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## *Art and Design of maps*

Nicolas Verdier & Jean-Marc Besse

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In June of 1738 the *Mercure de France* published a critique by Jean-Baptiste Bourguignon d'Anville (1697-1782) (QV) of the Dutch edition of *Description de la chine* by Father du Halde (The Hague: Henri Scheurleer 1736), for whose French edition in 1735 d'Anville had prepared the large maps. The foreword to the revised Dutch edition asserted that “without exaggeration, those [maps] in our edition offer as much as the maps engraved in *France*, as these latter ones from that distant country offer to all of those that have appeared until now...”(p. lxvj). Although the foreword claimed to have followed d'Anville's maps in detail, the original author expressed his reservations:

The overall general map is drawn with a relatively good hand, and is the best presented of all: however, the rows of mountains are interrupted almost everywhere. The general map of China falls far short: the mountains on the Dutch map are in very bad taste: they are small hills, completely detached and placed haphazardly, and without any setting to convey the natural: the writing is thin, and of equally bad taste [...]. The general map of the Chinese Tartary [Mongolia] is in the same [style of] engraving as that of China, and in many places, where it is not clear that there are very high mountains that form long chains between them, such as at Mont *Chanyen* or *Chapê*, which is almost always covered in snow: we do not see, or scarcely, the expression of these mountains in the Dutch copy...Throughout, the taste of engraving is more akin to woodcut than copperplate engraving. However, one should acknowledge the cartouches that were added to all the individual maps in the Dutch series; but does the beauty of these cartouches justify the liberty taken to place them where they are? Because it is absurd to place a cartouche on each of the maps that create a composition of several sheets, as do the [twelve] maps of Tartary and [the nine of] Tibet: for if the sheets are joined together to make a general map, this map will be scattered with cartouches and separate titles. (*Mercure de France*, June 1738, pp. 1089-1093)

[**Figs 1 & 2:** Dutch edition of d'Anville's China maps and d'Anville original]

D'Anville's reflections focus on the Dutch publisher's competence with regard the engraving and layout of the maps, not his “Dutch” style. In other words, maps produced in different places of cartographic production in the eighteenth century were not described in terms of national styles, but in terms of taste and effect.

Similar ideas suggested that there were no differences between different types of maps. Bradock Mead (QV John Green) refused to differentiate between land maps and marine charts, criticizing those who imagined that “a MAP is to be drawn only by a MAP and a Chart from a Chart”(p. 137), »] (Mead, 1717, 137) The review of Mead’s work in the *Nouveau Mercure de France* (March 1721/03, 178) translated this as “qu’une carte terrestre doit être dessignée autrement qu’une carte marine” using the word “design” (« dessigner ») and thus placing map composition as a graphic art (Jollain et Cousin, 1685). In fact, d’Anville’s comparison of his own maps with the Dutch copies used a criterion that was as much aesthetic as technical and his vocabulary indicated the practical and aesthetic challenges involved in the creation and reading of maps: the mountains on the Dutch map “are extremely tasteless” («sont d’un fort mauvais goût»); the writing is “equally tasteless” («d’un goût également mauvais»); a crude and unskilled “sense of engraving” («goût de gravure ») was more like woodcut than copper engraving; and finally the cartouches, though attractive, had been placed without any logic on the individual map sheets so that the assembled general map “will be scattered with cartouches and specialized titles.” Thus d’Anville’s harsh criticism that the Dutch copies lacked taste and the composition lacked simplicity highlighted two underlying principles in the design of maps in the eighteenth century, which reflected judgments of both producers and users: *taste* and *composition*.

### Taste

D’Anville was not alone in using the word *goût* [taste] in his critique of the Dutch maps. La Poix de Fréminville employed similar instructions regarding the production of property maps:

For the use of property maps to affix on geometric maps, there will be a difference in that the seigneur, who has a geometric survey made of his land, does so only to keep these maps; thus it will be necessary that the property maps be related to each other & arranged in the same **taste**. (Poix de Fréminville Edme (de la), 1746, 108).

Nicolas Buchotte made a similar assessment concerning relief representation:

With regards to the accompaniment of the entire map--I am referring to the landscape around it--there are few people who make tasteful maps showing plowed land and mountains and hills, these things not being as easy as they seem; because there is big

difference between the landscape shown in plan and that shown in perspective. In the latter, if the objects are shown in profile as they are seen in nature, they continue to make an impression. It is not the same as the landscape on a map: if the mountains and hills, are represented in bird's-eye view (meaning in a squashed manner) because of the frequent need to know the physical extent of their base, if they are not rendered with good taste, they have no impression, or provide only a disagreeable view..... »

(Buchotte, Preface, 1743/1754, [3-4] unpaginated).

Thus taste was both a criterion for evaluating the quality of maps, but also a general rule in their production, applicable to every cartographic mode. Therefore, the question of taste within a larger framework of the visual arts in general bears consideration.

The concept of taste was not restricted to fine art and poetry only. In the eighteenth century, it took on a familiar connotation in the development of aesthetics, such as the science of sensibility (Baumgarten 1735). Taste was defined as a feeling of pleasure bound to the experience of all kinds of objects surrounding humans. As such, this feeling applied equally to natural beings, works of art, and scientific creations. Aesthetics comprised the set of rules that determine an assessment, both intellectual and appreciable, of these various types of objects. In this way, maps, which are images presented as visual works, also provide an opportunity for an aesthetic experience. But the aesthetic assessment of cartographic images did not conflict with their cognitive significance. On the contrary, aesthetic assessment was carried out from a perspective of knowledge or geographic science, and from this basis the discernment of taste was implemented. “Art” and “science” were not in opposition, but linked in a common purpose of the readability and efficacy (or, “truth”) of geographic images. Map producers joined in a broader visual culture that connected them with painters, architects, engravers, and anyone involved in the design and production of images, whether “artistic,” “scientific,” or “religious.”

Certain key elements defined a work as being tasteful or tasteless. The *Essai sur le goût* by Montesquieu (1757) as well as the *Livre d'architecture* by Germain Boffrand (1745) provided some precisions: taste is a feeling of the pleasure or displeasure that is experienced by the soul when it is presented with something; it is the feeling of the pleasant or unpleasant that is the judge in this matter. Buchotte’s text cited above asserted anything drawn on the map is designed to trigger an effect on the viewer, and this effect will be considered pleasant or unpleasant, in other words, tasteful or tasteless, depending upon the choice of

representation. As with other graphic images, a map might be judged as tasteful, and thus pleasant to view, when it brings together the following qualities, according to Montesquieu: it shows things to the soul; it shows it with order (thus avoiding confusion); it incorporates variety (by avoiding uniformity); this variety embodies symmetry, that is, an overall balance of the parts (Baxandall, 1985). Montesquieu's instructions have a clear goal: the creator of the image must assemble a complete visual whole that is rich, varied, and ordered, easy to grasp visually, and easy to read (Montesquieu, 1757, 44). As Buchotte wrote: "If one is not born with a talent to draw, one should at least know how to draw tastefully in order to be understood by the connoisseurs and to recognize drawings [of others] that follow the rules" » (Buchotte 1722, p. 3 de la préface)

Indeed, Montesquieu and the *Encyclopédistes*, along with d'Anville, confirmed the prerogatives of classical taste against the excessive ornamentation characteristic of earlier periods. This broad discussion revolved around the legitimacy and form of ornament in the art of design. Charles-Nicolas Cochin (1715-1790), who himself designed cartographic ornaments, agreed with Montesquieu: "The primary shape of something is produced for this purpose [i.e., use and convenience], and the rest is only added to enrich and embellish it: thus ornament is subject to laws of decorum. The general rules of taste, established in all areas of art, are no less important: variety, symmetry, calm next to busyness, irregularity in masses and their components; proportional relationships of large to small, which are discernible to the eye and which are recognized as one of the main causes of the pleasure created by beautiful things" (Cochin, 1761, Avant-propos, pp. XIII-XIV).

A standard of taste occurred in all the arts, whether mechanical or decorative. The goldsmith, engraver, cabinet-maker, and others such as painters, sculptors, and scientists tended to comply with this rule. Over the course of the century, such thinking led to the creation of art schools for artisans where geometry played an important role, and also technical schools like the l'École des Ponts et Chaussées (QV) where cartographic production and geometric knowledge were equally valued (Picon et Yvon, 1989). The curriculum of the art schools determined that geometry would allow the ornament to be standardized and subjected to rules of good taste by curtailing the whimsical and bizarre (Courajod, 1874, p. 201).

## **Composition**

"A well composed picture," wrote Diderot, "is a whole, enclosed by a single point of view wherein the parts contribute to a common goal, and form a complete whole through their

mutual correspondence, that is as real as that of the limbs of an animal's body; in such a way that a fragment of a painting fragment simply has forms cast randomly, without proportion, or understanding, or unity, no longer deserving the name of an actual composition, any more than studies of a nose, eyes, and legs scattered on a bit of paper are worthy of being called a portrait or even a human form. ("composition," *Encyclopédie*, Vol. 3, p. 772). In other words, a painting, and moreover a map, were well put together when they demonstrated unity of viewpoint, symmetry and proportion in the arrangement of their whole and thus reflect their creator's good taste.

However, the issue of the unified point of view was debatable where the map was concerned. In 1722, Nicolas Buchotte still considered it "acceptable" (Buchotte, 1722, 104) to see certain elements drawn in elevation, whether manmade constructions (cities, houses, castles...) or landmarks, (mills, posts, crosses, prominent trees). Yet by 1801 Louis Nicolas de Lespinasse rejected this style of graphic representation, criticizing maps that "allow and accept trees, boulders and other objects in elevation[...]. One wonders about these inconsistencies between convention and execution and why one [mapmaker] accepts the geometrical, while another discredits it, thus creating the impossible" (Lespinasse, 1801, p. 47).

Peter Apian had long since defined chorography and geography based on Ptolemy in his *Cosmographie* (1584); he had illustrated their differences with diagrams of the ear (chorography) as opposed to the entire head (geography). Diderot's text on painting employed this same logic to the art of composition. Cartography, like painting, should be considered as an art that developed images that follow the general laws of visual composition established in contemporary visual culture. This hypothesis seems to be supported by Father Lubin's definition of the word *Tabula*: "The word *Tabula* in Greek is *πίναξ* from which is derived the word *Pinacographia*, the composition of maps; geographers, who make their reputation from geographic tables, should not dismiss the quality of *Pinacographs*, which is *Tavola* in Italian, *Carta* or *Mapa* in Spanish, *ein Tafel* in German, and *a chart* in English" » (Lubin 1678, 347-348). Diderot wrote that composing "is to put together several parts to make a body," and this activity, he added, applied "to the creation of the arts that suggest invention and genius, such as fine art, painting, sculpture, engineering, etc." (*Encyclopédie*, vol. 3, p. 768). Geography in the 18<sup>th</sup> century was a graphic art, an art of the image. Geography create maps and tables, that is to say first complex images intended for the visual communication of comprehensive information relative to a territory (its shape, history, contents and qualities) and the different interests, intentions and interpretations, for which it

was the object. When d'Anville criticized the useless proliferation of cartouches on the specialized maps of the Dutch map of China, he was considering the complete composition of the set of plates as a general map, and more specifically, the visual coherence of this composition. Visual simplicity was the rule that he applied.

Maps have long been studied from the perspective of the history of discoveries and the development in measurements. They should also be considered as part of the history of graphic arts, as images to be read and deciphered. They generate questions about the demands placed on eighteenth-century mapmakers as to the readability of maps, as well as their accuracy. As a whole, the graphic resources employed in the map production (legends, colors, fonts, drawing and engraving techniques, and layout), responded to the requirement of readability, which was expressed through *composition* and *good taste*.

### **The graphic organization of the cartographic page**

Any research program that studies maps within the context of graphic arts, a program that remains to be thoroughly developed, should consider the many issues that 18<sup>th</sup> century cartographers resolved before organizing information on the map. Among these are four little studied topics: a) the relationship between image and text (map and memory); b) the representation of cartographic practices and phenomena in different cartographic modes; c) the relationship between the map and the “frame” (the edge of the map); d) the collaboration among the different agents in the graphic production.

a) image and text: An example of the question of balance between text and image was considered by d'Anville in another critical letter in the *Mercure de France* (March 1751) leveled at Solomon Bolton, who had published a copy of d'Anville's map of North America (Paris, 1745) in London in 1750, to accompany the *Universal Dictionary of Trade and Commerce* (a translation of Jacques Savary's *Le parfait négociant* by Malachy Postlethwayt, London: John Knapton, 1751-1755). While d'Anville's overall critique explored whether Bolton's copy of the French original was “greatly improved,” as the title claimed and discussed the geopolitical nature of the two maps, d'Anville turned to the appearance of the Bolton copy in questioning the acceptable amount of text on the map.

The first of M. Bolton's legends does not say anything other than that according to the Treaty of Utrecht, the French have the right to frequent the northern coast of Newfoundland. This is certainly a fact about which I would agree with him; but I would have omitted it from my map on the grounds that I would have discussed it elsewhere, in notes of some kind. (Bourguignon d'Anville, 1751, pp. 153-154).

Bolton's copy had added too many words for d'Anville, who distinguished between good and bad relationships between the map and text. The larger subject of the relationship of the map to the accompanying memoir (QV Cartographic Memoirs), is only fleetingly touched upon here; it is the visual effect of legend and text on the map itself that concerns the French geographer. The question of where text belong had elicited comment from Bradock Mead too, who confirmed the ineluctable connection between the map and its accompanying memoir, without which the map could not be understood. D'Anville considered Bolton's map overloaded, specifically because the author had not correctly allocated the necessary information between the map and any memoir linked to it (which did not exist).

Maps created through different cartographic practices at different scales demanded different approaches to the text and map question. General maps compiled at a medium to small scale called out for explanatory memoirs because their production was based on multiple sources – graphic, textual, and oral – and their justification and value resided in the explanation of how these sources were evaluated and employed. For such maps, the memoir served as the extension of the map image, which allocated space for text in the form of title, dedication, scale, and explanatory legend. At large scales, property, topographic, or geodetic maps such as the Cassinis' *Carte de France*, based entirely on trigonometric ground survey, was not intended to be accompanied by published texts, even though it was based on the compilation on-site observation and texts and tables of information. (QV *Carte de France*) This map was designed to stand alone as a graphic image, without text. Any legends produced to accompany this map were prepared by commercial publishers, not by the Cassinis.

b) Representation of cartographic practices and phenomena: Most modes of cartography are concerned at a basic level with the naming of things or places and their location within a determined spatial framework. The distribution of people, places, objects, or institutions in space had long been considered the primary function of cartography. In the eighteenth century the concern for determining location with greater accuracy than ever before was accompanied by an increasing desire to identify and quantify physical phenomena and human practices. While not new in the eighteenth century, thematic maps of various sorts were made increasingly possible by the development of communication networks, by the increased gathering of statistical data, and by the observation and representation of [QV Thematic Mapping] Statistics and Cartography; Route maps and surveys]

Among the thematic maps that employed unusual graphic techniques in the representation of information were road maps, such as found in the strip maps of John

Ogilby's *Britannia* [FIG QV illustration for Road Map] or the route maps as found in the *Atlas Trudaine* [FIG QV illustration for Route Map]. These maps employ line and scale, and, in the case of Ogilby, *trompe l'oeil* techniques to devalue the actual nature of the terrain in order to emphasize the route or road as a straight line. Similar techniques were used in the battle map, which integrated lines representing the trajectories of cannon balls, and later, the movement of troops, culminating in very complex maps showing several displacements of the same units. [FIG QV Battle Map; Military Cartography] Thematic maps that showed the distribution of natural or manmade phenomena in space also demanded specialized symbols for the phenomena and explanatory legends to make them comprehensible, such as mineralogical maps of Jean-Etienne Guettard or of Belsazar Hacquet (Leipzig 1778). [FIGS QV Thematic mapping in France; Thematic mapping in Austrian Monarchy]. Graphic techniques of color and symbol were employed to show temporal events, such as the map of the storm of July 13, 1788 drawn by which Jean Nicolas Buache de la Neuville for the *Mémoires of the Académie des Sciences* (1790, 308, pl 4) (Vasak 2004), and the eclipse map of 1762 by Mesdames Le Paute, Lattré, and Tardieu, discussed below.

c) the relationship between the map and the edge of the composition: An aspect of map design rarely touched upon either in contemporary or modern literature is the question of the edge (the border or the frame) of the map. Leaving a map without an edge might imply incompleteness: the map was a draft, a sketch, an early attempt to render the image. The choice of frame or edge allowed the cartographer to create a visual marker for the whole of his composition and, in addition, to make a visual statement about the nature of the composition (its audience, its display, its intention), whether manuscript or printed. Most commonly, a map or plan, whether in manuscript or print, was finished with a neat line, a single line that encompassed the cartographic content of the map. Sometimes the line was doubled, and the intervening place filled with important information marking the grid of longitude and latitude. For example d'Anville's map of the ancient world (1740) **Fig 3** ([ark:/12148/btv1b59637331](#)) employs two distinctly different cartouches, one for the title and another for the scales, with text integrated into the latitude and longitude table; the whole composition is surrounded by a double line frame the encloses the longitude and latitude numbers, yet by necessity the geography of the map breaks the frame in order to provide a complete composition. Sometimes outside the double line, a border of scenes, views, portraits, peoples created an encyclopedic effect of a catalogue of information provided in

addition to the map content, such as this map of Africa by Jean-Baptiste Nolin fils **Fig 4** ([ark:/12148/btv1b77590957](#)). Similar pictorial elements might form the frame on maps whose purpose was that of display and historical grandeur. [FIGS QV Urban Plan ; Nolli Pianta di Roma]. we should also consider if a style in the decorative arts encouraged authors to work on compositions that would produce different types of combinations between texts, cartouches and maps on the same plate? For example the map of Rome published in the same year by Covens and Mortier, which increases the different styles of cartouches, and works with frames and graphic insertions **Fig 8** ([ark:/12148/btv1b530248990](#)) Part of the complexity of the eighteenth century could be summed up by what appears to be a tension between the style of this map of Rome, seemingly overloaded when compared to the apparent simplicity plates of a Cassini map **Fig 9** (<http://bfichet.free.fr/david/007-rumsey.htm>), like the tension between the Baroque style, or at least Rococo, and the Classical. Sometimes, the map or plan was surrounded by a *trompe l'oeil* frame, emulating the wood or plaster frame that a map might be housed in upon an owner's wall, as in the 1735 plan of Bath by the architect John Wood, who used the distinctive oval frame to set off the city plan, surrounding the oval frame with explanatory text, set within the corners of the outer rectangular frame. (Christian Michel, 1987) [FIG QV Urban planning and Cartography] A cartographer might also frame several separate maps, each with its own neat line or edge, within a larger whole, such as Philippe Buache's composition of 1740 of seven maps of the Antilles, copied from Henry Popple, [**Fig 5** [ark:/12148/btv1b59706865](#)] , encompassed by the neat line that ties them together, they acquire a completeness. The outer frame seemed to indicate both the edge of composition and the unity of the whole. Clearly there were many design choices open to the cartographer, and the varieties of frames used deserve a larger, more nuanced study within the context of the map's content, its perceived audience, and the meaning it adds to the image. (Foucart 1987)

d) The collaboration between different agents in the process of map production influenced the graphic choices and resulting compositions. The works by Mireille Pastoureau and Mary Pedley (Pastoureau, 1981 ; Pedley, 1984, 2005) have shown the importance of the relationships between cartographer and their engravers and the effect on different elements of maps and cartouches in France, yet no study has thoroughly explored the nature and consequences of this collaboration. Little archival evidence has emerged to elucidate this process. Even though d'Anville relied on his brother, the engraver Hubert François Gravelot

(1699-1773), for the design of many of his cartouches, and their close relationship must have been mutually beneficial, we know little of its details, and the small number of d'Anville's maps compared with growing production throughout Europe in the eighteenth century, means that we do not have a clear picture of the role of each protagonist in the design process. That this could be a collaboration of equals emerges from a map made famous because it was produced entirely by women, the *Passage de l'ombre de la lune au travers de l'Europe dans l'éclipse de soleil centrale et annulaire qui s'observera le 1er avril 1764*. "This map is the work of three women, the astronomer [*calculatrice*] who projected it, [Madame Le Paute], Mdm. Lattré, who engraved it, and Mdm. Tardieu, who was responsible for the ornamental details" (*Journal général de la France*, 23 juin 1762, p. 99). [FIG in Women and Cartography] Nicole Reine Le Paute (1723-1788) was a gifted mathematician who calculated pendulum oscillation tables for her husband Jean André Lepaute, clockmaker to the King, and calculated the return of Halley's Comet with Jérôme Joseph de la Lalande. Elisabeth Claire Tardieu (1731-1773) was the wife of Jacques-Nicolas Tardieu (1716-1791) both well known and reputable engravers, often of maps. Madame Lattré, née Marie Françoise Vérard, was the wife of the Jean Lattré, map and atlas publisher and engraver, and actively involved in her husband's workshop (Petto, 2009). The fact that the "work" (*ouvrage*) is attributed to all three women without any ranking of one as the author and the others as employees or workers is to be remarked. According to the *Encyclopédie*, a work (*ouvrage*) is "the creation of a man of letters" « la production d'un homme de lettre », but the word is also an architectural term referring to a construction resulting from the involvement of various specialists (*Encyclopédie* 11, 722 et 724). The fact that the *Journal général de la France* attributes the position of author of the work to all three women shows the strength of relationships built at the junction of cartographic technique: the projection and design of the map, the engraving, the ornamentation, and its printing in two colors, a rare example of this difficult technique [QV Reproduction of Maps in Print] ([ark:/12148/btv1b55000407b](http://ark:/12148/btv1b55000407b)).

The *Mercure de France*, which mirrored the taste of eighteenth century salons, revealed how the balance between concern for the accuracy and quality of engraving marked many commentaries of the period. In 1702, Nicolas de Fer was hailed in *Mercure Galant* for the "exactitude and design" of a recently revised celestial planisphere (*Mercure Galant*, 1702/04, 291). Two years later, de Fer's *L'Espagne triomphante sous le règne de Philippe V* was described as "more accurate and more detailed than what has been published up until that time, a beautiful engraving that is pleasing to view" (*Mercure Galant*, 1704/03 p. 297).

Twenty years later, the *Carte de la France divisée dans toutes ses généralitez* by Bourguignon d'Anville was recognized: “The accuracy of this edition, and the beauty of the paper & the style [which] will be no small advantage for such a useful work for the government” (*Mercure de France*, 1726/11, p. 2526). In 1751, the *Carte de la Monarchie des Goths, tant dans les Gaules qu'en Espagne* by Robert de Vaubondy was described as “very accurate and very elegant” (*Mercure de France* 1751/07, p. 116). Both neat drawing and neat engraving that was even elegant to see were the fundamentals for rendering maps presented as useful to the government and which could consequently inhabit libraries belonging to men of taste. In a period in which libraries and the building of libraries constituted a step on the social ladder, the acquisition of maps and atlases that were both useful and beautiful created a demand for these commodities which geographers were eager to satisfy. [QV Map Trade, all entries]

The definition of the word “Art” in the *Encyclopédie* rendered its meanings, if not synonymous, at least similar to those of “Science” and “Discipline” by emphasizing the “a system of rules or instruments, and guidelines aimed at the same goal” (*Encyclopédie* vol 1, p. 713). In the encyclopedic spirit of the eighteenth century, it is appropriate to consider the design and composition of maps not only by studying mapping techniques, now a standard approach, but also by studying maps in the context of the transformation of visual knowledge. The “rules and instructions” that define visual knowledge are expressed in the design of maps, a meeting point of increasing exactitude, careful engraving, and the skills of ornamentation.

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