

## CONTRIBUTIONS TO MAP HISTORY

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**TRIANGULATION ... IT'S NOT JUST "DOING THINGS WITH TRIANGLES"**

**I am a bit of a purist on the matter!**

Originally posted: 14 July 2021

<https://www.mappingasprocess.net/blog/2021/7/14/triangulation-its-not-just-doing-things-with-triangles>

Yesterday, I received, via the wonderful people of ILL, a chapter from a new book by Wolfgang Lefèvre on early modern textbooks and manuals in science and technology. In one of the inset accounts of ancillary technical information, I read

The triangulation method can be traced back to ancient Greek as well as medieval Arabic sources. In the early modern period, it was the Dutch physician Gemma Frisius (1508–1555) who proposed and described it as a key technique in connection with map making in his *Libellus de locorum describendorum ratione* (1533) — a book that was instrumental for the spread of this surveying method over many European countries in the following period. (Lefèvre 2021, 168)

The note for the paragraph reads:

59 Gemma Frisius' *Libellus* first appeared in Antwerp (apud Ioannes Grapheus, 1533). It became known to a broad readership when reissued as an appendix in Petrus Apianus' *Cosmographia* of 1540. Frisius, together with a goldsmith, managed a workshop for the production of globes.

I was intrigued as to the nature of the Greek and Arabic sources that this poorly referenced statement might have referred to.\* What had I missed? So, as one does in this modern age, I consulted the twitters. The results were illuminating, and point to a persistent problem that just annoys me to my core.

The issue is simply this: “triangulation” as a method appears to be the most complex and fundamental method of surveying, but is little understood, even by map historians. People know that it involves triangles. So, any procedure involving triangles gets called “triangulation” whenever someone wants to elevate its status and give the procedure the status of “Science! (oooohh!)”

\*The book is typeset with the main text being about textbooks and manuals and then inset paragraphs of relevant, technical information. (At least I think so: I only requested the one chapter, so I haven't seen any preliminary explanation by the author.) The inset paragraphs are not necessarily well sourced, seeming to rely on generally accepted work in the history of science and technology.

### Early Modern pseudo-Triangulation

This is a problem in map history as a large part of surveying practice since the sixteenth century has relied on imaging triangles in the landscape and measuring the angles and some of the sides. When I did land surveying courses as an undergraduate, I remembered the simple mnemonic I had learned in school about the minimum magnitudes (interior angles, lengths of sides) are needed to define an entire triangle, and related the permutations to the types of surveying practice I was being taught:

AAA — all three angles are known — triangulation

ASA — one side of the triangle is known, together with the angles at either end — intersection

SAS — two sides are known, together with the angle between them — traverse

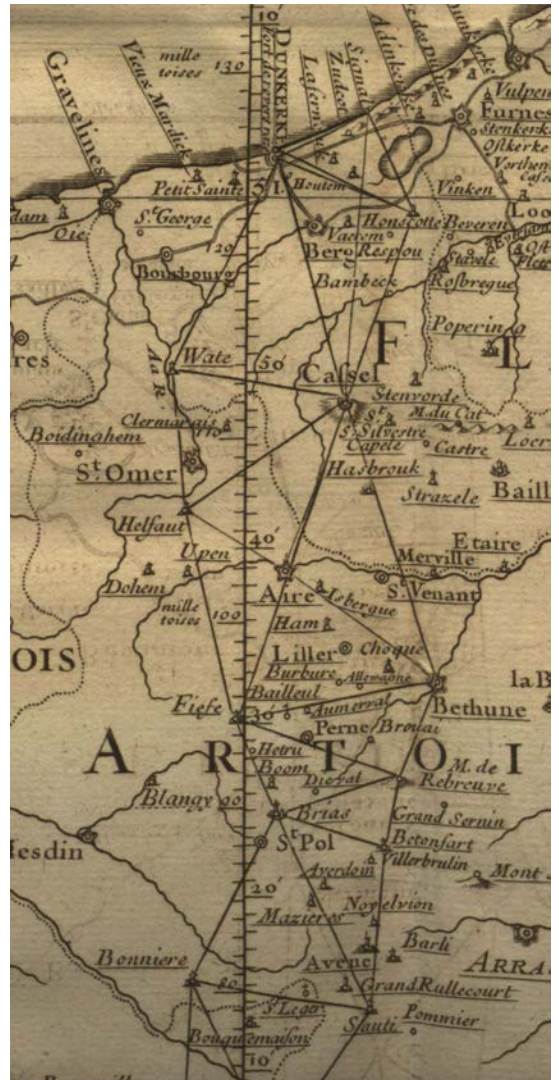
SSS — all three sides are known — trilateration

ASS — one angle and an adjacent and opposite side are known — ambiguous results, which make an ass of the student!

Intersection is often misleadingly called triangulation because the surveyor observes, or draws on a plane table, sight lines from two known places to a distant third location. I think this is a reflection of the colloquial use of “triangulate” to mean fixing one point from two others, a term misleading carried over into sociology (“social triangulation”).

The little classification is not perfect. Each surveying technique requires the combination of triangles and some other factors. In the case of triangulation, at least one side of a triangle has to be measured (the baseline) before that length is carried by trigonometrical calculations to all other sides. In effect, triangulation as a surveying technique is AAA in the field converted to SSS in the office. Here is a detail of the northernmost part of the chain of triangles measured by the French along the meridian of the Paris Observatory, from Jacques Cassini’s 1720 memoir (right)

The astronomer-surveyors sighted from towers to other towers. One baseline was measured along the beach at Dunkirk, between the fort and the “signal”; other baselines were used elsewhere along the chain. Other triangulations took the form of a network of triangles. In all cases, to be a triangulation



requires the direct observation of many angles between imaginary lines to form a mass of triangles to be solved trigonometrically in the office. (Someone might try to do a triangulation graphically on a plane table, but usually, the triangulation was undertaken, the final points then plotted into paper to be fitted onto a plane table for use in filling in the topographical details.)

In editing Volume Four of *The History of Cartography*, Mary Pedley and I were careful about many things; one was that “triangulation” was explained well (Bendall 2019) and that no-one misused the term.

### Ancient and Medieval pseudo-Triangulation

In the case of the quote that started me off, there is [no evidence that anyone before the sixteenth century](#) implemented the surveying practice of triangulation. From the answers I received on twitter, it seems that the medieval use of spherical trigonometry to resolve large triangles in the calculation of differences and latitude and longitude, by scholars such as al-Biruni, has been aggrandized as “triangulation.” But this is of course a process of trigonometry, not a careful and precise survey operation. The same method of turning itinerary distances into lat/long was probably used by Ptolemy in the second century CE, and probably by some earlier Greek scholars. It is a process that essentially turns itinerary distances and bearings (i.e., summary traverses) by means of a presumed size of the earth into differences of latitude and longitude.

More intriguing is a reference from a friend to a book arguing that the Greeks situated their religious sites according to some kind of geodetic triangulation (Manias 1969). Now, I don’t have the book, but I did find a relatively recent website on [“The sacred triangles of ancient Greece and their well-hidden meaning”](#) that seems to be based on Manias (1969). It’s an exercise in drawing triangles across Greece between certain locations, waving one’s hand, and going “Mystical science, ooooohh!” Go look for yourself. But lots of triangles do not make triangulation!

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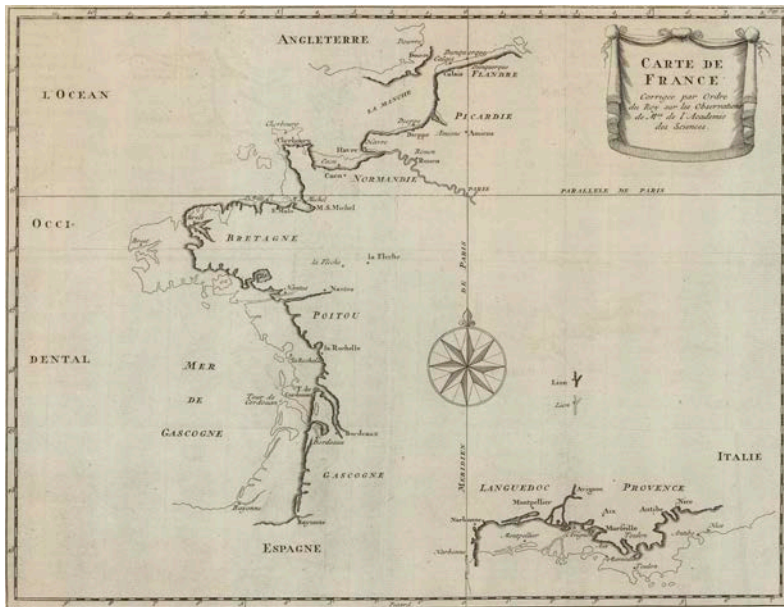
**MORE ON THE FETISHIZATION OF TRIANGULATION (AND ON THE POSSIBLE SCHIZOPHRENIA OF RECENT MAP HISTORY)**

**Jean Picard’s “Corrected Map of France” was not by triangulation ...**

Originally posted: 21 July 2021

<https://www.mappingasprocess.net/blog/2021/7/21/more-on-the-fetishization-of-triangulation-and-on-the-possible-schizophrenia-of-map-history>

Today, 21 July, is the birthday of Jean Picard (1620–1682), French mathematician and astronomer, renowned in particular for two projects in support of Colbert’s plan to fix the map of France, a project that was one of the main reasons he established the Académie des sciences in 1666. Already this morning (it’s 7am here in Maine), the twitters have advertised two blogs ([here](#) and [here](#)) on Picard’s life and work that both repeat the misunderstanding that Picard’s 1693 “corrected map of France” was based on triangulation. (It was not!) This is a surprisingly common mistake that, because I am a triangulation purist, I find very annoying. It makes me wonder why the mistake is so persistent.



Here’s the map (in a 1729 re-engraving, courtesy of the [Osher Map Library and Smith Center for Cartographic Education](#), University of Southern Maine):

**Colbert’s Map Project, Picard, Triangulation, and the “Corrected Map of France”**

To make better geographical maps required two new things in the late seventeenth century: knowledge of the size of the earth (still thought to be spherical) and a way to determine longitudinal differences. Latitude was already easy to determine. Given the size of the earth, geographers would be able to turn

itinerary distances and bearings into accurate differences in latitude and longitude, and so could be easily fitted into a network of known lat/long control points. As the number of observed and interpolated control points increased, they could then be used to fit existing provincial maps together to make a new and correct map of France.

To determine the size of the earth, Picard was tasked in 1669–70 with measuring a chain of triangles along the meridian of the newly founded Paris Observatory, north from Paris to the Amiens near the coast of the English Channel/La Manche. He soon explained the process and the final result in a short book (Picard 1671). Because this work forms the intellectual baseline of geodetic surveying through the eighteenth century, I went into Picard's techniques at some length in *Cartography in the European Enlightenment* (Edney 2019).

After this first work, Picard teamed up with Philippe de La Hire and Giovanni Domenico [Jean Dominique] Cassini [I] to address the other half of Colbert's plan. Colbert had lured Cassini from Bologna to Paris because of his work modeling the movement of the two largest moons (satellites) of Jupiter. If their motion, and more particularly the times when they eclipse (immerse) behind the body of Jupiter, could be predicted, then field observers could time such an event and then by comparing that local time with the Parisian time recorded in the predictive tables, could simply determine the difference in longitude between their location and the Paris Observatory. While the tables were still in development, in a proof of concept (as it were), Picard and La Hire made field observations around the coast of France, while Cassini continued with the observations from the observatory in Paris. On their return to Paris, Picard and La Hire could compare the times of paired (simultaneous) observations of Jupiter's first moon and determine more accurate longitudes for the field sites. The work was complete by Picard's death in 1682, but not published for a decade; the publication came with the above "corrected map of France" (Picard and La Hire 1693). The map contrasted the outline of France in a map by Nicolas Sanson from about 1670 (thin line) with the coastline (thick) corrected by longitude observations.

### **Why Do People Think that the Corrected Map Was the Result of Triangulation?**

Two reasons, I think.

#### **a) Presumed Unity of Mapping**

First, there was a move by French historical geographers after 1900 to blend together the early map work of the Académie des sciences, i.e., Picard's two projects, with its later work—both measuring the entire meridian as part of the debate over the earth's shape (Cassini 1720) and then doing longitudinal series of triangles and infilling the chains with a mesh of triangles so as to create a dense network of fixed points that might be used to fix existing maps (Cassini de Thury [1744])—and then the private



venture to undertake an entirely new survey based on that detailed triangulation to make the *Carte de France* (1750–1789). Earlier, map historians of all stripes had tended to see the projects as separate: one set falling into the realm of geographical mapping, the other into state-sponsored territorial surveys. But the historical geographers, following a nationalistic impulse, blended them all together into a single mapping urge (esp., Gallois 1909). This work in turn led Leo Bagrow (1951, 165) to drop the matter of longitude from the making of the corrected map of France and to attribute it solely to triangulation. Gallois influenced Perrier (1939) who in turn led Chapin (1995) to attribute the map to triangulation. Other recent scholars have echoed the argument (e.g., Iliffe 1993, 337; Branch 2014, 1–2).

### **b) Fetishization of the Chronometer and of Triangulation**

But this morning I realized that there might be a further factor at play. Cassini I's method of determining longitude from Jupiter's observations was complex and strictly terrestrial in implementation. It came to be in extensive use by the end of the 1700s, with the result that the world map was "reformed" and took on its modern continental outlines (Sandler 1905a, 1905b), its importance has been overshadowed by the issue of determining longitude at sea, for which the technique cannot be used. (It needed a pendulum clock to hold local time, once determined, and pendula do not run steadily onboard a heaving ship; it needed a long and steady telescope, but the heaving deck made the image bounce around; eclipses of Jupiter's satellites were simply too rare for the use of the mariner.) Since at least Goode (1927), map historians have focused on John Harrison's chronometer as the solution to "the longitude problem" and the key to modern, scientific geography, a solution further championed by Dava Sobel's *Longitude* (1995). In the process, map historians have quite overlooked the other marine methodology, of equal application in practice, of lunar distances! For all the early modern longitude techniques, and others, see Sandman (2019).

I am now wondering whether the separate fetishizations of the chronometer and of triangulation has created some kind of schizophrenia in map history. A divide in how historians perceive past mapping practices. On the one side is the sea, where longitude is significant and the chronometer is the technological fix. On the other, is the land, where triangulation appears as the fix for systematic observation and measurement without reference to longitude. In actual practice, there was no such divide. But with the post-1980 rise of the (common but false) argument that modern cartography arose with the implementation of geometry to map making in the Renaissance, the practices of terrestrial geometry seem to preclude longitude and promote triangulation. In such an intellectual system, the corrected map of France cannot involve longitude. It's a land map, it must have been based on improved techniques of land measurement, i.e., triangulation.

This seems to be an interesting byproduct of another historiographical trend that I have only just put my finger on (having been struggling with it for years). Specifically, even as sociocultural map history has since 1980 challenged the old ideas of "the map," that same kind of map history has only reinforced the idealization of "the map" created by the ideal of cartography ... which is why I'm trying to push

for some other approach to maps and mapping. For more on this point, though, you'll have to stay tuned for the next book, now entitled "The Map: Concepts and Histories.

Now I need my breakfast.

**Update 7/24/21.** The desire for breakfast led me to omit a final point when I write this the other day. The special status accorded the Pucard-La Hire corrected map of France is rather undermined by the fact that there are actually several other maps produced during the 1650–1800 era, showing old and corrected coastlines/boundaries, none even remotely associated with a triangulation. Only occasionally mentioned by map historians, at least three have been reproduced in *Cartography in the European Enlightenment*, volume four of *The History of Cartography* (Chicago, 2019), edited by myself and Mary Pedley:

fig. 11: John Cowley's *Coasting Lines of...North Britain* i.e. Scotland (1734)

fig. 281: J B B d'Anville's *Parallele du contour de l'Italie* (1744)

fig. 532: Tobias Mayer's *Germaniae...mappa critica* (1750) - this one fairly well-known

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**SOME THOUGHTS ON JACQUES BERTIN’S “[CARTO]GRAPHIC SEMIOLOGY”**

Originally posted: 20 August 2021

<https://www.mappingasprocess.net/blog/2021/8/20/some-thoughts-on-jacques-bertins-cartographic-semiology>

I’ve been thinking about, and am about to return to the chapter on, the role of post-war academic cartographers and other geographers in developing ideas that would eventually engender sociocultural map studies. As one part of this, I have been reviewing the work of [Jacques Bertin \(1918–2010\)](#), and especially his *Sémiologie graphique* (1967). What surprised me, is that Bertin’s magnum opus seems to have actually been much less important than I have been led to believe in promoting a semiological approach to map studies. The latter is perhaps typified by Denis Wood and John Fels’ (1986) analysis of a modern road map. Superficially the two sets of work seem connected, and seem to be commonly yoked together in the literature, but they are actually quite distinct, if not contradictory.

*Sémiologie graphique* (1967) went through a second edition (1973) that was then translated into German as *Graphische Semiologie* (1974) and into English as *The Semiology of Graphics* (1983). A metrical study of the literature cited in the ICA’s *International Yearbook of Cartography* found that *Sémiologie graphique*, in all its editions, tied for the highest number of citations with the many editions of Robinson’s *Elements of Cartography* (Kanakubo and Morita 1993, 18–19; see Palsky 2019, 189). Yet it seems that *Sémiologie graphique* was not that important in the development of new approaches to mapping, beyond the undoubtedly important fundamental principle of “[visual variable](#).”

**Semiotics and Semiology**

There is some room for confusion. Bertin used the French word for the study of signs, “*sémiologie*,” as advanced by Ferdinand de Saussure; however, his conception of signs was very much in line with the semiotics developed from the ideas of Charles Saunders Peirce. While properly distinct (Daylight 2014), the systems have similar elements by which scholars have tried to unify them (among many guides, see Chandler 2002). In Bertin’s case, Gilles Palsky (2019, 191) noted that because Bertin’s ideas explored the “relations between signs,” they therefore constituted a structural system like Saussure’s semiology.

Yet by “graphics” Bertin did not understand all imagery in general but specifically those networks, diagrams, and maps that together form the visual equivalent of mathematical notation. He thus construed “graphic representation” to be specifically monosemic, i.e., having just one meaning, a restrictive position that very much runs counter to semiology and its celebration of polysemy. In this respect, “graphics” possess a “double function as a storage mechanism and a research instrument” (Bertin 1983, 2; see MacEachren 1995, 229; Palsky 2019, 191). In other words, for Bertin, maps are both synoptic statements of geographical knowledge, as per the normative map concept, but also a means to explore data by visualizing them. Bertin’s goal was to ensure “efficient” communication: the greater the efficiency (speed of comprehension) with which a map is read correctly, the more optimal it is. His

approach was syntactical, seeking to codify the construction of signs in a manner appropriate to the nature of the data they represent and in a manner that reveals connections between signs. He did not consider the semantics and pragmatics that a complete cartographic semiotics would properly entail (Ormeling 2015, 7). (Morita (2011) demonstrated that Bertin did embrace, in his later work, a fuller semiotics, but that later work was not adopted by academic cartographers.)

The importance of Bertin's semiotics lay in his identification of "visual variables" (magnitude, shape, orientation, etc.) and their appropriate and inappropriate usages in creating graphics (Bertin 1983, 60–97). For example, the size of a sign on a map is intuitively read by percipients as relating to the size of the feature mapped, so that the size of signs should only be varied to indicate ordinal or scaled change in the feature; shape is read as relating to quality or type, so differently shaped signs should be used to map features of different types. Bertin's ideas were not well-received at first (Ormeling 2015, 7; also Head 1991, 239; MacEachren 1995, 271), but they did gain traction among academic cartographers. Finding them to be incomplete, [academic cartographers have worked to refine them](#) and to apply them further to tactile, animated, and aural mapping as well as static, visual mapping (Head 1991, 241–47; MacEachren 1994, 16; MacEachren 1995, 270–90; Jégou 2019).

Bertin's ideas proved especially important in the shift of map design studies towards mapping as geovisualization (Palsky 2012), especially as the Anglo-American style of psychophysical and behaviorist design studies was increasingly rejected in the 1980s. Construed as using "the map's power to explore, analyze and visualize spatial datasets to understand patterns better" (Crampton 2001, 235), geovisualization appears as a tightening of the circuit of circulation until the map creator is also the map percipient, effectively reasserting the cartographer's control over the map reader who has been turned into a non-professional map user. Much of the effort of academic cartographers has gone into the design of adaptive systems that can be tailored to the needs of the individuals using those systems to make maps but at the same time constraining their design options.

Yet, even here, the influence of *Sémiologie graphique* seems to have been less than commonly presumed. To judge from the essays collected by Francis Harvey (2019) in a special issue of *Cartography and Geographical Information Science* to mark the fiftieth anniversary of the book's first publication, Bertin's (1981 [1977]) manual of graphic information processing was actually more important in guiding the move to geovisualization.

*Sémiologie graphique* thus appears very much as an isolated period piece, without much significance for the international development of cartography.

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**REWORKING THE FOUNDING DISCIPLINARY NARRATIVE ALONG COGNITIVE LINES**

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<https://www.mappingasprocess.net/blog/2021/8/23/the-cognitive-reconfiguration-of-the-founding-disciplinary-narrative-henry-castner-and-barbara-petchenik-rework-the-history-of-cartographic-cognition>

*Another piece that delved too deeply for the book ms ...*

And just as a reminder: what many call “thematic maps”—a term so loose in its usage that it is effectively useless—I call analytic maps. [See blog post.](#)

**Robinson’s Disciplinary History**

Arthur H. Robinson (1915–2004) was a graduate student at Ohio State University when the USA entered World War II in 1941. Richard Hartshorne, at UW–Madison, was tipped to become head of a geography section being formed within a new Office of Strategic Services; en route to DC, he stopped off in Columbus and, enquiring about likely people who made maps, was led to Robinson, whom he promptly recruited to create and lead the OSS’s Map Division (1941–46); he ended the war as an army major (Martin 2005; Crampton 2011, 2014).

Promptly hired by UW–Madison, Robinson quickly wrote a new doctoral dissertation from scratch, focused on explaining the need for a new academic discipline of cartography focused on what he called “special” maps (Robinson 1947; published as Robinson, 1952, #4671). To sustain this argument, Robinson proposed a very specific narrative of the history of cartography that differed significantly from those already proposed by traditional map historians (historians of geography, historians, librarians, dealers and collectors of antiquarian maps) and internal map historians (map professionals and academics, [including surveyors](#)). As he wrote in the dissertation, he came away from his wartime service “acutely aware of the limitations of conventional presentation techniques” and the need to adopt alternative strategies of graphic design:

the creation of specialty maps (maps for specific presentations) was as much a problem in design as it was a problem in substantive research, and that the artist and commercial art were better fitted to solve the design problem than was the conventionally trained cartographer. Unfortunately bases for the evaluation of the visual presentation techniques were either lacking or if existing, were so aimed at specific undertakings, such as advertising, as to be essentially unusable by the cartographer. (Robinson 1947, vii)

(It is worth remembering that Robinson’s own training in map making was largely ad hoc and grounded more in his personal artistic skill with pen and ink; see Robinson 1970).

Robinson explained and sustained his argument for a new discipline by presenting a new narrative of the profession of cartography as an applied endeavor. Until the mid-nineteenth century, Robinson stated, cartography had comprised solely the practice of producing what he called “substantive” maps. Substantive mapping had continued to develop and improve, most recently through the many innovations, especially aerial photography, implemented during the recent war. But then, the emergent natural and social sciences had begun to make analytical maps (commonly known as thematic maps) and maps for presentation, all of which Robinson called “specialty” maps:

The story of the development of cartography from its beginnings is essentially a composite of the chronicles of exploration and survey, together with such abstruse material as the mathematics of map projections. Until recently the use of maps was largely limited to specialists such as navigators, surveyors, military planners and the like, and the preparation of their maps constituted a problem only with respect to the accuracy of the things mapped....\*

Only in the last few centuries have really major advances occurred in cartographic technique. The majority of these advances, such as the iso-line, the graduated circle, and the hachure, have come about because of the ever-present and fundamental problem of presenting quantitative facts. Accuracy is obviously the first objective of any scientific activity; but when presentations of factual materials become widely used, the manner of presentation becomes of primary significance. (Robinson 1952, 7–8)

Specialty mapping remained uncoded and rooted in “convention, whim, and...ill-founded judgment,” his new agenda of design studies based in psychology and undertaken in properly institutionalized centers of national excellence would amount, he suggested, to a modern cartographic “revolution” as profound as that of the Renaissance (Robinson 1947, vii, 10 (quotation), 1952, viii, 13). This simple narrative—little encumbered by hard evidence, beyond the fact that analytical mapping flourished after 1835 (Robinson 1955)—became something of a mainstay of the field as a whole, and not just the Anglophone portion (see Imhof 1963, 16; Morrison 1974; Kanakubo 1990; Azócar Fernández and Buchroithner 2014, 5–6).

That this historical argument was motivated by academic politics is perhaps indicated by the fact that Robinson soon gave it up. Once the field of academic cartography had grown some institutional roots, Robinson abandoned this argument, transitioning instead to a history of cartographic revolutions (Robinson 1976, 1982).

\* In my own writing about conceptions of “the map,” I use the terms coined earlier by Max Eckert (Eckert 1907, 1908, 1921–25) for the same concepts: not substantive and special, but “concrete” and “abstract.”



### Henry Castner

One of Robinson’s doctoral students, Henry Castner (b. 1932), offered a revision of Robinson’s narrative of bifurcation that perpetuated the internalist disregard of social or cultural influences on change in cartographic practice. Together, they offered an explanation of change that wedded changes in cartographic practice to the established developmental model of traditional map history. Their common goal was to provide a definition of “thematic map,” the kind of map at the center of much post-war cartography both in the USA and Europe (Arnberger 1970, 20), yet which had so far eluded precise definition.

Castner had been editing the English translations of a number of Leo Bagrow’s unpublished manuscripts on the history of cartography in Russia before 1800 (published as Bagrow 1975). In line with traditional map history, Bagrow addressed what I am starting to call “synoptic” maps: coarser resolution geographical and marine maps that present a society’s accumulated geographical knowledge. This is a kind of map concept that simply ignores fine-resolution maps of places and territories. Many of Bagrow’s examples were administrative maps made in support of the management of Russian timber resources, such as:



Detail from Vasilij Mikhailovich Shishkov and Ivan Shishkov’s map of the Kazan guberniya, “Karta Kazanskoj gubernii...opisi geodezistov Vasiliya i Ivana Shishkovykh” (1733), in “General’ny atlas sochinyonnoy iz imeyushchikhsya pri Admiraltejskoj chertezhnoj raznykh godov opisey vsyakogo roda

Iesam 1782 goda.” The map marks good pine forest (A) and worthless mixed forest (B). For another detail, see Postnikov (2019, fig. 805). Courtesy of the Rossiyskaya natsional’naya biblioteka, St. Petersburg (Manuscript Department, Hermitage Collection, f. 885, d. 610, map 31).

Such maps seemed to Castner to sit midway between the general purpose, reference map and the analytical map. In a presentation to the 8th International Cartographic Conference, held in Moscow in August 1976, Castner presented his argument (published as Castner 1980). He argued that all maps might be placed on a spectrum according to their ratio of “base” to “subject” information. At one end were maps entirely of base information; in the eighteenth century, this end comprised entirely synoptic reference maps that present the archive of primary locational data. At the other end were analytical maps with a small proportion of base information and the remainder subject information; the latter Castner defined as the “specialized information that is superimposed over a selection of base information and that represents the central thrust of topical matter of the map.” Any map might therefore “be characterized by the relative amounts and relative prominence of these two kinds of information.” In the middle of the continuum, comprised of approximately equal amounts of base and subject information were what he called “special-purpose” maps, typified by the Russian forest maps (Castner 1980, esp. 163–64).

Castner argued that in the eighteenth century, cartography began to evolve (his term) along the continuum with both the increase in the amount of base information and with the novel development of inventory mapping. The results of official surveys of forests, and also mineral resources, might not have generated true analytical maps (e.g., of the relative distributions of deciduous and coniferous trees) because the acts needed to generate them—the reduction and generalization of the base information and the abstraction of the subject information—were as yet little appreciated either by map makers or by map users. In this explanation, Castner continued to conceptualize the cartographic process as one in which the map designer created a map to be understood by the map reader in specific and constrained ways. Thus, the map maker

could not rely, as we do today, on his map reading audience having a strong enough mental image or schema of geographical areas to allow [the map maker] to generalize highly or [to] abstract [geographical areas] and still be sure that his readers could recognize them and supply the missing detail.

As a result, some maps may seem to be thematic in nature in that they appear to have been drawn to illustrate a specific distribution, concept, relationship, or event, but from a visual or graphic design point of view may seem to us to be more of a reference map. (Castner 1980, 164)

Castner used a series of examples to argue that inventory mapping in eighteenth-century Russia had made this first developmental step to the middle of the continuum, leading to the further step taken in the 1800s to true analytical mapping at the further end of the continuum.

In line with the long-standing developmental model of the history of cartography, Castner (1980, 173) concluded that “by 1800, Russian cartography had matured into an enterprise which produced a great variety of map products” (added emphasis). He reconfigured the equivalency drawn in the nineteenth century between the development of an entire culture and that of an individual organism into a less objectionable stance: cognitive development stemmed not from some metaphysical cultural growth (*Zeitgeist* or the more specific *Kartengeist* (Edney 2020) but from the general experience and practice of individuals within the culture. As people learned to process increasing amounts of data and as they became accustomed to more abstracted depictions of geographical features—as their cognitive experience and abilities grew more sophisticated—so specialized map makers could produce many more kinds of maps and expect them to be understood and read effectively. New kinds of special-purpose and thematic maps proliferated to augment existing reference maps. Castner’s developmental mechanism was thus, appropriately, internal to cartography itself.

### **Barbara Petchenik**

To be clear, Castner’s published essay was influenced by an essay by another of Robinson’s doctoral students and his collaborator on theoretical approach to maps, Barbara Bartz Petchenik (1939–92); Petchenik had, in turn, reacted to Castner’s original conference presentation.

Petchenik built upon Castner’s conference presentation to offer a more precise definition of analytical maps. She adopted Castner’s insights to argue that analytical maps are differentiated from reference maps by the cognitive acts that are brought to bear by the map reader. Reference maps are concrete: they permit identification of being-in-place (“here is...”). Analytical maps are those that encourage knowing-about-space. In this respect, she objected to Castner’s identification of a third category of special-purpose maps as unsupported by cognitive psychology. At the same time, she rehearsed the arguments of cognitive psychologists that construct necessary parallels between the individual’s cognitive development (through biological growth and learning) with the cognitive development of an entire culture (through communal education). For both, development happens in small steps, building incrementally on prior achievements. There is, she implied, a long history of cartography that can be told as a history of cognitive development (Petchenik 1979, esp. 10–11, 9).

Petchenik’s arguments for the primacy of the reader in determining maps’ meanings, including her earlier presentation to *Auto Carto II* (Petchenik 1975), had little impact on other academic cartographers. Even so, they contributed to the formation of the sociocultural map concept. But that is another story.

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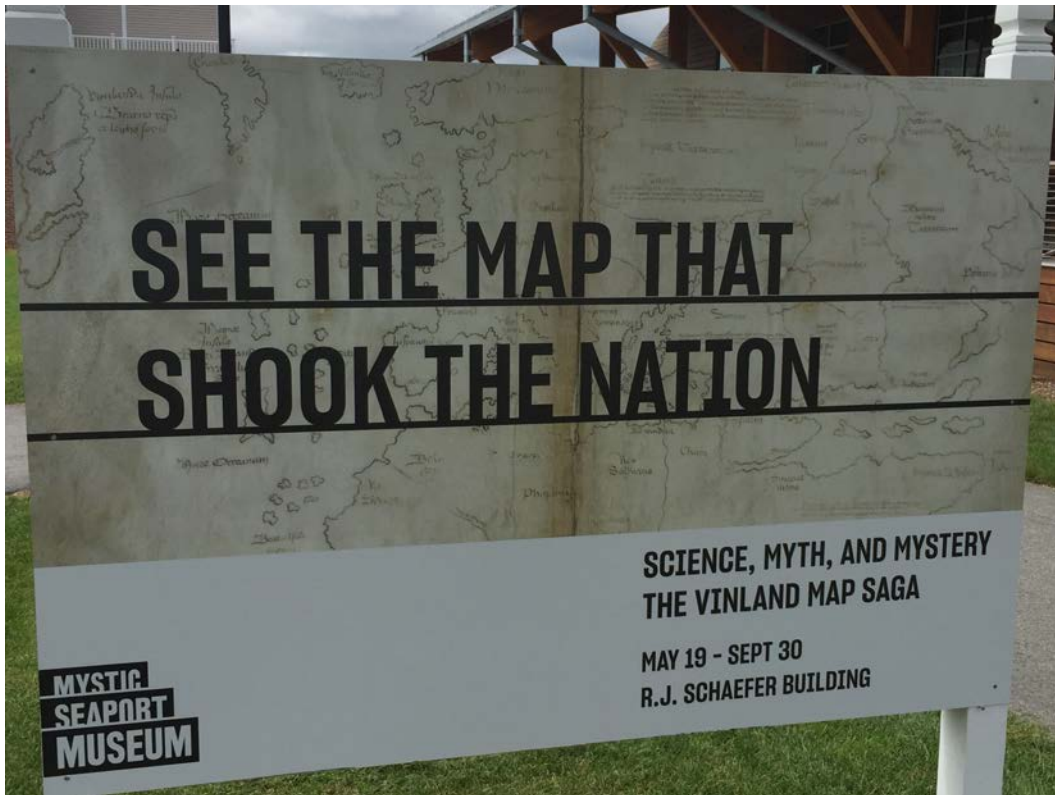
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**IT'S A FAKE—FOR REAL THIS TIME**

Originally posted: 2 September 2021

<https://www.mappingasprocess.net/blog/2021/9/2/its-a-fake-for-real-this-time>

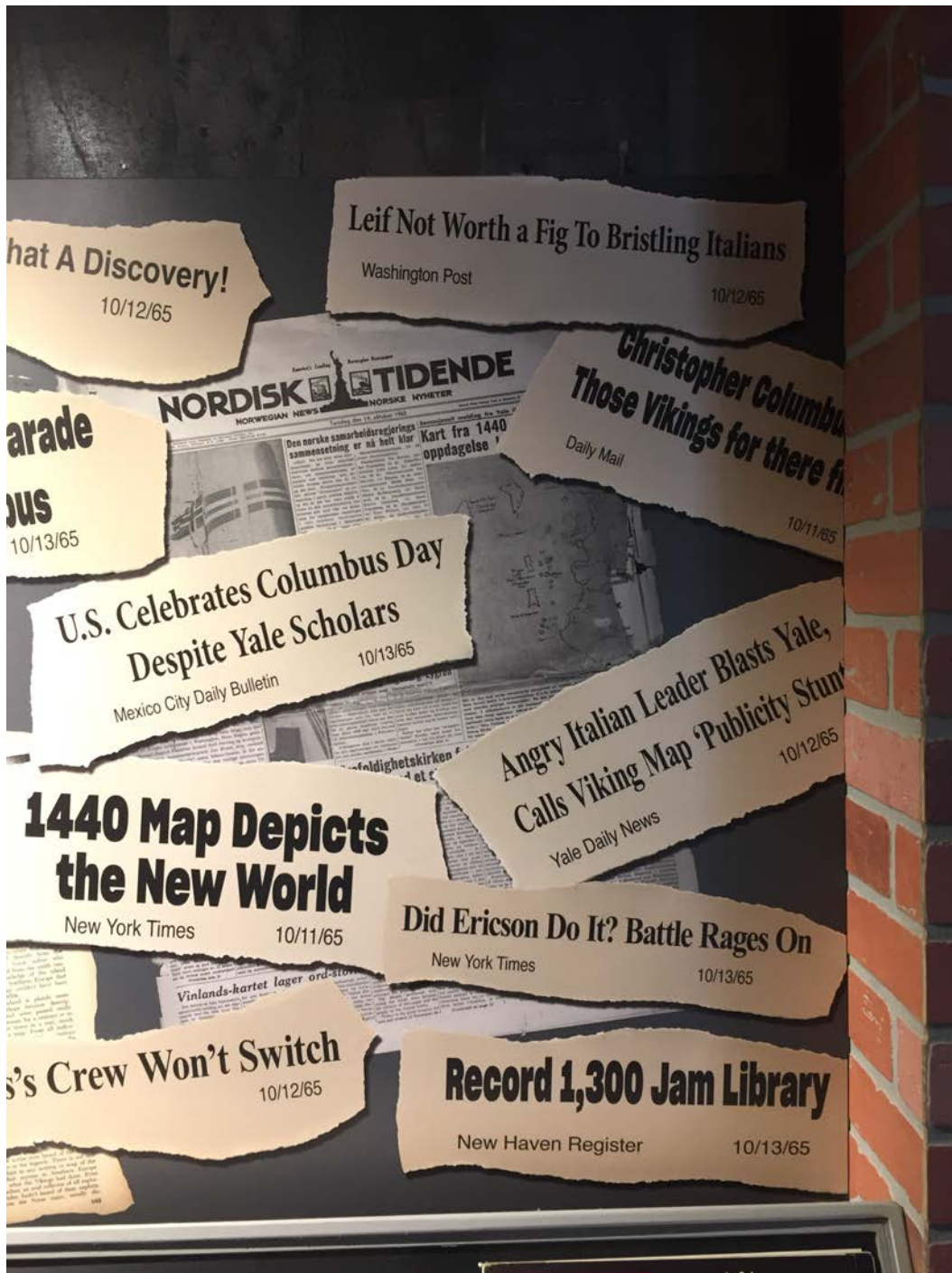
[Yale University has announced](#), finally, what most of us had long since concluded, that the so-called Vinland Map is a fake. I had already decided that Yale accepted this fact, when it let the map travel to Mystic Seaport in 2018 for an exhibition about ... why the map is a fake.



Verso of the signage outside the exhibit

The exhibit was really very well done. An initial section explored the reactions to Yale's announcement of the acquisition of the map on Leif Eriksson Day and just before Columbus Day, October 1965. Italian Americans were not amused. As a display of newspaper headlines indicated, there was even an impromptu demonstration at Yale:





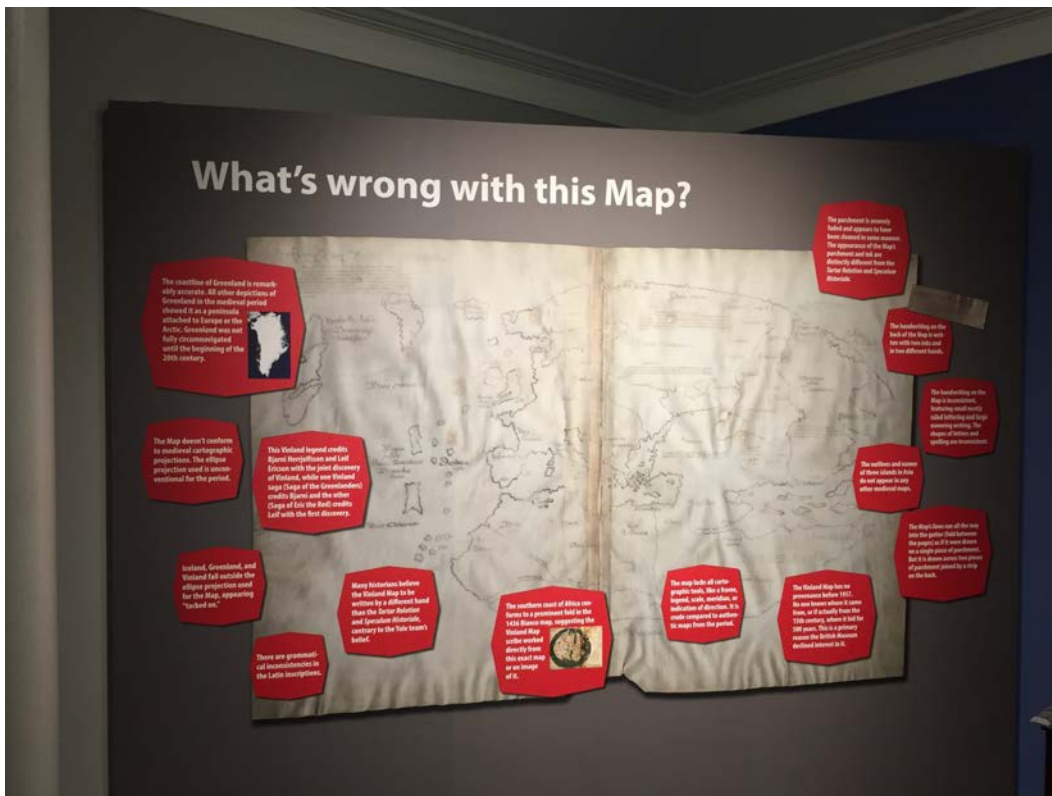
Part of a display of headlines reporting the reaction to the announcement of the map

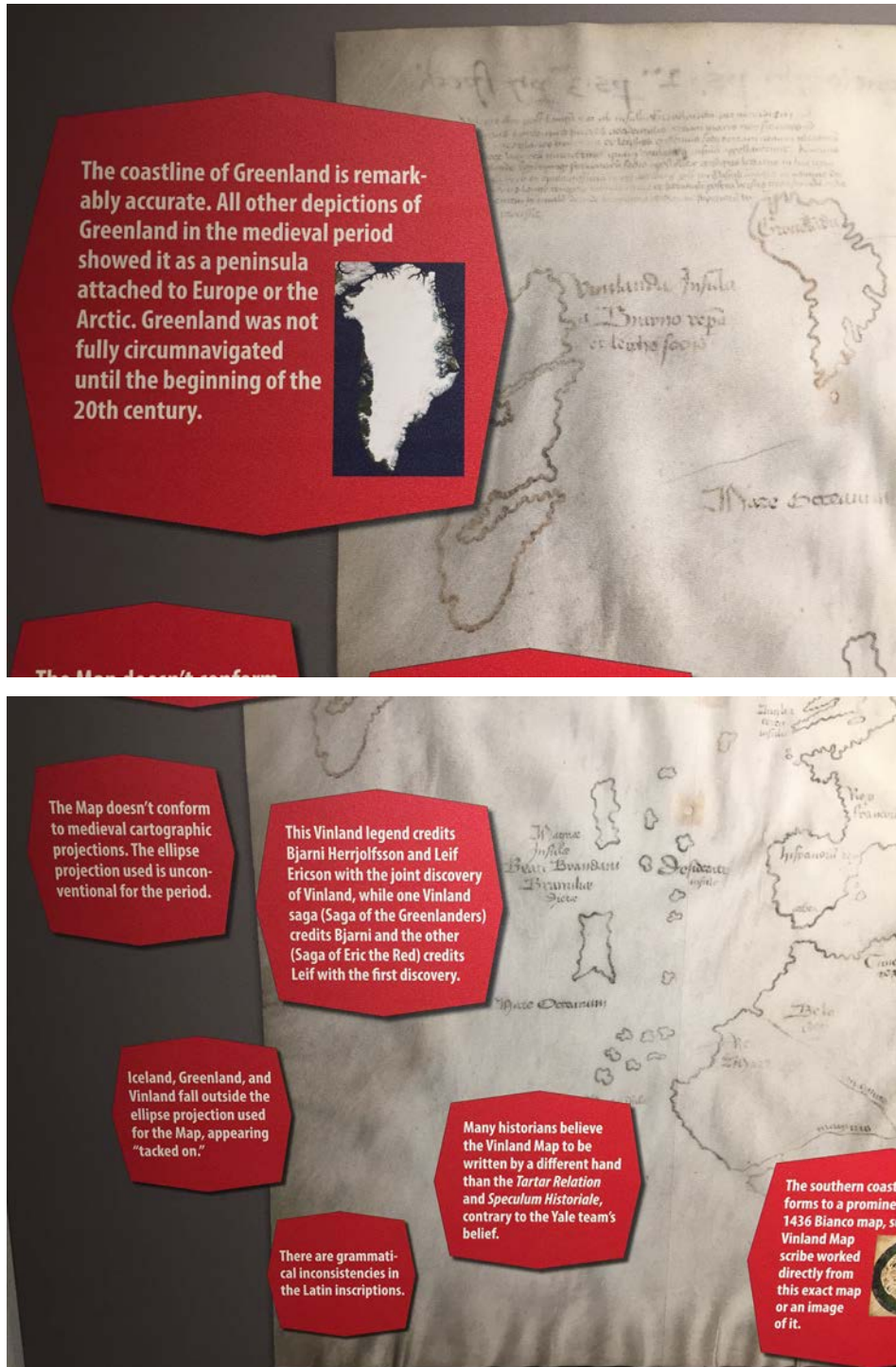
Despite the literary evidence of the Icelandic sagas, no-one except a stalwart few believed that the Norse had ever reached, let alone settled, in North America. The stalwart few, however, argued (and still argue) that certain colonial structures were in fact much older constructs by the Norse; these arguments began in the later 19c as a means to argue for the antiquity of White Settlement in North America (see Kolodny 2012).

Yet literary evidence was still verboten among real historians in the 1960s, so the revelation of a map—a map!!—seemed to be hard proof of the Norse voyaging and settlements. It was truly earth shaking news!

Shortly thereafter, archaeologists announced the discovery of the remains of Norse settlement in the Canadian Maritimes. The second part of the exhibition therefore addressed how the fact that the Norse had reached America beyond Greenland made the map all the more certain.

But then, doubts began to be raised by the material and cartographic character of the map. The exhibition's narrative split into two: to the left, examination of the cartographic evidence, to the right, explanation of the chemical analyses of the vellum and ink. The cartographic issues were well presented, at least I thought so as a specialist in the field. For example:





But the account of the technical studies were a bit too technical, and not as eye-catching (mostly a set of copies of the key articles/reports). The key to the chemical analysis was that the titanium dioxide in the ink was clearly of modern manufacture, and not an artifact of 15c ink manufacture (the crystals being too regular in shape and size).

Eventually, the map itself was revealed to the exhibition goer:



The exhibition curators did such a good job at being even-handed that many exhibition-goers were not actually convinced by the evidence against. At the end of the exhibition, viewers were asked to jot a note about what they thought of the Vinland Map and their reactions to the exhibition. By the time that I and a couple of colleagues saw the show in August 2018, it had been up for a while, and so many people had left notes about how the map was clearly genuine, that the curators had to add another bit of signage:





All this means that Yale's announcement is sort-of old hat. A team of conservators have undertaken a comprehensive analysis of the ink across the entire map, recto and verso, using a new non-destructive technique, and not just taken a few samples that could be permitted under the older, destructive techniques. They have also compared the ink with fifty or so samples of mid-15c ink, which are indeed completely different. The vellum might have been the original endpapers to a larger volume,

but the ink is most certainly 20c. I especially like the testing of the annotation on the verso, which was overwritten in the 20c to make it appear to refer to the map, not a note about the contents of the volume. The result is conclusive.

If the map was a vampire, then previous studies had succeeded, by waving of crucifixes, in forcing the Vinland Map into its coffin. This study is Van Helsing, come to pound the stake through its heart to prevent its resurrection, affix the coffin lid, and nail it down tight.

### **So who made it?**

As to who made the Vinland Map at some point in the 20c, the answer is still, probably, Father Josef Fischer, SJ. Kirsten Seaver (2004) explained the circumstantial evidence. But there is as yet no diary entry found, or letter to a friend, stating “I made this cool fake in order to own the Nazis [or whoever].” Until such an archival trace is found, assuming it exists, credit for the map must remain uncertain. (I daresay, given the nature of things, if it were found, some stalwart advocate for the map’s authenticity, would dismiss it as a forgery.)

ALSO: Mystic Seaport held a symposium, that I could not attend unfortunately. But the entire 6 hours are available for viewing on [YouTube](#).

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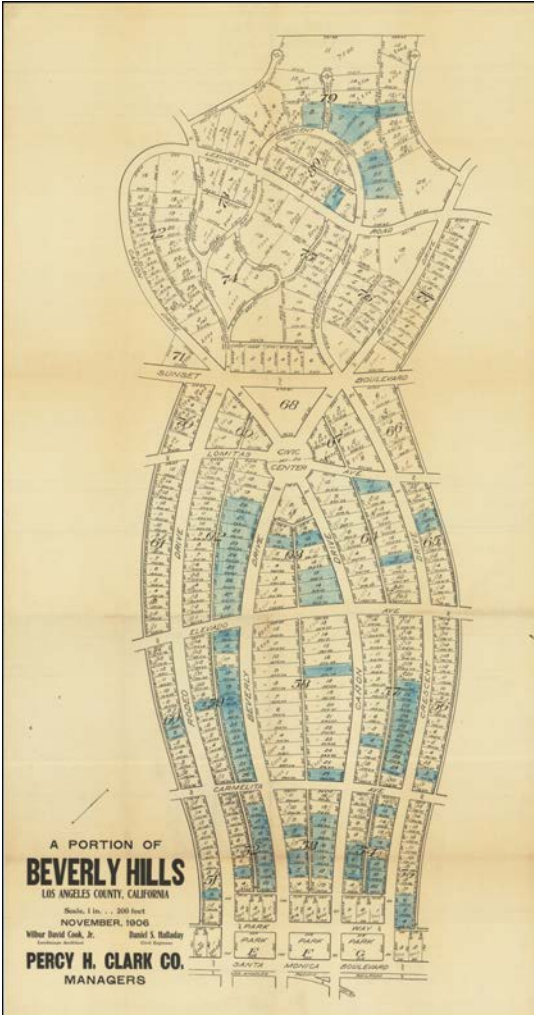
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### CONSTRUCTING A FEMINIZED LANDSCAPE

Originally posted: 13 September 2021

<https://www.mappingasprocess.net/blog/2021/9/13/constructing-a-feminized-landscape>

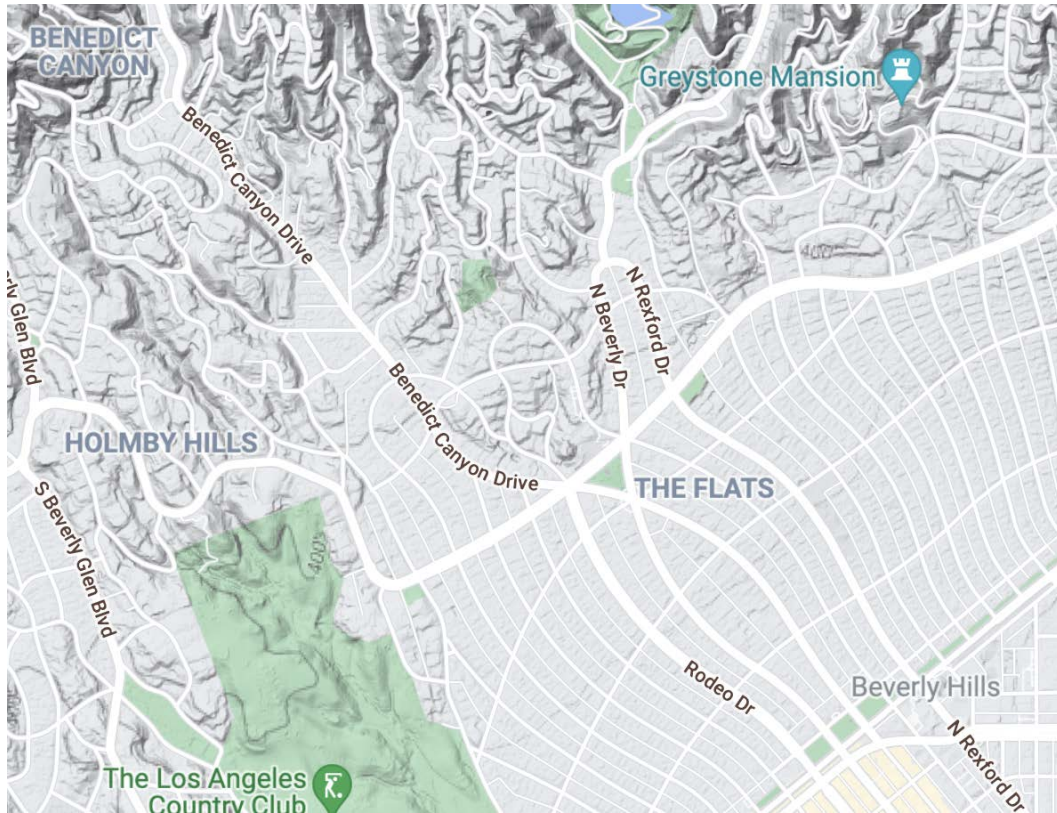


*This is a gathering, reorganization, and expansion of a thread I posted on Twitter earlier today.*

The wonderful map dealer Barry Ruderman shared an image last night of, I think he said, the first map to use “Beverly Hills” in the title. He has given me permission to use it here. The map was a “[Map of Portion of Beverly Hills](#)” issued in November 1906 as a real estate development plan:

What sets this map apart is the manner in which the development was shaped in the form of an attractive woman. Local lore maintains, Barry further added, that the development was modeled on the It Girl, Clara Bow, although Ms Bow was born only in 1905 and her photo shoots generally did not feature the demure Edwardian dress that the development imposed on the landscape and depicted in the map.

Sunset Boulevard forms a high waist. Running along the foot of the hills, the boulevard separates the hills above from “The Flats” below, reaching down to the Santa Monica Blvd. Here’s the area in Google’s terrain layer:



The rather suggestive (if anatomically mislocated) triangle of green on the modern map is the Will Rogers Memorial Park, pointing down to the 1906 plan's more correctly suggestive "Civic Center." In the end, the six-way circular junction remained thoroughly residential.

Above the waistline, the development lets the landscape itself present a female bust; below, the plan relies on curving roads to draw the edges of the skirt. As the image clipped from Google Maps suggests, those curves have been paralleled by later roads.

The imposition of a female figure on the landscape that is to be objectified, fetishized as small plots of property, and ultimately possessed needs little further comment. Had the map been intended to be a network, then its features would have been coded as male. But the possession of landscape requires a male gaze to possess the female.

Thanks, Barry.

**THE CONTROL-FREAKNESS OF AN EARLY MAP COLLECTOR**

Originally posted: 30 October 2021

<https://www.mappingasprocess.net/blog/2021/10/30/the-control-freakness-of-an-early-map-collector>

I just encountered an explanation of the principles behind an attempt at assembling an exhaustive map collection in the mid-eighteenth century. The collector was John Innys, a book seller turned gentleman. Among the books he published with his elder brother William was the *Atlas maritimus et commercialis; Or, a General View of the World, so Far as Relates to Trade and Navigation: Describing All the Coasts, Ports, Harbours, and Noted Rivers, According to the Latest Discoveries and Most Exact Observations. with a Sett of Sea-Charts, Some Laid Down after Mercator, but the Greater Part According to a New Globular Projection, Adapted for Measuring Distances (as Near as Possible) by Scale and Compass, and Authorized by Letters Patent under the Great Seal of Great-Britain. The Use of the Projection Justified by Dr. Halley* (London: James and John Knapton, William and John Innys, 1728), whose extensive geographical text was the work of Daniel Defoe (Thrower 1978, 226; Reinhartz 1997, 88). In 1749, Innys wrote a letter to a friend, explaining his exhaustive plan for his collection. I transcribe the letter below.

**Context: Richard Gough's Early Map History**

The letter was printed in a curious short work:

*An Essay on the Rise and Progress of Geography in Great-Britain and Ireland; Illustrated with Specimens of Our Oldest Maps.* London: printed by J. Nichols, 1780.

I was unaware of this work until just a couple of days ago, when a colleague sent me a note about it. Although anonymous, it was clearly the work of the British antiquary, Richard Gough. Gough's accounts and facsimiles of early maps are a significant part of his magnum opus:

Gough, Richard. *British Topography; Or, an Historical Account of What Has Been Done for Illustrating the Topographical Antiquities of Great Britain and Ireland.* 2 vols. London: T. Payne and Son, and J. Nichols, 1780.

This work forms the pivot from chapter 2 to chapter 3 in my current book ms, so I was immediately interested in this newly encountered short work. [update 7/24/2023: it now forms the opening vignette of (new) chapter 2]

*The Essay on the Rise and Progress of Geography* proves to be a reprinting of material scattered through the *British Topography*, not only the dedicated sections dealing with the maps, charts, and views of Britain and England (pp. 1: 57–113), Scotland (2: 575–606), and Ireland (2: 765–69), but also notices of local chorographical and urban maps scattered through the entire book. They have been intermingled in an

attempt to create a strictly chronological account of all of the maps, actually destroying the rough narrative provided in the main chapters. Some parts of the map text in the *British Topography* have been omitted, notably Gough's criticism of recent one-sheet county maps by "Bowen, Kitchen, and other modern makers" that, "notwithstanding [their] assertions...that their maps are framed from actual new surveys, there is scarce a single one which does not abound with faults" (1: 108). Some of the content has been rewritten and some of Gough's discursive notes have been moved into the main text. Some new material has been added, which includes Innys's letter.

The result is a curious hybrid that blends: the antiquary's celebration of national and local identity; existing histories of geographical mapping (e.g., Robert de Vaugondy 1755; Blair 1768); and Gough's own concerns to create a history of specifically British map making in line with the then new "philosophical history" of stadial changes in particular cultures.

### John Innys and His Map Collection

Not that much is readily known about John Innys. The LC authority files give his dates as 1658–1762, which is an excessively long life for the eighteenth century, although not impossible; or is the period during which a book of sermons by one John Innys was reprinted? (I daresay much more information is available in the secondary literature about the book trade in eighteenth-century England.) Anyway, by the 1740s, Innys was collecting his huge collection, from Redland Court, in Gloucestershire. It was eventually acquired in the 1750s by Thomas Coke (1697–1759), earl of Leicester, who moved it to Holkham Hall, Norfolk. According to a [Holkham Hall library blog](#) (also the source of the image in the blog-roll), the collection is currently being catalogued.

Helen Wallis gave some basic information about the collection in a couple of brief articles (Wallis 1991, 1993). The entire collection bears a grand title—"A General System of Cosmography, or Elements of Astronomy and Geography, Illustrated by Maps, Plans and Views Collected from the most Eminent Authors, Ancient and Modern by John Innys"—that matches the grandness of the collection and Innys's grandiose plans. It contains no less than 113 folio volumes that contain 5,767 maps, 7,799 prints and 64 manuscripts. Wow!

I think that I shall have to take a road trip, as my core family live about an hour away!

### Transcription of John Innys to "a friend," 5 June 1749

Note: the material preceding the '//' is found both in Gough's *British Topography* (1: 109) and in the *Essay on the Rise and Progress of Geography*. The transcription is taken from the Bodleian Library's digital scan, accessed through *Eighteenth-Century Collections Online*.

iv/

The late Mr. John Innys, of Redland-court., near Bristol, younger brother to William Innys the bookseller, and some time a partner in his business, had collected in a number of volumes all the maps, plans, views, &c. he could meet with for the whole world, but without specifying the maker or engraver; and had compiled an exact index referring to every place in each. This collection is now in the library at Holkham. // The letter here subjoined will shew Mr. Innys's plan.

*Copy of a Letter from Mr. John Innys to a Friend, giving a short Account of his Collections.*

*(This volume is dated Chelsea 1749, and Redland Court, Gloucestershire, 1762.)*

“Sir,

*Chelsea, June 5, 1749.*

“As you are pleased to desire a short account of my GEOGRAPHICAL COLLECTIONS, I here send it you.—

“The first and second volumes comprehend by way of introduction the general or cosmographical part, that is, as much of astronomy as has any connection with geography, the several hypotheses about the disposition of the universe, and the best schemes and designs for rendering that part intelligible and easy.

v/

“All the other volumes are purely geographical, consisting of maps, plans, views, &c. antient and modern, of all parts of the habitable world.

“At the beginning of every volume is a table of the parts it contains, divided and subdivided into the smallest territories; and in an opposite column is an account of the maps, &c. in it, with their dates and where engraven.

“The maps according to the antients stand first, then the modern in the order of time it is supposed they were published; the like disposition is observed in the cities, towns, churches, &c.

“Where there is no map of a particular province according to the antients, a reference will be always made to the general map.

“The table gives the names of places first in English, 2dly in Latin, and lastly as they are called by the natives and other nations. Thus, The Hague, Eng. Haga Comitit, Lat. S'Graven Hague by the natives, La Haye by the French; and sometimes the Greek names from Strabo, Ptolomey, &c.

“After the names of kingdoms, provinces, cities, &c. is a short account of their situation, ex[tent, &c. with their longitudes and latitudes according to what authors they are taken from: if by observation it is always expressed by an asterisk.

“In the descriptions of the parts of the world the distances will be in English computed miles of 60 to a degree; so that by measuring on the scale of latitude on any map, the place can easily be found



if in it; and if not in any map, by knowing how many miles it is east, west, north, or south, from any given town, its situation may easily be guessed at.

“When it happens that a plan of a town cannot be inserted in its proper place, the place where it is to be found will be referred to before its name in the tables. Thus Reading being in the corner of Speed’s map of Bucks the reference directs thither.

“Immediately before the maps general and particular, and before the plans and views of towns, cities, monasteries, &c. will be an account of such authors as have described them; and where no such account is prefixed the general one is to be consulted.

vi/

“Whatever plans or views, prints or drawings I have had intelligence of, but not yet procured, I write down on pieces of paper, which I place where the things themselves should be, and also enter them in a book, which I have found of use for placing them when they can be come at.

“The points wherein geographers disagree will be taken notice of throughout the whole work.

“When I have a plan whose chorographical situation is uncertain, I enter it in a book till I can get more satisfactory notice about it.

“The materials of such volumes are marked with the letters A, B, C, D, &c. and when the parts exceed one alphabet, another is begun; and if that be exhausted a third, and so on; and a volume may begin in one alphabet; and conclude in another; thus vol. LXXIII. begins 39 E. and ends 40 T.

“Every volume is titled on the back three ways, and sometimes four.

“I. What volume of the work it is.

“II. What letters the contents are marked with.

“III. What empire or kingdom.

“IV. What parts of that empire or kingdom.

“Thus

VOL. LLXXIII. } England, Part 7.  
39 E — 40 T } Gloucestershire.

“At the end of the last volume I have added a synopsis of the longitudinal measures of different nations reduced to English feet, whereby they may be easily compared with English miles.

“To the whole I have drawn up an alphabetical Index in four columns of all the empires, kingdoms, provinces, islands, and smallest territories in the world: whether I have any particular maps of such small parts or not; as likewise of all the cities, towns, villages, churches, houses, or monuments of antiquity in the whole collection, whereby the minutest place may be instantly found, proceeding from the more particular to the more general. Thus Weldon pavement in col. I. Corby hundred in col. 2.



Northamptsh. col. 3. England col. 4.

vii/

“You have here, Sir, a plan of what is designed: for though it has been the amusement of my leisure hours for above 30 years, yet it is not so complete as I could wish; I mean as to materials I have already by me; for new ones offer themselves daily.

“I am with great respect,

“Sir, your most obedient humble servant,

“Jo. Innys.

Aahus county.	Munster bishopric.	Westphalia circle.	Germany, 7 A. 38.
Alburg diocese.	North Jutland.	Jutland dukedom.	Denmark, 2 M 1.
Abbotsbury abbey.	Ugscomb H.	Dorset.	England, 37 T 5.
Bender.		Budziac Tartary.	Turky in Europe, 29 R. 6.
Corfe castle.	Blandford division.	Dorset.	England, 38 B. 12.
Corpus Christi coll.	Cambridge.	Cambridgeshire.	England, 33 K 16.
————	Oxford.	Oxfordshire.	———— 53 D 75.
Dover court church.	Tendring H.	Essex.	———— 38 Y I 7.
Evora territory.		Alenteio province.	Portugal, 28 K 10.
———— town.	Evora territory.	————	———— 28 K 11.
Kalmuck Tartars.		Tartary.	Asia, 78 B 13.
Ovo island.		in the Archipelago.	Turky in Europe, 30 F 8.
Wansted house.	Becontree H.	Essex.	England, 38 K 28.
Wapping, St. John’s parish in the liberties of London.			———— 49 D 1.

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**READING THE “BLATHWAYT ATLAS” OF COLONIAL NORTH AMERICA**

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<https://www.mappingasprocess.net/blog/2021/11/30/reading-the-blathwayt-atlas-of-colonial-north-america>

The John Carter Brown Library, in Providence, RI—one of the great US “treasure house” libraries—holds an incredible collection of maps of the English colonies in the Americas that was assembled by the leading politician and bureaucrat, William Blathwayt, in the later seventeenth century. The JCB reproduced the maps in beautiful facsimiles, with an excellent commentary by Jeannette D. Black (1970–75; also Black 1968, 1978). The JCB has also digitized all 48 maps in the collection and has made them available online (go to the [JCB’s digital collections](#), launch the Luna browser, select “JCB Map Collection,” and then search for “cabinet blathwayt”).

Prompted by some correspondence with a colleague, I thought I would post here an analysis of the entire collection that I prepared some time ago, as part of my never-to-be-published research on the mapping of British America and more particularly of New England. The issue is that Jeannette Black addressed the context of the early incarnations of the Board of Trade and Plantations, their map collections, and Blathwayt’s work, and she examined each map in detail. She did not consider the atlas as a whole,\* which is quite understandable given the period in which she worked (see also Webb 1984, 417–22). This atlas gives us some sense of the nature of the geographical materials used to conceptualize and comprehend the American colonies by the Lords of Trade and their secretary.

**William Blathwayt & His Atlas**

William Blathwayt (1649–1717) was a lawyer and Tory politician who nonetheless found favor under William III & Mary II. Among other things, he was secretary to the Lords of Trade (i.e., the Privy Council’s Committee of the Lords of Trade and Plantations), 1679–96; surveyor and auditor general of plantation revenues, 1680–1717; secretary at war, 1683–1704; acting secretary of state, 1692–1701; and member of Parliament, 1685–1710. The Lords of Trade were disbanded in 1696 and replaced with a new Board of Trade and Plantations; Blathwayt was prevented from becoming secretary to the new board by Whigs who sought to curtail his power, although he was appointed a member, serving 1696–1707. Blathwayt sequestered the large archive of the Lords of Trade, including its map collection, and apparently monopolized the information so as exert his influence over the new board (Webb 1969, esp. 398–99; Murison 1981, 113–76). While most of Blathwayt’s library was dispersed through several sales

\* On the analysis of atlas organization, see Wood (1987); Akerman (1995); the several essays in Winearls (1995); and Harley (1997).

in the eighteenth and nineteenth century, one bound collection of thirteen manuscript and thirty-five printed maps survived intact until it was acquired by the JCB in 1911. This is the “Blathwayt Atlas.”

In form, the atlas was a large “guard book,” which was the usual format in the early modern era for atlases and other volumes of graphic imagery. A guard book is formed by a number of paper stubs bound between boards; pages, whether impressed with graphic images or text, are pasted onto the stubs rather than being stitched directly into the binding. Such a system has two benefits. First, images lie flat and readable when the book lies open, without a gutter to obscure their central and usually most important portion. Second, images can easily be added to or removed from the paper stubs without destroying the book’s binding; this is clearly very useful when assembling a working collection of maps. (The Board of Trade and Plantations would in the later 1700s keep its maps in twelve large “portfolios” which seem also to have been guard books; refer Assiotti 1780).

The ease with which the contents of such a composite atlas can be altered means that we must be careful in distinguishing between the original assemblage of the atlas and its final state. The original assemblage of forty-four maps was recorded in the manuscript list of contents prepared in about 1683 by John Povey, one of Blathwayt’s clerks. However, the wide spacing of the entries in the manuscript list of contents suggests that it was perhaps expected that more maps would be added. And ten maps were indeed subsequently added to the volume, five depicting Africa and Magellanica (Antarctica), while six maps were removed. The list of contents was not updated to reflect these changes, so we have no clues as to when the changes were made, but they were probably accomplished later in the 1680s. In this respect, the final state of the atlas, with its forty-eight maps, might more properly be considered an “album” (Black 1970–75, 2:25–30).

### Assembling the Atlas

The following lists the contents of the atlas, emphasizing the contents as identified in John Povey’s index. Maps are identified by:

[n] the page number in Povey’s list of contents, corrected for Povey’s slips in misnumbering several maps; lacking for those maps that were subsequently inserted into the atlas.

“...” Povey’s brief title for the map in the index.

= Blathwayt x, the sequential number in the final assemblage of the atlas; lacking for maps that were later removed from the atlas. This number is used to identify maps on JCB website.

The dates of the maps are largely uncertain, and are generally not given here; [refer to the JCB catalog for details](#).

[1] “Sellers’ Map of the world.”

A printed double-hemisphere world map, by John Seller, depicting the earth’s land masses, probably the folio map that Seller included in editions of his *Atlas Maritimus* and his *Atlas Terrestris* in the mid-1670s. Later removed from the atlas.

[2] “Mercator’s projection” = Blathwayt 1

A printed world map constructed on Mercator’s projection, published by John Thornton, using the graphic conventions of sea charts to show the world’s oceans.

[3] “Woods America” = Blathwayt 2

A printed map of the Western hemisphere and North and South America together. Not actually a separate map of America, but the western sheet of a world map by Robert Morden and William Berry, dedicated to Cap. John Wood.

[4] “English plantations in America” = Blathwayt 3

A more precisely framed printed map of eastern North America from Newfoundland to Florida and the Caribbean, also published by Morden and Berry.

[5] “North-west Passage” = Blathwayt 4

A printed English marine map, by Thornton, Seller and others, of the Hudson’s Bay and surrounding territories and seas.

*insert 1 = Blathwayt 5 \**

[6] “Sanson’s Canada” = Blathwayt 6

A printed French map of New France, by Nicolas Sanson, 1656.

[7] “Newfoundland” = Blathwayt 7

An anonymous, English manuscript marine map of Newfoundland and the Gulf of St. Lawrence.

[8] “Massachusetts-Bay”

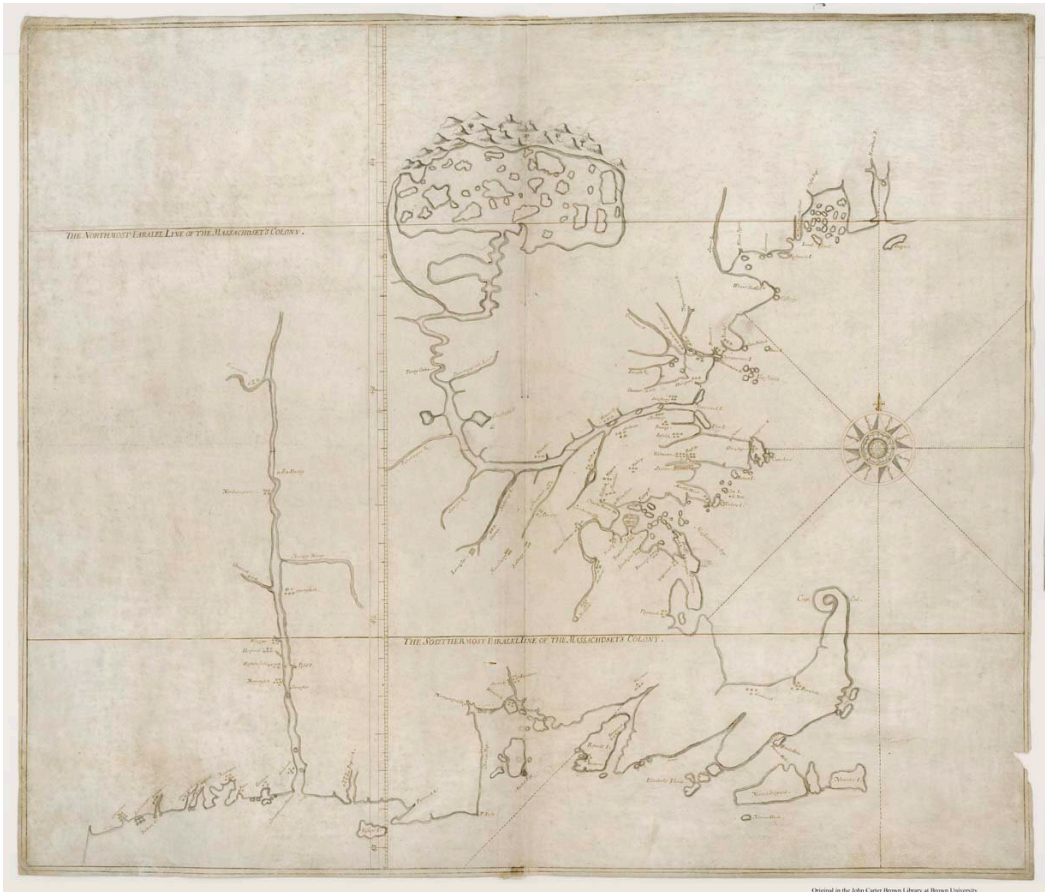
Probably a manuscript map, later removed from the atlas.

[9] “Merrimack River” = Blathwayt 8

An untitled, anonymous, manuscript map of Massachusetts Bay and New England, copied from that sent by the Massachusetts Bay authorities in justification of the colony’s

\* A printed geographical map, by Thornton, of the colonies from Hudson’s Bay to New England, with an inset for the eastern seaboard from Maryland to the Carolinas.

extensive territorial claims, to which the Merrimac River was key.\*



The anonymous map of the boundaries of Massachusetts Bay bearing three annotations on its verso: “Merrimack River”; “This Map was Copied out of an Original lent by Mr Stoughton & Bulkeley Agents of Boston.”; and, in Blathwayt’s hand, “Memorandum This Map was exactly Copied about 1678 from an Original lent Sr Robert Southwell by Mr Stoughton and Mr Buckley two Agents from New England.” Click on image to see in high resolution (search for Blathwayt 9).

\* This map was first noticed by Tuttle (1915, 112–15). Black (1970–75, no. 8) provided an exhaustive analysis of the map and of its copying by Robert Southwell (secretary to the Lords of Trade and Blathwayt’s mentor) from a manuscript map carried to London in 1677 by William Stoughton and Peter Bulkeley, agents for Massachusetts Bay. The original source of the map—by William Reed, ca. 1665—had delineated Fort Albany and the upper Hudson River; these features, and their related toponyms, were omitted from the surviving manuscript (Black 1970–75, 2:68). The map is sometimes known as the “Stoughton-Bulkeley map”; Boulind (1982) referred to it as the “Blathwayt map.” See also Allen (1982, no. 29) and Benes (1981, no. 25).



[10] “Nova Belgia” = Blathwayt 9

A printed Dutch map of Nieuw Nederland, by Allard, one of the so-called Jansson-Visscher series of maps of *Novi Belgii*.

[11] “Virginia, Maryland, New Jersey, New York & New England” = Blathwayt 10

A printed map of the middle British colonies, as far south as Virginia, with an inset of New England, published by Thornton and Robert Green.\*

*insert 2 = Blathwayt 11 †*

[12] “Berry's New England, New York, New Jersey, Maryland & Virginia” = Blathwayt 12

A printed map, depicting the colonies from New England to Virginia, published by Morden and Berry, annotated by Blathwayt and with watercolor boundaries and marginal key by Povey.‡

[13] “New Jersey”

Uncertain. Later removed from the atlas.

[14] “New Jersey w[i]th description” = Blathwayt 13

A printed map of New Jersey, by Seller and William Fisher, with four columns of descriptive text and a view of New York city.

[15] “Long Island & New York” = Blathwayt 14

An ornate English manuscript marine map, on vellum, of Long Island and the neighboring coasts, by Robert Ryder.

[16] “Pensilvania w[i]th description” = Blathwayt 15

A printed map of southern and eastern Pennsylvania, by Thornton and Seller, with four columns of descriptive text.

[17] “Maryland” = Blathwayt 16

An anonymous English manuscript marine map of the coasts of Maryland, i.e., the Cheseapeake and the Delmarva peninsula; probably part of a single set, with [18] and [21].

[18] “Virginia” = Blathwayt 17

\* A printed geographical map of the colonies, from New England to Virginia, published by Thornton and Greene.

† A printed geographical map of the colonies, from New England to Virginia, published by Morden and Berry.

‡ Blathwayt 11 and 12 are impressions of the same work (see n5). Given the extensive annotations by Blathwayt and Povey, Black logically took this impression to have been included in the original assemblage.

An anonymous English manuscript marine map of the coast of Virginia, so the southern end of the Cheseapeake; probably part of a single set, with [17] and [21].

[19] “Carolina” = Blathwayt 18

An anonymous manuscript marine map of part of the coast of Carolina.

[20] “Carolina” = Blathwayt 19

An anonymous manuscript marine map of part of the coast of Carolina.

[21] “Carolina” = Blathwayt 20

An anonymous English manuscript marine map of the coast of Carolina, coarser resolution than [19] and [20]; probably part of a single set, with [17] and [18].

[22] “Carolina” = Blathwayt 21

An anonymous manuscript marine map of Albemarle sound, in Carolina.

*insert 3 = Blathwayt 22 \**

*insert 4 = Blathwayt 23 †*

[23] “Bermudas” = Blathwayt 24

A large manuscript map of Bermuda, showing its colonial division into parcels of land, by Richard Norwood, drawn by Thomas Clarke.

[24] “Seller's Charibbee Islands” = Blathwayt 25

A printed marine map of the Caribbean, published by Seller.

[25] “Sanson's Antilles and other islands” = Blathwayt 26

A printed French map of the Antilles, published by Sanson.

[26] “St. Christophers” = Blathwayt 27

A printed French map of the island of St. Christopher, published by Mariette.

[27] “St. Christophers & Nevis”

Uncertain map of the two islands. Later removed from the atlas.

[28] “Martinique” = Blathwayt 28

\* A map of Virginia published in London in 1651, annotated by Blathwayt on the verso as “Old Map of Virginia”; so not included in the original assembly of the atlas as not a relevant work for administration, but perhaps later inserted for safe keeping.

† A printed map of Carolina, published by Gascoyne and Greene, perhaps just after the atlas was originally assembled.

A printed French map of the island of Martinique, published by Mariette.

*insert 5 = Blathwayt 29 \**

[29] “Monseratt” = Blathwayt 30

A remarkable English manuscript map of Montserrat, showing “facets” of settlement around the mountainous island, as (if) seen from the sea.

[30] “Guadeloupe” = Blathwayt 31

A printed French map of the island of Guadeloupe, published by Mariette.

[31] “Barbados” = Blathwayt 32

A printed map of Barbados, published by Overton, Morden, Berry, and Pask.

[32] “Jamaica” = Blathwayt 33

A printed map of Jamaica, on vellum, published by Lamb.

[33] “Slanyes’ Jamaica” = Blathwayt 34

A printed map of Jamaica, on vellum, by Edward Slaney, published by Berry.

[34] “Oglibly’s Jamaica” = Blathwayt 35

A printed map of Jamaica, on vellum, published by John Ogilby.

[35] “Moxon’s Jamaica” = Blathwayt 36

A printed map of Jamaica, published by James Moxon.

[36] “Peru”

Uncertain, probably Dutch. Later removed from the atlas.

[37] “Venezuela” = Blathwayt 37

A printed map of Venezuela, published by Willem Blaeu.

[38] “Surinam River” = Blathwayt 38

An anonymous Dutch manuscript map of Surinam and its rivers.

[39] “Surinam River” = Blathwayt 39

An anonymous, undated Dutch printed map of Surinam.

[40] “Chili”

\* A printed map of Tobago, published by Seller. Black is not clear that this map was added later to the atlas.

Uncertain, probably Dutch. Later removed from the atlas.

[41] “Brasile” = Blathwayt 40

A Dutch printed map of Brasil, published by Jan Jansz.

[42] “Paraguay” = Blathwayt 41

A Dutch printed map of the Rio Plata and its hinterlands, across to Chile, published by Jan Jansz.

[43] “Magellan Straights” = Blathwayt 42

A printed marine map of Magellan’s Straights, by Narborough, published by Thornton, Seller, Fisher, Atkinson, and Colson.

[44] “Island and port of Bombay” = Blathwayt 43

An anonymous English marine map, on vellum, of Bombay and adjacent islands.

*insert 6 = Blathwayt 44 \**

*insert 7 = Blathwayt 45*

*insert 8 = Blathwayt 46*

*insert 9 = Blathwayt 47*

*insert 10 = Blathwayt 48*

### Reading the Atlas

In its original assemblage, Blathwayt’s atlas possessed a coherent and rational structure. In reviewing the above list of maps in sequence, and thinking about the areas being mapped, it is clear that the atlas followed a specific geographical strategy. First, two world maps offered different perspectives on the entire frame of the world [1–2]. Then, two further maps focused attention on the geographical context of the Americas and then the English colonies in North America [3–4]. With the reader now led from the world to the overall spatial frame of the colonies, the atlas presented eighteen maps of colonies on the North American mainland, arrayed in sequence from north to south, from the far north of Hudson’s Bay [5] to the Carolinas [19–22]. Given this sequence, it might be suggested that the coarser resolution map of all of the Carolinas [21] had originally followed its stable-mates covering the Chesapeake [17–18] and introducing the three more detailed maps of Carolina [19, 20, 22].

\* The last set of five inserted maps are a printed map of Guyana by Jan Jansz. (Blathwayt 45), and printed regional and marine maps of Africa and its coasts, published by Seller (Blathwayt 44) and Jan Jansz. (Blathwayt, 46–47), and finally of *Terra australis*, the imagined southern continent, in a map by Jan Jansz. (Blathwayt 48).

Leaving the mainland colonies, the atlas's geographical focus shifted to the island colonies, starting with a map of the prosperous English colony of Bermuda, out in the Atlantic, and continuing with the West Indies. There, a general map of the Antilles and another of the entire Caribbean basin were followed by particular maps of the islands in which the English were interested, specifically St. Christopher, Martinique, Tobago, Montserrat, Guadaloupe, Barbados, and Jamaica. Curiously, Jamaica was represented by four separate maps, suggesting that it was then of special interest to Blathwayt and the Lords of Trade.\* Moving still further south, eight regional maps then encompassed South America: Peru, Venezuela, Surinam (two maps), Chile, Brazil, Paraguay, and the Magellan Straights. The atlas's last map was the only one not to depict any part of the Americas: it represented the island and harbor of Bombay, then the only Crown possession in Asia, and the subject of a long dispute in the 1670s between the English and the Portuguese over the interpretation of the terms of the dowry gift made to Charles II (see Gole 1997).

The systematic sequence followed the same basic principles of scale and regional progression established by Abraham Ortelius in his influential *Theatrum Orbis Terrarum* (1570) (see Akerman 1995). The coverage was relatively even across the colonies. In other words, the atlas was not an *ad hoc* creation intended simply as a means to preserve and protect maps of the colonies in the archives of the Lords of Trade. Rather, it was the product of a conscious effort on Blathwayt's part to create a unified vision of empire and of imperial competition.

The timing of the atlas is very suggestive. After 1675, the Crown asserted its authority over the hundreds of autonomous corporations which controlled many aspects of English life, starting with the corporation of the city of London. As part of the same movement, the Lords of Trade sought to forge the disparate colonies in North America and the West Indies into a single empire under royal authority. That is, the atlas was assembled at a crucial moment by the “bureaucratic linchpin”—Blathwayt—of this movement to unify the colonies (Webb 1995, 418 (quotation); also Webb 1968, 1969).

### **Implications concerning the Availability of Maps**

The pattern of printed and manuscript maps in the Blathwayt Atlas is revealing.

Almost all of the printed maps represented large regional conceptions and only a few dealt with particular colonies (notably Jamaica).

In contrast, all of the atlas's manuscript maps represented more particular colonies or parts of

\* Webb (1979, 1995) discerned a general concern among metropolitan officials to centralize the empire by military force, on the model of Jamaica's garrison government. However, Murison (1981, 28–65) persuasively argued that legal institutions and not military garrisons were the real core of the centralization process; see also Speck (1984, 389–91). This did not mean that Blathwayt was uninterested in Jamaica. As indicated by his “Reflections on a Paper Concerning America,” ca. 1685, Huntington Library, Blathwayt Papers, BL416 (reprinted by Murison 1981, 238–40), he had a particular interest in Jamaica: “All His Maties: Plantations as well as Jamaica (as Jamaica indeed in eminent degree) . . .”

colonies. At the same time, ten of the manuscript maps in the original form of the atlas were in the style of the Thames School of chart makers [7, 15, 17–23, 44]. None of them bears an annotation of its source, but several can be related to specific purchases listed in the accounts of the Lords of Trade (Black 1970–75, 2:15–22). Seven of the ten maps provide unbroken coverage of the colonial coast of North America from Maryland almost as far south as Spanish Florida.

Of the few other manuscript maps, three were clearly derived from maps sent to London by colonial authorities [9, 23, 29]. The final manuscript map, of Surinam [38], was by a Dutch copyist from an English source and Black was uncertain how it ended up in Blathwayt's hands, although Blathwayt might have acquired it when he was clerk to the English ambassador in The Hague, just after the Dutch conquered the tentative English colony in 1667.

Of the six maps that were removed from the atlas after its initial assemblage, two were probably manuscripts and of these one was probably derived from a government commission, specifically Randolph's lost map of Massachusetts Bay made in 1676–78 [8].

Of the printed maps, five were French and nine (plus probably two of the missing maps) were Dutch. Blathwayt himself could well have acquired the French maps during his several trips to Paris, when he purchased books and pamphlets; Dutch maps were readily available in London, often being sold by London map sellers with close ties to the Netherlands publishing industry, and Blathwayt could easily have bought them there as on his trips to the Netherlands. It is also worth remarking that the French maps were all of French colonies while the Dutch maps, with the exception of the impression of Allard's map of New Netherland (see Figure 3.4), were all of South America, which is to say areas which were not at the time commonly mapped by English geographers.

The maps in the Blathwayt Atlas can accordingly be placed in sets which conform closely to the contemporary state of map availability in London:

- geographical maps of the world, of larger regions of North America, and of certain colonies which had some political significance were all available in print from English map sellers;
- more detailed maps of the English colonies in America colonies—most of which were still limited to the coastal margin—were available in manuscript from English chart makers of the Thames School;
- sufficiently detailed maps of French colonies were available in print from Paris; and
- printed maps of South America (and, by extension, of other parts of the world) were available from Dutch sources via London map sellers or directly from Amsterdam.

Only a few areas, and Massachusetts Bay in particular, had to be covered by manuscript maps prepared in the colonies for more specific reasons than simply giving a sense of geographical structure to the Lords of Trade.



If the Blathway Atlas reflects the constituency of the larger collection of geographical materials assembled by the Lords of Trade, we can conclude that the imperial administrators in London during the later seventeenth century relied on geographical texts that were commercially available in London for their general spatial conceptions of the colonies. This point is borne out by an impression of a printed map by Robert Morden and William Berry which was the one map in the atlas which Blathway himself annotated and corrected [12]. One of several maps published by London map sellers in the mid-1670s to depict the sweep of the English colonies from New England to Virginia, this map perpetuated a rather incorrect, although understandable, delineation of colonial boundaries in New England: “Massachusetts Colony” ran northwards into “Laconia, or the Province of Main”; to its south, separated by a boundary marked by a line of dots, was “Plymouth Colony”; to the west of both, lying between Connecticut and Hudson rivers, lay “Connecticut Colony.” On his impression of the map, Blathway corrected these boundaries by crossing out the over-extensions to the names of the three colonies; his clerk, John Povey, applied water color to delineate the boundaries of seven colonial territories and added a key in the margin. All of the water-color boundaries stopped short of the Hudson River, in recognition of the duke of York’s proprietary ownership of New York; none were drawn with any great precision, and there were several glaring mistakes, especially in the northern boundary of Massachusetts Bay (shown as running to the south of the Merrimac River). It is fair to say that the lines were added more as an *aide memoire* than for any legal purpose. Politically, these boundaries graphically represented the manner in which, as Blathway wrote to Edmund Andros in July 1679, “the Jurisdictions of the Massachusetts” had been “somewhat lessened” and in which he hoped to continue to reduce the anti-monarchical “Ambition” of the Puritan colonists (Webb 1995, 419-20, quoting Blathway to Andros, 15 July 1679). Cartographically, it is telling that Blathway made these corrections on a printed, published map rather than commissioning a new geographical map. It strongly suggests that in the later seventeenth century, government officials tended to acquire their general geographical information from commercially available maps.

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