepts and Histories*, that can sort of stand by itself. Some of the following has to stay in the book, but only as it sustains my particular argument there about the origins of map history; this short essay addresses the bigger context, which I find fascinating but not 100% relevant.*

The Venetian antiquary Vincenzio Antonio Formaleoni (1752–97) argued in 1783 that medieval Venetian sailors had reached the new world well before Columbus. The crux of his argument was the delineation of a large, rectangular island called Antilia far out in the western ocean, as shown on a 1463 chart by the Venetian mariner, Andrea Bianco (fig. 1). Formaleoni's argument was simple: this great island does not exist, yet it is present on Bianco's chart, in a work of great accuracy and high quality, so it must derive from some partial memory, sustained by Venetian mariners, of large lands across the ocean that had been previously encountered.

Formaleoni's was not the first venture into the history of voyages for the purpose of claiming Venetian priority in the discovery of the new world. Famously, the sixteenth-century Venetian patrician Nicolò Zen* had published an account of the voyages that two of his forebears had supposedly taken, in the 1380s, into the northern Atlantic, where they had found many islands, notably Frisland and Estotiland. Zen also provided a map (fig. 2) that he claimed to have drawn, just as he had written the account, from his memory of fragmentary manuscripts he had read as a young man but that had long since been lost (Zen 1558).

Zen identified Estotiland as Newfoundland or Labrador, demonstrating that these Venetians had reached the new world a full century before Columbus. There were some factual elements to Zen's narrative—in particular, Frisland, or Frixlandia, appeared on charts from the late fifteenth century (Campbell 1987, 414)—but it has to be accepted that Zen's account was thoroughly spurious. Its fabrication must be read in terms of Zen's whole book, which Zen began with a narrative of his father's travels into Persia (see Formaleoni 1783a). Zen thus positioned Venice, and more particularly the Zeni, as the hinge of east and west and of the past and future of commercial success (Horodowich 2017,

* There is **much** confusion over the writing of the last name of this family. As far as I can tell, the family name is Zen, one male family member is "Zeno," multiple male family members are "Zeni."

143–72).

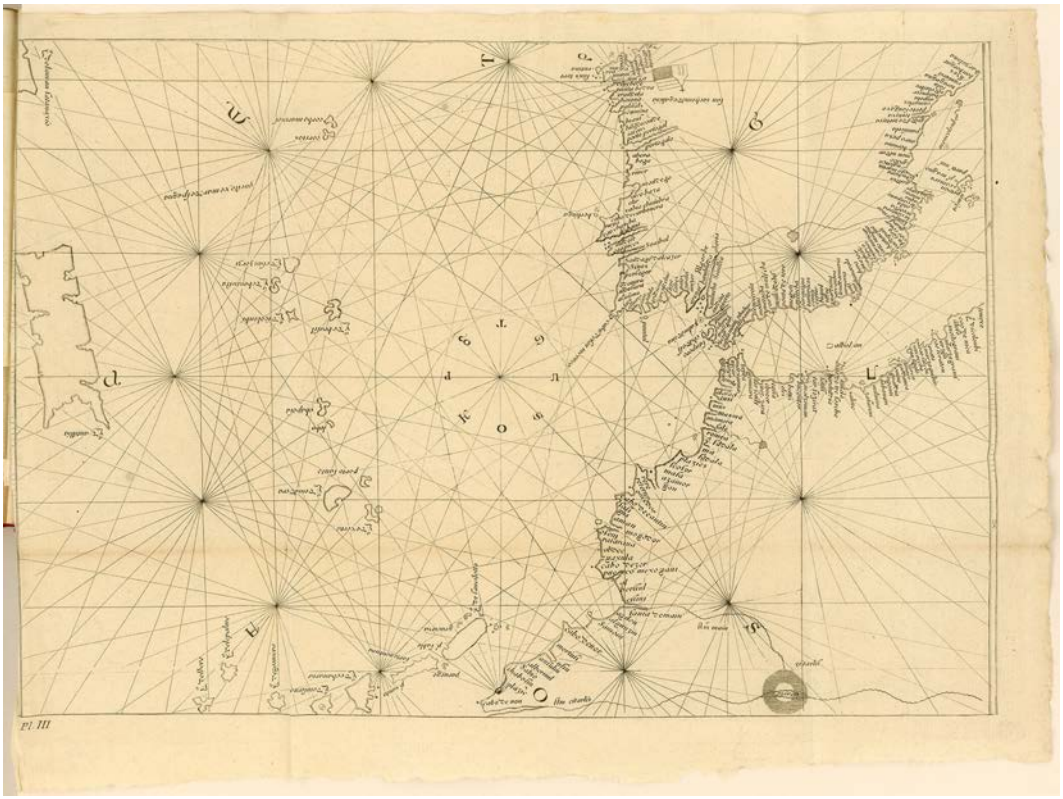

Figure 1. Andrea Bianco, untitled chart of the Straits of Gibraltar and the western ocean, as reproduced by Vincenzio Antonio Formaleoni (1783b, 2: between 40–41). Inverted so north is at top, to make the geography recognizable. "La Antilia" is the large, rectangular island at the very left (west) of the map. Bianco's 1436 original is Biblioteca Nazionale Marciana, MS. Fondo Ant. It. Z.76 [=4783], carta 5r. Copper engraving, 26 × 37 cm. Courtesy of the John Carter Brown Library, Brown University, Providence, R.I. (H788 F723e); click on image for high-res image.

Zen's map was reproduced, in a copper engraved derivative, in Girolamo Ruscelli's edition of Ptolemy's *Geography* (Venice, 1561) and its fictitious geography adopted by Gerhard Mercator, Abraham Ortelius, and other geographers (Karrow 1993, 600–2; Burden 1996, nos. 26, 29, 45). The map's precise placement of the fictitious islands of Frisland and Estotiland, by latitude and longitude, gave them a stable location when absorbed into other geographical maps. Of course, writing from the vantage point of the present, the fact that this map is structured by latitude and longitude screams that it was *not* made by medieval or even early modern mariners. Zen's map does not *look* like a marine chart and cannot be taken as one.

Figure 2. Nicolò Zen's map of his forebears' supposed voyages: *Carta da navegar de Nicolo et Antonio Zeni fvrono III tramontana lano M.CCC.LXXX.*, from Zen (1558). Woodcut, 28 × 38 cm, with late color. Courtesy of the Osher Map Library and Smith Center for Cartographic Education, University of Southern Maine (Osher Collection); cick on image for high-res version.

It might be argued that Nicolò Zen or a predecessor had constructed a geographical map from oral or written traditions. R. A. Skelton (1972, 69), for example, insisted that even if the account was fake, the map was genuine and that the original "had to have been a map of the North drawn in the later fifteenth century" by Nicolas Germanus, Henricus Martellus Germanus, or some other cosmographer (also Skelton 1965, 193, 197–99).

However, with no broader field of map history to guide him—the concerted study of map history began in the 1830s and 1840s—Formaleoni took Zen's map as gospel truth. In seeking to substantiate the travels of the fourteenth-century Zeni, Formaleoni followed at least two threads of research. The first was to find the original, fourteenth-century map in one of Venice's many libraries. The second was

to show that late medieval Venetian mariners, or at least the Venetian patricians who sailed aboard the vessels, had the mathematical acumen to use astrolabes to determine latitude directly, as Zen's map demanded.

Formaleoni did not find the original map by Zen's forebears (how could he?) but in the process he did find other maps of interest, beyond those previously mentioned by Giovanni Francesco Zanetti (1758, 2:46–48) in a celebratory history of Venetian arts. Formaleoni was especially interested in a 1471 marine atlas by Grazioso Benincasa, which he found in the library of San Michele on Murano (i.e., Campbell 1986, no. 159; Campbell 1987, 450), because it included both Frisland and a scale of latitude. Even though the mistakes in the latitude scale led him to suggest that it was a late addition by "an ignorant monk," Formaleoni (1783b, 1:26–27) nonetheless used it as evidence that the educated patricians of fourteenth-century Venice would indeed have known how to use the marine astrolabe to determine latitude (cf., Zurla 1806, 7–8; Zurla 1808, 143–44; also Campbell 1987, 386). This map evidence fueled Formaleoni's larger discussion of the comparatively advanced mathematical knowledge of early Venetians.

Then, as Formaleoni pursued the study of early Venetian mathematical abilities, the librarian of the Biblioteca Marciana introduced him to Andrea Bianco's 1436 atlas. Venetian mariner, Bianco is remembered as having helped Fra Mauro make his world maps in about 1450. The atlas contains one folio of geometrical diagrams, eight sea charts that together covered the Mediterranean, a circular *mappamundi*,[*] and a Ptolemaic map of the ecumene (Campbell 1986, no. 112; Campbell 1987, 451). The librarian brought the atlas to Formaleoni's attention not because of the maps but because of its initial folio of geometrical diagrams. Formaleoni noted that he had recognized the diagrams as an explanation of the rule of three and had "immediately mentioned this fact" to the abbé [Jacopo (Giacomo)] Morelli [the librarian], when he had placed Bianco's portolan [atlas] in my hand" (Formaleoni 1783b, 1:33, "…*e lo accennai tosto al Sig. Abate Morelli, allorchè m' ebbe posto in mano il Portolano del Bianco*").

> **[update 31 July]** On consulting gallica.bnf.fr, I just found a French translation of Formaleoni's study (Formaleoni 1788), which also includes a facsimile of Bianco's folio of geometrical diagrams. The facsimile of this folio in Formaleoni (1783b) was not captured by either of my sources for that work: the John Carter Brown Library only imaged the map facsimiles; and the copy of the book digitized by Google did not, as ever, have the fold-outs unfurled for copying, so the facsimile of diagrams is not evident. Ho hum.
>
> And in double-checking the JCB's online image bank—and searching for "Bianco" as well as "Formaleoni"—an English version of Formaleoni's facsimile of Bianco's map of the western ocean popped up: "Accurate Copy of a Map in Parchment of Andrea Bianco a Venetian, of 1436; preserved in St. Mark's library at Venice. | Published August 10th 1789, for F. Sastres. | S. Neele sculpt. 352 Strand." A binding stub is present, and a bit more

[*] The *mappamundi*, and Formaleoni's facsimile, featured in my recent post, "Here Be Dragons."

> work on Eighteenth-Century Collections Online identified the parent work as Francesco Sastres's *Il Mercurio Italico: o sia, Ragguaglio generale intorno alla letteratura, bello arti, utili scoperte, ec. di tutta l'Italia = The Italian Mercury: or, A General Account Concerning the Literature, Fine Arts, Useful Discoveries, &c. of All Italy* 2, no. 8 (August 1789): opp. 176 (i.e., at the end of the issue). The map lacks a "see page" reference, but the only essay in the issue that it might meaningfully accompany is the essay, "Viaggi e scoprimento dell'America = Voyages and Discovery of America," extracted from Girolamo Tiraboschi's ten-volume *Storia della Letteratura Italiana* (Rome, 1782–97). Sestres began to excerpt and translate this essay in 1, no. 3 (1789): 225–35; the sixth section is in 2, no. 8: 137–46 … and I am unable to find in the text of either volumes 1 or 2, any relevant reference to "Bianco," "1436," "Antilia" or "Antillia," "island," Formaleoni's work, etc. The facsimile would seem to have been added as color.

Looking at the rest of Bianco's atlas, or rather his eight charts, Formaleoni was struck by their accuracy and quality compared to the two earlier maps that he knew about: the Peutinger map, the medieval copy of a late Roman scroll-map of the ecumene (Talbert 2010); and Francesco Pizigano's 1367 chart in the Biblioteca Palatina, Parma (Campbell 1986, no. 99; Campbell 1987, 454). So even as he downplayed the question of Frisland and Estotiland, neither of which appear on Bianco's chart, Formaleoni played up the size and location of Antilia instead, preserving the primacy of the Venetian discovery of the new world.

The argument is so simple and straightforward that it would be independently echoed by later scholars, albeit with different nationalist underpinnings. H. Yule Oldham (1862–1951), a British geographer who taught at Cambridge (1893–1921) and who in 1901 had successfully repeated the Bedford Level experiment (Garwood 2007, 167–68), gave a lecture to the Royal Geographical Society on the equivalency of Antilia, on Bianco's 1448 chart, to South America and therefore offered it as evidence of pre-Columbian voyages by the *Portuguese* (Biblioteca Ambrosiana, Milan; Campbell 1986, no. 84). Oldham mentioned Bianco's 1436 atlas but not Formaleoni's work (Oldham 1895). The immediate response to Oldham's paper were highly critical (Ravenstein et al. 1895), and the idea was further refuted by Carlo Errera (1867–1936), a young Italian geographer (Errera 1895). In all this heat, my favorite contribution was by the Portuguese diplomat, Jaime Batalha Reis (1847–1934), whose essay in support of Oldham excoriated his detractors by simply appealing to basic standards of historical criticism and logic:

> And here it is opportune to point out another common fault of the historians of geography: Navigations and geographical discoveries are, to a great extent, unintelligible if we consider them apart from all the other manifestations of national activity. To properly study the history of geographical discovery, all history must be studied. (Batalha Reis 1897, 207)

Finally, I must note that the great Portuguese historian, Armando Cortesão (1953, esp. 3) made a similar argument for the Portuguese priority in the discovery of the Americas based on the presence of

Antilia on a 1424 chart by Zuane Pizzigano (see Campbell 1987, 411).

Does Antilia reflect a folk memory or oral tradition of the existence of the new world before Columbus, handed down by Portuguese or Venetian mariners? I have no idea and I have none of the skills and knowledge necessary to come to even attempt a conclusion. But what is obvious is that such arguments are wrapped up in and motivated by nationalistic yearnings and the shading of the historical record that are otherwise common among map historians and historians of discovery, as Batalha Reis observed.

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AN EARLY NARRATIVE OF MAP HISTORY

Rufus Blanchard's *Historical Map of the United States* (1876)

Originally posted: 16 August 2020

https://www.mappingasprocess.net/blog/2020/8/16/an-early-narrative-of-map-history

> *Here's another little blip that I've had to cut out of* The Map: Concepts and Histories *that can sort of stand by itself. I was going to use this as the introductory "hook" for the chapter on traditional map history, but the reworking of the previous chapters means that it no longer works. While I might mention the topic, it's too minor to get so much coverage in the book. I've reworked the material and I've also expanded it with some digressions* …

Here is an early work of traditional map history in map form (fig. 1).* It was prepared by Rufus Blanchard—a publisher, photographer, map maker, and historian, born in New Hampshire in 1821, who worked in Chicago from 1854 to 1904 (Selmer 1984)—and published in January 1876 in commemoration of the centennial of the US Declaration of Independence. A large map, measuring 137 × 145 cm (4'6" × 4'9"), it was mounted on cloth and housed in sturdy covers. It was also backed with a long chronology of key events in US history, which Blanchard called a *Tablet of History* (fig. 2).

The version in David Rumsey's collection lacks them, but the map was sold with looped cloth "tapes" to permit the whole to be suspended on a wall to display either side. A note added to the map explained that the work could be folded up for easy storage (below). (One of OML's two copies shows extensive wear along the folds and the cloth loops: it has been nicely imaged.)

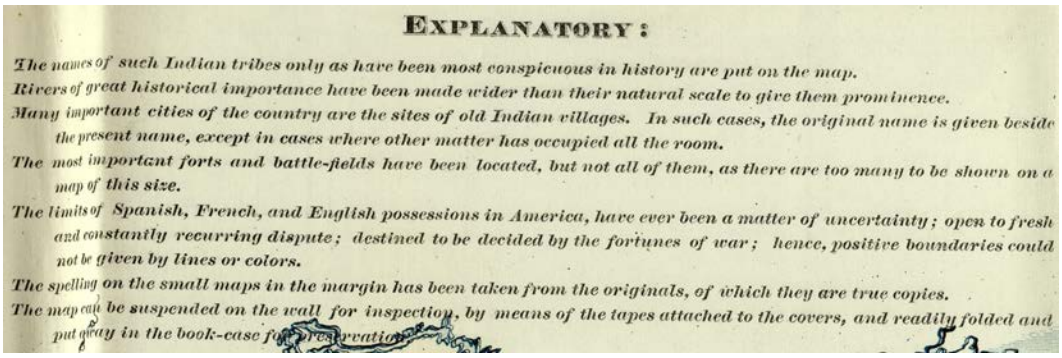
There is much to be said about this large wall map in its construction of US history and national identity. The rhetoric of the map and of the *Tablet of History* makes them an instructive read, and I recommend them to anyone who teaches or studies US history in the post-Civil War period. Blanchard was very much a proponent of the USA as a WASP country—White, Anglo-Saxon, Protestant—and he consistently referred to the mother country as England, never Britain (with all its Celtic elements!). Susan Schulten (2012, 57–59) has discussed the manner in which Blanchard selected and mapped out the events (discoveries and battles), places (towns and forts), and routes of explorers that Blanchard deemed of significance to US history. He began with the discoveries of Columbus and the Cabots and continued to the 1876.

* "Traditional map history" is the field of study that was often called the "history of cartography" or "historical cartography" between the 1830 and the 1960s. Despite the apparent inclusivity of its name, especially in its use by R. A. Skelton (1972) and his followers, this field of study has actually excluded other scholarly communities that possess different agendas in studying early or historical maps. I therefore call it "traditional map history" to indicate that it constitutes just one kind of map work. NOTE: I have since renamed "traditional" map history "comparative."

Figure 1. Rufus Blanchard, *Historical Map of the United States, Showing Early Spanish, French & English Discoveries and Explorations, and Forts, Towns & Battle Fields of Historic Interest. Edited by Rufus Blanchard* (Chicago, 1876). Issued folded, in boards. Color lithograph, 137 × 145 cm. Courtesy of David Rumsey (3967.001); www.davidrumsey.com. Click on map for high-res image.

Figure 2. Rufus Blanchard, *Tablet of History Outlining the Discovery and Exploration of America, and the Settlement, Wars and Civil Progress of the United States, from Her Colonial Beginning to 1876*, verso of his *Historical Map of the United States* (Chicago: Rufus Blanchard, 1876). Courtesy of David Rumsey (3967.000); www.davidrumsey.com. Click on "tablet" for high-res image.

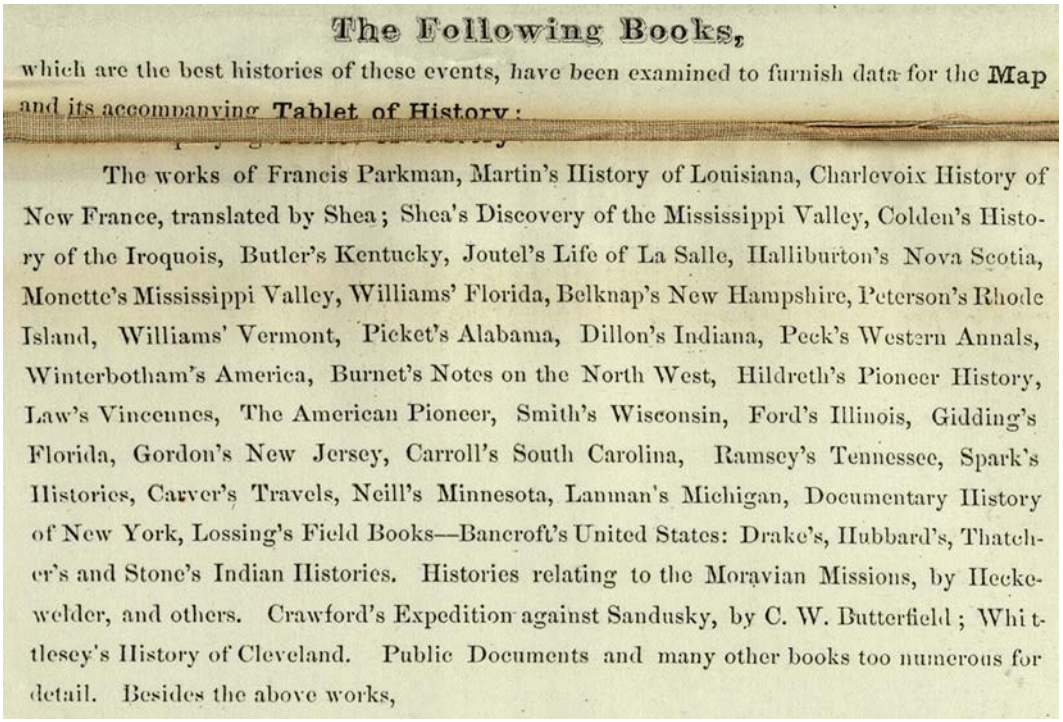
The map uses color to show the imperial divisions of eastern North America as they existed at the time of the Revolution: the province of Quebec, as defined by the British government in 1774, in pale yellow; the thirteen original colonies of the USA, in pink; the western lands annexed from France in 1763, uncolored; and the edge of Louisiana, in green, hinting at the republic's later westward expansion. Schulten noted the vagueness of Blanchard's depiction of political divisions, his blurring of the edges of imperial control, and how he widened "rivers of great historical importance…to give them prominence," as the map's explanatory notes also stated:


EXPLANATORY:

The names of such Indian tribes only as have been most conspicuous in history are put on the map.
Rivers of great historical importance have been made wider than their natural scale to give them prominence.
Many important cities of the country are the sites of old Indian villages. In such cases, the original name is given beside the present name, except in cases where other matter has occupied all the room.
The most important forts and battle-fields have been located, but not all of them, as there are too many to be shown on a map of this size.
The limits of Spanish, French, and English possessions in America, have ever been a matter of uncertainty; open to fresh and constantly recurring dispute; destined to be decided by the fortunes of war; hence, positive boundaries could not be given by lines or colors.
The spelling on the small maps in the margin has been taken from the originals, of which they are true copies.
The map can be suspended on the wall for inspection, by means of the tapes attached to the covers, and readily folded and put away in the book-case for preservation.

Detail of explanatory notes from Fig. 1

Blanchard described himself in the map's title as the "editor" of the map, asserting that he had simply assembled facts rather than created a complex narrative. He even gave, within the text covering the far west, a bibliography of the histories and accounts that he had used for the map and the chronology.



The Following Books,

which are the best histories of these events, have been examined to furnish data for the **Map** and its accompanying **Tablet of History:**

The works of Francis Parkman, Martin's History of Louisiana, Charlevoix History of New France, translated by Shea; Shea's Discovery of the Mississippi Valley, Colden's History of the Iroquois, Butler's Kentucky, Joutel's Life of La Salle, Halliburton's Nova Scotia, Monette's Mississippi Valley, Williams' Florida, Belknap's New Hampshire, Peterson's Rhode Island, Williams' Vermont, Picket's Alabama, Dillon's Indiana, Peck's Western Annals, Winterbotham's America, Burnet's Notes on the North West, Hildreth's Pioneer History, Law's Vincennes, The American Pioneer, Smith's Wisconsin, Ford's Illinois, Gidding's Florida, Gordon's New Jersey, Carroll's South Carolina, Ramsey's Tennessee, Spark's Histories, Carver's Travels, Neill's Minnesota, Lanman's Michigan, Documentary History of New York, Lossing's Field Books—Bancroft's United States: Drake's, Hubbard's, Thatcher's and Stone's Indian Histories. Histories relating to the Moravian Missions, by Heckewelder, and others. Crawford's Expedition against Sandusky, by C. W. Butterfield; Whittlesey's History of Cleveland. Public Documents and many other books too numerous for detail. Besides the above works,

Detail of bibliography from Fig. 1

Blanchard thought that this analytical mapping of US history was innovative. A February 1876 account in the *Northwestern Chronicle*—the kind of puff piece placed by publishers as supposedly disinterested reviews—stated that it was the "first" work "to inaugurate this system of showing history on maps" (quoted by Selmer 1984, esp. 27–28). Blanchard was clearly not the first to do so (see Schulten 2007 on Emma Willard), but he was one of the first in the USA to engage in narrative map history. Blanchard's narrative was graphic in form, comprising a series of facsimiles of early maps.

Blanchard's Blurring of Analytical Mapping of the Past and Map History

I should note that it is not clear where the division might be drawn between Blanchard's analytical mapping and map history. The two lower corners of the map feature two inset maps of the USA in 1783 and after "half a century's growth." Blanchard later issued the inset map for 1783 as a separate

map, by transferring the original drawing to another lithographic surface for printing. This separate map was advertised in the *Chicago Daily Tribune* for 14 April 1876. The advertisement gave its price as 25 cents retail and stated that "Everybody wants it" (fig. 3):

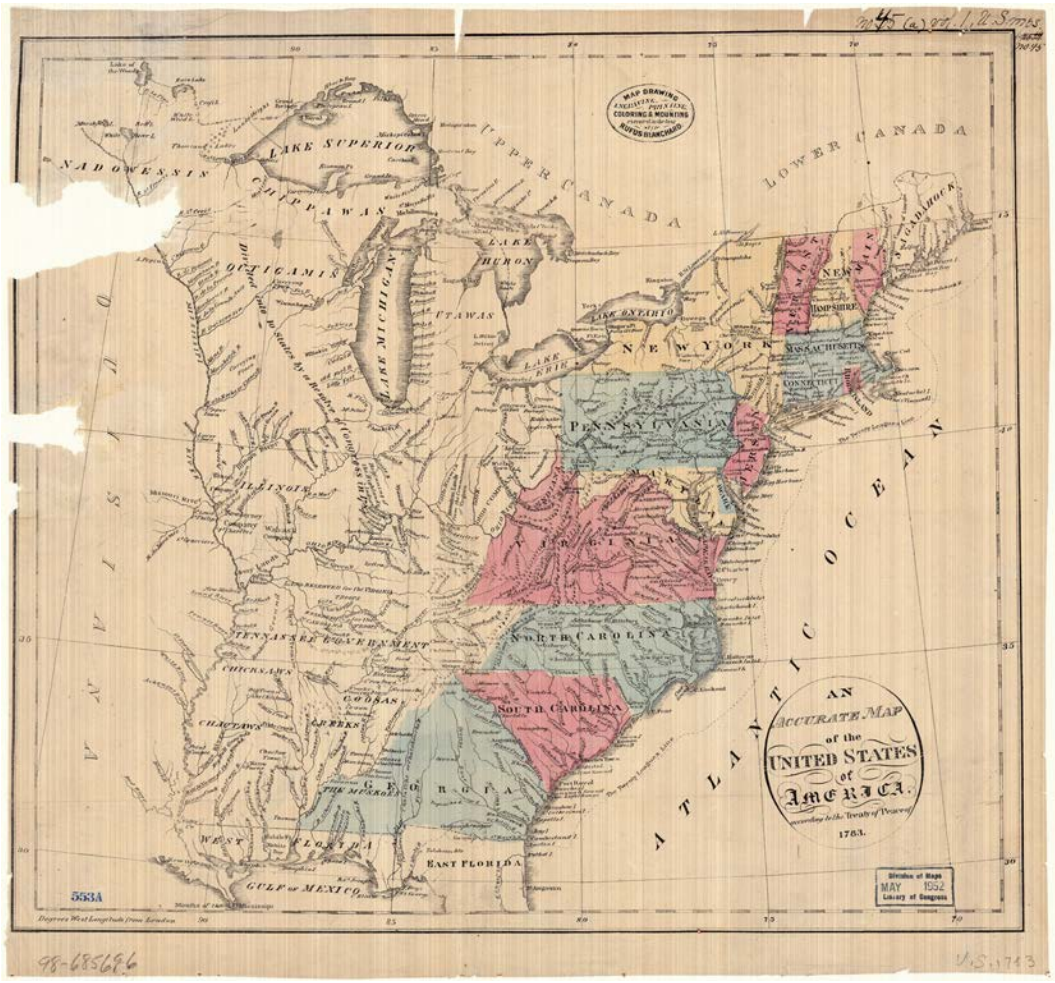


Figure 3. Rufus Blanchard, *An Accurate Map of the United States of America According to the Treaty of Peace, 1783 / Map Drawing, Engraving, Printing, Coloring & Mounting Executed in the Best Style, Rufus Blanchard* (Chicago: Rufus Blanchard, undated but [1876]). **My thanks to Ed Redmond for the image!** Courtesy of the Geography and Map Division, Library of Congress (G3701.S4 1860).

The separately map was differentiated by the addition of his business details in the upper-right portion of the map (the same kind of icon found close to the left-hand neat line of the *Historical Map*.

For this map and that of the USA in 1833, Blanchard seems to have taken maps from those

periods and redrew them in the mid-nineteenth-century style of American commercial geographical mapping. I must admit that have not done the work to determine which maps Blanchard used as sources for these two maps, although the map for 1783 is likely derived from one of the maps created directly after the Treaty of Paris (Ristow 1978). In appearance, the two inset maps seemed to be modern analytical maps, which is to say maps made *now*, that illustrated the USA's growth over its first half century.

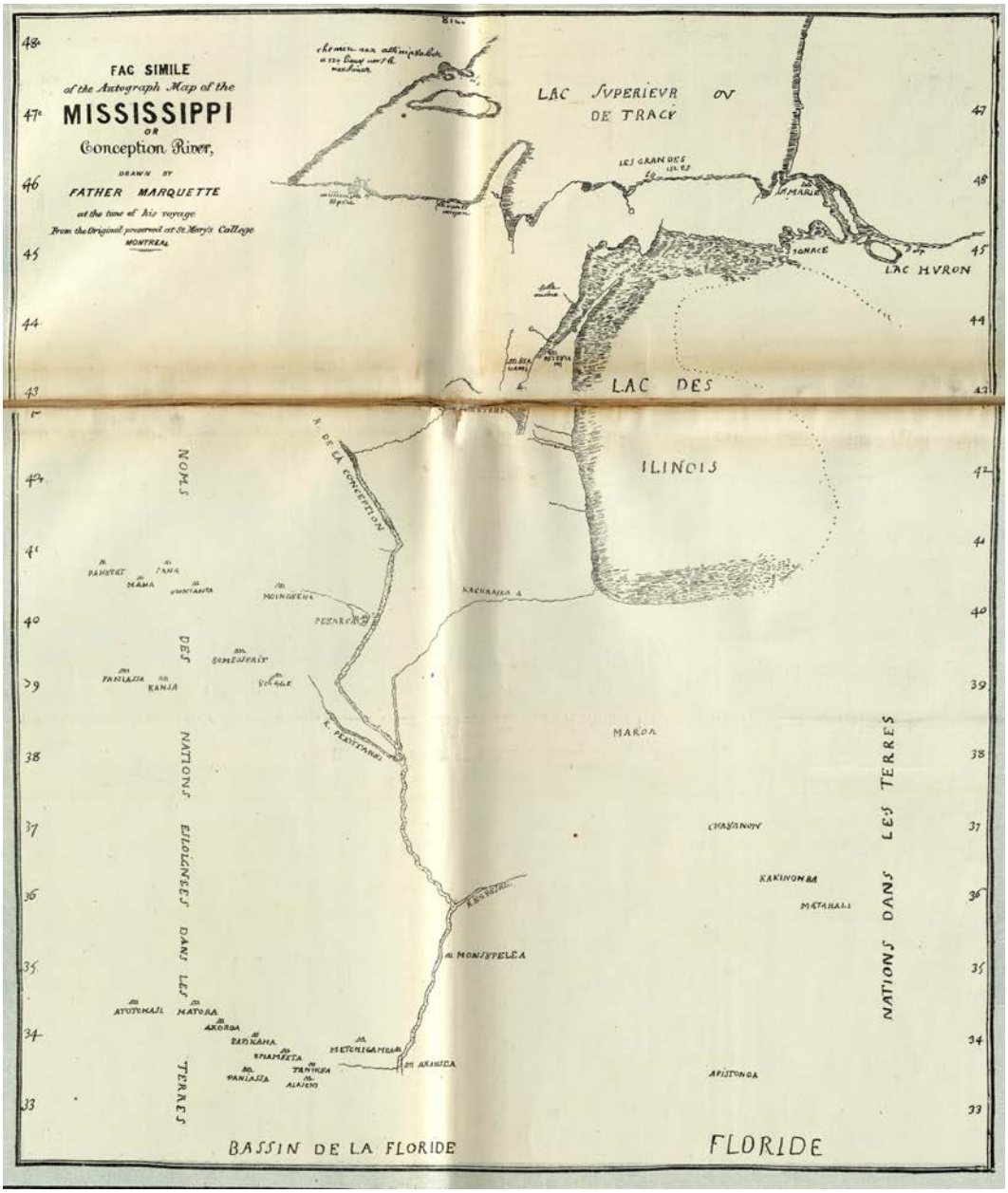
Blanchard's other four inset maps in the Atlantic Ocean and Gulf of Mexico, however, were photographic transfers of old maps that were only slightly modified. They looked old, in both their aesthetic and content, and were clearly images of mapping *then*. Blanchard emphasized the unmediated nature of their reproduction in the explanatory notes (above), where he stated: "The spelling on the small maps in the margin has been taken from the originals, of which they are true copies." They are indeed close reproductions made at the same size as the originals. The alterations are small, but significant. The result sustained a narrative constructed in line with existing ideas of "American" identity and Manifest Destiny.

Narrating the Discovery and Settlement of the USA

The key change to each facsimile was the addition of a date, in relatively large lettering, to three of the maps. The dates are not necessarily correct, but they indicate how Blanchard expected the maps to be read: as a narrative.

Two of the four facsimiles are of maps that are today well-known within certain cliques of US map historians specializing in the mapping of particular parts of colonial America. The other two are really minor works that are readily identifiable only because of the extensive (obsessive?) work listing maps that show certain geographical features. They are, in Blanchard's chronological order:

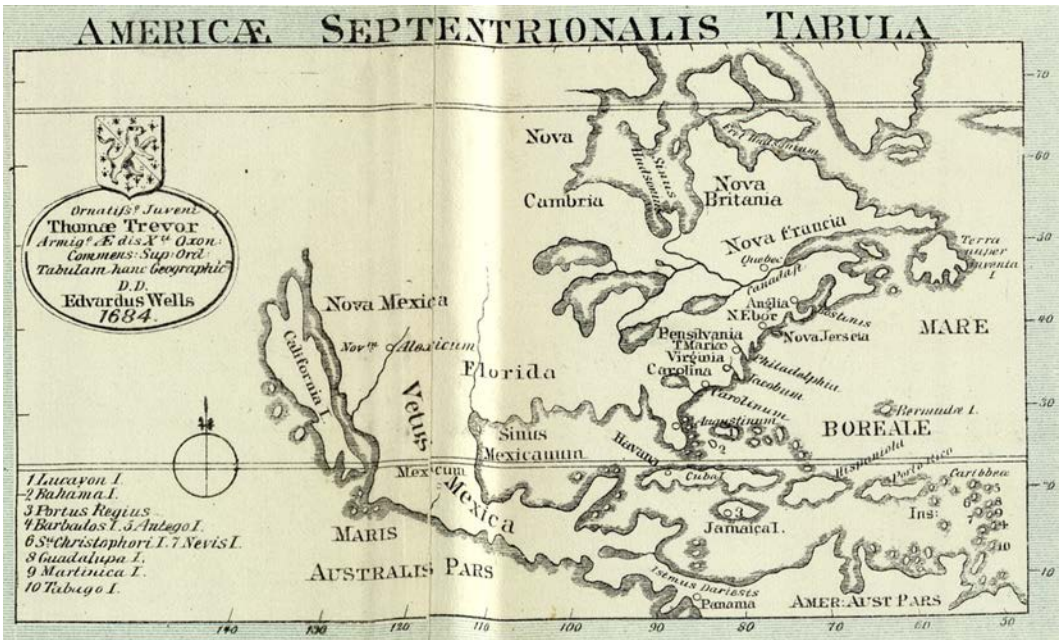
> 1) at the right, the largest of the facsimiles, of a manuscript map of the Mississippi country that has generally been attributed to Jacques Marquette. The facsimile is undated but is supposed to date from Marquette's voyage in 1673–74. This particular map is well known to historians of the upper Mid-West. Blanchard his image not from the original manuscript, in Montreal (Buisseret and Kupfer 2011; also Kupfer and Buisseret 2019), but from a facsimile thereof by John Gilmary Shea in his *Discovery and Exploration of the Mississippi Valley* (1852, opp. 268), one of the books in Blanchard's bibliography.



Detail of fig. 1: *Fac Simile of the Autograph Map of the Mississippi or Conception River Drawn by Father Marquette*, 43 × 36.5 cm

2) the supposedly "1684" map actually appeared twenty years later, in the first edition of the Latin translation by Edward Wells of the travels of Dionysius Periegetes (1704, opp.

38); it was reprinted in later editions through the eighteenth century (McLaughlin and Mayo 1995, no. 205).

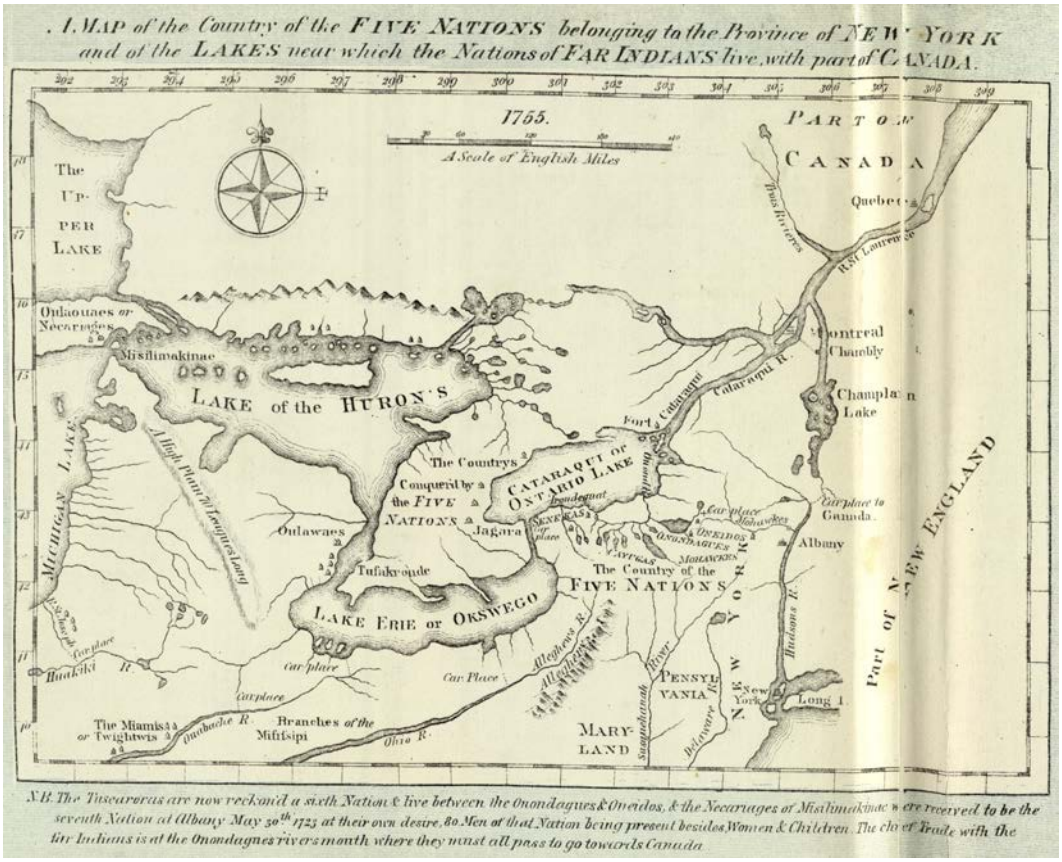


Detail of fig. 1: Edward Wells, *Americæ septentrionalis tabula 1684*, 8.5 × 15.5 cm

3) the binding instruction reproduced with the "1690" map indicates that it had to have been taken from the first Parisian edition of a minor geographical text by a provincial French scholar (Croix 1693, 4: opp. 273; see Burden 2007, no. 695).

[Detail of fig. 1: *L'Amerique septentrionale 1690*, 14 × 19 cm]

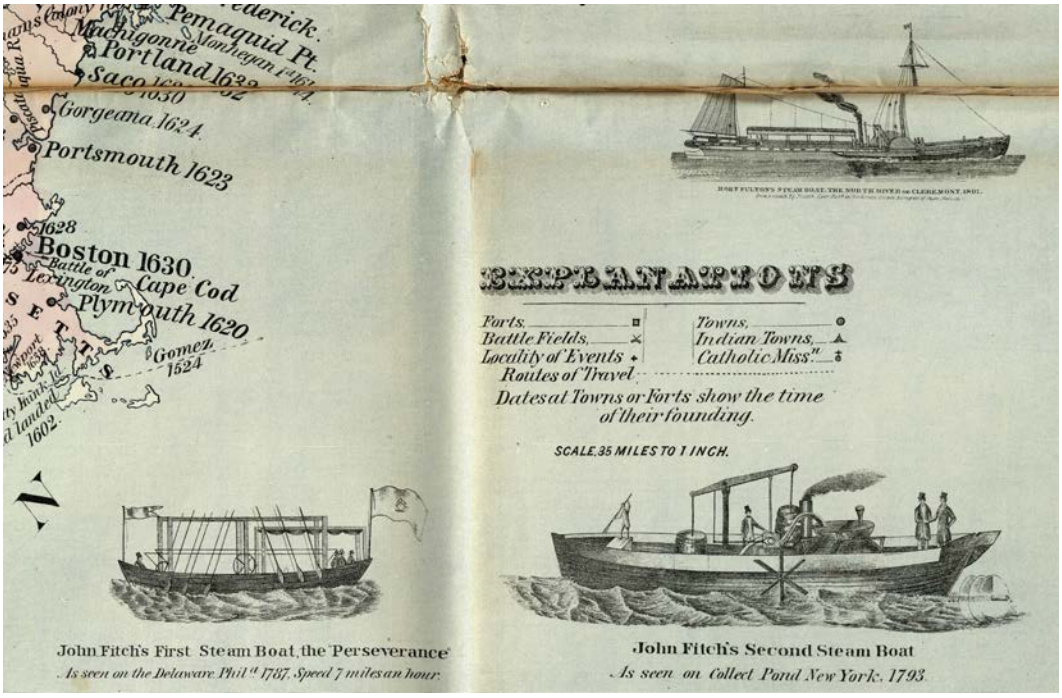
4) the 1755 map of the country of the Five Nations—i.e., the Haudenosaunee (called the Iroquois by the French)—was copied from Cadwallader Colden's map that had been printed in the three London editions of his *History of the Five Nations* in 1747–55. The source for this photographically transferred facsimile is uncertain: the image matches neither the original impressions nor the known facsimiles thereof. [See appendix]



Detail of fig. 1: *A Map of the Country of the Five Nations…1755*, 15.5 × 23 cm (neatlines)

By improperly dating Wells's sketchy and crude map two decades too early, Blanchard placed it earlier than the de la Croix map, which had many more details about the interior, including the Mississippi River. That river and its tributaries, including the Illinois River and its connection to the Great Lakes, which would eventually lead to Chicago's foundation, were the subject of the large manuscript outlining Marquette's travels in 1673–74. The suggestion is of the expansion of French knowledge of the continental interior through exploration, hinting at the growth of geographical knowledge and the subsequent rise of colonies. With Colden's much later map, Blanchard's then drew attention to the eighteenth-century rise of English power over both the French and the Indians. (Notice the far superior outline of the Great Lakes over Wells's map.)

The narrative constructed through these maps was extended into the present by the Furthermore, set above the Marquette manuscript are images of three of the first US steam vessels, all designed for river work, with which the continental interiors would be opened up to commercial exploitation in the nineteenth century.



Detail of Fig. 1

At the far left, situated out on the western plains, a further vignette, depicted an English farmer displacing/replacing a despondent native hunter:

Combined with the four facsimiles, these vignettes suggest an ongoing movement not only to settle the continent but to advance the "civil progress" of the USA, as the title to the *Tablet* put it.

Blanchard outlined this interpretation for the reader of the *Historical Map*. Much of the text on the left-hand side of the map is a summary history of the discovery of North America. Continuing on directly from the bibliography that followed the historical summary, Blanchard then stated:

> Besides the above works,
>
> **Maps of the Country,**
>
> in various periods of its progress, have been brought into service. A few of these have been copied and printed on the margin of the Historical Map, which will be useful to the student of history, as landmarks of settlement and possession by the United States at different times.

Blanchard, working in Chicago, thus recapitulated the first works in the "history of cartography" published in Paris in the 1840s and 1850s. The facsimile collections by Edme François Jomard and by the viscount of Santarém had been designed to allow scholars to compare sequences of early maps so as to develop their own understanding of the growth of geographical knowledge and of Western civilization. But Blanchard turned that larger narrative to the more precise service of the growth of the American nation and the Westward Course of Empire.

Blanchard's Motivations

I have uncertain where Blanchard got the idea to use early maps in this way. Jomard's and Santarém's facsimile collections were large and expensive, few were made, and were unlikely to have reached Chicago (at least, before the Chicago businessman Edward E. Ayer acquired copies for his own library, which became a kernel of the Newberry Library's great collections). Perhaps Blanchard had been inspired by the German geographer, travel writer, and historian of North American discovery, Johann Georg Kohl, who had passed through Chicago to and from his travels in the upper Mid-West in 1855 (Wolter 1993).

However, the idea of using maps "as landmarks of settlement and possession" to demonstrate the progress of discovery and civilization was well established in the early nineteenth century. A key text, Conrad Malte-Brun's history of geography in the first volume of his *Précis de géographie* (1810) would be republished in English editions in the USA (Malte-Brun 1824, 1827). If not these volumes, then the works on discovery that Blanchard mentioned in his bibliography, especially Shea's (1852) account of Marquette et al. on the Mississippi, might have prompted the use of maps.

I am especially struck by the fact that to construct his narrative of civil progress, Blanchard had to use what today appear to be very minor maps. There are none of the grand manuscript maps that could be found in European libraries, nor even the major printed works, such as Delisle's maps of the

continent that were the basis for Colden's map. Perhaps the issue was space: Blanchard needed smaller maps to fit in the waters around the USA that would complement and not overwhelm the main map. But it would seem that Blanchard relied on maps that he had in his own library or to which he had access in some other collection. (We cannot look at the books he had in his library because it burned down with his home studio in 1885: Selmer 1984, 28.) Overall, it seems that Blanchard picked up on contemporary intellectual trends in the history of discovery as that field had been turned to support the nationalistic burden of US exceptionalism and manifest destiny.

Appendix re "1755 map"

I have identified the following variants of this famous map:

[0] Cadwallader Colden probably first drew this map in 1723, when surveyor general of the province of New York.

[1] New York engraving: *Map of the Countrey of the Five Nations* (with an 'e' in Country) (Stokes 1915, 3:862, 6:259–60; Wheat and Brun 1978, nos. 317–18):

> [1.1] William Bradford engraved and printed it as the frontispiece to Colden's (1724) commentary on recent acts by the colonial legislature. Bradford later advertised it for sale as a separate work at the same time as the printing of Colden's *History of the Five Nations* (Colden 1727, 2017; see Dixon 2016, esp. 74).
>
> > a) Facsimile (lithograph): in *Iconography of Manhattan Island* (Stokes 1915, 3: A pl. 2b)
> >
> > b) Facsimile (lithograph): in *Acts of the Privy Council of England*, Colonial Series, "Unbound Papers," vol. 6, *1676–1783*, ed. James Munro (London: HMSO, 1912), §336, which summarizes the matters surrounding the 1724 commentary and the rational for the map (bound at end).
> >
> > c) I must mention, for the sake of completeness, although I refuse to reproduce it here, that the 1724|7 map was used in about 1952 as an advertising piece for Iroquois Indian Head Beer and Ale in Buffalo (with a completely incorrect attribution to "London 1728")
>
> [1.2] The plate was modified extensively for reprinting in 1737, again as a separate issue.
>
> > The NYPL online catalog suggests that there is a facsimile of this map, published by William Loring Andrews in New York in 1868; according to the catalog for the famous Brinley sale, however, that Andrews provided an ornamental title page for a binding for two impressions, one each of 1.2 and 2.1 (Anonymous 1878, 2:95, no. 3446).

[2] London engraving: *Map of the Country of the Five Nations*

[2.1] A new engraving, very precise in execution, slightly reduced in size, and with the title and explanation moved above and below the neat line, was made by an unknown engraver for a London edition of Colden's *History of the Five Nations* and his 1724 commentary (Colden 1747). This work was reissued twice, with the map unchanged, in 1750 and 1755 (Wroth 1934, 178–83). Note that the text below the neat line is in three lines. A recent reproduction is Schulten (2018, 78–79).

a) Facsimile (lithograph), lacking original title (replaced with "Grand Canal Celebration") and text below, in William Leete Stone, *Memoir, Prepared at the Request of a Committee of the Common Council of the City of New York, and Presented to the Mayor of the City, at the Celebration of the Completion of the New York Canals* (New York: Corporation of New York, 1825); digitized (NYPL print division). The impression in the NYPL maps division, also digitized, bears a manuscript annotation that gives the catalog title: "Copy of a Map attached to Govr. Colden's History of the Five Indian Nations, Printed in London A.D. MDCCXLVII."

b) Facsimile (copper engraved), in *Report by a Committee of the Corporation, Commonly Called the New England Company, of Their Proceedings, for the Civilization and Conversion of Indians, Blacks, and Pagans, in the British Colonies in America and the West Indies* (London, 1829), opp. 44, see also 5n; my thanks to John Dixon for this reference. Three lines of text below; slightly different spacing than in original.

c) Facsimile (redrawn): in the *Sessional Papers of the Legislature of the Province of Ontario* 1 (1898): 49. Just two lines of text below.

d) Facsimile: in John Fiske, *The Dutch and Quaker Colonies in America* (London: Macmillan, 1899) and later editions.

e) Facsimile (copper engraved): unidentified; known from its further (lithographic) reproduction in Blanchard's *Historical Map* (1876). Blanchard's image is definitely from a copy that had redrawn the original. The differences with the original are plain. The toponym "carrying place" is missing in southern Michigan. More obviously, the three lines of text below the map start with different lines: the lines on the original London impressions start "N.B. The Tuscaroras…" / "received to be…" / "The chief Trade…" whereas those on this unidentified facsimile have less space between "NB" and the aligned text which start, "N.B. The Tuscaroras…" / "seventh Nation…" / "far Indians…."

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A LITTLE-KNOWN FACSIMILE

Ramón de la Sagra's facsimile of Juan de la Cosa's depiction of the New World in 1500

Originally posted: 19 August 2020

https://www.mappingasprocess.net/blog/2020/8/19/a-litle-known-facsimile

A fun story is the initial reception of Juan de la Cosa's world map in marine style from 1500. I'm not an expert in the map itself, so details escape me. But somehow it ended up in a Paris book store in the winter of 1831–32. The Baron Charles Athanase Walckenaer (1771–1852) found it and immediately bought it. Walckenaer was an Anglophilic Frenchman with interests in archnology and entomology (don't google his name if you're afraid of bugs!), the history of geography and discovery, and the history of literature. His private library was substantial (Anon. 1853) and he opened it to any scholar who needed access. Hossam Elkhadem and others (1992, no. 39) called him the Dutch ambassador to France, and this has been copied by later writers (e.g., Martín Merás 2000), but this is a mistake (Cortambert 1853; Naudet 1855; Michaud and Desplaces 1854, 44:221–37).

Juan de la Cosa's world map of 1500, now in the Museo Naval, Madrid. This image from the Wikipedia entry on the map.

In the spring of 1832, Walckenaer showed off the new acquisition to Alexander von Humboldt, then visiting Paris from Berlin. Humboldt was captivated by the work and he immediately set out to

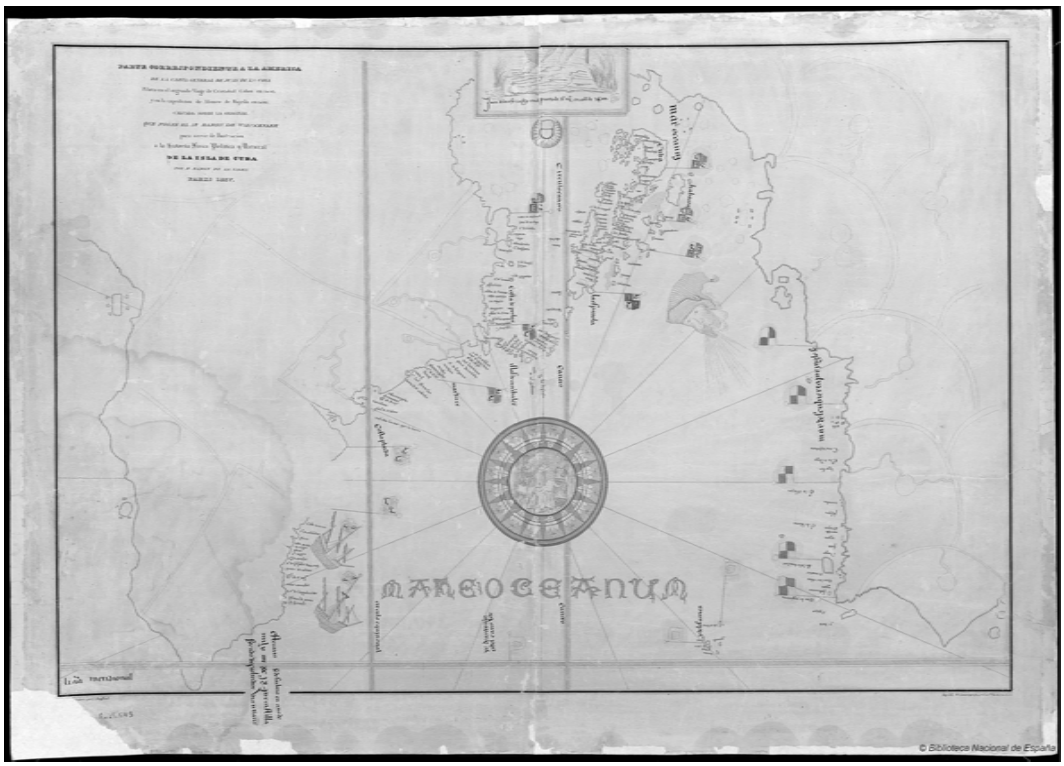
authenticate it, based on the inscription below the figure of Christ in the far west: *Juan de la cosa la fizo en el puerto de S: ma en año de 1500* ("Juan de la Cosa made it in El Puerto de Santa Maria in the year 1500"). As he recorded in an essay dated to 1833:

> It would fail the duties of an affectionate acknowledgment, if I did not provide at the end of this preface, a public tribute to Baron Walckenaer, my colleague at the Institute, whose noble zeal for the cultivation of the sciences is not confined to enrich his own labors, but who still likes to help with his advice and the free use of his extensive library, all those who try to travel the same career as him. It was amid the riches contained in this library that I was fortunate to recognize, with Mr. Walckenaer, in the spring of 1832, during my last visit to Paris, the author and the date of map of the world that has resulted in very informative observations. The New Continent is traced there, in 1500, by Juan de la Cosa, who accompanied Christopher Columbus on his second voyage and was pilot of Alonzo Hoyeda in the 1499 expedition, in which there was Amerigo Vespucci. To understand the importance of this geographical monument, just remember that it [was made] six years prior to the death of Columbus, and that the oldest maps of America not included in editions of Ptolemy, or in the sixteenth-century cosmographies that are so far known, are those from 1527 and 1529 in the library of the grand duke of Saxe-Weimar. The last is the most famous because it bears the famous name of Diego Ribero. (Humboldt 1836–39, 1:xxiii–xxv)*

The map gave Humboldt a direct and almost visceral access to the Great Discoveries that did so much to change (in his and his contemporaries' belief) the nature of the West, of Western science, and Western morality.

* Ce serait manquer aux devoirs d'une affectueuse reconnaissance, si je ne rendais pas, à la fin de cette préface, un hommage public à M. le baron Walckenaer, mon confrère à l'Institut, dont le noble zèle pour la culture des sciences ne se borne pas à les enrichir de ses propres travaux, mais qui aime encore à aider de ses conseils et par le libre usage de sa vaste bibliothèque, tous ceux qui essaient de parcourir la même carrière que lui. C'est au milieu des richesses que renferme cette bibliothèque que j'ai eu le bonheur de reconnaître, avec M. Walckenaer, au printemps de l'année 1832, pendant mon dernier séjour à Paris, l'auteur et la date d'une mappemonde qui a donné lieu à des observations très instructives. Le Nouveau-Continent y est tracé, en 1500, par Juan de la Cosa, qui avait accompagné Christoph Colomb dans son second voyage, et qui était pilote d'Alonzo Hoyeda dans l'expédition de 1499, où se trouvait Amérigo Vespucci. Pour concevoir l'importance de ce monument géographique, il suffit de rappeler qu'il est de six ans antérieur à la mort de Colomb, et que les plus anciennes cartes de l'Amérique non insérées dans les éditions de Ptolémée, ou dans les cosmographies de seizième siècle que l'on ait connues jusqu'ici, sont celles de 1527 et 1529 de la bibliothèque du grand-duc de Saxe-Weimar. La dernière est la plus connue parce qu'elle porte le nom célèbre de Diego Ribero.

De la Cosa's depiction of the new world equally enthralled others. Almost as soon as he read Humboldt's account, the Spanish polymath, historian, and politician Ramón de la Sagra (Ramón Dionisio José de la Sagra y Peris, 1798–1871), then resident in Paris, approached Walckenaer to make a facsimile of the map. In a brief notice, de la Sagra (1842–61, 1:5) admitted that the map showed the whole world but that its depiction of the new world made it truly remarkable:



Ramón de la Sagra, *Parte correspondiente a la America de la carta general de Juan de la Cosa, piloto en el segundo viage de Cristobal Colon en 1493. y en la expedicion de Alonzo de Hojedo en 1499. calcada sobre la original que posee el Sr. baron de Walckenaer para servir de ilustracion a la historia fisica politica y natural de la isla de Cuba por D. Ramon de la Sagra Paris 1837*, engr. L. Bouffard (Paris: Lemercier Benard et Cie., 1837). Reoriented and digitally enhanced for clarity. Hand colored lithograph, 60 × 88 cm. Courtesy of the Biblioteca Nacional de España (MA00019643).

As the title suggests, de la Sagra thought he would include the facsimile in his great history of Cuba that he was then preparing, and he listed it at the head of the many facsimiles included at the end of volume 2 of that work (Sagra 1842–61). It seems however never to have been included in the book (Martín Merás 2000, 84n5) and remained a rare, separate publication. At least one exhibition has displayed this fasimile in lieu of the original manuscript work, and without noticing its character as a

facsimlle (Elkhadem et al. 1992, no. 39).

De la Cosa's map would soon be again reproduced in facsimiles that are well known today, in its entirety by Edme François Jomard (1854–62), a detail of Africa by the viscount of Santarém (1841–44), and other details by Humboldt. What I don't have time to do, nor the language skills, is to research de la Sagra's entire interest in early maps; it would be an interesting study!

This has been another blip built out of material cut from The Map: Concepts and Histories.

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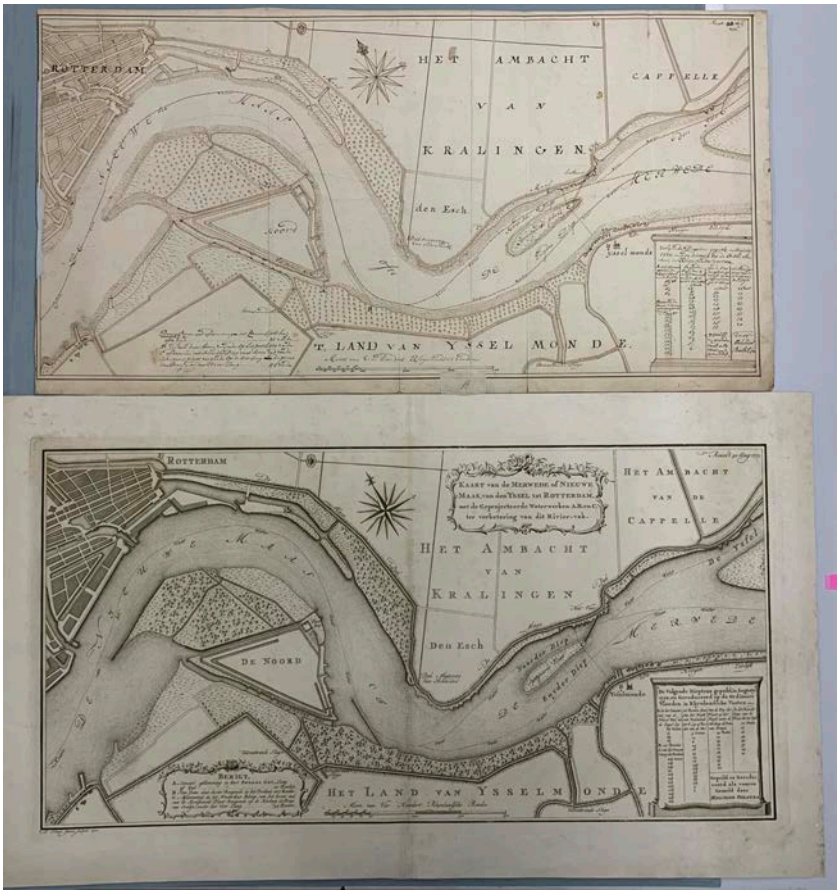
RIVER NAMES

A Question of Whose Ontological Consistency

Originally posted: 26 August 2020

https://www.mappingasprocess.net/blog/2020/8/26/river-names

A brief exchange on twitter this morning provides another example of how Western and non-Western practices are not necessarily distinct. There is nothing essential about the West that makes Westerners innately different to non-Westerners; it's always a question of the practices that different groups use to comprehend and represent the world.



The occasion is the naming of rivers, or rather the local treatment of channels as opposed to the rationalized concept of "river." Both are cultural constructs, but the former is part and parcel of living in the landscape, the other the imposition of outsiders seeking to understand and order a landscape. The specific prompt was the tweet by Gijs Boink, of the Dutch National Archives, of an image of a manuscript map of the Meuse/Maas at Rotterdam in 1771, and the printed version of 1772 (right).

But, wait, I here you cry, Rotterdam is famous for being the port at the mouth of the Rhine. The Meuse (French) or Maas (Dutch) is a tributary of the Rhine, flowing north from Lorraine through Maasstricht. But the situation is far more complex than that! Google Maps places Rotterdam on the Nieuwe maas (New Maas):

Approximately the same area on maps.google.com as in the 1771/2 maps.

Google has the Oude Maas (Old Maas) flowing to the south. Other, lower-resolution (smaller scale) maps show the rivers differently. One map (proprietary, so follow this link to see it) identified Rotterdam's river as the Nederrijn (Lower Rhine) with the Meuse/Maas flowing to the south, past Dordrecht. Another basic map of the Netherlands shows the Rhine splitting into two distributaries, the Lek (going through Rotterdam) and the Waal (going through Dordrecht).

Confused? You should be. I was, a few years ago, when I realized that different authors for *Cartography in the European Enlightenment* referred to the same maps as showing different rivers. A couple of hours of work clarified that one author used modern names, the other the names in use in the eighteenth century. One of the things I learned was that the Rhine, that great big mighty river, became no more than a side channel running through Leiden, to the north of the main streams.

The issue, as any Dutch person will tell you, is that the waters of the Rhine and the Maas flow close to each other and intermingle and form a horribly complex system of waterways in which there are two Maas rivers (old and new), the Waal. the Merwede, the Lek, and yes the Rijn. Making things worse is the manner in which the Dutch have for centuries extensively managed and canalized the rivers, redirecting water and enabling access.

The idea that there is a single dominant channel — a single river — that continues and perpetuates the single channel of "the Rhine" upstream in Germany, that keeps the same name all the way to the

sea, is incorrect. It is a modern short-hand. To talk about the Rotterdam as being at the "mouth of the Rhine" is an easy way to reduce complexity to simplicity: useful at the lower resolution of geographical mapping, but irrelevant and misleading when applied to the higher resolution of topographical and territorial mapping.

A further comment in the twitterfeeds by Diana Lange—whose wonderful *An Atlas of the Himalayas by a 19th Century Tibetan Lama: A Journey of Discovery* was just published by Brill in Leiden (now on the Oude Rijn, according to Google)—about the difficulties that the British had with Tibetan river names, reminded me of a great passage from Francis Buchanan, in *The History, Antiquities, Topography, and Statistics of Eastern India ,* ed. Robert Montgomery Martin, 3 vols. (London: Wm. H. Allen, 1838), 2: 591-592, about the practice by the residents of Dinajpur to keep the same name for channels of the Ganges, even as they silt up and become stagnant marshes:

> This has been a source of great trouble to European geographers, who, endeavouring to trace a great river from where it joins the sea to its most remote source by its principal channel, are astonished to find that it sometimes loses its name altogether; or again, another river, after having for some part lost its original name, is traced further, is found with its former name restored. The geographers of Europe are apt to be enraged, when in tracing a river they find that an inconsiderable stream falling into their grand channel changes its name, and that the source of this smaller stream is obstinately considered by the natives as the source of the river, either having been the first to which they had access, or having at one time been the largest. Geographers are in general very unwilling to admit of these absurdities, and therefore construct their maps according to their own plan, with the same name following the same river from its most remote source to its mouth. It must, however, be confessed, that this improvement, until it shall have been adopted by the inhabitants of the country, is attended with considerable inconvenience to those who wish to use the maps on the spot, and often leads them into most troublesome mistakes.
>
> (I quoted this passage in *Mapping an Empire*, chap. 10)

Buchanan, writing at a time when the different modes of mapping seemingly gelled into "cartography," reacted to the obvious inability—the same as confronts us today—to reconcile geographical features defined within different spatial conceptions. There is not, there cannot be, a single spatial conception in which all features are represented in a "truthful" way, as the ideal of cartography holds.

In the case of the distributaries in a river delta, we might identify at least three different sets of spatial conceptions:

> 1) as maintained by local practice, which might be further differentiated between those who use the waterways and the residents on the adjacent lands;
>
> 2) as recorded by those who map and otherwise reference (in legal documents, for example) the waterways and adjacent lands for others (normally outside the local

> communities), the surveyors (generally outsiders, or if locals then using representational strategies developed for non-local purposes) who record the results of interviews with locals to the best of their orthographic abillity, which is a process made fraught by social inequalities; and
>
> 3) as constructed by geographers and other outsiders who map for their own agendas unrelated to the landscape and its inhabitants.

In other words, the ontology of spatial features is not a question of geometry and the degree of generalization from high-resolution surveys to low-resolution maps. Nor is it a question of cultural perspective: it is not that "Europeans" rationally insist that a single channel must bear a single name from source to estuary, while "non-Europeans" follow irrational or even mystical naming practices. No, it is a question of spatial discourse: it is *geographers* who want a single channel, who want to impose their reason onto the world.

I HAVE LOCATED A TOWN ...

Depicted in an anonymous plan of timber and land quality, having been misled by a stupid error on the map!

Originally posted: 12 September 2020

https://www.mappingasprocess.net/blog/2020/9/12/i-have-located-a-town-

One of my favorite objects in the Mapping Maine exhibition is an untitled, undated plan of an unidentified town, presumably in Maine:

Plan of an unidentified town in the Mapping Maine exhibition.

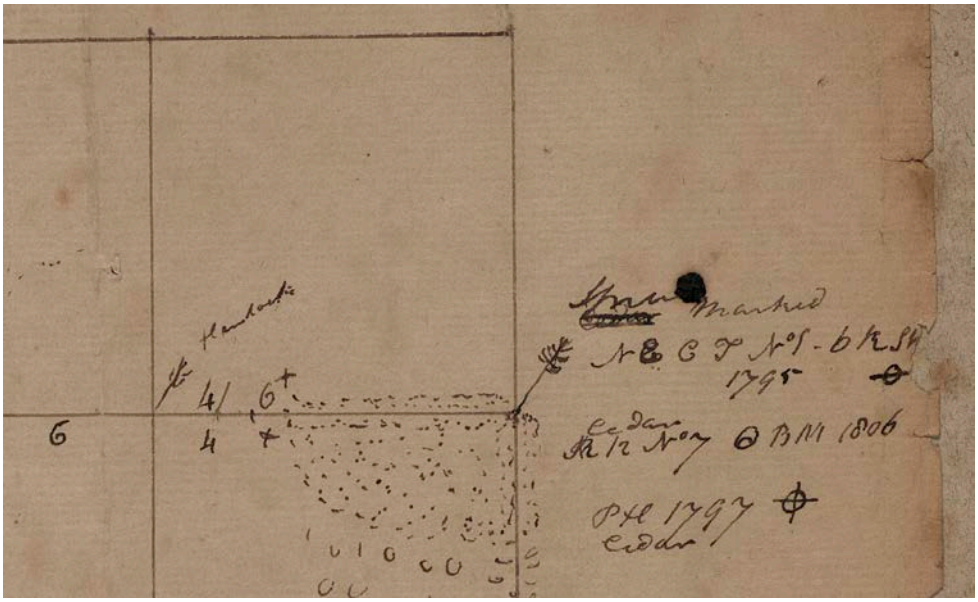
It is tatty and worn, but it is wonderful because it shows the assessment of timber and land quality by the early proprietors. Here's the legend, followed by a detail of the central portion. (Go look at the plan on the OML website to see more; click on any of these images).


1 Hard wood 1st quality
2 Mixt - 2d do - mostly hard
3 Hard - 2d quality
4 Mixt - 2d quality
5 Mixt - 3d do - poor
6 Black - 3d do poor
+ Rocky
Bog - poor
Swamp Cedar
Pine timber
Alder ground
Meadow
very best
Marshalls pond
107 acres
776 acres

But where is it? Is it even in Maine???

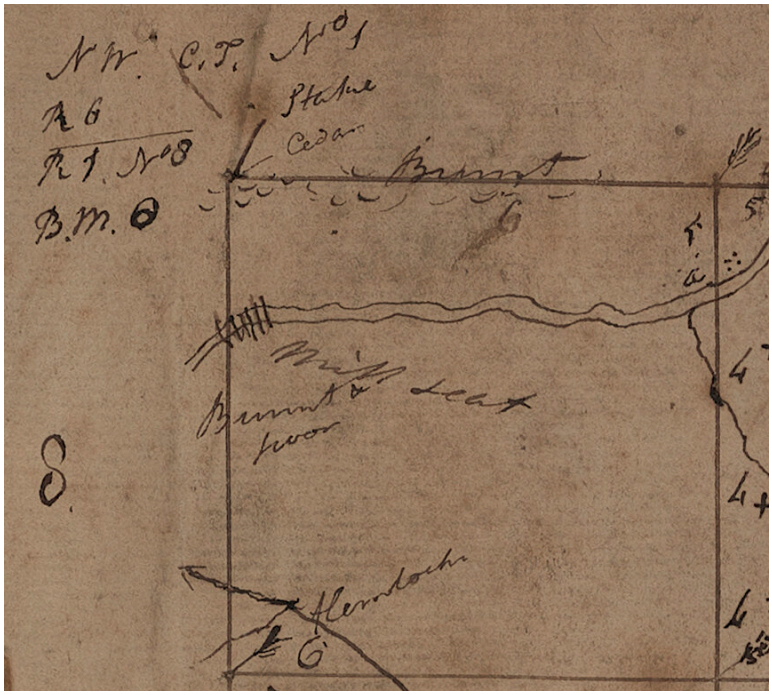
When OML acquired this plan in 2019, it was part of a batch of materials with ties to the map maker and frontier entrepreneur, Moses Greenleaf, so we presumed that it showed a part of Maine, like all the other materials. I initially focused on the names of the three lakes: "Sunday Pond," the largest in the middle of the town (see above detail); Marshall's Pond, just downstream of Sunday Pond; and, down in the lower-left corner, "Pleasant Pond." None of these names has persisted into the present, it would seem, so that was a bust. With plenty of other things to be done, I put the question aside and decided to treat the plan as a generic example.

This morning, though, as I was pulling together the last elements of the talk I'm giving this afternoon, I decided to give it another try. The reason was that I realized—I'm rather ashamed to admit—that there are actually location indicators on the map. I was so fixated on the indication of hard woods and swamps, etc., that I missed them. In the top-right corner of the map, although not at the very corner:



This reads, "Cedar" corrected in a later hand to "Spruce marked NE C T No. 1 - 6 R SW[?] 1795" and then a circle with a horizontal line, which is the blaze mark. Then, "Cedar R12 No.7 <blaze> BM 1806" and "PH 1797 <blaze> Cedar."

Then, in the top-left corner, in the actual corner (at right): "NW. C.T. No.1 R6 | R1 No.8 B.M. <blaze>"

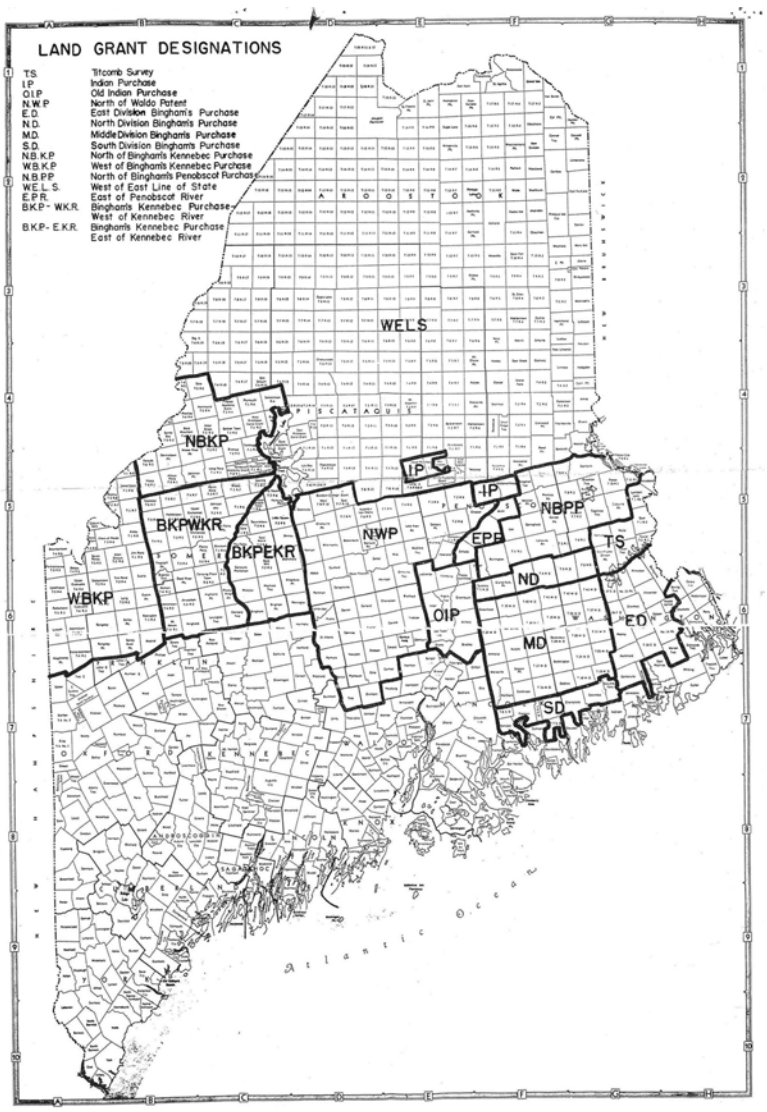


And, then, the kicker, in the top center, at the same level as the top-right annotation:

"T4 – 7R SW <blaze> 1795" and "T5 – 7R"

Interpretation of these clues was further helped by the inscription of the cardinal directions across each side of the plan. The top of the plan, which is to say the top when the map's content and legend are right-reading, is labeled "East 6 Miles"; the left-hand side, "North"; the bottom, "West"; and the right, "South." This implied that the top-right corner was the North-East corner (NE C) of township (T) number 1 in range 6, and also a corner of township 7 in range 12 ("R12 No.7). Given the orientation of the plan, with East at the top, then T1R6 needs to be to the right of the town shown in the map. So, I'm looking for a town, next to T1R6, whose eastern side passes the boundary of T4R7 and T5R7 and then jigs a bit eastward before ending at another corner marking the North-West corner (NW. C.) of township (T.) number 1 (No.1) in range 6 (R6) and of township 8 uin range 1 (R1 No.8).

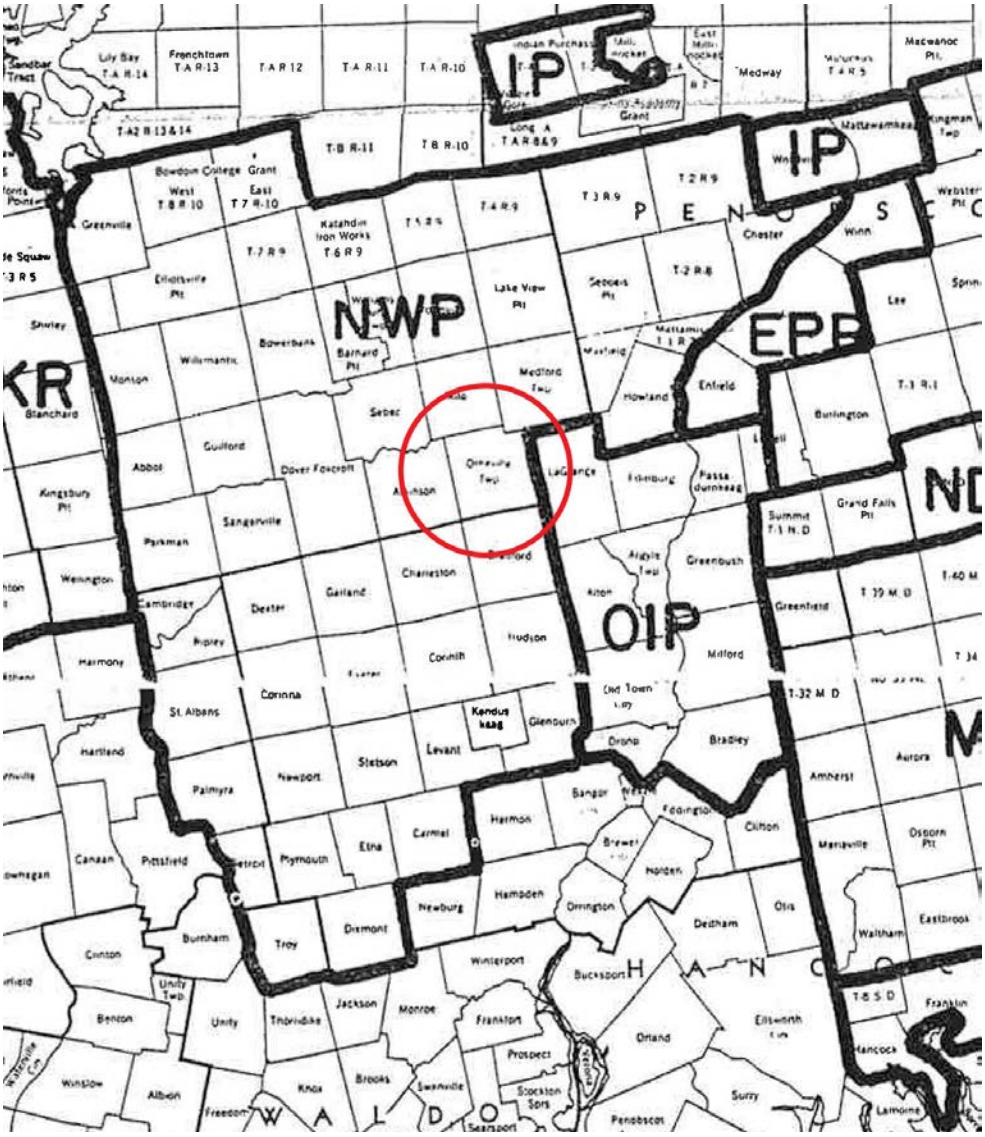
Now, Maine was subdivided into ranges of towns in several sections, each identified with a code. Here is one of my favorite maps, which lays out (rather crudely) the state's towns in three bands: the colonial south (haphazard arrangement); post-independence land grants by the Commonwealth of Massachusetts (mostly square, but angled because laid out to magnetic north); post-Maine statehood (i.e., post-1820) towns laid out with respect to true north and all forming the WELS region ("West of the East Line of the State," which requires the state's eastern boundary to be known and fixed, but that's another story). Fortunately, with my handy guide, I could try and find a town that fits these requirements.



This map came out of a pamphlet that I let Nate Hamilton buy, and I lost the original citation. Also, it's a scan from a xerox … my apologies.

But no joy. Couldn't figure it out.

But then I had a brainstorm: what if the written cardinal directions were wrong? If the top of the map was, in fact, north [!], then the top-left and top-right references to the NW and NE corners of T1R6 would mean that the mapped town **was** T1R6! And the tell-tale jog would be on it's north side. And, I very quickly found the site:

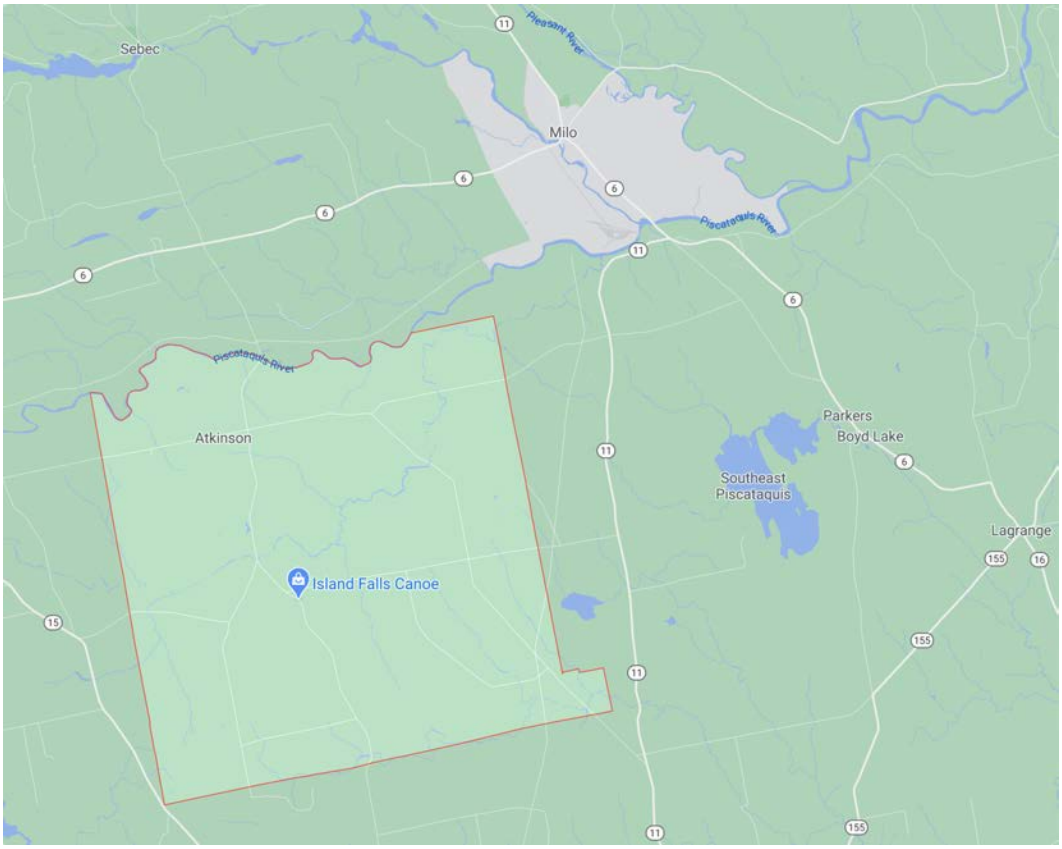


The map uses contemporary names for the towns, but counting down from the top, where the townships were not named, makes **Orneville** T1R6 NWP = North of Waldo's Patent, on the edge of

the Old Indian Purchase (i.e., the 1796 acquisition by Massachusetts of much of the lands of the Penobscot).

This explains the reference to "SW" in the town identifications: Samuel Weston was the lead surveyor of this area in the 1790s.

For confirmation, I went to Google Maps, which does not actually know of "Orneville" (see below), so here's the neighboring town of Atkinson. Orneville is the area east of Atkinson and south of Milo:



The lakes are correct! Although with different names applied by later proprietors; Sunday Pond is now Boyd Lake.

I also found a potted history of the changing ownerships and identities of the town after its annexation from the Penobscot:

Orneville Township, Piscataquis County, Maine

Compiled from the History of Piscataquis County, Maine, by Rev. Amasa Loring, c1880

Orneville, Number 1, 6th Range, 23,040 acres. Includes Alder Brook and Dead Stream. There are good falls and a steady water supply. In 1805, General J. P. Boyd was the Proprietor.

Eben Greenleaf lotted out the east half, after which the township was resurveyed by Japeth Gilman. The west half was lotted by D.W. Bradley, 1820-1825. There was a county road through the township from Milo to Bradford. …

In 1870 the population was 575, with the valuation $80,062.

Became Boyd's Plantation: 1805
Incorporated as Milton: January 30, 1832
Changed to Almond: 1841
Changed to Orneville: 1842
Deorganized: March 8, 1945

So, the map is of Orneville, Piscataquis County, Maine.

Is it the work of Eben[ezer] Greenleaf, Moses Greenleaf's younger brother, henchman, and surveyor? Possibly, given the supposed origin of the map. If so, then this would perhaps make the map a guide to land value before individual lots were sold off.

Puzzle solved!

THE GROWTH OF MAP HISTORY IN THE NINETEENTH CENTURY

An Analysis of Three Bibliographies of the "History of Cartography"

Originally posted: 6 November 2020

https://www.mappingasprocess.net/blog/2020/11/6/the-growth-of-map-history-in-the-nineteenth-century

> *Here's another bit that I'm cutting from the book as no longer fitting, this time because I have revised my understanding and half of the analysis is moot. I might do more with* Acta Cartographica*, especially as it pertains to the different precise approaches (traditional vs internal) and, within traditional, between globalist and localist, content-emphasis and context-emphasis. But I'm now wondering that all such analysis would do would be to reveal the editorial biases of the editorial board and nothing much about the character of map historical work in the nineteenth century. That further analysis requires me to do a lot more (rather tedious) classification of the works reprinted, and that is taking time, so don't count on it.*

In support of a general account of the rise of the study of map history, I undertook a simple analysis of some works that allow approximate metrics of the number of works in the history of cartography published in the nineteenth century. I originally did this work when I still thought that the systematic and organized study of early maps began in the early modern era. Spoiler: it didn't. There were sporadic elements of interest in early maps, from a variety of perspectives, but no organized search for early maps and their study until the 1830s. The benefit of this analysis is not as great as it might be, and frankly would take more words to explain and justify the analysis than to present and discuss the results, so I'm cutting it from the book manuscript.

But people might be interested in the data and the conclusions they do sustain, which I expand on a bit here, anticipating the book.

Data

There are three twentieth-century bibliographies of primarily nineteenth-century works on "history of cartography" or "historical cartography," or even just "cartography." All three are far too variable and inconsistent to permit much more than counts of works by decade, but they nonetheless agree on the broad phases of growth in the field's productivity.

1) P. Lee Phillips (1901)

One of the first tasks undertaken by P. Lee Phillips after 1897, when he was appointed as the first head of a separate Hall of Maps and Charts in the Library of Congress, was to produce a preliminary catalog of maps of America held in that institution. He prefaced the catalog with a bibliography of cartography, which is to say a listing of essays and books that had come to his attention as dealing with the practices and history of map making (Phillips 1901). The bibliography contained a total of some 1,150 entries (12–13 entries per page, for 86 pages), and each work appeared twice (once by author, once by subject). Out of about 650 unique works, about 100 concerned contemporary rather than early maps. That is, they were cartographic manuals and accounts of surveys, etc., that were not themselves historically minded but that were sufficiently old to be of historical interest; as such, they are not of interest in tracing the rise of map history as a field of study.

Phillips's bibliography helps date the serious rise of map history: of the remaining 550 identified works, which had an historical mindset, almost all had been published *after* 1860.

2) Lev Bagrow (1917–18)

Shortly thereafter, Leo Bagrow—when still working as a hydrographer in the Russian navy under his original name of Lev Semenovich Bagrov—prepared a much more extensive bibliography of no less than 1,881 items in the history of cartography (Bagrov 1917). He prefaced this bibliography with a short account of the history of cartography and also a brief historiography of the field (translated by Sims 1991, 96–98). The bibliography presents a curious bibliographical conundrum that Doug Sims was not able to fully resolve. Specifically, the bibliography was originally published as an entire issue of a journal, under date 1918 (Bagrov 1918), and then reprinted as a separate work under date 1917 (Bagrov 1917). Go figure. I have a xerox copy of the latter, which I have used for the analysis.

The origins of the bibliography lay in Bagrow's trip to the library of Helsinki University to consult the collections of the famed Finnish Arctic explorer, Adolf Erik Nordenskiöld, prior to leading his own 1912 expedition to the Kara Sea, north of Siberia. Once there, he discovered Nordenskiöld's substantial collections of early maps and atlases and also works on map history. Bagrow was entranced. Nordenskiöld's library formed the basis of the bibliography, but Bagrow further noted that he had not been able to verify all the references against the holdings of the libraries in St. Petersburg and therefore acknowledged that there were undoubtedly errors (Sims 1991, 92, 96). Bagrow too listed books and essays that were not historical works when published.

A simple tally of the dates of publication of the works itemized by Bagrow is revealing. The number of itemized works increases steadily, decade by decade through the nineteenth century, with a sudden increase in the 1870s, and another in the 1890s. Fully half of the identified works came from the two decades between 1890 and 1909. See columns 6–7 in the following table:

3) *Acta Cartographica* (1967–81)

	Acta Cartographica				Bagrov (1917)	
	N works	%age	Σ pages	%age	N works	%age
1800-1809	3	0.7	131	1.0	18	0.9
1810-1819	0	0.0	0	0.0	15	0.8
1820-1829	1	0.2	46	0.3	18	0.9
1830-1839	6	1.3	220	1.6	34	1.7
1840-1849	11	2.4	458	3.4	48	2.4
1850-1859	17	3.7	552	4.1	60	3.1
1860-1869	21	4.6	1,009	7.5	54	2.8
1870-1879	40	8.8	980	7.3	129	6.6
1880-1889	64	14.1	1,311	9.8	195	9.9
1890-1899	141	31.1	3,572	26.7	490	25.0
1900-1909	77	17.0	2,448	18.3	539	27.5
1910-1919	54	11.9	2,202	16.5	* 370 / 111	* 18.9
1920-1930	18	4.0	623	4.7		
Total	453		13,371		** 1,701	

Table. Temporal distribution of early works in map history, by decade. (cols. 2–5) Works reprinted in the 27 volumes of *Acta Cartographica* (Amsterdam: Theatrum Orbis Terrarum, 1967-1981); the three separate selections from Kohl's *History of the Discovery of Maine* (1869) have been counted as one work. (cols. 6–7) Works of all kinds identified by Bagrov (1917, 61–136). *) Bagrov listed works only through 1912, so the figure for the final decade has been prorated from 111 over three years to 370 over ten, for the sake of comparison. **) total lacks the inflated prorated figure for the final decade; Bagrov listed 1,881 items in his bibliography, of which 180 were undated or predated 1800.

The third resource is not actually a bibliography but a collection of old works on map history collected within the twenty-seven volumes of *Acta Cartographica*, published by Nico Israel in Amsterdam between 1967 and 1981. The reprints were photographic reproductions, page by page, and did not involve any resetting of the type. Almost all the reprinted works were articles and book chapters, supplemented by

a few doctoral dissertations and monographs; all had originally been published after 1800. Some essays were very short, no more than two or three pages; others ran into the hundreds of pages. Most were works of traditional map history, but there were also a few internal works by practicing map makers, and there was a smattering of contemporary works that were seen as having historical value.

While many of the reprinted works came from the leading journals, such as the *Bulletin de la société de géographie* or the *Geographical Journal*, many more had appeared in rather obscure outlets and had likely not been widely accessible to the international map historical community, even when they had originally been published. For example, the blurb on an advertising brochure specifically cited the manner in which "the records of the mapping of N.W. America, for instance, were published in the U.S. Treasury Department Reports" (Horn [1972]). This statement referred to J. G. Kohl's essays published in the reports of the U.S. Coast and Geodetic Survey (Kohl 1856, 1857a, 1885). (Although, as it happened, none of those publications would actually be reprinted in *Acta Cartographica*!) In the post-war era of academic expansion, it seemed important to make all of these old and inaccessible studies available to a new generation of map historians.

Israel was self-consciously internationalist in scope: not only did each of the five members of the editorial board, identified in each volume, represent a particular national community but he made the final selection of works to be reproduced with the goal of giving equal treatment to the different languages of the community. The advertising brochure for the series stated that the five members of the initial editorial board—Wilhelm Bonacker (Germany), François de Dainville (France), Cornelis Koeman (Netherlands), Walter Ristow (USA), and R. A. Skelton (UK)—had "combed" 80 journals "to yield a crop of 1,450 articles in 7 languages" with a total of 7,500 pages. These articles were then selected for publication with an eye to ensuring parity in the representation of the languages across the volumes: 79 in German, 76 in French, 73 in English, 29 in Italian, 15 in Dutch, 8 in Spanish, and 2 in Portuguese (Horn [1972], [ii]–[iv]).

Beyond this apparent principle of linguistic and by implication national equity, there seems to have been no editorial principles concerning subject matter. Brian Harley (1968) accordingly lamented the complete lack of commentary about the editorial principles behind the selection of works to be reprinted; explanatory prefaces first appeared only with volume 19 (1974) but they remained rather vague.

Despite the difficulty of accounting for precise editorial biases, the overall chronological pattern of works included in the volumes of *Acta Cartographica* is the same as for the two bibliographies. Of the 453 works reproduced in all, only about 8% predated 1860, with the majority originally appearing after 1890. There is an understandable drop off in the reprinting of more recent works, presumably because they were considered to be more accessible to map historians (columns 2–5 in the above table). It is also possible to count the total number of pages of reprinted works—13,371—which again grew steadily in output until the 1860s when the page count increased rapidly, and again in the 1890s.

Conclusions…and the Twentieth Century

Putting these three bits of data together, we can identify three early periods in the study of map history.

First, before 1860, an era of little interest. Frankly, most of the works in this era comprise studies in the history of discoveries and exploration, in which maps were cited as sources of evidence, sometimes extensively, but the maps themselves were not the objects of study.

> ** This is the period described by Kohl in his 1856 lecture to the Smithsonian Institution, in which he argued for the promotion of geography as the newly configured discipline of human-environmental relations and for the careful curation of maps in libraries. Kohl was really pushing for the formation of a national map library at a moment when some people were pushing for the newly founded Smithsonian to become a national library. (The Library of Congress would not acquire that role until well after the Civil War.) "Until our days," Kohl declared, geography had been "neglected," the "history of geography" had been utterly neglected," and "the history of geographical maps, has scarcely ever been thought of." For centuries, maps—"these old and precious documents"—had been "allowed to perish" and were "never raised to the dignity of historical documents." Only in "our days" had "some enlightened men…undertaken to glean and collect the few scattered relics which may yet be found" (Kohl 1857b, 94–95). He went on to refer to the example of the work of Alexander von Humboldt in "bringing to light and making accessible…that excellent picture of the world made by Juan de la Cosa" (i.e., Humboldt 1836–39) and to Friedrich Wilhelm Ghillany's (1853) study of Martin Behaim and his globe, a work that included a contribution by Humboldt on the first maps of the new world and the name "America" (Humboldt 1853). And Kohl observed that "such publications have become comparatively numerous in Germany, as well as in ltaly, in England, and in other countries. It is now quite a common thing to edit old globes and maps, and to write dissertations on them." He noted how it had become "the fashion to adorn…the republication of an old work of travels with a sketch of an old map, which some 30 or 40 years ago would not have been considered an ornament at all." This trend encompassed not only histories and documentary facsimiles concerning discoveries and exploration (e.g., Navarette 1825–37) but also locally focused works: "Nay, scarcely any place has of late published a catalogue of its town library without taking advantage of the occasion to add a copy of one of its old chartographical treasures" (Kohl 1857b, 97)

Second, a period of modest interest and growth in the three decades of the 1860s, 1870s, and 1880s. This is when scholars start to come to grips with the character and particular history of maps and their makers, working from both a globalist perspective (history of empire and Western civilization) and a localist one (history of nations and provinces).

Third, a "take-off" after 1890, which seems to have been stimulated by the 1892 Columbus Quadricentennial. (My gut feeling is that had I counted by half-decades, the threshold would have been

1885, as scholars started gearing up for the event.) This was the explanation offered in an anonymous review of a lengthy cartobibliography and exhibition catalog of maps of the Pacific (Wroth 1944) that had almost certainly been written by John Kirtland Wright, former librarian and then director of the American Geographical Society. Wright began the review with an historiographical reflection:

> Although many geographical ideas cannot be expressed on maps, the fundamental and distinctive geographical facts and conceptions admit of clear and unambiguous exposition on maps alone. For this reason, the study of old maps has come to be recognized as more than a mere appendix to the history of geography, dealing with an important auxiliary craft or technique. It is recognized as providing a central core of evidence concerning the evolution of geographical knowledge, comparable to the central core of evidence that old musical scores provide for the history of music.
>
> The intensive cultivation of historical cartography from this point of view and in the critical modern sense began a little more than fifty years ago. Universal interest in the great age of discovery aroused by the four-hundredth anniversaries of the voyages of Columbus and Da Gama led in the 1890's and 1900's to the investigation and reproduction by such scholars as A. E. Nordenskiöld, E. L. Stevenson, Konrad Kretschmer, and E. G. Ravenstein, not only of maps and globes of the fifteenth and sixteenth centuries, but of the whole European cartographic background furnished by the maps of Ptolemy, the medieval mappaemundi, and the portulan charts. More recently, similar research has been carried into ever widening and more remote domains. Thus we have, among much else, Konrad Miller's work on the maps of the medieval Arabs, that of Baddeley on the early cartography of Siberia and of Hermann on ancient and medieval Chinese cartography of inner Asia, the contributions of Wagner, Karpinski, Nunn, and others to the historical cartography of the American continent, and now the present notable monograph by Wroth for the Pacific Ocean. (Wright 1945, 505)

In other words, the history of geographical exploration and discovery continued to drive interest in early maps and led to their study. This was clearly the case with Adolf Erik Nordenskiöld in his two great studies of early geographical and marine mapping, that together bracketed the triumphal Columbian celebrations of 1892 (Nordenskiöld 1889, 1897). Samuel Eliot Morison (1942, xv–xvi) also suggested that the 1885 Treaty of Berlin, when the European powers had carved up Africa between themselves, had raised interest in the political import of early mapping.

It is not coincidental that these reflections were made in the midst of World War II, a period of intense increase in map literacy in the USA (Schulten 1998, 2001) and also profound technological changes in cartographic practices that prompted historical and historiographical reflection. (Such reflection would also lead to new and influential retellings of the history of cartography by Brown 1949 and Crone 1953.)

There appears to be something of a chronological parallel between the rise in historical studies of

maps and of Latin America, in that both have been bracketed by the quadri- and quincentennials of the Columbian Encounter. (I am indebted to Jordana Dym for drawing this parallel, in conversation in January 2019; see also Lois 2012.) The tricentennial of Columbus in 1792 had been largely unrecognized, except for some attention in the newly independent U.S.A. (Edney 2020, 208). The quadricentennial kicked the study of early maps into high gear, although it must be acknowledged that this interest was not solely globalist and imperialistic. The quincentennial led to the wholesale rethinking of the disastrous effects the Columbian encounter on the peoples, environments, and economies of the Americas, at the same time as scholars were rethinking the political nature of maps and cartography. Traditional map history did not come to a crashing halt, but its pursuit was substantially curtailed.

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JOMARD VS SANTARÉM

Retelling the Dispute at the Origin of the History of Cartography

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https://www.mappingasprocess.net/blog/2020/11/6/map-historys-big-bang

Update 27 May 2021: significant updates and corrections have been made throughout. Changes include to the title, which was originally "Map History's Big Bang: Rethinking the Dispute between Santarém and Jomard at the Origin of the History of Cartography"

It is commonly accepted that the first major publications in the history of cartography were the large facsimile collections that were prepared and published in Paris by Edme François Jomard, curator of geography and maps at the Bibliothèque royale, and the second viscount of Santarém, Portuguese émigré and historian of discoveries. Jomard's project was titled *Les monuments de la géographie* and was officially published in 1854, although the first fascicule had been issued in 1842 and more fascicules were issued through 1862 (Jomard 1854–62); the full set were described and placed in a final sequence by Jomard's colleague Marie Armand Pascale d'Avezac (1867). Santarém issued what is commonly thought of as a single "atlas," as he called his collection, that appeared in three parts or editions (generally dated to 1841, 1842-44. and 1849).

Despite the fame of these works, their histories and characters remain little known. It is to fill these lacunae that I have written an essay, "The First Facsimile Collections and the Origins of the History of Cartography," that has been accepted for publication in *Imago Mundi*. (Another essay, accepted for the *Portolan*, considers the quite different map work of Joachim Lelewel in 1845–50, which historians have often improperly grouped with Jomard's and Santarém's efforts.)

Map historians have been largely distracted from studying the collections themselves both by their rarity and by the distraction offered by the acrimonious public debate between Jomard and Santarém over credit for the idea of such collections. Certainly, even as I have been writing up a short account of their work for the current book, I have found myself getting into the weeds of the debate. This is especially inappropriate and distracting because, in the end, the debate had no impact on how the history of cartography would develop as a field of study. It was indeed "full of sound and fury, signifying nothing" (*Macbeth* V.5). So, let's rethink the debate here, if only to get it out of my own system!

Previous Accounts of the Debate

The principle account of the dispute between Jomard and Santarém is in Armando Cortesão's

historiographical introduction to his *History of Portuguese Cartography* (Cortesão 1969, 15–22, 29–32). Like other Portuguese scholars before him and since, Cortesão saw Santarém as the founder of the critical study of cartography and its history. Not only had Santarém coined the word "cartography," as he recorded in a letter of 8 December 1839 to the Portuguese diplomat Francisco Adolfo de Varnhagen (Santarém 1906, 25–30, esp. 30), his *Essai sur l'histoire de la cosmographie et de la cartographie* had been the first systematic study in the history of cartography and he had even used the phrase "history of cartography" in its title (Santarém 1849–52). It was manifestly clear to Cortesão that Santarém should be given credit for the idea of the facsimile collection and for the creation of the field as a whole. He used some commentary by Santarém in his correspondence with the Portuguese government to argue that Jomard was jealous at the fact that Santarém's work had funded by the Portuguese government whereas the French state had declined to underwrite Jomard's work (Cortesão 1969, esp. 32).

Anne Godlewska was more equivocal and did not seek to assign credit. Instead, she argued that Jomard had a pattern of reacting strongly when someone else stole a march on him without having done any of the hard work that he had. This had happened with Jean François Champollian's decipherment of Egyptian hieroglyphics, courtesy of the Rosetta Stone, and now it seemed to have happened when Santarém began publishing his facsimiles well before Jomard (Godlewska 1995, 122–28; Godlewska 1999, 142–43).

Finally, Mike Heffernan has most recently pointed to the political dimensions of the dispute. Santarém began to prepare his facsimiles in support of the Portuguese government's imperial claims, against those of the French, to Casamance, a district in the Senegal. Jomard's colleague at the Marine, Marie Armand Pascale d'Avezac, would forcefully advance the pro-French position. For Heffernan, Jomard-Santarém dispute manifested nationalistic and imperialistic competition (Heffernan 2014, 13–15).

Problems

All of these discussions have, however, been hampered by several factors:

> 1) both Jomard and Santarém shaded the record about their projects so as to put themselves in the better light. Their commentaries are internally contradictory about dates, initial concepts and plans, and rates of progress. They simply cannot be relied upon without further corroboration. Godlewska (1995, 123, 127) has explored some of the inconsistencies in Jomard's recollections. I have also found several inconsistencies in Santarém's recollections of his project, e.g., between the introduction to volume one of the *Essai* (Santarém 1849–52, 1:xiii–lxxxvii) and a report he sent in June 1854 to the Portuguese Foreign Office (reproduced in Cortesão 1969, 16–18).
>
> 2) Santarém did *not*, in fact, coin the word "cartography": that was the achievement of the Danish émigré in Paris, Conrad Malte-Brun, who had used *chartographie* in 1808 and later

publicized the word in the 1820s, when it was accepted as *cartographie* by several members of the Société de géographie. Indeed, the first use in English of "chartographie" seems to have been in 1834, by a German émigré to the USA (van der Krogt 2015; Edney 2019, 114–20). Moreover, Jomard (1840, 438) had already used the "history of cartography."

3) it is not actually clear in the accounts of the debate, just what the debate was over: was it over the priority of creating a collection of facsimiles, or was it over the creation of a collection of facsimiles curated so as to show the "history of cartography"? This question becomes important when it is realized that others in Paris had published collections of facsimiles just previously, as the essay in Imago Mundi explains.* The issue was the *purpose* of the facsimile collections.

4) it is assumed that Santarém's *Atlas* constituted a single project, issued in three editions, or three distinct atlases (Cortesão 1969, 15–22; Skelton 1972, 77–78; Wallis and Sijmons 1985, 10–24; Harley 1987, 12; García 2006, 9–13; Protásio 2006). It is in fact more appropriate to consider it as two atlases, for reasons that will be clarified in the book, in the *Imago Mundi* article, and below.

5) it is assumed that the dispute was a single and coherent affair but, by understanding the changing nature of Santarém's work, we can construct a chronology that is more sensitive to what it was that Jomard and Santarém objected at different times.

It is also possible, thanks to the ongoing digitization of the period's publications, to dig a bit deeper into the records to clarify the chronology. Note that newly available material might require the following to be refined but I don't think that it will have to be completely reorganized.

Rethinking the Debate

Previous Facsimile Collections in Paris

Neither Jomard nor Santarém worked in isolation; both were well-connected scholars and both were members of the Société de géographie. In the 1830s, the frequent visitor to Paris from Berlin, Alexander

* This point is not entirely new. Harley (1987, 13 n. 96) expressed doubt that by the 1830s anyone could have considered "the idea of a facsimile atlas" to be "the private property of any one scholar." In justification, he cited two other scholars who had pursued such atlases: Lelewel, although he began his map historical work only in 1845 and is therefore irrelevant to Harley's argument; and Marie Armand Pascale d'Avezac, who observed in 1842 that he had long since begun and abandoned, out of deference to Jomard's project, his own facsimile project (Anon 1842, 222). D'Avezac's work is not only from this statement and a brief, late, and unreliable elaboration by Jomard (1847, 6), who asserted that d'Avezac had been collaborating with the British medievalist Thomas Wright (1810–77). Santarém, in the preface dated 10 January 1844 that he included in his first facsimile collection, had previously identified Wright as having searched the British Museum collections for maps on Santarém's behalf (Freitas 1909, 199). Jomard had previously paid Wright to have a copy made of the Royal Geographical Society's 1831 tracing of the Hereford *mappamundi* (Bailey 2006, 59–60).

von Humboldt, was continuing to work on the many volumes stemming from his voyage with Aimé Bonpland to the Americas (1799–1804). Prompted by the acquisition by Baron Charles Athanase Walckenaer of the manuscript world map in marine style signed by Juan de la Cosa and dated 1500, Humboldt engaged in a brief passion for the history of discoveries and cartography. One product of this was his collection of five folios of facsimiles of details of the new world on early maps he issued with his history of Columbus's and Vespucci's expeditions (Humboldt [1835–37]; see Buchholz 2020, 135–39, 199–216). The de la Cosa map also prompted the work of Ramón de la Sagra in preparing a small collection of facsimiles of Cuba and the Caribbean on early maps, as I have previously discussed (Sagra 1842–61, 1:5–6).

So, Jomard and Santarém were certainly aware of the idea of a collection of facsimiles, both Humboldt's and de la Sagra's.

Round One

Santarém began work on his first *Atlas* in December 1840 as a graphic version of the argument he had been commissioned to make by the Portuguese government in support of Portuguese claims to Casamance. He displayed some of the folios of facsimiles to the Société de géographie late in 1841 (Berthelot 1841, 368–70) and the completed work on 18 February 1842 (Anon. 1842, 158). It seems that this atlas was issued with a title page dated 1841 with the title, *Atlas composé de mappemondes et de cartes hydrographiques et historiques du XIe au XVIIe siècle*…. It contained 21 numbered folios, mostly focused on Africa and its western coast (fig. 1).

Santarém further emphasized the explicitly political and conceptually focused nature of his first *Atlas* when Jomard rose before the assembly of the Société de géographie on 4 March 1842 to ward off any potential claims that he might have plagiarized Santarém. According to the published minutes, Jomard observed that he had already spent "several years" in creating a collection of facsimiles so that it would be inappropriate, when he finally began to publish them, for people to think that he had copied from the facsimiles published by the viscount. (On this occasion, d'Avezac also stated that he had a facsimile project in mind but that he had deferred to Jomard's priority when he had discovered that Jomard was already pursuing his own project.) The minutes to this meeting also record that Santarém responded that he had acknowledged the priority of Jomard's project in the introduction of his accompanying volume, which acknowledgment Jomard had accepted (Anon. 1842, 221–22). In his introduction, Santarém (1842, xvi) had indeed praised Jomard's work in creating a collection of "cartographic monuments" that served to "shed light on the history of cartography." By contrast, he had clearly intimated that his own collection served only a narrowly political argument.

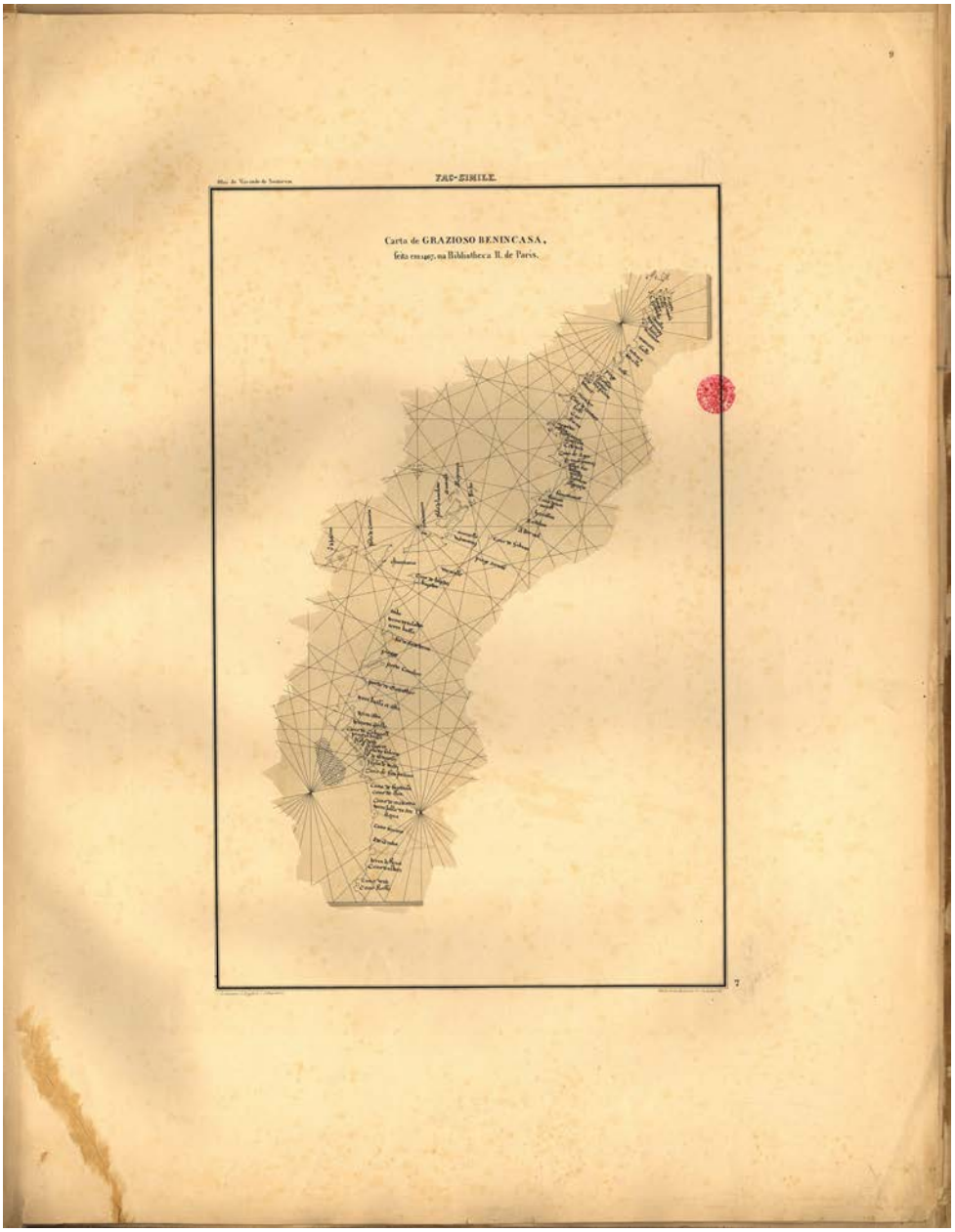

Figure 1. Santarém's facsimile of the western coast of Africa from a chart by Grazioso Benincasa, 1467 (BnF DD 1988), Santarém (1842[–44]), pl. 7. Biblioteca Nacional de Portugal.

Moreover, in a further statement that he made at the society's next meeting (18 March 1842), Santarém reiterated the political nature of his work, in particular by stating that "several scholars in Europe are [already] occupied with similar publications" ("Il ajoute que plusieurs savants en Europe s'occupent de publications semblables"). At first sight, this statement seems to refer to the preparation of facsimile collections. However, Santarém specifically identified Joaquim José da Costa de Macédo (1777–1867), perpetual Secretary of the Royal Academy of Sciences at Lisbon, as having published such work 35 years before; Macédo had written on the priority of Portuguese discoveries along the African coast (Cortesão 1969, 37) so the reference referred to Santarém's project as a political effort (Anon. 1842, 282).

The published minutes of the society's meetings might well have been made anodyne. They did not provide a verbatim transcript. I am intrigued about why Santarém should have felt the need to reiterate the difference in his own work. I am left to think that Jomard did speak intemperately and might have misspoken in the heat of the moment. For his part, Santarém seems to have been perturbed by what he took to be Jomard's active hostility. In a letter to the Portuguese government of 14 May 1842, he blamed that hostility on a nationalistic jealousy that the Portuguese authorities would underwrite such a work when the French government would not (quoted by Cortesão 1969, 30).

And that was that. If the minutes are to be believed in content (if not in tone), and I think that they should be, Jomard was concerned about future impressions of plagiarism. And Santarém publicly acquiesced but also reminded everyone that Jomard's project was not itself new.

End of round one.

Jomard's *Monuments*

One effect of Santarém's presentation of his *Atlas* to the Société de géographie in February 1842 was that it seems to have stung Jomard to start publishing his facsimiles. The first fascicule, containing six large folios that together reproduced the famous *mappamundi* at Hereford, appeared later in the same year (Jomard 1842) and he continued to publish more under the title *Les monument de la géographie* until his death in 1862 (Jomard 1854[–62]). While it is undeniable that there were many more maps that he wanted to include in the atlas, Jomard also was able to present a narrative of the development of the endeavor of cartography: three threads in the medieval era—comprising Islamic astronomy, detailed chorographical mapping, and cosmography—all came together in the European Renaissance, culminating in Gerhard Mercator's eight-sheet world map of 1569 on his new projection (fig. 2).

At the same time, Jomard was not averse to others making facsimile collections. He seems to have helped de la Sagra prepare his collection. He also gave his two manuscript copies of the circular world map commonly attributed to al-Sharīf al-Idrīsī to Joachim Lelewel for his use in his own facsimile collection; Lelewel (1850, viii, x) admitted combining into one the two images, one from the Bodleian, the other from the Bibliothèque royale (Edney in the *Portolan*).

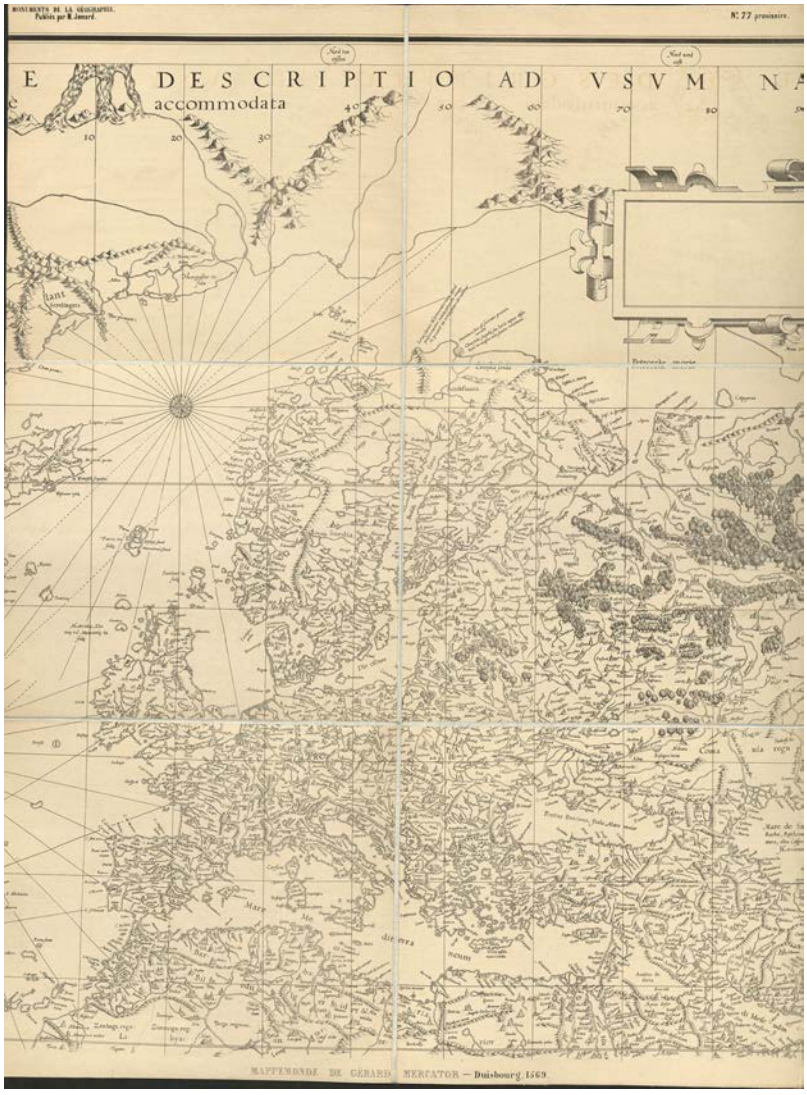

Figure 2. Sheet 3 of Jomard's facsimile of Mercator's 1569 world map, published in 1862: Jomard (1854[–62]), provisional sheet 77. Courtesy Harvard Map Collection.

Round Two

The real dispute between Jomard and Santarém began when the latter thought to expand his first facsimile project still further.

The possible acrimony of Jomard's and Santarém's verbal exchange or the reaction of the assembled geographers to his facsimiles led Santarém to begin to reconfigure his own facsimile project. In May 1842 he wrote for approval from the Portuguese government, granted in June, to expand his collection with the inclusion of more medieval world maps. In seeking permission, Santarém played up how the Parisian scholars had been 'astonished' by his collection and that if another series of

mappaemundi were not soon published then the French would steal a march and claim all the intellectual glory for themselves. Although, as ever, one must take Santarém's protestations to his funders with a grain of salt (Freitas 1909, 82–84, esp. 83; Cortesão 1969, 16).

When the Portuguese authorities agreed to the request, Santarém had a new title page and preface prepared. Dated 1842, the title now read, *Atlas composé de mappemondes et de cartes hydrographiques et historiques du XIe au XVIIe siècle*…. Santarém continued to add a few more folios of cosmographical works to the first atlas, through 1844.

But then he developed plans for a still larger atlas, one that would reproduce many maps in their entirety. He formally announced the new project in 1847, when he staked out what he claimed was new intellectual territory:

The history of cartography is an entirely new science.

He began.

> The works of ancient cosmographers were all buried in the obscurity of libraries and archives of different nations of Europe. Only two or three scholars at most have occupied themselves with some of these monuments and then for a very special and restricted purpose. But no one has yet conceived the idea and the general plan of bringing them [early maps] together by coordinating them systematically in chronological order, *in order to publish them for the benefit of science*, and to note the priority of the discoveries of the Portuguese in West Africa, and the services that this nation rendered to the geographic sciences. (Santarém 1847a, 289–90, original emphasis)*

That is, while retaining his emphasis on the political narrative of Portuguese discoveries, Santarém would further demonstrate Portuguese contributions to the history of the "geographical sciences."

With such a restricted remit, the new facsimile collection could indeed be considered, technically speaking, as new and innovative, but placed within the context of the pursuit of the history of cartography, these statements proved a red flag to Jomard, who promptly asserted his priority of conceiving a facsimile collection that would narrate the history of cartography. He responded accordingly (Jomard 1847) and Santarém responded in kind (Santarém 1847b).

It is not necessary to get into the details of their tedious recriminations about who had what idea first, especially when much of what they say cannot be accepted *prima facie*. Moreover, there was little effect on the projects: Jomard continued publishing his facsimiles; Santarém went ahead and produced

* "Les travaux des anciens cosmographes se trouvaient tous enfouis dans l'obscurité des bibliothèques et dans les archives des différentes nations de l'Europe. A peine si deux ou trois savants s'étaient occupés de quelques uns de ces monuments dans un but tout à fait spécial et restreint. Mais personne n'avait conçu l'idée et le plan général de les rassembler en les coordonnant systématiquement par ordre chronologique, *afin de les publier au profit de la science*, et de constater la priorité des découvertes des Portugais dans l'Afrique occidentale, et les services que cette nation prêta aux sciences géographiques."

his enlarged *Atlas composé de mappemondes, de portulans, et de cartes hydrographiques et historiques* (Santarém 1849[–54]), to which he did give a structure to narrate his understanding of the history of cartography, which was very much focused on Europe's change of cultural state as it passed into the Renaissance (see Edney 2020); and Santarém also completed and published, before his own death from tuberculosis, three of the six planned volumes of the associated *Essai sur l'histoire de la cosmographie et de la cartographie* (Santarém 1849–52). At most, the dispute prevented Santarém from reproducing more maps from the collections of the Bibliothèque royale.

Conclusion

The intensity with which Jomard and Santarém asserted their respective claims in 1847 demonstrates that, right from the start, the new field of study of the "history of cartography" entailed significant cultural and political stakes. Their debate was less about the idea of a curated collection of facsimiles and more about their role in creating the "history of cartography." Initially, Santarém saw himself working within the history of discoveries, adducing maps to serve a history of Portuguese exploration and of European geographical knowledge. Santarém's first *Atlas* was sufficiently different from Jomard's that the latter was threatened only by the possibility that people might think he had plagiarized Santarém. But Santarém's second *Atlas* offered too great a competition to Jomard's intellectual vision.

In the end, Jomard's vision for the history of cartography was not widely adopted, whereas Santarém's was very much in close alignment with the need to support Western imperialism. The irony is that when Armando Cortesão (1969) argued that scholar needed to pursue a new kind of "history of cartography," which he understood as a field aligned with the histories of astronomy, navigation, and science, in distinction to the "historical cartography" that supported the history of geography and discoveries, he completely got Santarém's and Jomard's work the wrong way round. For Cortesão, it was his hero Santarém who had first advanced the "history of cartography" only for his vision to be subverted by the "historical cartography" of Humboldt, Jomard, and d'Avezac; now, Cortesão argued, Santarém's vision of the "history of cartography" had to be resurrected, to which end he offered his new history of Portuguese cartography as a preliminary contribution. However, it had been Jomard whose vision of the history of cartography had aligned with Cortesão's and had been short lived; Santarém's had persisted. (This is one reason why a new historiography is needed: too much confusion over basic terms.)

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UNKNOWN EARLY DISCIPLES OF HUMBOLDT AND SANTARÉM

The "history of cartography" of the basins of the Black and Caspian seas by Xavier and Adèle Hommaire de Hell (1844–45). Commentary and Translation

Originally posted: 16 November 2020

https://www.mappingasprocess.net/blog/2020/11/16/unknown-early-disciples-of-humboldt-and-santarm

Note: all images in this post have been taken from the digital collections of the Russian State Historical Library (Государственная публичная историческая библиотека России). I use them here with grateful thanks for the digitization of the Hommaires de Hell's fugitive atlas.

Note: the works I discuss in the following are commonly attributed solely to Xavier Hommaire de Hell. It is however clear that his wife Adèle was active in the initial travels and was later instrumental in cowriting and editing the works (Hommaire de Hell and Hommaire de Hell 1843–45, 1: vi–vii; see Monicat 1994–95). She should be properly credited as such. I am certainly not going to presume that she had no hand in volume three, or the "scientific part," of *Les steppes de la Mer Caspienne, le Causcase, la Crimée et la Russie méridionale*.

I've been drawn into the work of Ignace Xavier Morand Hommaire de Hell (1821–48) and Jeanne Louise Adélaïde "Adèle" Hommaire de Hell née Hériot (1819–83) as two of the very first proponents of the kind of "history of cartography" pioneered by Alexander von Humboldt and the viscount of Santarém. Their work in map history seems almost completely unknown to map historians. Armando Cortesão (1969) did not identify them in his biobibliographical listing of early map historians; they do not appear in any of the bibliographies of early works in map history discussed in a recent post. All that I have yet found are the brief mentions by Tony Campbell (1986, 94; 1987, 457 n. ee) to Xavier's finding of a now untraceable chart from 1497 or 1500; his letter announcing the discovery was published by Santarém (1847).*

I first discovered Xavier's and Adèle's work some years ago when I was using Google's n-gram tool to find early instances of "cartography," "history of cartography," and "historical cartography" in various European languages. Specifically, chapter nine in the third volume (1844, pages 344–65) of their account of the steppes of southern Russia was entitled "Coup d'œil sur l'histoire de la cartographie du bassin de la mer Noire et de celui de la mer Caspienne." I left it at that until just the last couple of days,

* Since this was written, I have discussed the Hommaires de Hell in Edney (2023).

when I stumbled across the fact that the three-volume book was accompanied by an "atlas historique" and an "atlas scientifique"; the latter included some folios of facsimiles of early maps. As is clear from recent posts on this site, I have been looking at the importance of facsimiles in the study of the history of cartography and in the development of the field of study in Paris in the second quarter of the nineteenth century. With that in mind, I spent time to go through their short narrative with some care, to see their sources and influences.

In the bigger scheme of things, there's little reason why the Hommaires de Hell *should* be prominent in map history: Xavier made a couple of maps, he found an early chart, and with Adèle he wrote one, short narrative in map history. They appeal to me as an example of the initial moment of popularization of the "history of cartography" just as it began to pull away and separate from the history of geography and of discoveries.

Before I can get to this early exercise in map history, however, I need to get through some biographical background and bibliographical complexity.

The Hommaires de Hell

Xavier and Adèle met in Saint Étienne, where Adèle was living with an elder sister and where Xavier studied at the École des mines. They married in 1834. In 1835, pregnant, Adèle joined Xavier in Turkey where he worked for the Ottoman Empire on internal improvements (suspension bridges, lighthouses). In 1838, they moved to Russia to work on a series of projects in southern Russia. Among other things, Xavier found coal deposits on the Dnieper river (fig. 1). In this respect, he prefigures the economic exploration more commonly associated with European imperialism in the later nineteenth century, as with Ferdinand von Richthofen's work on the Shantung peninsula in China, with its extensive coal deposits (Hudson 1977; Wu 2014).

After Xavier fell ill when building roads in Moldova, he returned with Adèle to Paris in 1842. They prepared *Les steppes*, which in 1844 won for Xavier the "grand prix" of the Société de géographie in Paris.

Eventually, they went back to south-west Asia on a commission from the French government to examine the agricultural and commercial systems of Turkey and Persia. Adèle returned to France relatively early, to preserve her health; Xavier would die in Isfahan in August 1848. Adèle edited an account of this second voyage from Xavier's notes.

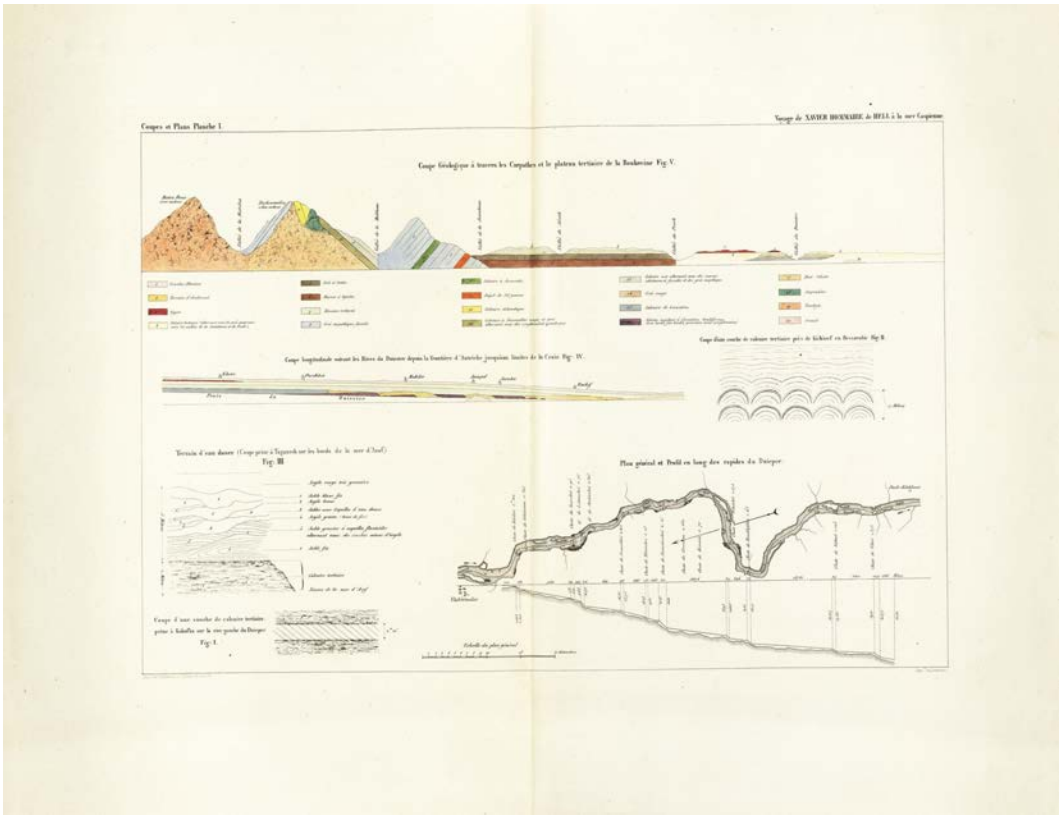


Figure 1. Hommaire de Hell, "Coups et Plans Planche I," including a plan of the rapids on the Dnieper and a geological cross-section of the Carpathian Mountains.

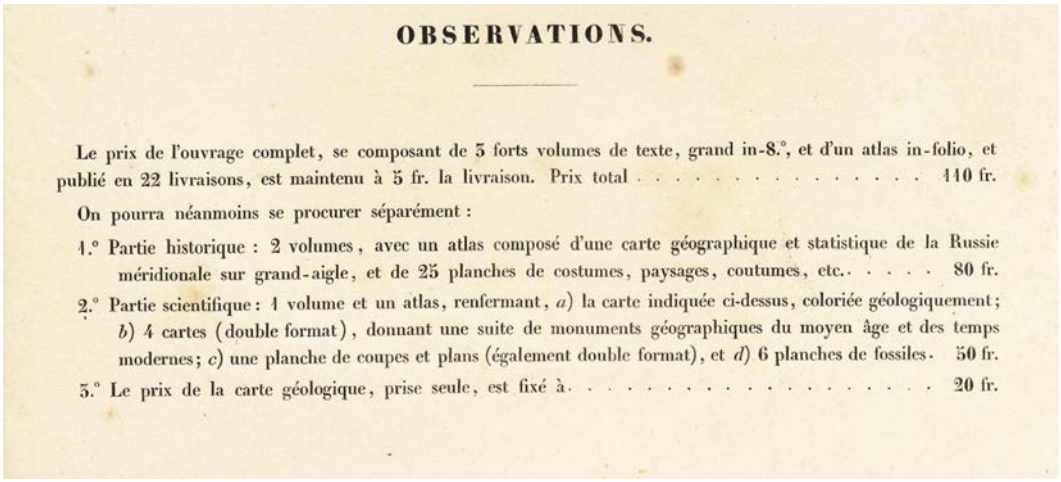
Bibliographical Complexities

Three Text Volumes and *One* Atlas, or Should it be *Two* Atlases?

The atlas(es) associated with *Les steppes* exemplify the confusion generally surrounding folio atlases issued in fascicules, especially in comparison with the apparent stability of the neatly bound volumes of text produced in the early nineteenth century. The folios were large and expensive to produce. Issued in several fascicules, an owner might not acquire all of them. Unbound, being held together only within paper wrappers, some of their contents might be frittered away, while the folios could be arranged and rearranged in any order their owner preferred. (The set in the Russian State Library is quite disorganized.) Each set is likely to differ from all others.

Lacking the coherence of the bound atlas, the number of atlases could not necessarily even be consistently counted. Consider the "Observations" included within the set of folios digitized by the Russian State Historical Library, which describe the overall work and provide a tariff for buying it in

whole or in part:



OBSERVATIONS.

Le prix de l'ouvrage complet, se composant de 3 forts volumes de texte, grand in-8.°, et d'un atlas in-folio, et publié en 22 livraisons, est maintenu à 5 fr. la livraison. Prix total . . . . . 110 fr.

On pourra néanmoins se procurer séparément :

1.° Partie historique : 2 volumes, avec un atlas composé d'une carte géographique et statistique de la Russie méridionale sur grand-aigle, et de 25 planches de costumes, paysages, coutumes, etc. . . . . 80 fr.

2.° Partie scientifique : 1 volume et un atlas, renfermant, *a*) la carte indiquée ci-dessus, coloriée géologiquement ; *b*) 4 cartes (double format), donnant une suite de monuments géographiques du moyen âge et des temps modernes ; *c*) une planche de coupes et plans (également double format), et *d*) 6 planches de fossiles. 50 fr.

3.° Le prix de la carte géologique, prise seule, est fixé à . . . . . 20 fr.

Detail of "Observations"

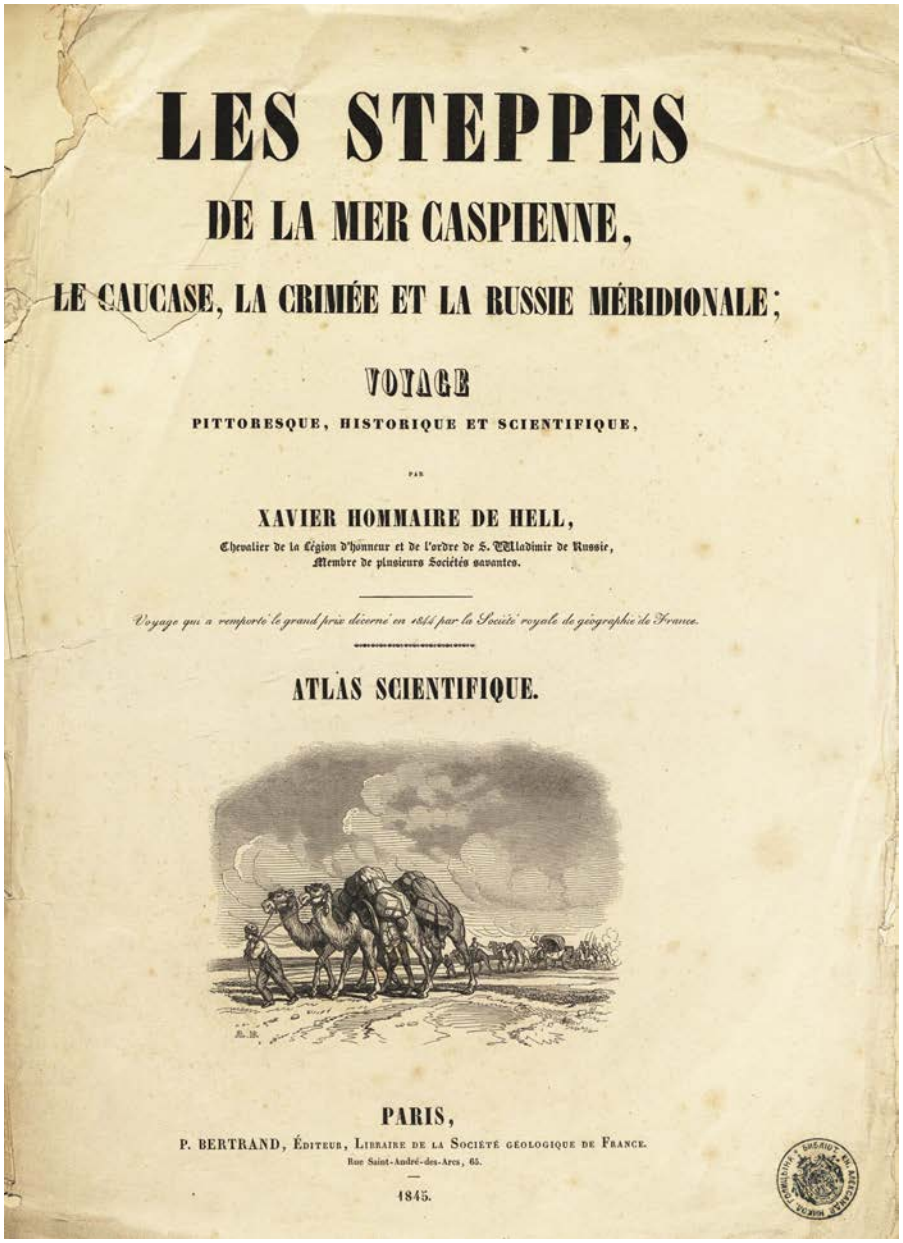
This statement suggests that, as a whole, *Les steppes* comprised three volumes in octavo and **one** atlas in folio issued as 22 fascicules (*livraisons*). Yet, the description went on to identify that the whole could be divided into two thematic parts, one historical the other scientific, and each with its own atlas. So, **two** atlases!

Indeed, the unbound set in the Russian State History Library includes two titlepages, both identical in the settings of type, divided by horizontal rules and by a vignette of a camel train, except for one line:

> Les steppes de la Mer Caspienne, le Caucase, la Crimée et la Russie méridionale; Voyage pittoresque, historique et scientifique, par Xavier Hommaire de Hell, Chevalier de la Légion d'honneur et de l'ordre de S. Wladimir de Russie, Membre de plusieurs Sociétés savants.
>
> Voyage qui a remporté le grand prix décerné en 1844 par la Société royale de géographie de France.
>
> Atlas scientifique. [*or* Atlas historique.]
>
> Paris, P. Bertrand, Éditeur, Libraire de la Société géologique de France. Rue Saint-André-des-Arcs, 65
>
> 1845

According to the "Observations," and also to the pasted-on tariff on the outer wrapper of the set in the Russian State Historical Library, the *Atlas historique* should have contained one map ("carte

géographique et statistique de la Russie méridionale") and 25 plates of landscapes (fig. 2), costumes (fig. 3), etc. (That set lacks only the general map and one picturesque view.)



LES STEPPES

DE LA MER CASPIENNE,

LE CAUCASE, LA CRIMÉE ET LA RUSSIE MÉRIDIONALE;

VOYAGE

PITTORESQUE, HISTORIQUE ET SCIENTIFIQUE,

PAR

XAVIER HOMMAIRE DE HELL,

Chevalier de la Légion d'honneur et de l'ordre de S. Wladimir de Russie,
Membre de plusieurs Sociétés savantes.

Voyage qui a remporté le grand prix décerné en 1845 par la Société royale de géographie de France.

ATLAS SCIENTIFIQUE.

PARIS,

P. BERTRAND, Éditeur, Libraire de la Société géologique de France.
Rue Saint-André-des-Arcs, 65.

1845.

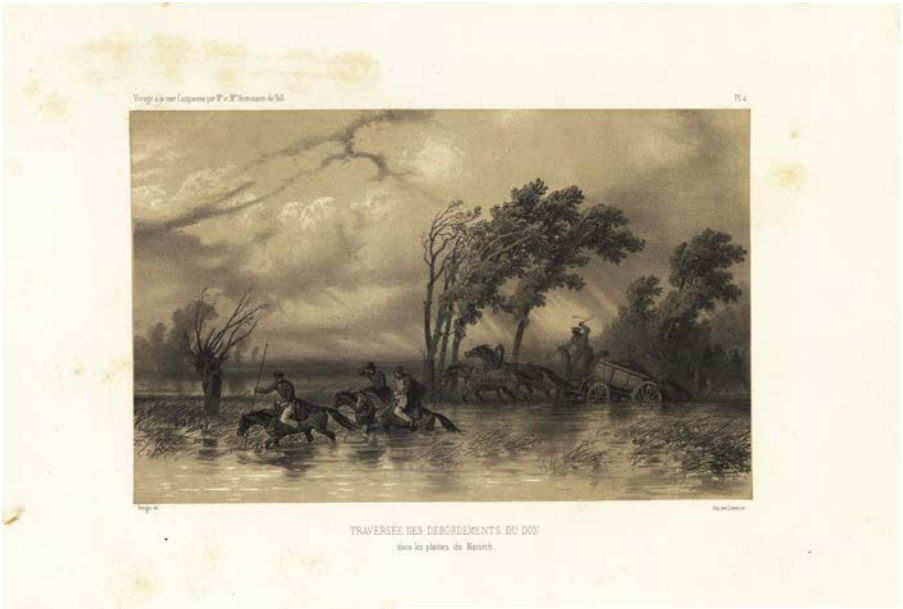


Figure 2. "Traversée des débordements du Don dans les plaines du Manitch," engr. Férogio, printed by Lemercier. "Voyage à la Mer Caspienne par Mr et Me Hommaire de Hell, pl. 4"

Figure 3. "Prière du soir chez les Kalmouks," engr. Férogio, printed by Lemercier. "Voyage à la Mer Caspienne par Mr et Me Hommaire de Hell, pl. 8"

The other (half of the) atlas, the *Atlas scientifique*, was intended to contain four elements:

- the same regional map as in the *Atlas historiques*, only now colored with geological strata [fig. 4];
- 4 folios "bearing a collection of geographical monuments from the Middle Ages to

modern times" — which are of course the items that are of interest to me

• 1 folio with views and plans (see above)

• 6 folios with images of fossils, which accompanied the several chapters at the end of volume three on paleontology, written by one Alcide d'Orbigny.

Figure 4. "Carte géologique et statistique de la Russie méridionale, 1844" engr. L. Bouffard, printed by Lemercier, with Bertrand's imprint.

One more point of confusion and uncertainty: if bound, which way should the folios be oriented? The set in the Russian State Historical Library is in portrait orientation: the titlepages appear like that of a normal book (see above) but all the folios are rotated. (I have unrotated them for inclusion here). However, a partial copy imaged by SPL Rare Books is in landscape orientation, including the titlepage (this set bears the titlepage of the *Atlas scientifique* but contains just seven of the plates from the *Atlas historique*). Did the Russians modify the digital images of the titlepages to make them look portrait orientation, or were the titlepages issued in two formats?

The Four Folios of Facsimiles

In addition to the complexities inherent to the manner of production—22 fascicules of conceptually two atlases that should be bound as one—there is a further point of confusion stemming from the author's perhaps overly grandiose plans. Both the text and the "Observations" (above) indicate that there are 4 folios of facsimiles (reproduced below). Each bore the main title

> Histoire de la Cartographie de la Mer Noire et de la Mer Caspienne

Each bears a unique subtitle in the upper-left corner:

> Monuments géographiques du XV et du XVI Siècle.
>
> Monuments géographiques du XI-XIII et XIV Siècle. No. I
>
> Monuments géographiques du XVI, du XVII et du XVIII Siècle. No. III
>
> Monuments géographiques Européens XVIII & XIX Siècles, Arabes XII & XIII. No. VI

That is, the 4 folios are not numbered 1 through 4, as one might expect, but are unnumbered, 1, 3, and 6. Did Xavier and Adèle have plans to do more? Or was the lithographer (Schwaer Jr., rue S. André des arts, 60) incompetent? In the event, we have a simple concordance:

> H de H plate "No. I" = "pl. I" as specified in the text (see H de H note 9)
>
> H de H unnumbered plate = "pl. II" as specified in the text (see H de H note 21)
>
> H de H plate "No. III" = "pl. III" as specified in the text (see H de H note 24)
>
> H de H plate "No. VI" = "pl. IV" as specified in the text (see H de H note 30)

So, incompetence: the lithographer forgot to add the plate number to the second plate, and then transposed the digits to "No. IV" to make the actual "No. VI."

The History of Cartography of the Basins of the Black and Caspian Seas

General Comments

The narrative by Xavier and Adèle Hommaire de Hell is characteristic of the early nineteenth century engagement with early maps. They were very much aware of having only limited access to the relevant geographical "monuments," even those produced by European culture. They knew that other cultures made maps, and especially the Islamic cultures of south-western Asia, but they lacked knowledge of them. In this respect, they looked forward to the eventual release of further monuments of geography from the obscurity of dusty archives and libraries. (Remember: libraries and archives were only just being opened up even to socially elite scholars in the early 1800s.)

Their lack of knowledge is manifested in many confusions. When they refer to Claudius Ptolemy's "astronomy," do they mean his *Almagest* or the *Geography*? They cite J. B. B. d'Anville approvingly, but do not seem to know of his *Essai d'une nouvelle carte de la Mer Caspienne* (1754), which displays a distinctly modern outline, of which they would have approved. They cite one of works of Vincenzio Antonio Formaleoni, but not his mapping of the Black Sea based on medieval marine charts (Formaleoni 1788–89). So, because they worked from little knowledge, and most of what they knew they took from Santarém or from printed maps, their narrative cannot be said to be a thorough history.

There is some slippage in their usage of "cartography" or "cartographic." This should not be surprising: the word was still new, and people were still trying to figure it out. At times, Xavier and Adèle used it to mean "(the field of) the study of maps," as in the obvious parallel between *carte-graphy* (the description of maps) and geography as the study/description of the earth. The "history of cartography" was the narrative ("history" *per se*) not of the field of study, of course, but of the endeavor of map making. The proper pursuit of this history was through the chronological arrangement of early maps (a *cartographie chronologique*). In doing so, they could see both progression and regression in the amount and quality of knowledge.

In making their facsimiles—for which they used the same printers as Santarém and Ramón de la Sagra—they focused specifically on the depiction of the Black Sea and Caspian Sea. They changed or added key toponyms to their modern equivalents, reoriented the maps so that north was at the top, and in some cases seem to have added meridians and parallels. Compare, for example, their detail of the British Library's Cotton MS Tiberius B V/1, the so-called "Anglo-Saxon Map," with the same area from a digital image of the original (fig. 5).

They discuss how, in the past, mapping entailed different kinds of work that would be united in the modern era. Having said that, they still treated all geographical information as equivalent, regardless of the kind of mapping involved; the significance of recognizing different kinds of mapping lay in accounting for the spread of geographical information.

They also reveal a common understanding of the importance of printing in distributing information and knowledge. Their understanding of medieval culture is also very much of their time and reads today as a parody. In particular, they subscribe to notions of medieval culture as being poorly informed and so characterized by "systematic" thought, which I take to mean theoretical systems by which the world is organized, shaped, and structured.

Overall, their narrative is a presentist paeon, a march onwards to better knowledge and truth. That truth is defined by the map as perfected in the modern age.

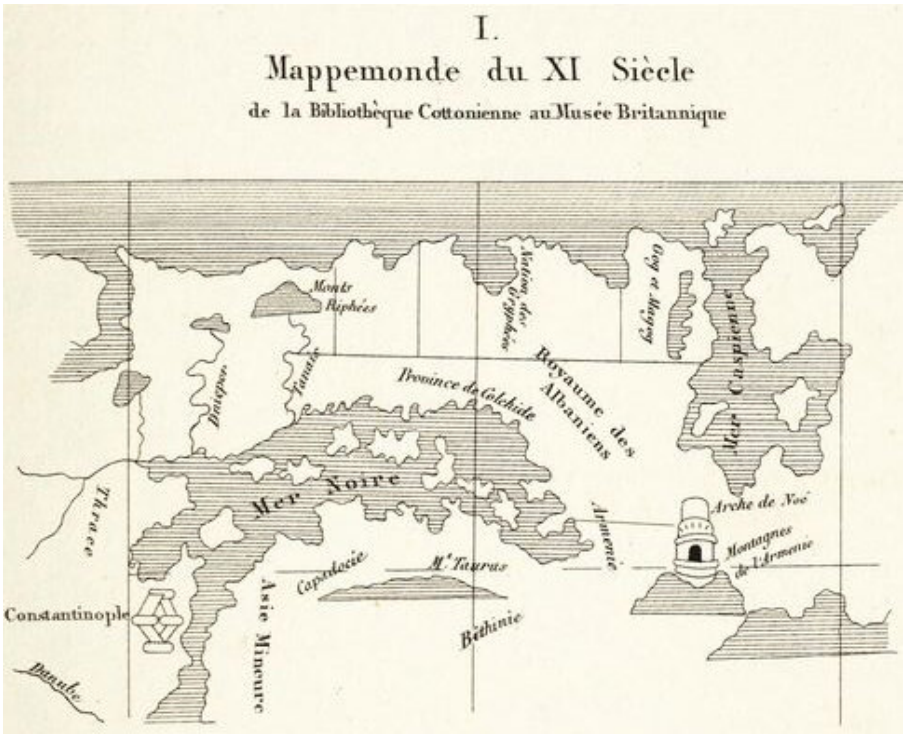


Figure 5. "Plate 1, figure 1"

Detail of the original (rotated for ease of comparison)

I am most taken by their indication of resources. They were motivated by the examples set by Humboldt and by Santarém, with his first facsimile atlas—see a recent post for more information—to map a region over time; they also owed much to Edme François Jomard in the Bibliothèque royale,

although work on his own facsimile collection was barely begun. But, because they were interested in the knowledge of one region, and not really with the overall history of cartography (as Jomard would be in his facsimile collection, and Santarém in his second), they brought their narrative all the way up to the nineteenth century and Humboldt's map of central Asia. At the same time, they suggest an understanding of the study of early maps that bears all the hallmarks of what Santarém would publish a couple of years later (in Santarém 1847), so Santarém was proselytizing for his new disciplinary vision.

The following transcription is a preliminary translation; fortunately, the language of the original is relatively unadorned, so that a literal translation is mostly sufficient. It is not a critical edition and should be read as such; I have *not* corrected their errors and have updated only a few names to their modern Anglophone equivalents. Note numbers have been made sequential, the notes being situated as indented quotations after the relevant paragraphs. Page numbers are indicated in bold. Images of the facsimiles are inserted just before each is first referenced. I have not translated the remainder of the chapter, which explains Xavier's construction of his own map of the Black Sea.

Translation

Hommaire de Hell, Xavier, and Adèle Hommaire de Hell. 1843–45. *Les steppes de la Mer Caspienne, le Caucase, la Crimée et la Russie méridionale: Voyage pittoresque, historique et scientifique*. 3 vols. + atlas. Paris: P. Bertrand.

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CHAPTER IX. A look at the history of the cartography of the Black Sea basin and that of the Caspian Sea.

Having studied, from a historical and physical point of view, the geography of the great seas which nature has placed between Europe and Asia, as well as that of the various rivers which bring them the tribute of their waters, it is essential now to complete these notions, to link together the various parts considered in isolation, by taking a general look at all of human knowledge as it is recorded in the cartographic monuments that the past centuries have bequeathed to us and whose testimony we have already so often invoked during the course of our discussions. We cannot, of course, pretend that by undertaking a still incomplete work we will arrive at a rigorous appreciation of the successive modifications and progress which took place in geographic science over the course of the Middle Ages and modern times. Such a task would go completely beyond the framework that we have outlined for ourselves. The cartographic works **345** known about the countries which concern us, are besides still too limited in their number, for it is possible to treat such a subject with the developments which it involves. We therefore ask for the reader's benevolent indulgence in reading this chapter.

An entirely new science, cartographic studies date back barely fifty years. Buried in the obscurity of libraries and public archives, the parchments of old cosmographers were for a long time if not despised then at least seen as quite useless. G. Delisle, d'Anville himself, as well as the most eminent

scientists of their time, remained totally foreign to all these precious summaries, which successively framed the results of the great maritime and terrestrial discoveries of the thirteenth, fourteenth, and fifteenth centuries. In the latter century, it is true, geography was far from attaining the high degree of development which it has reached today; scholarship was preoccupied almost exclusively with classical studies; the ardor for historical research which characterizes our time did not yet exist and the writers of the Middle Ages, the great part in manuscript, very rarely had the honor of a commentary.

Heeren, who rightly counts among the great intellectual lights of Germany, was one of the first to understand the usefulness of cartographic studies. He analyzed the world map of the Museo Borgiano, and despite the **346** inevitable imperfections, [1] the work he published in 1804 had the undeniable merit of having popularized within the learned world knowledge of one of the most curious geographical monuments of past centuries, and thus of having awakened attention to a kind of research that had until then been entirely neglected. Around the same time, Cardinal Zurla published a long dissertation on Fra Mauro's world map of 1460. Since then, with the vigorous impetus which historical studies soon received, other writers, among whom the illustrious Alexander von Humboldt [2] and the abbé **347** Andreas, [3] also dealt with cartography; they adduced documents and arguments as positive as they were interesting, and along with their essays they prepared facsimiles and reductions of several extremely remarkable old maps.

1. The monuments of medieval geography were then so little known that Heeren could not make any comparison between the Borgia world map and similar works. It must be said, however, that before him, Formaleoni and Jean Potocky had also already appreciated, to a certain extent, the scientific value of the ancient cosmographers. The first published, in his Treatise on the Navigation of the Venetians, a reduced copy of Andrea Bianco's world map of 1436, and the second borrowed from Freduce d'Ancone the map of the Black Sea, drawn in 1497. But all these works had very little impact in their time and it is not surprising that they escaped Heeren's knowledge (see Memoirs of the Academy of Göttingen: *Explicatio plani globi orbis terrarum, faciem exhibentis, ante medium seculum XV summa arte confecti*).

2. Humboldt, in his *Examen critique de l'histoire de la géographie du nouveau continent* (1839), published several fragments of the world map by Juan de la Cosa, pilot of Christopher Columbus; this most remarkable monument, which belongs to Baron Walckenaer, dates back to 1500.

3. Father Andreas published in 1822 a dissertation on Bartholemé del Pareto's map, drawn up in 1455.

All these early efforts, however, produced only partial publications that each related exclusively to this or that subject, and no one yet thought of bringing together the many monuments disseminated throughout the libraries of Europe and of systematically publishing them in chronological order to form a complete collection within the reach of everyone. In 1842 a big question, although already of a

very old date, again preoccupied the scientific world, that of the priority of the Portuguese discoveries on the western coasts of Africa. Thanks to the pretensions formerly raised by the Genoese, the French, and the Spaniards, pretensions resuscitated by some writers, spirits were greatly impassioned and from the struggle naturally sprang new insights and new notions that considerably enlarged the once thoroughly restricted domain of medieval geography. As a Portuguese and as a first-rate geographer, the **348** viscount of Santarém took the most active part in the discussion; he surrounded himself with cartographic documents from all countries and soon, carried away by the interest of their study and seduced by the value of the testimony that they gave him, he extended the circle of his research, and was not long in designing the idea of one of the most interesting publications of our time. It was thus, following a particular debate, that science was enriched with a magnificent atlas, which will allow us before long to study and compare the principal geographical monuments transmitted to us by the different nations which took part in the great political and intellectual movements of the Middle Ages, whether arranged in chronological order or topically. [4]

> 4. The viscount of Santarém has already published 32 world maps, all prior to the discoveries of Columbus and da Gama, and summarizing as a whole the history and general state of geographical and cartographic knowledge during the ten centuries of the Middle Ages. The second series currently consists of 22 equally remarkable monuments [i.e., marine charts], the most recent of which was made by Jean Guerard, cosmographer of Dieppe, from 1631. The viscount of Santarém today continues work on his beautiful publication with as much activity as devotion. We are happy to join in with all those who have already paid him the tribute of their praise, and to express to him in particular all our thanks for this benevolence, so dignified and so kind, with which he has made all his documents available to us, even his completely new materials.

349 We will not seek to respond to those who have tried to belittle the value of geographical monuments. This task has already been victoriously accomplished in the works of Humboldt and the viscount of Santarém, [5] as well as in our own works, if we are permitted to mention them. [6] Only by resorting to cartography have we been successful in shedding new light on various aspects of early geography and in finding meaningful data about the configurations, internal distances, and reported positions previously adopted for the countries in which we have ourselves traveled. Finally, it is only in the chronological arrangement of maps (*cartographie chronologique*) that we have revealed a series of documents that precisely indicate the phases of progress and decadence through which the physical and geographical sciences have alternately passed relative to the basins of the Black Sea and the Caspian Sea.

> 5. See Central Asia and the Critical Examination by M. de Humboldt, and the Researches on the Discovery of the Countries Located on the West Coast of Africa, by M. le Vicomte de Santarem.
>
> 6. See our Journey of the Black Sea and the Sea of Azof, as well as our Historical Geography of the Caspian Sea (same volume).

The monuments which we are going to examine belong to two distinct categories; some are systematic, others result from more **350** or less positive, or more or less erroneous, observations. Prior to those remarkable centuries which saw the growth of the commercial predominance of the republics of Italy and of the kingdoms of Portugal and Spain, cartography was a truly minor science that was naturally the preserve of scholars who, lacking contemporary information, drew their ideas almost exclusively from the writers of antiquity. Their various representations of the globe were all necessarily systematic; cartographers reproduced, according to the manuscripts they possessed or their own imagination, the opinions of Strabo, Pliny, Denis, and Solinus. [7] And with these opinions appeared jumbled up quotes from the Bible, traditions from the earliest times, and the most fabulous legends that have ever been accredited. Such are most of the world maps [8] that date back to the tenth, eleventh, twelfth, thirteenth, and fourteenth centuries. We can **351** readily analyze those world maps that seem to be most characteristic.

7. We have often had occasion to recall that the propagation in the scientific world of Ptolemy's astronomical tables dates only from the end of the fifteenth century, and rather still from the beginning of the sixteenth.

8. The oldest map of the world that has come to our knowledge is that belonging to a manuscript by Cosmas Indicopleustes, and which appears in the atlas of the viscount of Santarém. This completely amorphous monument can only interest us in its manifestation of the belief in the Hyrcanian gulf.

In the *mappamundi* of the Cotton Collection of the British Museum, [9] dating back to the eleventh century, the Black Sea, a vast basin curved as an arc of a circle, merged with the Sea of Azov and dotted with a large number of islands, is at an equal distance from the North Sea and the Caspian Sea; the Tanaïs comes out of the Rypheus mountains, imagined by Aristotle and reproduced by his successors; Herodotus' Gryphons inhabit the ends of the earth, and Gog and Magog find themselves relegated to the western shores of the Caspian Sea, depicted as a gulf that receives its waters from the great ocean which surrounds the ecumene. In the south, the mountains of Armenia appear to be surmounted by Noah's ark, and the Taurus mountain range extends, in accordance with the opinion of the ancients, into the vicinity of the Eastern Sea. Towards the west, Constantinople is seated at the northern end of a vast canal, the length of which is at least equal to that of the Black Sea; in its center we can see a vague indication of the Sea of Marmara, into which our cartographer boldly makes the Danube debouch.

9. This world map is part of Santarém's atlas (see our Cartography, pl. I, fig. 1).

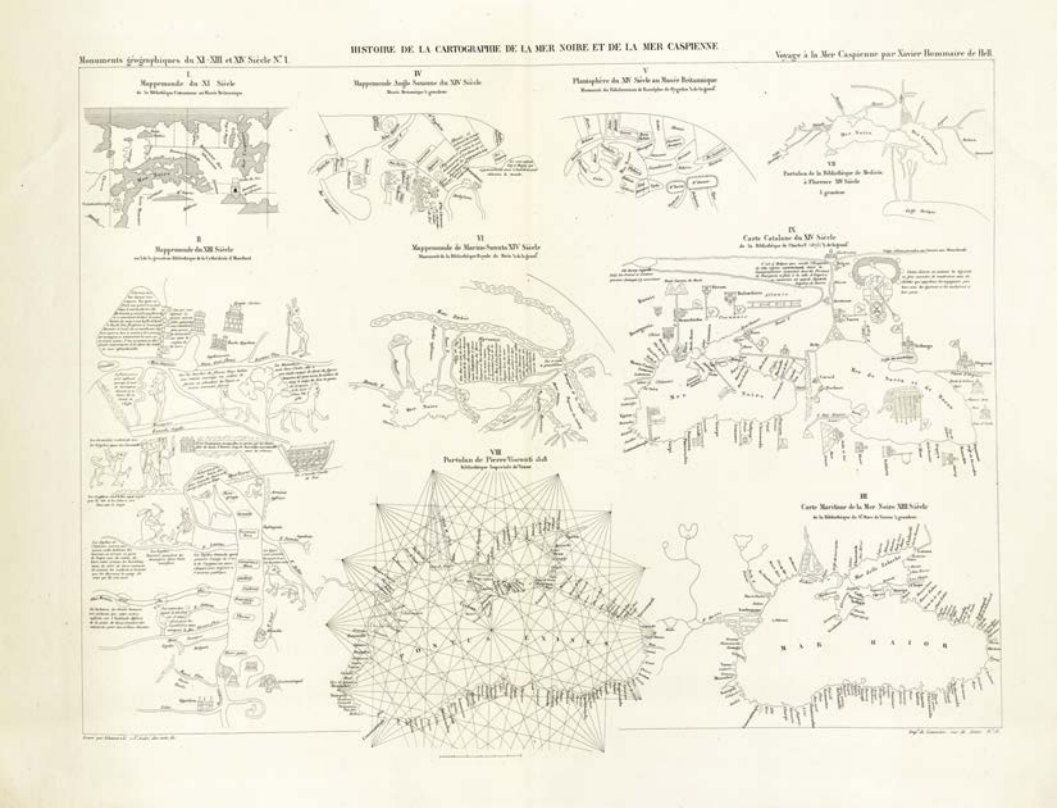

Plate I of facsimiles.

352 The *mappamundi* of Hereford cathedral [10] is even more curious. It undoubtedly constitutes one of the most remarkable monuments that have been bequeathed to us from the thirteenth century, as much for the grandeur of its execution as for the infinite number of legends and drawings with which it is enriched. Its configuration, however, is still almost as fabulous as that of the eleventh-century *mappamundi*. It shows the Pontus Euxinus [Black Sea] as a long canal that the author has divided into three seas, the Propontis, the Cimerienne and the Euxine, in the middle of which he has ingeniously transported several islands of the Archipelago. [11] The course of the rivers is **353** however traced there with more accuracy than on the Cotton map. The Danube no longer flows into the Sea of Marmara: it discharges its waters through several mouths north of Constantinople. The indication of the Dnieper [12] and that of the old Halys in the south are precise, and with a little good will it is even possible to find the Dniester, the Don, and the Phase. As for the Palus Maeotis [swamp/sea of Azov], they are shown as a long channel, the northern extension of which is a river [Fluv. Meotides] that can only be the Tanaïs [Don]. To the east, the Caspian Sea still forms a gulf of the northern ocean; but two great rivers flow into it: one bears the name of Oxus, and the other, although without designation, can only be the Cyrus or the Araxis, which we see emerging from above the mountains of Armenia, as ever

crowned by Noah's ark. In the northern part of the Hyrcanian Gulf, to the west, **354** there is a third stream; it is, according to legend, the infernal river which escapes from obscure mountains, where one finds, it is said, the entrance to hell.

10. It is because of the indefatigable perseverance of Jomard that the Bibliothèque royale in Paris has since 1842 possessed a facsimile of this precious monument. May Jomard also allow us to express to him here all our gratitude for the constant and eager benevolence with which he facilitated our laborious research in the magnificent map collection of which he can rightly be proud to be the founder. We sincerely regret, however, that his multiple commitments still prevent this learned curator of the Bibliothèque royale from enriching the scientific world with the numerous cartographic documents which constitute his particular responsibility, whose importance we have been able to appreciate even from our rapid examination. The original of the Hereford map is drawn on vellum and colored. Its dimensions are 1.65m by 1.55 (see our Cartographic Monuments, pl. I, fig. 2).

11. One notices, among others, the islands of Thassos and Pathmos in the vicinity of the island of Achilles.

12. The Dnieper is already identified as the *Danaper*. This denomination and some other names belonging to the tributaries of the Danube are, in the countries which concern us, almost the only ones which are foreign to classical tradition. We have already said [in a previous chapter] that Danaper (Danapros) appears for the first time in the *De administrando imperio* of Constantine VII Porphyrogenitus. Is the English cartographer's geography the result of the knowledge of Byzantine writers, or that of an obscure traveler's account? We will not seek to determine the answer; Jomard's work will probably clear up all doubts in this regard.

The numerous inscriptions [13] which appear in the Hereford map are no less interesting than its purely cartographic layout. They are all the more valuable in that they positively indicate **355** the main source for the geographical notions that had been used in the composition of this precious monument. In fact, we find textual accounts in the midst of historical commentaries, all of Solinus's fabulous legends: the people of Scythia, with bloodthirsty and bizarre customs; the Gristé (Gelons), turning the skin of their enemies into clothing for themselves and their horses; the Satarchs, despising the use of gold and silver; the Arimaspes, questing for precious stones; and Jason, in search of his fleece. There are depicted the Gryphons, guardians of emeralds; the Lynx, with the piercing gaze; the Mantichora, with the human form; and all the fantastic parade of animals with which the imagination of the ancients had enriched natural history.

13. We thought it necessary [for the facsimile] to translate into French all the Latin legends that illustrate the Hereford map. We have been greatly helped in this difficult task by Jomard and Paris, of the Institute, as well as by d'Avezac. Solinus's text was also of great help to us; for, as is easy to see, most of the quotes from the English cartographer are a

> literal reproduction of that author's passages. This comparison which we made between the legends of the world map and the passages of Solinus enabled us to judge all the variants and all the interpolations which must mark the majority of old manuscript maps. Thus, in the Hereford map, in the midst of textual citations, Solinus's Gelons appear under the name of Gristé, the Arimaspes as the Carinialpis. Several traditions have even been attributed to the Latin writer that we could not find anywhere in his works, such as that relating *to the accursed children of Ham, who must appear with the Antichrist to bring destruction to the entire surface of the earth*, etc. This is indisputable proof that the manuscript of Solinus used by the English cartographer was different from all those which have come to our knowledge. There are also many inscriptions on the Hereford map in Anglo-Norman, with which we did not concern ourselves.

During the fourteenth century, English cartographers kept the systematic ideas of earlier ages almost intact. [14] The world maps we have from this period reproduce at least all the main features of the cosmography of the *mappaemundi* of the eleventh and thirteenth centuries. **356** They nevertheless prefigured the revolution in geographical concepts and scholarship. The Caspian Sea, it is true, retained, as in the past, its communication with the northern ocean; Gog and Magog are still prisoners on its shores; certain islands of the Archipelago are still visible in the middle of the Pontus Euxinus; and the Tanaïs, as in the past, has its source in the Rypheus mountains. But Solinus's fabulous animals have disappeared and in place of the populations of Scythia, so strangely characterized by Solinus, there are regions whose names already belong to the Middle Ages.

> 14. Cartographers of other nations appear, prior to the fourteenth century, to have been just as backward as those of Great Britain, judging by some world maps in Santarém's atlas. We found these later works to be so crude in their depiction of the countries around the Black Sea that we thought it unnecessary to mention them further. [Yet see figs. 4–5 on plate I]

While the scholars of Western Europe, in their dearth of contemporary documents, dragged themselves into the rut of the classical authors, whose cosmography they blindly adopted, Italian navigators roamed all the coasts of the Mediterranean, entered the Black Sea and the Sea of Azof, everywhere multiplying their trading houses and their commercial relations. From these actions there resulted the most positive benefits for the craft of navigation and for the geography of the Eastern countries. From the thirteenth and the fourteenth centuries, the Venetians and the Genoese were enriched by portolans, whose accuracy and beauty of execution still cannot be sufficiently admired today. [15] The Spaniards and **357** the Portuguese in their turn appropriated the knowledge of the Italians, and in this way gradually spread new conceptions among the Mediterranean nations, which were not long in bringing about a complete revolution in European cartography. The great systematic errors of past centuries and the classical toponyms then quickly disappeared, to make room for historical and geographical truths, proclaimed for the first time by clerical ambassadors, [an echo of Conrad Malte-Brun 1810] then confirmed and completed by Italian explorers. During the course of the

fourteenth century the mathematical configuration of the portolans was already incorporated into most *mappaemundi*. The planisphere of Marino Sanuto, the map of the library of Florence, and that known as the Catalan Atlas from 1375 [16] successively reproduced the Pontus Euxinus and the Palus Maeotis with all the precision of the layout of the Italian navigators and all the richness of their nomenclature. However, apart from the maritime explorations of the Genoese and the Venetians, mainly in the regions located to the east of the Black Sea, the depiction of geographical features was still far from being rigorous and the few travelers by land were not **358** sufficient to correct all of the errors that so many centuries had accumulated. Thus, although they separated the Caspian Sea from the northern ocean and properly traced the courses of the Tanaïs, the Volga, and even the Kama, the fourteenth-century cartographers still followed the example of ancient writers. Like them, they had no notion of the Aral Sea and they made the famous river Oxus flow, albeit under another name, into theHyrcanian sea. [17] In the monument of Marino Sanuto, the Rypheus mountains still served as a starting point for the Tanaïs and the Volga. The author of the Florentine map even represented some of the fabulous riverine connections invented by the poets of ancient Greece. Equally large errors are also inevitably to be found in the maps' geographical configurations and in ratios of distances [between the map and reality]. We have already pointed out the numerous variations through which the course of the Caspian Sea successively passed; now the neighboring countries underwent the same vicissitudes. To the east of the Hyrcanian Sea, Marino Sanuto placed a second basin, bearing, like the imaginary mountains which surround it, the name Caspian. [18] Then for him, as with the author of the Catalan map, the Caucasus Mountains extend **359** to the most northerly ends of the Caspian Sea, [19] and the distance separating this latter basin from that of the Black Sea is so restricted that it almost equals the width of the Danube Delta, as indicated by both cosmographers.

15. See in our Cartography, pl. I, figs. 3 and 8: the maritime chart of the Black Sea, from the thirteenth century, of the Biblioteca Marciana, Venice; and that from the portolan atlas by Pierre Visconti (1318). The first is now part of the royal library [I don't see how: not in Campbell's (1986) census; Jomard did not reproduce it in his facsimile atlas, although he might have taken a tracing from the original]; thanks to the Vicomte de Santarem, we have a facsimile of the second, the original of which is in Vienna.

16. See pl. I, figs. 6, 7, and 9.

17. See pl. I, fig. 9, for the Catalan map of 1375.

18. Can we see in this indication some vague knowledge of the Aral Sea? This is what it is really not possible to appreciate.

19. It is seen here that the fourteenth-century cartographers were entirely faithful to the opinions that we attributed to the ancient writers (see our Historical Geography of the Caspian Sea, in this volume, p. 165).

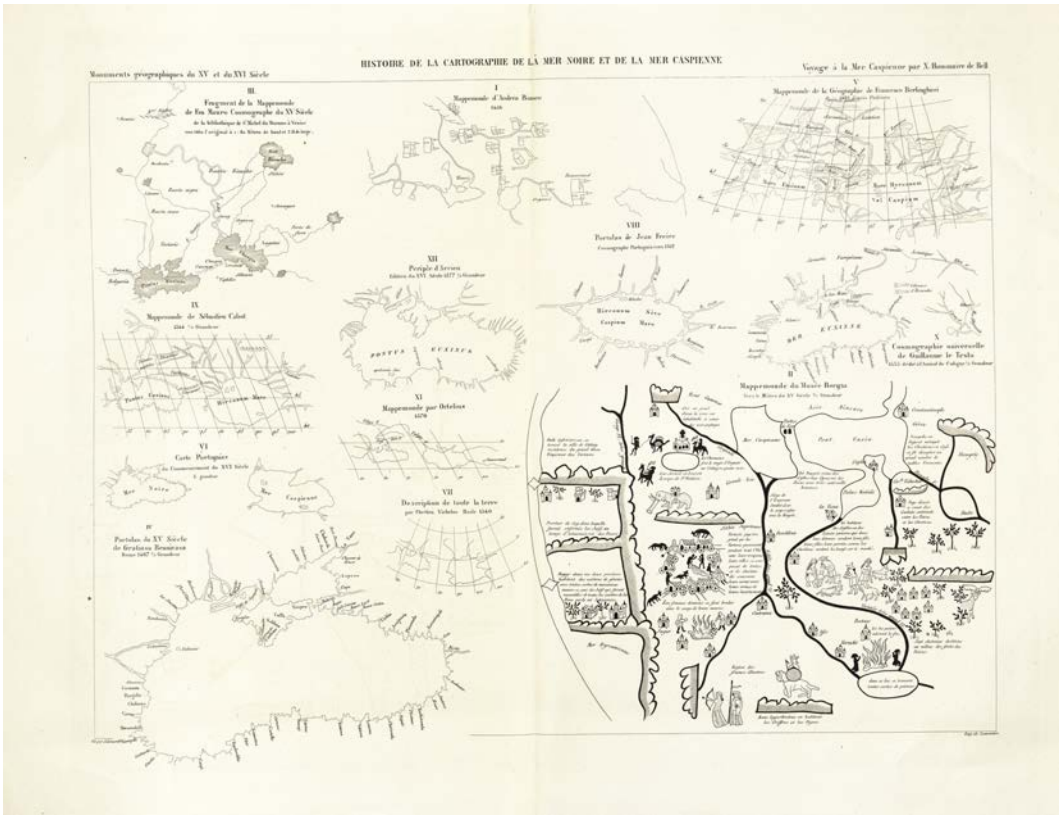

Plate II of the facsimiles.

In the fifteenth century, maps generally remained faithful to the navigators' good delineation of the Black Sea and the Sea of Azov. [20] Yet, as in the previous century, cosmographers varied the configuration of the Caspian basin according to their imagination, or according to their interpretations of travelers' itineraries. Only occasionally, undoubtedly among certain proponents of classical authors, do we see the re-emergence of the traditions that had marked the Anglo-Saxon *mappaemundi* and generally all European maps prior to the thirteenth century. Thus, the author of the *mappamundi* in the Museo Borgiano, [21] while roughly accepting the outline of contemporary cosmographers as well as a host of positive geographical conceptions, while no longer imagining the Caspian to be a gulf of the Hyrcanian sea, reconfigured the history of Gog and Magog **360** and brought the famous Amazons back to life at the foot of the Hyperborean mountains. We do not believe, however, that the scholars who constructed such maps put full and complete trust in all of these wonderful traditions; they undoubtedly recorded them in their works, not as positive and contemporary notions, but as remarkable quotations belonging to a literature of which they were fervent admirers. It would be difficult to explain otherwise the presence of passages, with origins dating back to Herodotus, in the midst of numerous commentaries on the political state of these eastern regions during the course of the fifteenth century.

20. See, pl. II, Andrea Bianco, 1436; Fra Mauro, 1460.

21. Plate II, fig. 2.

Towards the end of this same century [i.e., 15th], a second revolution took place in European cartography following the adoption of Ptolemy's astronomical tables, which, until then unknown, were quickly accredited and popularized in the scientific world by the art of printing. The works of previous cosmographers and the portolans themselves existed only as manuscripts and so gradually escaped the knowledge of geographers; [22] and soon, towards the middle **361** of the sixteenth century, the very precise observations of the Genoese and Venetian navigators were condemned to oblivion and replaced by those, naturally much less rigorous, of the astronomer of Alexandria. The configuration of the Black Sea and the Sea of Azov was then considerably distorted on the maps of the world, [23] and underwent incessant variation. The fabulous mountains of antiquity momentarily regained possession of the plains of Russia. The Caspian Sea, whose true position had been vaguely sensed by Fra Mauro and the author of the Florentine map, lengthened definitively towards the east and its basin was confused with that of the Aral Sea, being fed by the Oxus and the Iaxartes.

22. Many portolans were nevertheless composed during the sixteenth century. But the printing press did not reproduce them, they were used exclusively by navigators, and so remained either ignored or disdained by scholars (see the Cosmographie universelle of Guillaume le Testu, pl. II, fig. 10 (Dépôt de la guerre), 1555; the portolan by Jean Freire, belonging to Santarém, fig. 8; the unnamed Portuguese map, fig. 6, etc.; and also among the portolans possessed by the Bibliothèque royale, those by Rosny, Don Domingo Deuillaroil, 1589, Diego Homen, 1574, etc.).

23. Plate II, world maps by Francesco Berlinghieri after Ptolemy, 1481, and Sebastien Cabot, 1544; the periplus of Arrian, 1577, etc.

The travelers who explored Russia towards the end of the sixteenth century nevertheless quickly made disappear from maps Ptolemy's assumptions about the topographical constitution of the interior of this country. [24] But the Black Sea and the Sea of Azov, closed to **362** European navigators since the [Ottoman] capture of Constantinople, went through the most bizarre configurations from the moment that the observations of the astronomer of Alexandria were found to be faulty, and that true nautical charts were attempted to be constructed from contemporary reports. The Dutch portolans are distinguished among other things by the strangeness of their layout. [25] They excluded the Sea of Azov and the Crimea in the most extraordinary way; gave the Pontus Euxinus a length four times its width;

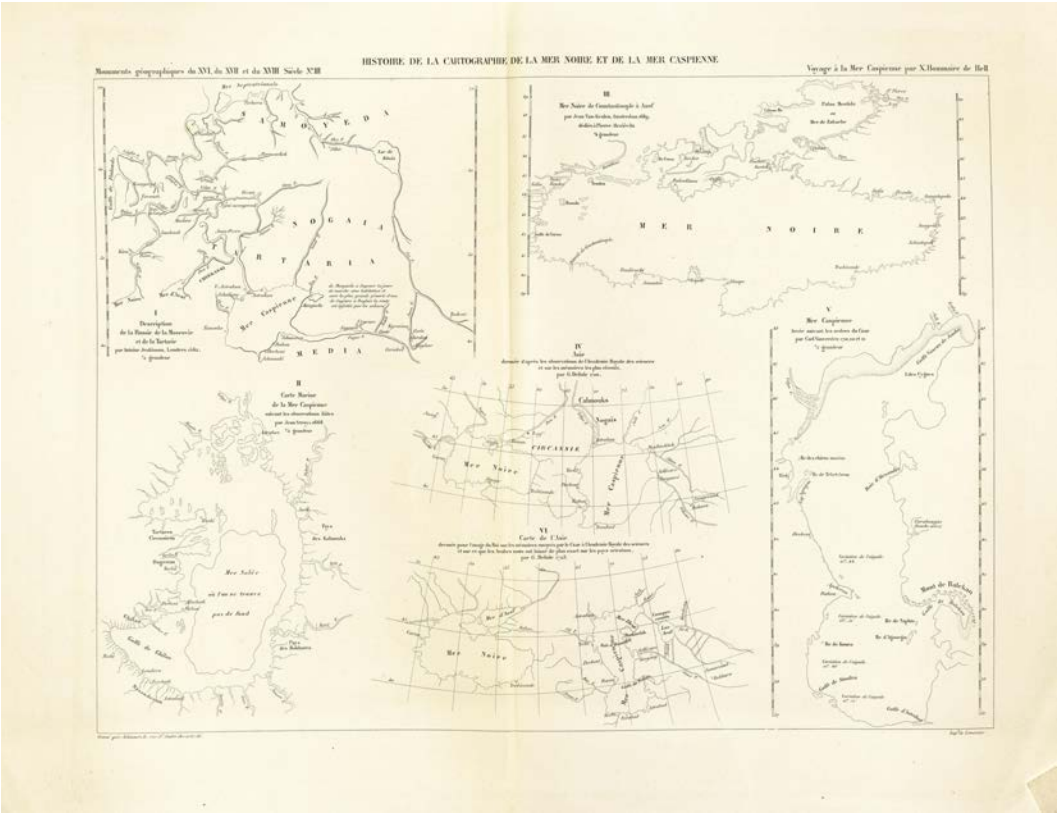

Plate III of the facsimiles.

indicated sandbanks to the east of Snake Island [Insula Şerpilor]; and finally, undoubtedly according to Pliny's statements, they imagined under the name of Samsoun a vast gulf to the south-east of Sinop. Thanks to the Russian conquests and many commercial explorations, the Caspian Sea basin was proportionately much better known. We have already discussed all the modifications its geography underwent at the hands of Jenkinson, Oléarius, Jean Struys, [26] and the hydrographic expeditions ordered by Peter the Great, [27] so this matter need not concern us further.

24. Map of Jenkinson, 1562, pl. III, fig. 1; Vichelus, 1540, Ortelius, 1570, pl. II, fig. 7 and 11. [By "Chrétian Vichelus" is meant, I think, Christian Wechel, who printed Oronce Fine's double cordiform world map in Paris 1531 (Shirley 1983, no. 66), which was republished in Basle in 1540, in an edition of Pomponius Mela.]

25. Black Sea from Constantinople to Azof, by Jean Van Keulen, 1689, pl. III, fig. 3. Doncker's map, 1699, and La Mottraye's map, 1727, are just as flawed.

26. Nautical chart of the Caspian Sea, by Jean Struys, 1668; map by Van Verden, 1710 to 1721; pl. III, figs. 2 and 5.

27. Plate III, fig. 4.

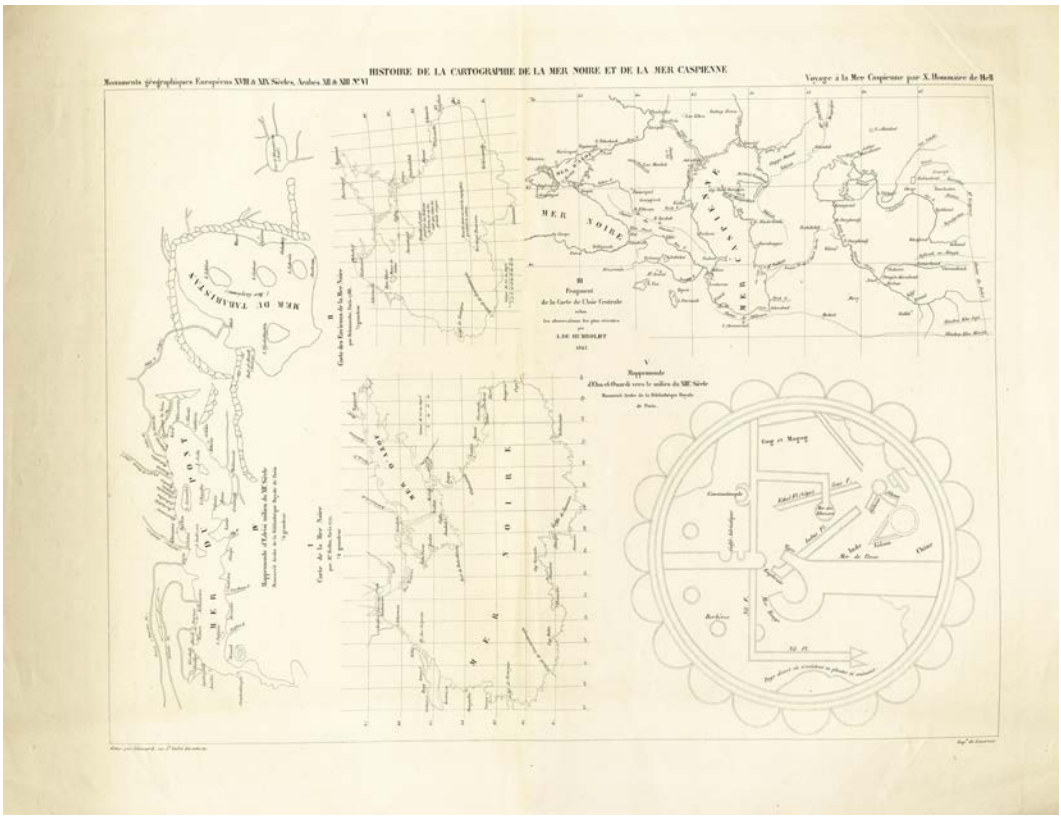

Plate IV of the facsimiles.

The configuration of the Black Sea and the Sea of Azov **363** thus varied for a long time according to the interpretation and the nature of the more or less exact, more or less false, data that the geographers managed to obtain. In 1700, Guillaume Delisle gave the Black Sea an almost quadrangular shape; [28] in 1723, correcting his work no doubt according to the new documents provided by Peter the Great, Delisle came considerably closer to its true form. [29] Around 1777 there appeared, under the name of Bellin, [30] the first nautical chart published in France, although it was far from meeting the needs of navigation. Despite its many shortcomings, it was nevertheless, for a long time, the one and only resource for sailors. Later, in 1788, Delamarche [31] also published a map of the Pontus Euxinus and Palus Maeotis, including within its framework the neighboring regions. But following Bellin's example, Delamarche kept the Gulf of Samsoun, followed exactly the same route for the Black Sea's coasts, and in compensation for a weak rectification in the Sea of Azov, he imagined between the

Crimea and Cape Kérempeh (in the middle of the Pontus Euxinus) two groups of reefs which for a long time terrified navigators.

28. Plate III, fig. 4.

29. Plate III, fig. 6.

30. Plate IV, fig. 1.

31. Plate IV, fig. 2.

With the occupation by Russia of the **364** northern coast of the Black Sea, and with it the inevitable consequences of the development of the imperial navy and the lifting of the ban on travel through the Bosporus at Constantinople, the publication of accurate nautical charts became an urgent necessity. The Russian government naturally took the initiative. However, the hydrographic studies which were carried out in 1806 by Lieutenant Boudistchef, and which served for the drafting of new maps abroad, were still very incomplete and far from being able to meet the requirements of so difficult a navigation as the Black Sea. The total lack of exact works, together with the new commercial activities established between the Mediterranean and the southern provinces of Russia after the Bourbon restoration, led the French government to charge its own officers with the mission of recharting the coasts of the Black Sea. This important work, entrusted to the care of Captain Gautier, was carried out with as much zeal as intelligence and in 1820 France had the honor of providing European navigators with a truly scientific nautical chart.

Since then, the Navy has made yet other noteworthy works. M. Taitbout de Marigny published in 1830 a chart enriched with the most valuable information, thereby forming an indispensable complement to Gautier's map. Finally, after Taitbout the Russian captain Manganari published **365** in different sheets a work as remarkable as it was conscientious of all the northern coasts of the Pontus Euxinus between the mouth of the Dnieper and the limits of the Russian possessions in Asia. [32]

32. This same officer also published in 1833 the best nautical chart that we have of the Sea of Azov.

While traversing the many vicissitudes which mark the cartography of the basin of the Black Sea and of that which we call the Aralo-Caspian basin, we remained absolutely silent concerning eastern writers. We would certainly have greatly desired to be able to venture into the domain of the Arabs, Persians, and Turks. Unfortunately, we are so poor in geographical monuments belonging to these nations—and those we do have are so imperfect, so few, and most of them so out of harmony with the real knowledge of their supposed authors—that we felt it necessary, for the moment, to forbid ourselves any kind of discussion with regard to them. We therefore refer the reader to the two Arabic maps which appear in our Plate IV. [33] He will thus be able at a glance to judge for himself the singular ideas which presided over the drafting of cartographic drawings among eastern peoples.

33. Plate IV, fig. A, map of al-Idīsī from the Bibliothèque royale in Paris; fig. B, map from a manuscript of Ibn al-Wardī, no. 589 [i.e., in the Bibliothèque royale].

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RETHINKING MAPS AND MAPPING AND HOW THEY HAVE DEVELOPED AND EVOLVED

A fairly simple enquiry — how relevant is it to talk about the *development* and *evolution* of maps and mapping? — soon gets wrapped up in questions about the nature of "maps" and "mapping" and therefore how we define maps, cartography, map history, and map studies generally.

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https://www.mappingasprocess.net/blog/2020/12/7/rethinking-maps-and-mapping-and-how-they-have-developed-and-evolved

> "On this primitive map, as the mother tree, was grafted the mathematical map and it is very interesting to observe, for how long a time the wild branches of the mother tree continued to grow up amidst the nobler shoots. There is still a struggle for life between the two types. This struggle was keenly fought in the Netherlands, where the primitive map reached its highest point of achievement. It is one of our aims in this publication to follow that struggle and to go back to earlier maps in order to explain the primitive features of the earliest mathematical maps."

So wrote the Dutch map historian F. C. Wieder in the preface to the first volume of his *Monumenta cartographica* (1925–33, 1:x). This has just become my new favorite-quotation of the moment, being a highly unusual and early statement that models the history of maps on the biological metaphor of **evolution**. Wieder was not explicit, but his metaphors of the "tree," its "branches," and the "struggle for life" plainly reference Darwinian ideas of evolution and natural selection. At the same time, however, there is clear sense of **development**, in that the "primitive map" (one of pictures and iconography) could reach "its highest point of achievement." The two processes were commonly combined in the early twentieth century in ideas of eugenics, seen here in the idea of the "nobler shoots" of the "mathematical map" that eventually won the struggle for life.

For the most part, however, map historians have used metaphors of biological development in writing their narratives of the history of cartography. Wieder's use of a more overt evolutionary metaphor is actually quite rare until the rise of sociocultural map studies in the 1970s and 1980s, when a very few scholars have explicated "evolutionary" models to structure and perhaps explain the history of maps and mapping. The key figure in this respect has been Denis Wood. In studying Wood's use of evolutionary theory, I have found myself finally understanding (I think) his understanding of the nature of "map" and therefore of "map history."

In thinking about the analogical function of biological models in map history, and in pondering

their applicability to a *processual* understanding of maps and mapping, I've therefore found myself thinking about Wood and the nature of maps and mapping. The result is a fairly long statement, one that has grown in odd ways over the months I've been working on it. It's only fair that I give you a quick abstract of its sections:

> Section 1, "Some Definitions and History," is a quick and very basic review of the biological ideas about **development** and **evolution** advanced by Jean-Baptiste Lamarck and Charles Darwin, and how they were irresponsibly combined in the deeply flawed concept of "recapitulation";
>
> Section 2, "Ideas of Cartographic Development," summarizes how the history of cartography has been pursued as a **developmental** process, even when mistakenly called "evolutionary" or "Darwinian";
>
> Section 3, "Denis Wood's Recapitulationism," is a big chunk getting to terms with Wood's arguments that *cognitive* "mapping" is a **developmental** process whereas "maps" have indeed **evolved** and that the history of cartography is a process of **evolution** (I stress cognitive mapping, as Wood's construal of "mapping" is quite different from my own);
>
> Section 4, "Defining the Scope of Map Studies,' considers the implications of developmental and evolutionary analogies in setting meaningful and logical limits to the field of map studies; and
>
> Section 5, "Evolution and Development in a Processual Approach to Mapping and Map History," finally gets, in a rather anticlimactic way, to the question of whether biological metaphors are at all relevant to processual map studies?

1. Some Definitions and History

Let's start with getting the pesky terminology and its history out of the way. The following might seem obvious, and even crude in its generalizations, but please bear with me.

Both "evolution" and "development" are words with long histories that predate their modern adoption by biologists. They are still widely used in their generic meanings as a change of state in a system or process. The system might be landscape, it might be cartography, it might be both:

Justin Sorenson, composite image at head of post, "The Evolution of Cartographic Mapping" (26 January [2018]). J. Willard Marriott Library, University of Utah.

"Development" and "Evolution" tend, in this respect, to be interchangeable. As one map maker recently wrote (in a piece to which twitter serendipitously led me as I was in the middle of the first attempt at writing this short essay):

> An unfortunate side effect is that all our maps start to look the same.
>
> …which can be great for communicating across cultures and regions and ideologies. It gets less great when we think about who gets to define mapping standards and why. Who gets to say what a map looks like? who gets to keep the gates? It also gets less great when we think about how we as humans thrive on—need—diversity and change. And less great again when *we know that our development—our evolution—our ability to conceive of and perceive the world* is shaped by the input we receive. By continually homogenising our view of the world we create an ever shrinking evolutionary spiral, ending up being unable to conceive of different maps. We limit our ways of describing and interpreting the world. (Steer 2020, emphasis added)

A further element of unclarity is the assumption that cognitive maps (a metaphor, only ever a metaphor) and maps are intimately or even directly related; this is a key tenet of the individualist preconception of the ideal of cartography (Edney 2019, 64–73). In the passage just quoted, it is not entirely clear whether it is individuals, humanity, or maps that are changing/developing/evolving. But then, Steer's purpose is to blur these categories: after all, his theme is, "we map because we are maps, we are maps because we

map."

As an academic, I try to be precise in my language, or at least consistent in my terminology. (Although I can't say that I succeed! And terminology can be slippery, and usage can shift over time even in one's own writing.) The issue is that when modern scholars write about evolution and development, they always draw on their *biological* meanings, whether explicitly or implicitly. It therefore behooves us to be precise in our usage:

> **Evolution** is the process whereby populations (of bacteria, fungi, plants, animals, etc.) change their characteristics over time.
>
> **Development** is the process of change of an individual or of one thing (like landscape). In growing, maturing, and aging, individuals develop physically and cognitively, becoming more articulated and specialized. While development is necessarily directed by the individual's complement of genes (nature), it is by no means so determined and is heavily shaped by external conditions (nurture).

1.1. Jean-Baptiste Lamarck (1744–1829)

That plant and animal species evolve over time was recognized in the later eighteenth century, at the same time as the Biblical chronology of a six-thousand-year-old Creation was replaced by an understanding that the earth is perhaps even *billions* of years old. Early in the nineteenth century, the French botanist Jean-Baptiste Lamarck proposed a mechanism for how evolution occurs. Central to his necessarily complex model was the idea of "the inheritance of acquired characteristics": an organism adapts in order to live in a new or changed environment, and then passes that "acquired characteristic" onto its progeny, which inherit it. Note that Lamarckian evolution requires change to happen *within* individual organisms.

Lamarck could not suggest a precise motive force for evolution and, in line with the era's Romanticism and the concept of *Zeitgeist* as the spirit that drives an age, argued that the whole biological system is driven by the "power of life" which causes the continual creation of filaments of life.

Lamarckian concepts of evolution are what gave credence to the climatic (or more generally physical) determinism that in turn gave intellectual cover for Western nationalism and imperialism in the nineteenth and twentieth centuries. Early sociologists, notably Herbert Spencer, in particular sought a model to help explain the complexity of interactions within societies and saw an especially productive analogy with the biological organism. The model was productive in that modeling societies as organisms justified emergent ideas of the "nation," as the expression of the unity of culture and society, and also seemed to explain scientific credence to the long-established religious, economic, and educational arguments that all cultures pass through predetermined stages by recasting the sequence in terms of "racial" capacities. This last application of Lamarckian models further undergirds the widely held but incorrect conviction that evolution somehow follows a guided or preordained trajectory toward some

goal of perfection, driven by some motive power.

The adaptation of Lamarckian biological models to explain social function also led to what many people insist, mistakenly, in calling "Social Darwinism." The underlying concepts of that idea were developed before Darwin ever published; it was, for example, Spencer who coined the phrase, "the survival of the fittest" in 1852.

1.2. Charles Darwin (1809–82)

Charles Darwin did not "invent" or "discover" the concept of evolution, as many people seem to believe, but proposed a novel mechanism to explain how change occurs in organisms: **natural selection**. His particular insight—and also Alfred Russell Wallace's—was to shift the mechanism of evolutionary change from the individual to the population.

Recognizing that individual members of a population vary in their particular characteristics, Darwin argued in *On the Origin of Species* (1859)—and later in the explicit context of humanity in *The Descent of Man* (1871)—that as environmental conditions have changed over long periods of time, so members of a population that possess certain characteristics that are beneficial in helping them live will be more likely to survive to pass on those characteristics. Over time, those beneficial characteristics will become more pronounced in a population, perhaps ubiquitous. Natural selection is probabilistic. The principle does not imply that an individual organism that lacks a beneficial characteristic will not survive to reproduce, only that it is less likely to do so.

Darwin could offer no explanation of why variations should exist in the characteristics of individual members within a population. By the early twentieth century, biologists had identified DNA as the bearer of genetic information, and of course the post-war discovery of DNA's double-helix form allowed for the identification of precise mechanisms of genetic change and mutation in individuals that work in ways that Darwin could never have imagined.

The biomolecular foundations of mutation and inheritance precludes the possibility that evolutionary change happens through changes within individuals. Much has been recently made of the idea that prolonged and intense biological stress can modify DNA, but such modifications seem not to persist for more than a few subsequent generations. Lamarck's model of evolution is thoroughly discredited by biologists, together with all its implications and applications. Its analogical applications must also be discarded, if only for the seriously iniquitous practices they have sustained over the last 200 years.

Biologists have advanced and debated other population-level mechanisms that can account for the preferential selection of characteristics within a population, notably altruism, but there remains general acceptance that natural selection is the dominant process. There is also nothing in population-level evolution that can be identified as a guiding force/spirit/ethos/motive. At the same time, there is nothing that says that *only* beneficial characteristics can be inherited, or that characteristics are necessarily

the result of natural selection. There is, by definition, huge variation within any given population, sustained by constant mutations introduced through the process of reproduction; the relationship of the individual to the overall population remains statistical, not determined.

1.3. Recapitulation

Several biologists, most famously Ernst Haeckel (1834–1919), complicated matters no end by relating individual development to population evolution. At least in terms of the development of embryos, Haeckel argued that "ontogeny recapitulates phylogeny": the individual's biological development (ontogeny) repeats or rehearses the same stages through which the parent population passed in its evolutionary development (phylogeny). This "recapitulation theory" relied heavily on Lamarckian principles but sought to apply them to Darwinian ideas of speciation. While refuted early (and often) within biology (Gould 1977), it has unfortunately had something of a tenacious hold in the humanities and social sciences. It seems to linger especially in cognitive development circles (follow the last link to the Wikipedia entry to see an example from 1994).

There has long been a recapitulationist edge to the ideal of cartography. Several of the ideal's preconceptions suppose that each act of map making parallels or repeats the manner in which cartography as a whole had developed. The practice of drafting a map in manuscript before being printed, for example, is held to repeat the manner in which the manuscript reproduction of maps gave way to their print reproduction (Edney 2019, 26, 78, 93, 180). Recapitulationist suppositions have not ended with the rise of sociocultural map history. In particular, the equivalency commonly drawn between indigenous mapping in the present and preliterate mapping in the distant past (see below) has sustained a commitment to the individual's expression of their internal, cognitive map as an external, sketch map as the "basic act of mapping—both the *Ursprung* of the cartographic endeavor and the impetus of each act of mapping" (Edney 2019, 71).

I am automatically leery of the use of recapitulation theory because, while it sustains what seem to be profound arguments, it allows scholars to not actually address the mechanisms involved.

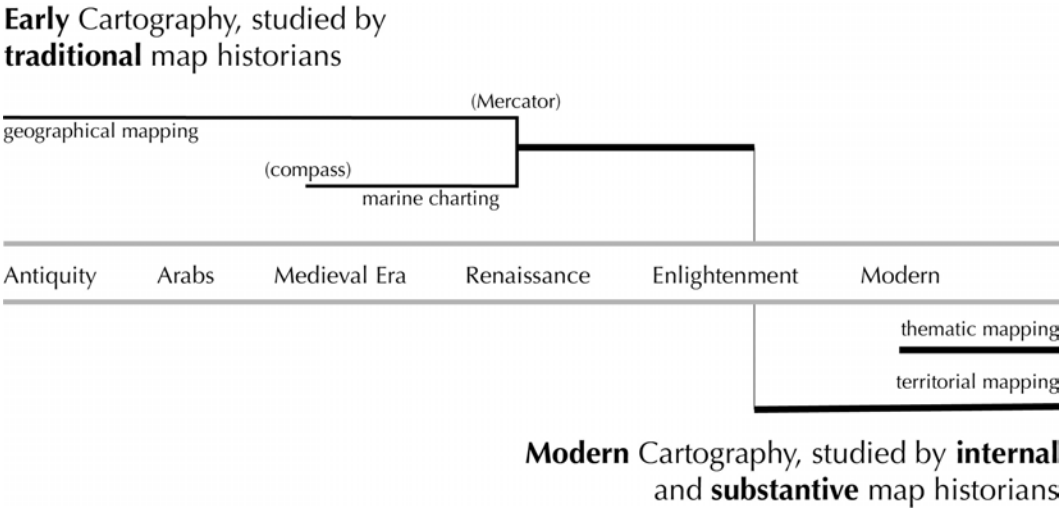
2. Ideas of Cartographic Development

2.1. Unilinear and Progressive Trend of Cultural and Cartographic Development

Beginning in the early nineteenth century, even as the concept of "cartography" was formulated and increasingly accepted (Edney 2019, 114–20), the history of cartography was written in line with theories that every culture (like an individual) passes through a set sequence of developmental stages. These theories, in line with Lamarckian and Spencerian models, conflated the individual with the population, holding that social development was an expression of individual attainment. The making of maps

indicated that a culture had attained a civilized state, and the nature of those maps positioned the culture on the ladder of civilization. (I address this topic in part in Edney 2020 and more thoroughly in the next book.)

Narratives of the history of cartography within Western society structured that history as a series of stages through which each map-making culture passed. The stages were rungs on a single ladder of progress leading to the modern state of cartographic perfection. Here's a schematic diagram that I developed for my 2011 presentation to the International Conference on the History of Cartography:



The "early" cartography that traditional map historians studied comprised two lines of geographical and marine map making practices that were seemingly united by Gerhard Mercator with his famous world map of 1569, and thereafter formed a single line until the "reformation" of cartography in the eighteenth century; at that point, modern cartography featured fine-resolution territorial surveys and thematic mapping that comprised the subject matter of internal and substantive map historians (also Edney 2014).

2.2. Development Mistaken for Evolution

In their manifesto for a new, sociocultural history of cartography, Michael Blakemore and Brian Harley (1980, 17–23) called this dominant metanarrative the "Darwinian paradigm" of the history of cartography. (On their quite incorrect use of "paradigm," see Edney 2019, 23–24). Their use of "Darwinian" was, with hindsight, quite ill-advised because they were really dealing with a developmental rather than evolutionary process: as they admitted as they began their discussion, the "basic premise" of the "Darwinian assumption" "seems to be that as civilization improves so map-making also progresses…through 'stages of development'" (Blakemore and Harley 1980, 17).

At one point Blakemore and Harley (1980, 20) asserted that the ICA project to produce a glossary of past cartographic innovations (Wallis 1976; see Wallis and Robinson 1987) revealed "a tendency to trace back innovations through the evolutionary tree to their common ancestor (a fundamental Darwinistic assertion)." However, the ICA project was very much still in the developmental mold of a progressivist history of cartography, made no reference to evolutionary trees, nor sought to understand cartographic technologies in a branching manner.

Part of the problem, of course, is that colloquially "evolve" and "develop" seem interchangeable: Blakemore and Harley supported their terminology by citing examples of map historians using "evolve" when they should more properly have used "develop" (as Goode 1927; Brown 1949, 12). Really, what Blakemore and Harley highlighted was a progressivism that had nothing to do with evolution, let alone Darwin's concept of natural selection. Rather, it was an understanding of development that was thoroughly implicated in the Lamarckian and thoroughly racist claims of Spencer and his ilk.

3. Denis Wood's Recapitulationism

3.1. Development and Recapitulation

The primary work that Blakemore and Harley took to suggest the existence of an evolutionary metaphor or analogy within the study of map history was Denis Wood's (1977) study of the history of hill signs, which he had presented to the International Conference on the History of Cartography, held that same year in Washington, D.C., and then published in the Library of Congress's journal, *Prologue* (both versions are available here). Paul Harvey was prompted by Wood's presentation and publication to structure his innovative history of topographical mapping (1980) along lines suggested by Wood's analysis.

But, as Wood (in Dahl 1982, 73–75) quickly pointed out, his own study had been "explicitly *developmental*" in character, not evolutionary. Wood had been studying the ways in which children and young adults in the USA drew hills in sketch maps—in profile, obliquely, and in plan—as they developed cognitively and he made the radical comparison of these with the history of the development of landform representation in human culture as a whole. Because he was concerned with intellectual change in culture, rather than biological, Wood referred not to phylogeny but to ethnogenesis.

Wood advanced the recapitulationist argument that there existed a

> striking parallel between the development…of hill-form types in [sketch maps drawn by] contemporary Americans with the development…of hill-form types in the history of mapmaking as a whole.

This parallel manifested in degrees of abstraction and genericness,

> In each instance the hill form is initially a concrete picture of a hill, medially an abstraction

> based on the shadow-throwing property of hills, and finally an abstraction founded on the abstraction of elevation [i.e., height above a datum]. In both cases the hill form starts out as a generic hill, as any hill and as all hills, becomes differentiated into types of hills—isolated, rolling, foothills, mountains—and ends up capable of representing uniquely any instance of whatever character or magnitude of relief. In the beginning in both cases the hill is represented as seen from the egocentric perspective of the typical human, frontally, in elevation [i.e., profile]; later it is represented as seen from the perspective of a bird's eye, and finally is shown as seen directly overhead, as if from an airplane. (Wood 1977, 158)

Wood relied on a graphic argument to validate his recapitulation, displaying ontology and ethnogenesis in two graphs. First, a graph of the ethnogenesis of hill signs, in which the vertical axis (to be read from top to bottom) marked the cultural development of hill signs, from profile to oblique to plan, the horizontal axis showing time (fig. 1).

Second, a graph of the ontogenesis of hill signs, in which the vertical axis indicated kinds of hill signs, again sequenced from profile to oblique to plan, and the horizontal axis age of the test subjects. (For non-US readers: add 5 or 6 to the grade to get the child's age; e.g., 12th grade is age 17–18 years.) The cells in this matrix indicate the number of times (as a percentage of occurrences) a particular school sign was used by test subjects in each age group (fig. 2).

Significantly, Wood diverged from the unilinear trend of cultural development by arguing that each category of hill sign was not displaced by successive categories, but rather that they continued in use and coexisted with later categories. Thus, in Wood's ontogenetic figure, the test subjects who were graduate students used profile, oblique, and planar signs to represent hills and single subjects used different forms of hill sign on the same sketch map. (At least, that's how I read the values provided in this figure.)

Importantly, Wood provided a mechanism for this recapitulation, specifically, education and training in map making. As new map making techniques are developed and as map making becomes progressively more sophisticated (ethnogenesis), so education and training disciplines the individual cognitively so that more sophisticated techniques are progressively adopted with continued exposure to education (ontogeny). The mechanism was feasible and, by explicating it, Wood avoided any unwarranted Lamarckian inferences.

Unfortunately, when Paul Harvey adapted Wood's categorization to structure his history of topographical mapping in three parts, each addressing a kind of topographical representation—symbolic, pictorial, and surveyed—he also reintroduced presumptions of unilinear development:

> It is an odd (though explicable) fact that some of the oldest maps to be discussed…are among the most advanced, belonging to the third phase of development [surveyed], while most of those discussed from the first, primitive, phase are relatively recent. (Harvey 1980, 26)

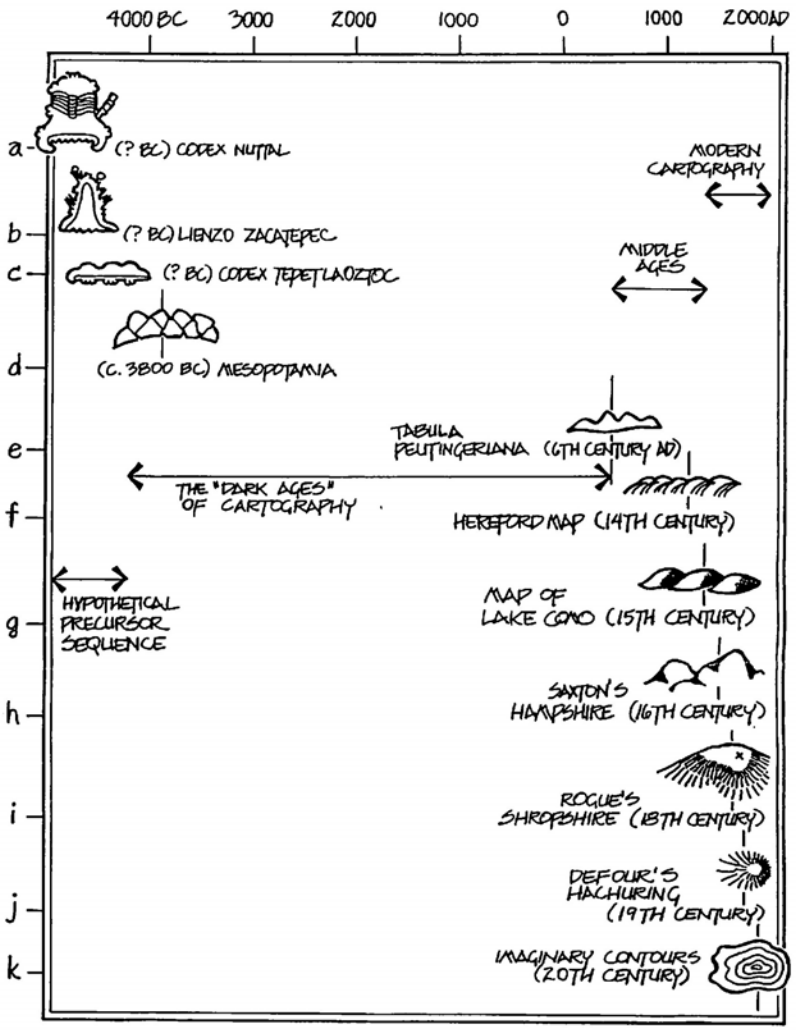


Figure 2. The ethnogenesis of hill signs. The hypothesized precursor sequence is that illustrated in figure 1.

Figure 1. Wood (1977, 154): "The ethnogenesis of hill signs"

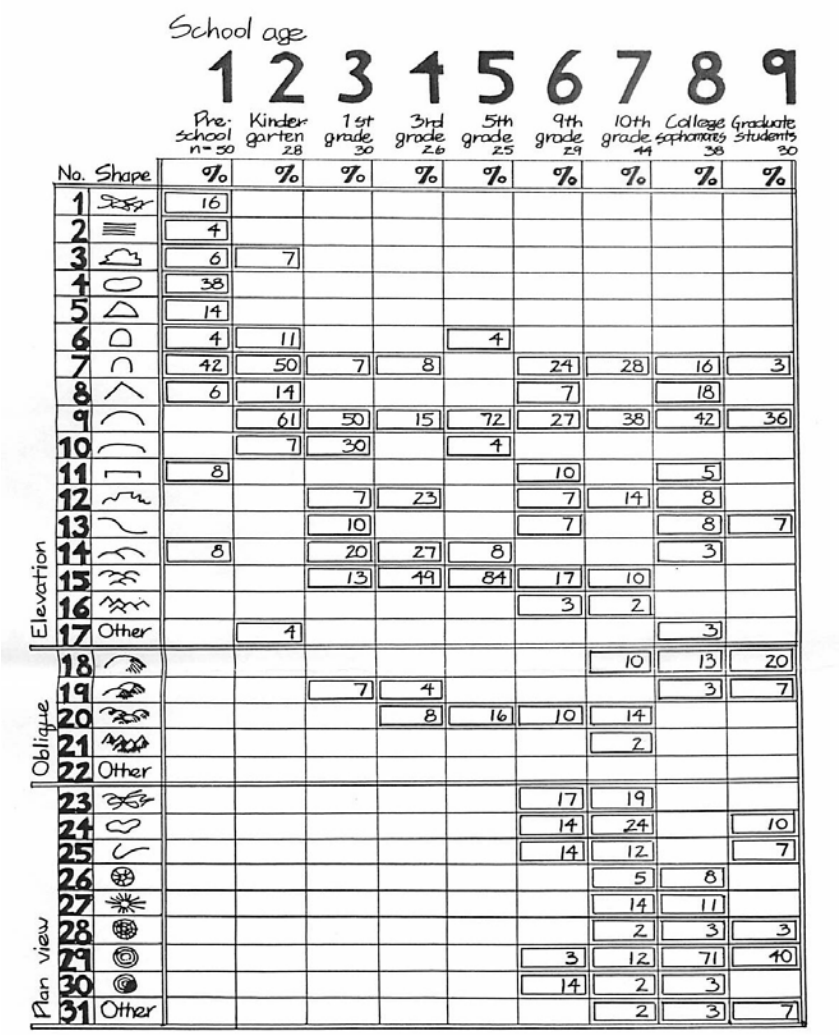


Figure 5. The ontogenesis of hill signs. School age is shown on the horizontal axis; hill-sign type, on the vertical.

Figure 2. Wood (1977, 159): "The ontogenesis of hill signs."

Harvey's use of "advanced" and "primitive" indicate that he was still working in, or at least influenced by, the traditional narrative of maps as markers of location on the ladder of progress and civilization.

Much of Harvey's difficulty lay in the selection of signs Wood deployed in his neat and seemingly authoritative ethnogenetic graph. The appearance of different kinds of hill signs was never so precise; if one fitted error bars to Wood's ethnogenetic graph, they would completely overwhelm the trendline. Moreover, dating the early meso-American hill signs to 4,000 BCE is wildly inaccurate and seems only to justify the preconceived notion that profile signs must precede oblique signs must precede planar

signs. Certainly, the graph of the ethnogenesis of hill signs collapses *all* cultures into a single line of development. Sound familiar?

Indeed, by giving such early dates to the meso-American hill signs, Wood rehearsed the circular argument implicit in models of linear cultural development, that all early/primitive cultures are the same, regardless of when they existed, so that a contemporary or recent early culture stands in for early stages in the past of cultures that have attained higher degrees of civilization (but that lack evidence of those early stages), requiring early cultural forms from complex cultures to be dated early. Wood's model of ethnogenesis is fundamentally flawed; without it, his recapitulationist argument collapses.

3.2. "Mapping" Develops

Wood expanded on the developmental model of mapping in later work, but in doing so kept the focus of analysis to particular cultures (Wood 1992a; Wood 1992b, 28–47; Wood 1993). His basic argument was that maps themselves do not develop in a biological sense, beyond the process of their production in which a map might be steadily elaborated and articulated over time. He used the example of J. R. R. Tolkien's creation of the map of Middle Earth that "grew" over several years as Tolkien added more sheets to manage his ever-expanding creation (see McIlwaine 2018).

What does develop, Wood observed, is an individual's physical and cognitive abilities to experience and understand the world in which they live and then to express that understanding in some manner. For Wood, this individualistic process of cognition is "mapping." It is a much more restricted understanding of that term than I use, which is why the word is in scare quotes in the heading to this short section.

As an individual's capacity for mapping develops, so does their ability and propensity for making maps, an ability and propensity shaped by their education and training. In this last respect, Wood identified the economic nature of a society as the key determinant of how people develop as map makers, whether they live "map immersed" in modern industrial societies, constantly surrounded by examples of how maps should look, or in much less articulated and specialized societies with far fewer occasions for map use and therefore map education.

3.3. The Evolution of "Maps"?

But if maps don't develop, Wood (1994) argued, they do evolve. Wood made this argument in an essay review of two of Paul Harvey's later works on medieval maps (Skelton and Harvey 1986; Harvey 1991). Wood argued that in those works, as in his 1980 history of topographical mapping, Harvey had pursued an essentially evolutionary form of thinking:

Because Harvey saw maps *evolving* from map*like* antecedents, rather than simply getting

> better or worse with time, what he chose to regard as maps continuously evolved as well. Harvey was explicit about this: "As the reader may or may not have noticed—we have silently adjusted our idea of what is and what is not a map as we have moved to different cultures and different ages" [Harvey 1980, 101]. This disturbed some reviewers, but since it is apodictic that maps as we know them today did *not* spring full-born from the brow of early humans (any more than the car, the comic book, or the skyscraper), their antecedents doubtless *were* map*like* rather than just more or less accurate versions of what we call maps today. It follows from this that the further back in time the origins of maps are sought, the less and less likely it is they should resemble the maps we know today (the less and less likely it is they *were* the maps we know today). This is thinking about evolution the way biologists do. Harvey's construction of the history of maps from map*like* antecedents is like the story we tell about human evolution, which is less one of *humans* changing from one form to another (so called vertical change), than of human *speciation* from antecedent *pre*human forms (from some ancestor common to us *and* the contemporary great apes, from some earlier mammalian predecessor, from…*single-celled protozoa*). (Wood 1994, 52)

For Wood, the history of cartography—or, rather, the history of maps—should be understood as being implicitly evolutionary. He provided a useful set of diagrams modeled on evolutionary tree diagrams to show the different approaches:

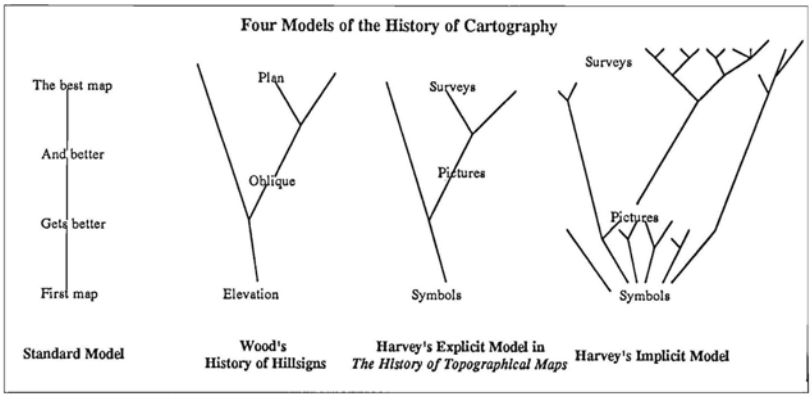


FIGURE 1. *Schematic representation of four models of the history of cartography.*

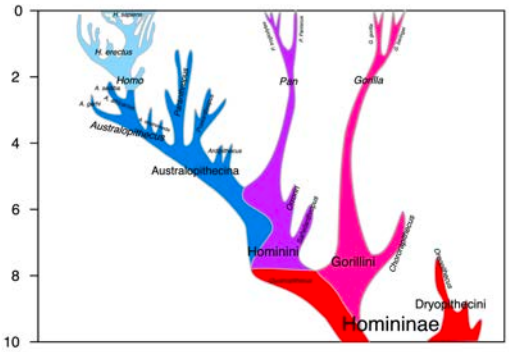
Wood (1994, 55): "Schematic representation of four models of the history of cartography"

From the left: the progressivist sequence of unilinear development; Wood's own 1977 model of hill signs (which he now understood as having been limited); Harvey's 1980 understanding of the history of topographical maps; and (at right) Wood's extrapolation based on the evidence of Harvey's later works of a model that is more akin to a biological model in which there is "diversification" of forms but also their periodic "decimation" (Wood 1994, 55, quoting Gould 1989, 46–47).

It is crucial to Wood's argument that maps today are not the same as maps in the past, in the same way that *homo sapiens* are not the same as other Hominini (chimpanzees or *australopithicus*) or other

Hominidae (like orangutans and gorillas) or other mammals. Wood thus rejected the definition of "map" advanced in the first volume of *The History of Cartography*—that maps are "graphic representations that facilitate a spatial understanding of things, concepts, conditions, processes, or events in the human world" (Harley and Woodard 1987, xvi)—for being so generic as to be over-reaching. One might as well include cats in a study of humans!

Wood uses Harvey's evidence, and that also offered by Richard Talbert (1991) for the Roman world and by certain essays in David Buisseret's (1992) volume on mapping in the early modern state, to argue that "the map" is a creation specifically of the Renaissance, the modern state, and of capitalism. Before then, before the development of an appreciation for the idea of "the map," there were only sporadic and specific occasions in which something map*like* would be made to fill a particular need, as a one-off work, and not as part of a concerted and self-aware endeavor of cartography. That is, for Wood, "maps" are strictly modern, surveyed images; cartography is the modern endeavor. In studying the evolutionary precursors of "the map," one must clearly distinguish them as precursors to and not as the same species or even genus as "the map."



There are several problems with Wood's evolutionary model. To begin with, on a relatively minor point, his preferred (rightmost) diagram fails to capture, to my mind, the manner in which some older map forms persist even as others died out. A better kind of image is the kind of genetic tree offered more recently by evolutionary biologists, such as this "Model of the phylogeny of Hominini over the past 10 million years." Vertical axis: millions of years BP. Source: wikidata.org

More important problems are as follows:

• the model perpetuates the ideal's individualistic preconception in its insistence that maps are direct expressions of the map maker's own experience.

• Wood based his model on evidence and theorizations that pertain solely to the detailed, fine resolution maps of place (topographical mapping) and has *nothing* empirical to say about other kinds of maps, such as marine, regional, world, or analytical maps.

• Wood's vision of "map" is as limited and partial as that of scholars who adhere to the normative conception of maps as factual statements about the world. In this respect Wood perpetuates the observational preconception of the ideal of cartography, that all maps are properly based on the observation and measurement of the world (Edney 2019, 76–83).

• like others who pursue sociocultural approaches to maps and mapping, Wood argues that "cartography" is a product of the European Renaissance, and that other cultures have

made only map*like* works. However, it is clear that the ideas of "map" as a singular category of image and of "cartography" as the endeavor of making such maps are the creation of post-1800 Western culture (Edney 2019).

• Wood's is an Anglocentric approach, in that it is based on the distinctiveness in the English language of "map"; it only has one other meaning, for "rabbit," used only in northern English and Scots and of uncertain etymology (OED *map, n.2*). In other European languages, words that are translated as "map" are for more semantically complex. In French, for example, *carte* very much retains its original sense as "paper" and refers to a wide variety of things, of variously official nature, produced on paper, from restaurant menus, business cards, to manuscripts, to government decrees.

• conversely, harking back to the idealization of "map" after 1800, there are other words widely used for different kinds of map, even in English: chart and plan.

• Wood avoids the question: if maps evolve, what then is the mechanism of evolution? What's the cartographic equivalent of DNA that is susceptible to variation? What is the mechanism by which certain variations become dominant? The model is thus descriptive rather than explanatory.

• the model only makes the established metanarrative of the history of cartography more complex and does not do away with it; it maintains the Western-imposed artificial sequence of ancient to medieval (bypassing the Arabs!) to modern practices.

• ultimately, Wood's model does not challenge the idealization of cartography.

This argument revolves around the core of Wood's position vis-à-vis defining maps and cartography and their history. For Wood, "the map" is specifically a graphic that possesses a sign plane in which the *position* of signs in that plane bears significance (i.e., denoting location; Wood and Fels 2008, xv–xvi). This is an absolute. It does nothing for Wood to consider a piece of landscape art as a map, nor a geological cross-section, nor an aerial photograph. This is the problem with Harley and Woodward's (1987) definition: it's just too broad, too encompassing. It might have been a valiant attempt to overcome the existing, narrow parochialism, but it went too far and was too catholic (compare with Andrews 2007).

4. Defining the Scope of Map Studies

4.1. Wood's Absolute Delineation

There is a key implication for Wood's strict position, which became clear in his review of Jordana Dym and Karl Offen's *Mapping Latin America* (2011). Taking exception to the breadth of images discussed by contributors to that volume as a marker of the influence of Harley and Woodward, Wood let rip at the

very conception of the edited volume:

> Harley and Woodward's reactionary definition was ridiculously capacious, failing to distinguish a map—with its singular logic—from almost any other graphic—with their individual [different] logics—drawings, paintings, photos, diagrams, graphs; failing to distinguish a map from, say, one of William Playfair's statistical graphs, from a watercolour by J. M. W. Turner (say, his *Upper Falls of the Reichenbach*), from one of those oil sketches by Willem de Kooning (*Rosy Fingered Dawn at Louse Point*), from one of Richard Misrach's luminous ocean photographs, from a satellite photograph, or from one of Richard Diebenkorn's paintings of Ocean Park.
>
> This is throwing away the map to save it, ignoring its peculiar power to demonstrate its pervasiveness. It begs the very question, If it's just a graphic text that can be analysed to reveal something about space, why then, in this book, so narrow a focus on so particular a subset as…*the map*? Why not a Latin American equivalent of Kivelson and Neuberger's *Picturing Russia: Explorations in Visual Culture?* (Wood 2012, 137)

The issue is profound and at one time certainly troubled me. How does one legitimately delimit the field of map studies or, in my particular case, the field of map history if "map" is up in the air?

An adherent of Harley and Woodward's definition, as I once was, faces a quandary: even as one pursues new and interesting studies, as per Harley and Woodward, one continues to define the limit of those studies—the limit of one's field of study—by unacknowledged and unexamined concepts about "maps" and one runs the profound risk of simply perpetuating the long-established, narrow and restrictive range of things that were once privileged as maps. How does one delimit—de-fine—the field in an intellectually appropriate manner?

Wood's solution is to insist on cartography's ontological preconception, that what characterizes all maps, if they are to be maps, is the "singular logic" of their signification of location. Anything else is just another kind of graphic. By this standard, verbal maps are not maps. (They're part of the cognitive mapping process, although expressed through the semiotic medium of language…but they do inform about location, perhaps through relative cues rather than the absolute system that Wood wants for locational signification.)

4.2. Prototype Theory

Another solution is to use the prototype theory advanced by some linguists (esp. Lakoff 1987) to define "maps," as has been done by some map scholars (Vasiliev et al. 1990; MacEachren 1995). This model suggests that there is a "prototype" conception that defines a noun, around which is a field of acceptable noun-ness. So, there's some concept "map" against which one can compare an image, and if the image is "close enough" and falls within some threshold of map-ness, then it's a map. If not, it's not a map. Vasiliev et al. (1990) sought to clarify the elements that together constitute the prototype, although to

my mind they only ended up reifying the modern idealization of the normative map: their test subjects identified map-ness according to how they had been taught to think of maps.

I'm not sure if Lakoff's prototype theory is still widely accepted among academic cartographers. But the theory does seem to model how sociocultural map scholars have intuitively modeled their understanding of "map" and "cartography" since the 1980s. That is, as they reject the normative restrictions placed on maps, they have effectively expanded the map/not-a-map threshold so that an ever greater conceptual region is included, yet still without wondering too much about the prototype. (I referred above to Wood's definition of map as being absolute because it effectively constructs a threshold that is coincident with his prototype.)

This is also a situation facing other arenas of scholarship. Art history, in particular, has a long history of struggling to define "art" and therefore the field of "art history." Art historians have wondered, for example, whether it makes sense to use the conception of "art" developed in the eighteenth century for all of human history (Shiner 2001). They have realized that the vast majority of images made in human history are informational in nature (including maps), so that "visual expressiveness, eloquence, and complexity are not the proprietary traits of fine art," so what then becomes of art history (Elkins 1995, 553)? Indeed, in looking at the original emergence of "art" as the practice of making meaningful marks, an archaeologist understands art to have emerged from visual communication generally, in the second communication revolution within human evolution (after speech but before writing: Davidson 2020). In all these cases, disciplinary definitions are steadily expanded. I don't know enough about art history to know if philosophical delimitations have expanded so far as to reach a breaking point, but they have for cartography.

4.3. Map Studies are Delimited by Mapping Processes, not Maps

When I still thought that "cartography" was a valid conception, rather than an idealization, like Wood I had a hard time with the idea of leaving such a fundamental point unexamined as the nature of maps. Cartography is defined as "map making," so what is cartography if the prototypical map is uncertain? Harley and Woodward (1987) proposed an amorphous prototype; Woodward and Lewis (1998) made the prototype still more ineffable by including ephemeral forms of maps. What then *is* cartography? What would be included in a history of cartography, what not? Logically, one can be *either* catholic in one's understanding, in which case one must own up to really engaging in "visual culture," *or* one adopts a clear and unambiguous definition of map and delimit one's studies accordingly. Wood is thus hostile towards scholars like Dym and Offen who he thinks want to have it both ways.

What I have realized, as I continue to wrap my head around the fact that "map" and "cartography" are idealizations, is that this philosophical problem of ring-fencing and definition is not actually a problem. At least, it is only a problem when couched in terms of cartography, in terms of some big universal endeavor, and of map, as a graphic characterized by a particular, singular logic. Neither

conception is historically valid. In getting past the hegemonic mindset of "cartography," it is necessary instead to think in terms of mapping, as the (any) process of "representing spatial complexity," and of map as any semiotic text "representing spatial complexity" (Edney 2019, 41). Maps are the epiphenomena of the processes by which spatial complexity is comprehended and communicated and utilized. In this respect, I see multiple kinds of maps made in different ways (not only graphic) to different ends and for different communities.

Only by conceptualizing the subject as broadly as possible, far more broadly than Harley and Woodward (1987) and as broadly as Woodward and Lewis (1998), is it possible to get beyond all the pesky problems that happen when one draws a boundary around a subject. Wood (with John Fels) distinguishes between *map*; *perimap*, which is to say all the material on the same surface as the map but lacking its propositional logic of denoting location; and *epimap*, which is to say all other the images and objects that conceptually surround the map and give it context. Perimap and epimap together constitute the *paramap* (Wood and Fels 2008, 8–12). The problem is that it is difficult (if not impossible) to establish the signification of a map (so defined) distinct from the perimap; the signification of maps bleed off the edge of the paper and into the surrounding book and into other semiotic texts. The boundaries, seemingly neat and orderly, dissolve.

Such uncertainty arises every time we construct a boundary around any intellectual construct. What is a work of art? (I appreciate Davidson 2020's comparison of a mural by Banksy and a structurally similar advertisement; the former ceased being mere property-damaging graffiti and became art once Banksy was accepted as a creative genius, the latter will never be considered as art because of its overtly commercial and consciously designed nature.) What is a book? What is the discipline of geography, or history, or physics? What is literature? What is a university? What is a language? What is literacy? What is the USA (Immerwahr 2019)? And so on, and so on, *ad nauseam*.

So, three options:

1) We can throw up our hands in disgust, and resort to the intuitive, prototype-theoretical practice, say, "I don't know what X is, but I know it when I see it," and then trust in our abilities to be as inclusive and as critical as possible.

2) Or, we can construct precise definitions and then engage in lengthy battles to preserve the intellectual field we have thereby created, as Wood.

3) Or, and this is the fundamental point of so much intellectual work about "social construction," we accept that everything is messy because people behave in messy ways, and through their communal behavior constitute society itself.

I recommend option 3. It is not enough to say that things are socially (politically|ideologically) defined, as if society somehow exists to shape and define things. Rather, it is by doing things, from living in and communicating about the world, in expressing ourselves through graphic imagery (and through words, and in sculpture, or video), that societies and cultures are made (Latour 2005).

Everything is a process.

Art is a process, or should it be "artification" to prevent the confusion offered by "art" as a thing (Shapiro 2019). (Maybe "arting"?)

Mapping is a process, a process of communicating and learning about the world, of producing, circulating, and consuming maps that inform about the world and its nature. Not only to locate things, although much mapping has that task, but to develop organizational schemas that are shared within particular communities.

So, yes, mapping is a social practice, maps are social constructions. That does not mean—just to head of the usual, tiresome criticism—that there is no objective truth and that everything is subjective. Such critique is, to me, an especially willful misunderstanding of such "constructivism." The social construction of science does not deny that there are fundamental truths about the world (2+2=4; e=mc2) but that the entire apparatus of science is done by and for particular groups of humans, and that communally defined conventions govern scientific work, not just personal genius or insight. I, too, want maps to show me how to get from where I am to some other place I want to be, but I am not going to insist that because *some* things that are manifestly maps serve a navigational function, that *all* maps should have a navigational and factual essence. There are a multitude of maps, created and used within a multitude of communal contexts—not individual contexts—and the combination and overlapping of those precise contexts (call them spatial discourses) is what constitutes society as a whole, with all its social inequalities and power dynamics.

I could go on at length, as I have before now (Edney 2019, chap. 2). And I will do so again, I am sure. But for now, let's get back to the implications of all this for considering the nature of historical change in mapping and whether "development" and "evolution" are appropriate concepts.

5. Evolution and Development in a Processual Approach to Mapping and Map History

The terms "develop" and "evolution" with their biological connotations have different meanings and implications according to the different understandings of mapping.

From a normative perspective, traditional map historians have long argued that cartography *develops* in line with each culture: map making begins simple then gets ever more complex and sophisticated over time. It is, in fact, one of the key elements contributing to the normative concept of maps: if map making did not develop over time, then it is not really map making! (And only Western map making has developed over time, so only Western maps are really maps.)

If we discard the normative perspective, as scholars have tried to do since 1980 or so, then different options present themselves:

From an absolutist and cognitive frame of reference, à la Wood, then we can say that maps

> *evolve* and moreover that they speciate, producing markedly different kinds of maps for different purposes, all of which nonetheless share a common mapness, and that the individual's capacity for mapping (as a cognitive act) *develops* along with physical and cognitive capacity.
>
> From a relativistic and sociocultural frame of reference, à la Dym and Offen (and most other sociocultural map scholars), then … well, the terms *develop* and *evolve* are not banded about often, in large part because sociocultural map historians are not really interested in diachronic analysis. Sociocultural map studies tend to focus on particular maps in particular contexts and are overwhelmingly synchronic in their agendas.

But from a processual perspective, can we use *develop* and *evolve* in a meaningful way? That is, are their unavoidable and inevitable biological connotations permissible or do they entail incorrect or misleading assumptions?

The key to a processual map history is that mapping is undertaken within precise spatial discourses. The community of individuals who participate in a specific discourse—who produce, circulate, and consume texts in order to communicate and comprehend a very particular understanding of the world—can certainly change their practices, their conventions, and their constitution. In the case of the mapping of the urban place called Portland, Maine, for example, a very specific set of representational strategies emerged early in the nineteenth century that were later altered through the incorporation of nationalized engineering conventions and a broadening of the community involved to encompass trained engineers and commercial cartographers as far away as Philadelphia (Edney 2017). It is plain that this precise spatial discourse changed over time and indeed that it spawned new spatial discourses: the city map in the city directory persisted, but the mapping of the city as wall displays constituted a new discourse overlapping with the first yet nonetheless distinct in its participants and processes. Within a spatial discourse, I do not see the kind of increased articulation and specialization that merits an analogy with development.

As for evolution, that is perhaps a different manner. When I began this essay, I was thinking that change over time in mapping is not analogous to evolution. After all, what is the mechanism of selection? But as I'm writing this, I'm thinking about not only the small community in Portland that produced and consumed city maps in city directories, but also the fact that there were similar communities in other antebellum US cities (Boston, New York, Hartford, etc.). Can we think of this collection of spatial discourses, which I have tended to think as each unique unto itself, as actually comprising a population of spatial discourses that undergoes stress and variable selection? Even so, at this point, I'm still at a loss to identify the manner in which a population of spatial discourses reproduces itself. (What would the mapping equivalent be to "The Birds and the Bees"?)

The mechanisms of change in mapping occur within individual discourses. Each spatial discourse will change over time; my sense is that change is inevitable, but there is a potential for constancy that I can't rule out yet. New spatial discourses emerge, undoubtedly others are disbanded. But they are not

organisms. They don't grow in size, gobbling up other discourses to survive. They don't start simple, mature, and then decline into senescence. So, no, mapping does not evolve, nor does it develop.

All this is to say: analogies of development and, to some degree, evolution have undergirded the history of cartography, both normative and sociocultural. The analogies contribute to the persistent myth of "cartography." They are among the many conceptual habits that map scholars must discard as a field if we are ever to get out of the rut of cartography.

tl;dr – no one should use "develop" or "evolve" in their map historical studies in any way that might be interpreted as analogous to biological processes.

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HARLEY'S UNDERSTANDABLE, BUT MISPLACED, CRITICISM OF BAGROW'S "HISTORY OF CARTOGRAPHY"

Or, the Problems of Relying on an Edited Translation without Referring to the Original

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update 23 Jan 2021: I have inserted a reference to Woodward (1974).

As the sociocultural critique of maps and mapping got under way, one of the targets of critique was the manner in which traditional map history over emphasized European mapping during the Renaissance and paid little attention to the Enlightenment and effectively no attention to mapping in the period after 1800. It seemed that the field of map history had been defined by the antiquarian obsession with the old and the pretty. Michael Blakemore and Brian Harley (1980, 23–26) called this the "Old-is-Beautiful" bias. A key piece of evidence was a passage in the preface to Leo Bagrow's *History of Cartography* that drew a sharp line between mapping as "works of art," of "individual minds," and of "craftmanship" as opposed to modern mapping as a "specialized science" and as a mechanical practice (Bagrow 1964, 22). The former was the grist for Bagrow's mill, the latter was excluded. Bagrow's statement seemed to express a common sentiment, that the eighteenth century was when cartography became a science, and so gave credence to the implication that the field of the history of cartography had been shaped first and foremost by antiquarian dealers and collectors, from whom the field needed to be rescued if it was to have any hope of fulfilling its intellectual potential. Harley (1987, 25–26) repeated the criticism; it was commonly rehearsed in conversations at conferences. I too used the passage to indicate the problems with existing approaches to map history (Edney 1993, 56; Edney 2005, 69).

I have, however, come to realize that Bagrow's position was not as absolute as his preface made out. In reading the original German text, *Die Geschichte der Kartographie* (1951), it rapidly became apparent that the English translation had made a significant intervention that was far greater than the results of free translation. Bagrow's own narrative was thus more complex than Anglophone map historians have realized.

In this post, I compare the 1951 German and 1964 English editions of Bagrow's *magnum opus* and explain the changes to point out that the single, lineal history of cartography actually comprised at least two, competing progressive narratives.

Comparing the 1951 and 1964 Editions

Bagrow originally completed *Die Geschichte der Kartographie* in 1943 and it was printed in Berlin in 1944, but all copies were lost to fire (Bagrow 1951, 376). After the war, Bagrow published the work again in 1951, together with new images: 97 black-and-white maps set within the text, 112 grey-scale plates, and 8 color plates. After Bagrow's death in 1957, the book was translated into English in 1960 by D. L. Paisey, and then edited by R. A. Skelton, superintendent of the British Museum's map room. Skelton stated that the editing comprised "some rearrangement of Bagrow's text," the insertion of "a few linking passages," and the addition of "brief notes, mainly of bibliographical character." For the most part, Skelton indicated, the 1951 images were used, with the addition of a few from a book issued by the same publisher (in Leithäuser 1958) together with the provision of "some new ones," otherwise unspecified (editor's introduction in Bagrow 1964, 4–5). All told, the English translation possessed just 76 black-an-white maps in the text, 116 grey-scale plates, and 22 color plates. It would seem that still more plates were intended—another 15 monochrome and 4 color—and these were included in a further edition (Bagrow 1985).

Bagrow explained his subject matter in a short preface:

> Es wird in diesem Werke erstmalig der Versuch unternommen, eine Übersicht der verschiedenen Kartentypen zu geben, ohne auf die speziellen Fragen einzugehen, wie das Material, das als Grundlage für die Karte gedient hat, beschafft worden war (topographische Aufnahme), wie dieses Material ausgewertet wurde (Projektion, Maßstab usw.) und was sich aus diesem Material in Einzelheiten ergab (historisch-geographische Analyse). Der Verfasser führt sein Werk bis zur Mitte des 18. Jahrhunderts, weil erst von dieser Zeit an diese drei Frage anfangen, die erste Rolle zu spielen. Das äußere Bild der Karte, die ästhetische und kunsthandwerkliche Seite in ihrer Bedeutung für den geistigen, kulturgeschichtlichen Gehalt, auf den in diesem Werke besonderer Wert gelegt wurde, tritt nun in den Hintergrund zurück. Das künstlerische wird von der Technik abgelöst, und es wird unmöglich, das Werk fortzusetzen, ohne das bisher mit Stillschweigen Übergangene zum Hauptthema zu machen. Dabei berühren diese technischen Fragen den nicht fachlich interessierten Leser am wenigsten. (Bagrow 1951, 7)
>
> This work makes the first attempt to give an overview of the different types of maps without going into the specific issues of how the material that forms the basis for the map was obtained (topographic survey), how this material was compiled (projection, scale, etc.), and what detailed use can be made of this material (historical-geographical analysis). The author carries his study to the middle of the eighteenth century, because these three issues then begin to dominate [in map production]. At that time, the outward image of the map—its aesthetic and craft elements, in their importance for the intellectual, cultural-historical level [of history], to which special emphasis is paid in this work—recede into the background. The artistic being replaced by the technological, it becomes impossible to continue the study without turning subjects that had hitherto been passed over in silence

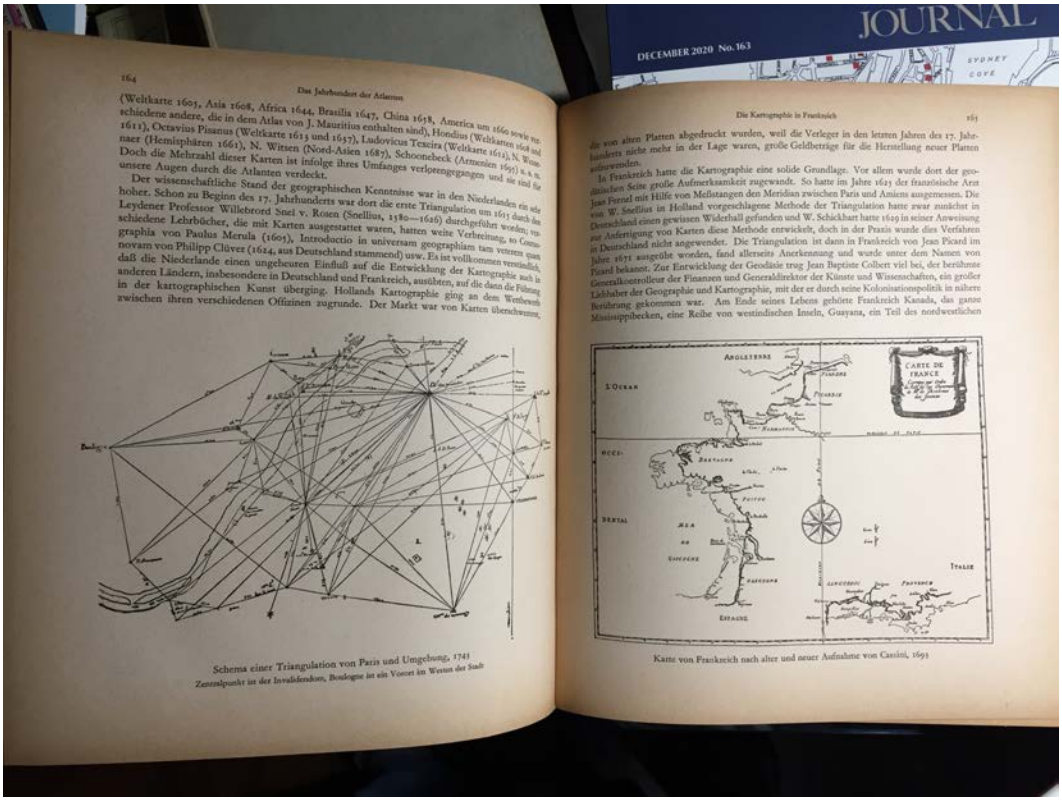
> into the main subject. In any case, these technical issues are barely of concern to non-technically interested readers.

By contrast, in Skelton's edition, the same passage has a quite different flavor:

> This book is intended to acquaint the reader with the early maps produced in both Europe and the rest of the world, and to tell him something of their development, their makers and printers, their varieties and characteristics. Our chief concern is with the externals of maps: we *exclude* any examination of their content, *of scientific methods of mapmaking*, of the way material is collected, or of the compilation of maps. This book ends at the point where maps *ceased to be works of art, the products of individual minds, and where craftsmanship was finally superseded by specialised science and the machine*; this came in the second half of the eighteenth century. This book contains the history of the evolution of the early map, but not the history of modern cartography. (Bagrow 1964, 22, emphasis added)

It is a good, colloquial translation, especially compared to my own labored translation of the 1951 passage, but the parts I have italicized seem to be the result of Skelton's interventions. Whereas Bagrow was pragmatic about the apparent changes in Enlightenment mapping, Skelton much was less flexible. He turned historical change into an eventuality ("finally superseded") and the rise of new practices and institutions into a fundamental shift in culture and intellect. (Woodward 1974, 102, was quite confused by the results of Skelton's edits; from his perspective, Bagrow's book was *not* about the "externals" of maps, at all.)

Indeed, Skelton cut out of Bagrow's original text parts that actually dealt with the more scientific elements of cartography! Bagrow was not, in fact, set against "scientific cartography" in the way that critics, including me, have thought from reading Skelton's edited preface. He briefly discussed eighteenth-century innovations and in particular the rise of triangulation-based systematic surveys, in his chapter on the "century of atlases"; this placement was in line with summary histories of cartography by academics and practitioners that presented the ever-increasing collection of geographical data as requiring ever larger atlases that eventually became the organized sheets of a systematic survey (as, e.g., Stavenhagen 1904; Thiele 1938, 3–115). In doing so, Bagrow even reproduced part of a diagram of the triangulation network around Paris, apparently from a 1743 manuscript:



Bagrow (1951, 164–65)

On the facing page, Bagrow placed a reproduction of the "corrected" map of France (*Carte de France corrigée par ordre du roi*) drawn by Jean Picard and Philippe de la Hire in the 1680s and first published in 1693 (Edney 2019, fig. 4.4). This map depicted the correction to the coastline of France made by new observations of longitude based on Jean Dominique Cassini's implementation of the observation of the eclipses of Jupiter's largest moon behind the body of the planet; the map actually predated the publication of Cassini's perfected tables for field observation of longitude (1692) because the French astronomers had used simultaneous observations of the eclipses, Picard and de la Hire in the field, Cassini in the new Paris Observatory. Now, however, Bagrow obscured the map's origins by labeling it as a "map of France before and after Cassini's survey" (*Karte von Frankreich nach alter und neuer Aufnahme von Cassini, 1693*), improperly suggesting that the map derived from the terrestrial survey that would later underpin the *Carte de France*.

But, in Skelton's hands, the whole passage on the French triangulation (and also Snellius's early seventeenth-century triangulation in the Netherlands) disappeared entirely. The triangulation diagram was also cut. The corrected map of France was kept, but Skelton relocated it to the last chapter, where it sat undigested and unreferenced. I'll have more to say about this relocation in the next section.

It is clear that, regardless of the correctness of his treatment, Bagrow was not himself against "scientific cartography" or unafraid of talking about more modern cartographic practices. He was, after all, a trained navigator and hydrographer. Bagrow's overall approach—albeit obscured by the organizational complexity of the book—is very much in line with the view of the history of cartography developed in the nineteenth century. In this established narrative structure, Western cartography passed through a series of epochs, of which the Renaissance was most important because it marked the birth of a new rationality and mentality. The long eighteenth century was a period of transition from old forms of geography to modern cartography, the latter being the proper preserve of professional and academic map makers rather than map historians.

By stripping out the triangulation material and by reframing the work's overall intent, Skelton made Bagrow's narrative agree with the recently advanced narrative that the history of cartography was the history of how an art became a science, even if it inverted the narrative's triumphal rhetoric to sustain the disjuncture between cartography and historical cartography. That Skelton thought in terms of the art-to-science narrative is sustained by his relocation of the image of the "corrected" map of France.

Relocating the "Corrected" Map of France

If it's not yet apparent, Bagrow's *Die Geschichte der Kartographie* is somewhat disorganized. His short, last chapter, on the "The Map as a Work of Craft and of Art" (*Die Ksrte als Kunstwerke und Bildwerk*), dealt mostly with the different physical forms of maps (atlases, engraved on silver, hung on walls, used as decoration, and also typographic printing), but it begins with a paragraph on the place of decoration and iconography in ear.y maps:

> Die Bedeutung der Karte im menschlichten Leben ist groß. Wenn man annimmt, daß die Karte als Endziel und Endergebnis aller geographischen Forschung, Entdeckung oder als ein Mittel erscheint, die Erdoberfläche darzustellen, die Erde in Form eines Bild vorzuführen, so ist es vollkommen verständlich, daß die alten Kartographen danach strebten, dies Bild wirklich künstlerisch zu gestalten. Das wurde mitunter sogar unwillkürlich dadurch hervorgerufen, daß es erforderlich erschien, auf der Karte außer den speziellen symbolischen kartographiscne Bezeichnungen auch eine bildliche Darstellung der Einzelheiten anzubringen: Abbildungen von Tieren, Pflanzen, Menschen, letztere oft in ihrem Volksleben, des weiteren Landschaften, Städteansichten usw. Alles dies ließ sich bei der alten Karte um so leichter durchführen, als die Fläche dieser Karte hierfür noch genügend Raum bot, da sie noch nicht mit Einzelheiten oft noch wenig erforschter Gegenden überfüllt war. Je weniger bekannt ein Land ist, um so mehr sind freie weiße Flecken bei ihrer Darstellung auf der Karte vorhanden, und um so stärker erscheint die Notwendigkeit, nicht nur diese Flecken auszufüllen, sondern auch durch die Zeichnung die charaketeristischen Einzelheiten des Landes und seiner Natur aufzuzeigen, was sich durch die symbolisch bedingten Bezeichnungen nicht erreichen läßt. Und vollkommen

gerechtfertigt erscheint ser Spottvers des englischen Satyrikers Swift auf die Kartographen, die die Karte neben dem Text mit zahlreichen Abbildungen anfüllen:

> *"Geographers in Afric maps*
> *With savage pictures fill their gaps*
> *And over inhabitable* [sic] *downs*
> *Place elephants, for want of towns."* (Bagrow 1951, 199)

Maps are of great importance in human life. Whether they are considered as the end-product of geographic research and discovery, or a means of representing the surface of the earth in the form of a picture, it is perfectly understandable that early cartographers strove to make that picture really artistic. This was sometimes even spontaneously brought about by the apparent requirement to place pictorial representations—of animals, plants, people (often in scenes from daily life), landscapes, and cityscapes, etc.—in addition to representation through special cartographic symbols. It was all the easier to do this with early maps: they generally offered enough space for pictorial details because areas that remained little explored were not yet filled in by details. The less well known a country is, the more blank spaces were available to be filled and the greater was the need not only to fill in these blanks but also to give a sense of the nature of the country when cartographic symbols were insufficient. And the mocking verse of the English satirist Swift, on cartographers who fill the map with numerous illustrations beside the text, seems perfectly justified:

> So Geographers in *Afric*-maps
> With Savage-Pictures fill their Gaps;
> And o'er unhabitable Downs
> Place Elephants for want of Towns.

This famous quatrain by Jonathan Swift has several readings (Edney 2018). In the context of Swift's poem, it is a figurative complaint, complete with Classical allusions, about the practice of hack writers to overfill their poetry with distracting imagery. Bagrow, like others in the first half of the twentieth century, took the quatrain at face value, as a literal statement of the practice of map makers to fill gaps in maps with pictures and decoration.

Others, however, dwelled more on the satirical and mocking aspect of the quatrain. It seems to be censorious, to be objecting to the practice, and as such it has been taken as marking the emergence of a new, scientific ethos in mapping. This figurative interpretation of cartographic practice was first made by Erwin Raisz (1938), an academic cartographer at Harvard, who in 1938 used the quatrain as a key element in his argument that the eighteenth century was a pivotal period in that it was when cartography ceased to be an art and became a science. After World War II, other map historians were motivated by the huge strides then being made in mapping to reflect at length upon how cartography had attained its contemporary degree of perfection. They adopted Raisz's art-to-science narrative. In

particular, G. R. Crone advanced the narrative in his *Maps and Their Makers* (1953).

Crone was a close colleague of Skelton's, and Skelton had already relied on Crone's small book for his essay on the development of cartographic technologies after 1750 (Skelton 1958). Skelton has also imbibed a variant of the art-to-science narrative in the form of J. K. Wright's (1947) concept of "geosophy" (the study of geographical knowledge) as entailing a progressive replacement of geographical information with experiential knowledge (see Skelton 1965).

In editing Bagrow's last chapter, which he now called a postscript, Skelton subtly edited the paragraph leading up to Swift's quatrain to emphasize that the presence of decoration in early maps was a necessity. And then he inserted, as noted above, on the following page and otherwise unremarked, the "corrected" map of France (Bagrow 1964, 215, 216). This map has no relevance to the subject matter of the rest of the final chapter/postscript. Its presence can only be explained, to my mind, by its great significance for the art-to-science narrative. The "corrected" map was first highlighted by Christian Sandler (1905) as the emblem of the reformation in the world map that took place because of the introduction of the method of determining longitude from the eclipses of Jupiter's satellites. Sandler called his book *Die Reformation der Kartographie*, actually referencing older ideas about the "reformation of *geography*" (as early as Robert de Vaugondy 1755, 129), but this phrase would become chapter titles for both Raisz (1938) and Crone (1953). Crone (1953, 129) also reproduced the "corrected" map of France as the only image in his chapter on "the Reformation of cartography in France" and, with Lloyd Brown (1949, 147), began the proliferation of reproductions of the map as the emblem of the scientific reform of cartography in the eighteenth century (Edney 2015, 609). By keeping Bagrow's incorrect title to the map, which related it to its improper usage by the other map historians, and by placing it in close proximity to Swift's quatrain, Skelton referred once more to the art-to-science narrative. (I have no idea how he thought the non-expert reader would understand the reproduction of the "corrected" map of France.)

Bagrow seems not to have shared the modernist sensibilities that drove Raisz, Crone, Brown, Skelton, and others to write histories of cartography so as to explain the contemporary triumph of cartography. He was thus unmoved by the art-to-science narrative. His take on the history of cartography was an old-fashioned one. Skelton sought to bring his narrative more in line with recent intellectual developments. I really am not sure that, contrary to Skelton's claim, Bagrow would actually have appoved of his editorial interventions.

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