

Clements Library

Occasional Bulletins

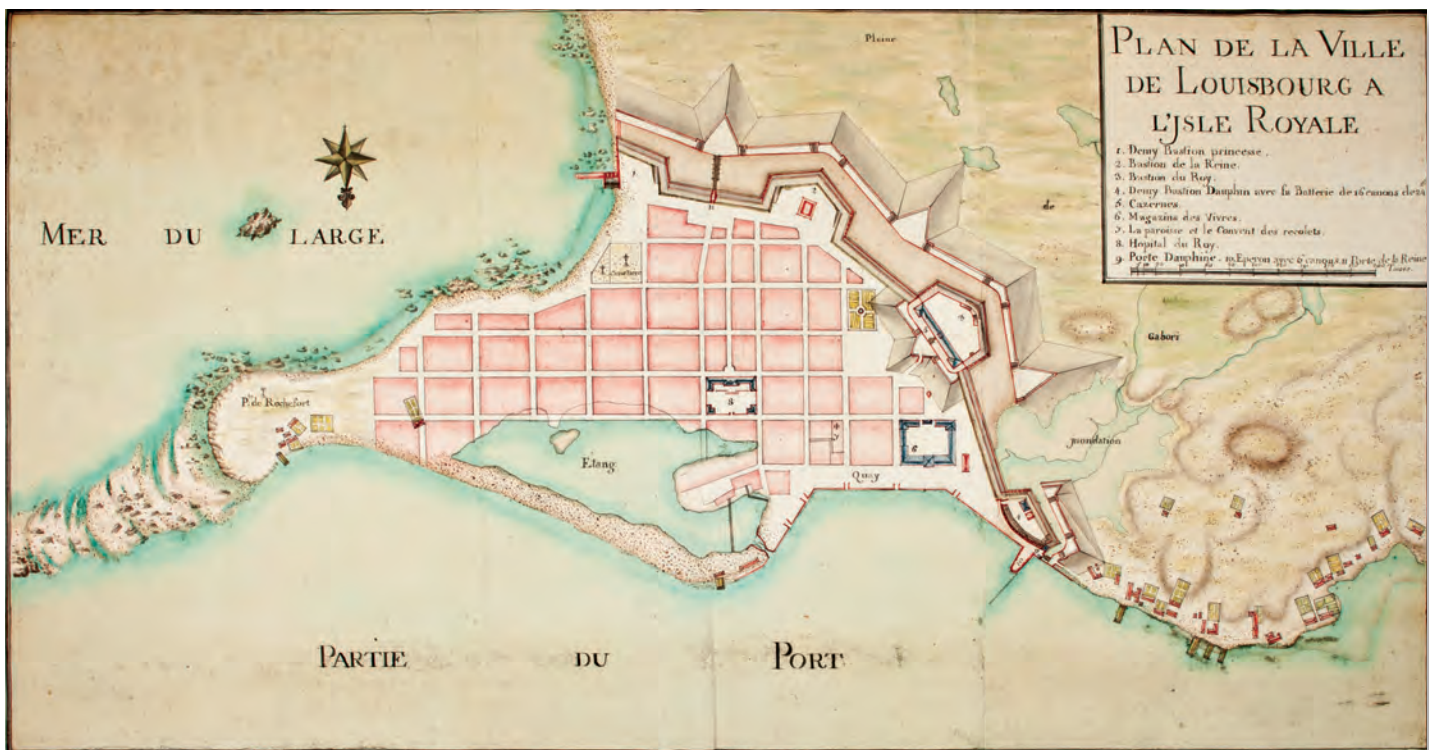
CARMINE, INDIGO, AND GUMDROP YELLOW

One of the great research assets of the William L. Clements Library is its collection of eighteenth-century manuscript topographical maps and plans of fortifications and towns. These unique, hand-drawn creations are preserved in the medium by which military engineers, surveyors, and architects of 250 years ago projected or recorded their work. Such maps were not usually intended to be engraved and duplicated as prints, but manuscript copies were made as needed.

Many of these enchanting visual documents came to the Clements Library with the archives of correspondence and military documents originally assembled and used by senior officers of the British, American, and French forces in America in the era of the War for Independence. During the 1920s William L. Clements was able to purchase the official papers of such luminaries as General

Thomas Gage, General Sir Henry Clinton, William Petty, the 2nd earl of Shelburne, and Secretary of State Lord George Germain as well as those of some lower-ranking line or staff officers. In most cases the papers had near-perfect provenance because Clements purchased them directly from the officers' descendants.

Mr. Clements's collecting successors, the four Directors who have administered the Library since 1923, have continued to acquire, whenever possible, the papers of British, American, German, and French officers and officials—Frederick Mackenzie, Henry Strachey, Eyre Coote, Josiah Harmar, Anthony Wayne, Henry Burbeck, Freiherr von Jungkenn, Louis de Tousard, and more. Many of these archives included maps and plans, sometimes in large numbers—Gage came with 90; Shelburne 34; Germain 41; Coote 90; and Clinton an impressive 383. The Library's curators have also



Etienne Verrier's circa 1740 plan of the French fortress town of Louisbourg on Cape Breton Island employs most of the coloring conventions established by the late seventeenth century: red for masonry and house blocks; blue (slate) for royal buildings; green for turf; dark brown for wooden bridges; stippling for sand, watery green for the water's edge, etc. Maps 3-B-1740-Ve.



Coloring Manuscript Maps in the Eighteenth Century

January 2017

acquired numerous individual manuscript maps and plans to build a collection that provides representative examples of the genre from the Seven Years' War through the American Civil War. Much of this manuscript cartography is beautifully water colored.

Eighteenth-century manuscript maps and plans were not colored simply for aesthetic reasons, despite the obvious care with which the pigments were applied. Particular colors had definite and consistent meanings when observed on topographical maps and plans. Anyone who knew the conventions of the use of color could read these visual documents virtually at a glance. The two works presented here in English translation from their original French were intended as teaching tools for the application of color to manuscript maps. The first of them, a printed broadside designed by Pierre Paneron, was one instructor's way of familiarizing aspiring mapmakers with the rules of color and the proper

manner of rendering elements of the built environment—bridges, mills, roads, etc. The second document is an anonymous, 32-page manuscript *cahier* (notebook) titled “Mélange de toutes les couleurs” (“Mixing of all the colors”) that appears to be evidence of one student's efforts to master an important skill of his chosen profession.

These two documents lay out the generally accepted rules for the use of color and symbols on eighteenth-century manuscript maps. On a practical level, how closely do the hundreds of topographical maps in the Clements collection adhere to these rules? That question will be answered by the examples presented here of the effect on maps of the “mixing of all the colors.”

— Brian Leigh Dunnigan

Associate Director & Curator of Maps



P. Nicole's circa 1779 topographical map of Paulus Hook, New Jersey, includes brilliantly colored renderings of wetlands, crop fields, and elevations. Only the vibrant blue of the marshlands deviates from the normal coloring conventions. *Small Clinton Maps* 216.

AN INTRODUCTION TO THE TRANSLATIONS

— Mary Sponberg Pedley, Assistant Curator of Maps

“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 a big difference between the landscape shown in plan and that shown in perspective.” So remarked Nicolas Buchotte, a geographical engineer in the French army, in the 1754 edition of his often re-published *Les règles du dessin et du lavis pour les plans* [*The rules of drawing and coloring plans*] (Paris: Charles Jombert, 1754), pp viii-ix. Buchotte’s publication was intended as a textbook for both the amateur surveyor and the military mapmaker or engineer in the eighteenth century, an age when no vocational schools and only a smattering of military academies trained surveyors in Europe. Many surveyors, engineers, and garden designers were self-taught or attended private courses that could provide them with the necessary skills to make a graphic representation of landscape effective and meaningful.

The Clements Library has recently acquired two unusual documents, one printed and the other manuscript, that highlight both the importance of color on maps and the methods used to train young mapmakers to apply color correctly, consistently, and tastefully. The printed broadside is entitled *Etude pour le lavis ou il est fait mention du mélange & de l’emploi des couleurs dans les plans de fortifications & les cartes topographiques* [*Exercise for coloring in which mention is made of the mixing and use of colors in fortification plans and topographical maps*]. It was published by Pierre Panseron (born ca. 1742), the son of a French gardener who studied in Paris at the Académie Royale d’Architecture and taught briefly at the École Royale Militaire from 1769 to 1771. He continued to teach architecture, drawing, and mathematics privately, for which activity he produced many architectural designs and prints. By the early 1780s he had expanded his repertoire to garden design prints; the collection was marketed under the title *Recueil de jardins anglais et chinois* and distributed not only from his private address but also from the premises of two well-known Parisian map publishers, Louis Charles Desnos and Jean Mondhare. It may have been in the context of his teaching both in the École Militaire and privately, combined with his interest in landscape design, that he created and published the *Etude*. In one broadside sheet it offered a representation of a fortification with surrounding countryside, the series of symbols frequently used on such large scale maps, and an explanation of the method for applying color to a map or plan.

In contrast to the printed broadside is a 32-page manuscript notebook, “Mélange de toutes les couleurs” (“The mixing of all the colors”), undated and unsigned but embellished with eight pen-and-ink wash illustrations. Through a series of short chapters, the notebook’s text explains the process of mixing colors, the method of applying them to a map or a plan, and specific colors to be used to convey particular topographical detail. From the situations

described and from the analysis of the color, it would seem that this manuscript also dates from the latter half of the eighteenth century. These two documents provide a new lens through which to see color in action in the rich collection of manuscript maps already in the Clements Library.

The challenge for any large-scale mapmaker, then as now, is the rendering of landscape and showing the nature of the land—its variety and its three-dimensionality—in a way that can be easily read without the use of words. To achieve such readability, the mapmaker relied on line and color to define, enhance, and identify elements of landscape and to add a layer of meaning to the drawn outline. In the eighteenth century the role of color was particularly important on manuscript maps, which were the common medium for property surveys, engineering projects, and military maps. Color on these manuscript maps is neither random nor whimsical as such maps were created for a particular purpose. As delineations of extent and descriptions of ownership, property surveys could become legal documents; engineering plans focused on new building or renovation of existing structures; military maps were designed to document past or existing situations and to plan for new campaigns. In the same way, manuscript maps also were used for administrative purposes—to identify, to plan, to project. Within the contexts of these different types of mapping activity, color was used to highlight and identify landscape; to denote architectural features and/or ownership; to convey plans for alteration through new building, remodeling, or destruction.

Because of color’s importance in conveying meaning, consistency was equally important for the map’s readability and comprehension. Just as today we think of green and brown on a map as meaning land and blue as meaning water, so codification of color guaranteed that certain colors always meant the same thing. Such codification in military mapping may be seen in the instructions given by France’s great general and military architect Sébastien Le Prestre de Vauban (1633–1707). In 1680 Vauban issued a *Mémoire* for his fortification officers to insure that color on maps and plans would not be misinterpreted. Precise colors were to be consistently used when depicting a proposed building or other built work (yellow), a project completed, often in masonry (red), and those existing works which were to be left in place (black), and a dotted line for buildings or works destroyed. In placing emphasis on fortification plans, Vauban was demonstrating his own skills in designing complex defenses to counteract the dramatic advances that came about in warfare throughout the seventeenth century with the increased use of gunpowder and its capacity for more destructive bombardment. His rules of color became richer and more varied as military tacticians after Vauban responded to evolving campaign strategies in which cannon became smaller and more portable and cavalry and infantry more nimble.

Battles in the open field meant that an understanding of the landscape was even more important. In both the case of fortification planning and the design of military maneuver, the large scale topographic map grew in importance. As time was often of the essence in battle, the map required a clarity of meaning that could be quickly and easily apprehended. The consistent and stable use of color was an important component in legibility and comprehension and thus in decision making.

Training surveyors, engineers, and topographical map makers was not a military or civilian priority until the latter part of the seventeenth century, the time of Vauban. By the long eighteenth century the use of instruction manuals, both for property surveying and military mapping, increased at an equal pace with the development of military academies, in which drawing and mapmaking became essential parts of the curriculum. Perhaps the best known examples of such published manuals were the work of two French authors: the aforementioned Buchotte, whose *Les règles du dessein* was first published in 1722, and Louis Charles Dupain de Montesson whose *l'Art de lever des plans* (1763) concerns surveying and *Spectacle de la Campagne* (1775) the representation of landscape. These were works published many times and used throughout the military world of Europe.

As military academies developed, not all teaching was done via textbooks, such as those of Buchotte or Dupain de Montesson. The tried and true method of lecture and lecture notes also prevailed, both in the military academy and in the civilian engineering school of roads and bridges (*École des Ponts et Chaussées*) in Paris. In offering translations of both the coloring portion of the Panseron *Etude pour le lavis* and of the "Mélange de toutes les couleurs," we hope to bring to life the care taken by a mapmaker to render landscape and the built environment through the mixing and application of color.



Panseron, *Exercise for Coloring* . . .

The method of using colors in fortification plans and topographical maps:

The ordinary usage for the employment of color is to make a mixture of them at the moment you are going to use them. When they are mixed in advance, you stir each color in particular in order to mix them well.

You allow different colors about which we are going to speak to thicken in the sun, to the degree that is agreeable to use them.

After lining in that which ought to be done in China ink, you outline in red ink that which is the wall and the building.

Then you draw the shadows and the necessary shading with clear China ink.

After you draw the rock, the coasts and the mountains with umber.

The rocks are colored with a shade of red made with red pencil.

Then you put the shade of the background for the fields and the woods, which is made with the gumdrop yellow and the

watery green, with the yellow dominating.

After this, you prick the meadows with the ink pen with tree green, which is made with watery green and yellow. The green dominates; make this mixture thicken in the sun.

The lawn is made with tree green, lightened with water.

The shades of the background for the worked lands and the vineyards are made with a light shade of the fields and a light shade of red ink. You place the two shades alternatively, melding one with the other at the extremities where they meet. After this background is really dry, you speckle with the brush with umber and brown that which is fallow and that which is sown with a weak tree green.

All that is a river, a ditch filled with water, swamp and wetland, is represented with watery green very weakened with water and undulating with the pen with a thicker watery green.

For all a mass of woods, after you place a background of yellow, you use tree green. When it is perfectly dry, you draw the trees with pen and very thick China ink; after that you shade them with a brush with weaker China ink. (a)

The lands lying fallow are done with tree green, mixed with umber or bistre, set in an agreeable degree with the water.

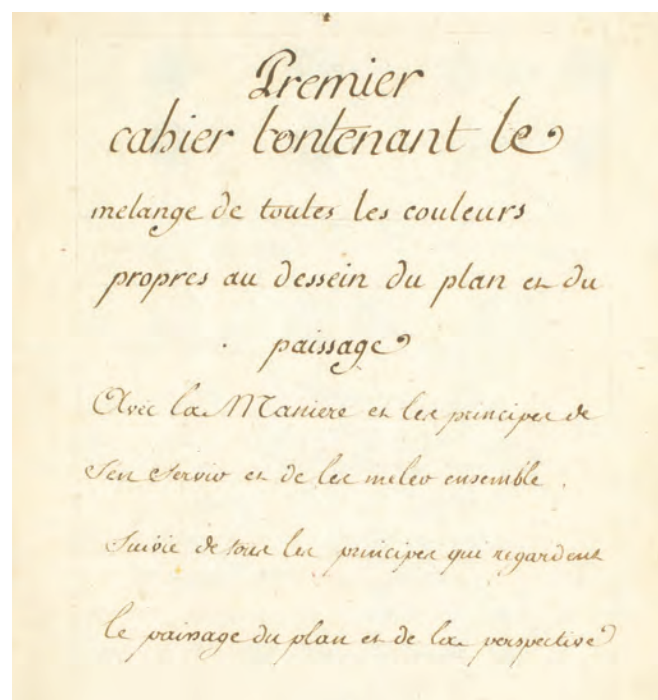
You make the stands of vines with bistre with a pen and the vine stocks with tree green, using a pen.

The sand dunes are represented with a tint of light bistre and stippled with the pen using a darker bistre.

The massifs of towns, chateaux, and houses are filled in with clear red ink and on the shady side with the same ink only darker.

The wooden bridges are drawn with bistre as well as the windmills, wooden crosses and ice house.

(a) If you are assured the China ink is not faded, you can draw the trees first and then shade them and sketch them, as it has just been said.



you do not want any diversion in your favour I can therefore very well spare him 1500 men I shall try something certainly towards the end of the year whether at any rate it may be done before you that

Watery green [light green]
Bistre [brown]

Royal blue
Bladder green [dark green]

China ink [black]
Gumdrop [yellow]

Indigo
Carmine [red]



Mixing of all the colors

First Notebook

Containing the mixing of all colors appropriate to the design / drawing of a plan and of landscape

With the method and principles of their use and their mixture. Followed by all the principles that regard the landscape of a plan and perspective. The eight colors marked above are the principal [colors] for drawing a plan; they each have their use viz.

About black

Black is used to draw all lines that indicate works which are of earth or clay in a fortification and also in landscape. But you must be careful that when black ink is not available, you can trace in lines everything that should be expressed by a stroke using an earth color, like the contour of houses, of gates, of windows, of terraces.

[4]

About red

Red is used to mark all the works which are in stone or in masonry. Consequently when you would like to signify a work in stone, you begin by drawing its contour in red, which you tint afterwards with a shade of lighter red. If the work expresses a talus or slope, but only the surface or a flat area of it, the shading is all one tone, without being lightened.

About yellow

Yellow is used to mark all projected works and for this reason you use it as you use red. The difference consists only in tracing the contour of these projected works with black lines in strong China ink. You then fill in the interior with a shade [5] of light yellow. But if the work is supposed to express a slope or a talus, you put the dark yellow on the upper part that represents the high points of the work and lighten it imperceptibly towards the lower [parts].

About dark green

Bladder or dark green is used for all the works of the country

that are already a dead green such as the glacis, the taluses that are turfed, lastly, the dead trees, and all the works of the country where there is a lot of moss, like the marshes, the mountains, and the deep woods.

Remark

Dark green mixed with a little of the watery green will give a very vivid color for marking or expressing trees, hedges, meadows, pastures, and vineyards, and in general all that should represent [6] a pleasant countryside with ploughed fields, groves, and terraces. You should only be careful that the trees and the hedges are darker than the fields and pastures. We will speak more amply below about the method of expressing everything we have proposed concerning this color.

About brown

Brown is used for expressing all works that are earthen, like roads, highways, ploughed lands, and in general all the works made of earth or mud. Be careful to mix a little red into it for the mountains, likewise for ploughed lands. But you take the brown in its full strength and without mixing it for the contour of roads and highways, which you fill in later with a much lighter shade of pure brown. It is used also for coloring works of timber and carpentry and structures such as [7] bridges, trunks of trees, palisades and in general all works in wood. When you do not have any brown, you can make it by taking weak black with red and a little yellow.

About indigo

Indigo is used to mark all works that are in iron. Be careful to mark them with an extremely light shade and in measure with the ironwork being strong, the more the color should be strong, and inasmuch as the work is thin, so should the color be weak. You also express with a stronger indigo everything that is nails, and even the bands of vaulting. One marks also the barracks and all the buildings covered with slate with a weak shade of indigo. In observing the shading everything that expresses a talus [8] by placing the stronger shade of indigo at the top and lightening it towards the bottom.

About watery green

Watery green, also called greyish green, is used to mark all rivers and streams. Be careful in this: that when the rivers are broad, lighten the shade away from the two banks in a way that the middle [of the river] is nearly white. In addition, be careful to place the color that you should lighten a little more prominently on the shady side so that one sees the direction of the light on the plan. But if the rivers are not so broad, you watercolor the bank of the river which is in the shade a little more broadly and leave the other bank, being careful to drag along the color of the bank that is in the shade over to the other bank that is in the light. If it is only little streams that you want to draw, you put a unified shade [9] over all the width of the stream without any shading because in a small width it is impossible [to shade]. The rivers being thus watercolored their centers always remain lighter than the banks and it is this which we call the bed of the river. You mark its current by an arrow whose point is turned in the direction of the current. You also use watery green for marshes. You color the currents of water which are between the firm land with what is ordinarily expressed by a shade of bladder green, and you shade without distinction the two banks of these currents by putting a little line of watery green on each side, then shade it in between. You then draw in the reeds in these currents more or less according to the taste of the designer.

About royal blue

Royal blue is used to mark all the works which are in slate; sometimes for lack of royal blue, you take very clear [10] indigo and color the works in slate with this color.

Observation

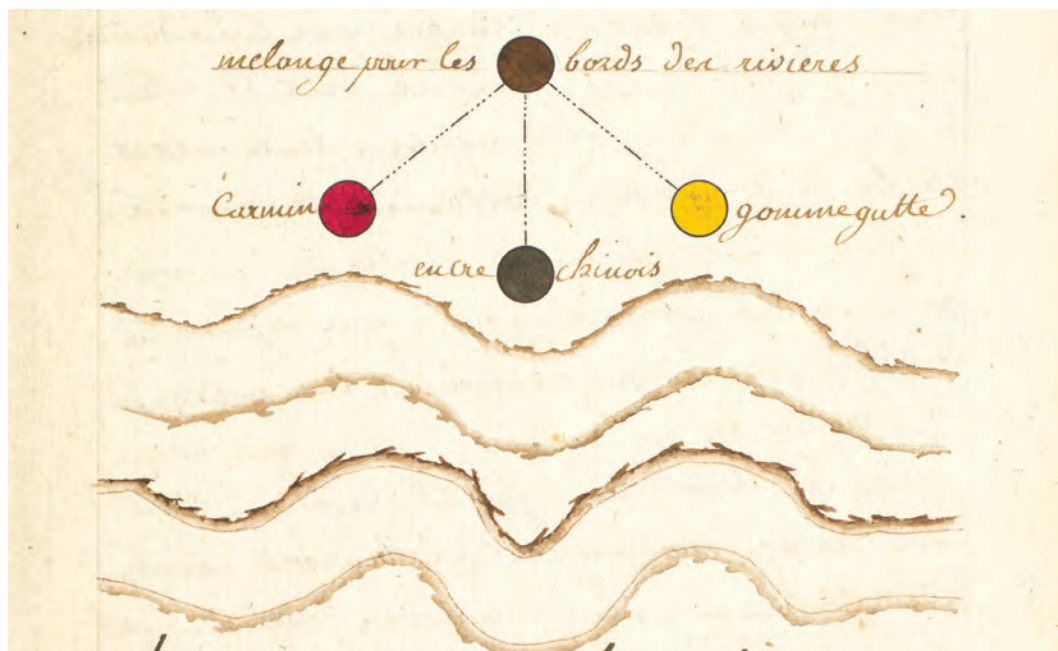
And general rule for mixing the colors well appropriate to a plan

We have said that red is used to mark all the works in masonry. Consequently, when you have some work to mark in stone, you

begin by drawing the lines that should mark the thickness of the work with dark carmine. Once this is done, you put between these lines a much lighter and uniform shade of carmine if the work should only indicate a thickness with a slope; but if this work should express a slope, you mark it by putting a shade of dark red on the highest part and shading it towards the other line which marks the flat part of the work. If it is a round work, you lighten the shade [11] of red on both sides, observing however that the shading will be always deeper on the side of the shadow. You observe the same rule for all the works which ought to mark roundnesses with all the other colors as with red, in order to express even better the roundness and the shadows. You first lighten with a shade of light China ink and then pass above this shadow, lightening the color in relation to the object.

About the contours of rivers

There is still a mixture which is used to mark the contours or the banks of rivers which is made by taking some yellow, some red and some good China ink which you mix well together. And since you might be puzzled by how much you should take of these three colors [12], I am going to give the quantities of each with its strength in the following figure. You take one brushful of light China ink, two of dark red, and one of dark yellow. However the red ought to dominate over the yellow; this mixture being well made, be careful to watercolor the two banks of the river by expressing well all its collapsed banks from the side to the deep part of the river. The two banks being thus colored with the first shade, be careful to pass over again with the same shade to express well the collapses on the bank of the river which is in the shade, trying to avoid over-fashioning them lest they resemble scallops rather than collapsed earth. This is why it is necessary to boldly throw strokes of the brush indirectly and leaving some of them without shading in order to express the motes of land which have collapsed [13] and the edge of the river which is in the light will remain colored with the first tint.

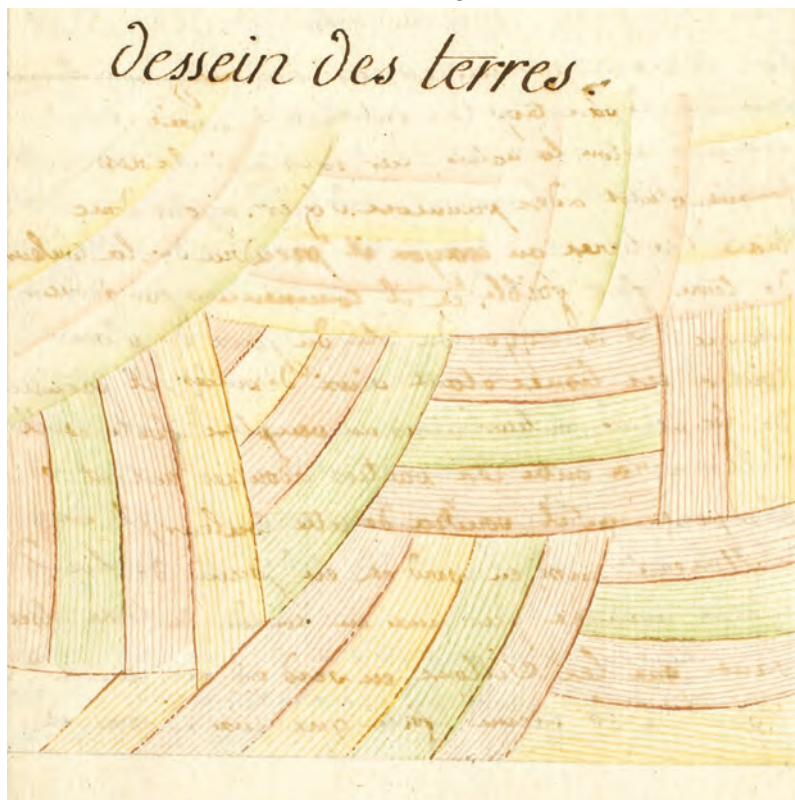


you do not want any diversion in your favour I can therefore very well spare him 1500 men I shall try something certainly towards the close of the year not later at any rate. It may be done before you that you may think

Tint for cultivated land

Once cultivated lands are well drawn with pencil and the furrows all [14] in parallels, you take the earth color prepared as described above but very pale, and place a little thread of color on each pencil line, lightening it up to the other line, always towards the side of the light on the plan. When this first tint is dry, the draftsman will divide the acres with different sorts of color as he wants, whether with yellow for grain, green to express root and other vegetables, with earth tones to express lands lying fallow or not yet seeded. He will trace then with the pen or the brush the furrows between each acreage, all well close to each other with the parallels between them, being careful that one furrow not be confused with another. This can happen very often if you squeeze the furrows together too much. Once all the acres are furrowed, in order to enliven the lands [15] you separate each acre with a furrow of a dark earth color on which you might place some hedges and a few fruit trees *ad libitum* and without arrangement. The lands thus drawn will be finished.

The design of lands



Observation on the cultivated lands

After the designer determines how to place the fields on his plan, he will outline them first with pencil, being careful not to interlace them too much, but to draw them according to nature, otherwise they would rather resemble willow baskets. Once he has traced the lands in pencil, he will take a very weak earth color and

begin to shade each pencil line from the side of the light of the plan. All these lines being thus designed, he will take the same color, but a little darker, and furrow between the shaded parts as many of acres that he would like of this color. He will furrow them also in green and in yellow in the same way as those as the earth color, being careful that the furrows in green and in yellow are of the same strength as those in earth tones and furrowed in the same way. [17] The lands being thus designed, you separate the ones from the others by a furrow with dark earth color, as we have said above, and the lands will be finished.

Tints for meadows

We have said that the tint for the meadows is made by mixing bladder green with watery green, but it is still appropriate to know the quantity for the mixture and how to place the color on the drawing. So you take 4 brushfuls of bladder green and 7 or 9 of watery green, a half brushful of bladder green, that you mix well together. The color being thus prepared and extremely light, you place it equally on all the part that should express meadows, being careful to not leave any blanks in all the extent of the meadow. And as beginners are often accustomed to fill up their drawings with color and consequently make a painting rather than a drawing, I exhort them, if they want to draw well [18] to put all their tints as light as possible; in case some are not dark enough they can always augment them; on the other hand, if they are too dark, you cannot remedy this since colors once on the paper are easily absorbed and thus they cannot be lightened.

The base of the meadows being thus expressed you sketch in with small twig-like strokes of a very fine pen the grass which is found in the meadows. It is necessary that this twig-like sketching be done with half strength ink and not in a regular way but being careful to put more in certain spots, as nature teaches us, for it is very rare to see the meadows equally charged with grass. If you want, instead of sketching in black, you can sketch in the grass in green, which is more natural and also makes a better effect. In the meadow you will mark some hedges and trees placed irregularly, just like it happens sometimes [19] in nature. It is necessary also to be careful that the sketching in with twig-like strokes is not done in straight lines, which will have an air of being overly arranged, but the twiggling in ought to be done below and above without any arrangement.

Tint for the pastures

The tint for the pastures is precisely the same as for the meadows. Be careful in doing the wall of the pasture the same way, with the exception that before putting on the base of the color of the meadows, you do it at pleasure with little spots of red or carmine, of bladder green, or of yellow, but it is necessary that these spots be extremely light and shaded in every sense, and when they are dry

you do not want any diversion in your favour I can therefore very well spare him 1500 men I shall try something certainly towards the shore the year will be at any rate it may be of use before you hear of any more

you pass over them the color of the meadows, and when this tint is dry, you draw on it some trees and some hedges, being careful, however, not to fill up the meadows too much, [20] being the part which ought to furnish hay.

Tint for the background of the woods and vineyards

As it would be ridiculous in a drawn plan for trees and hedges to be on a white paper, so much more so in a woods. There is always grass and sand as well as vineyards, [so] you provide for the background of the woods with a green wash, scattering some touches of the brush with a stronger green tint which you lighten in all directions by making these spots ease into each other, and when this shade or these shaded bits are dry, you plant there the trees and hedges, but not by lining them up, as so many beginners mistakenly do, but always in groups, being careful to leave in the outline of the woods plenty of empty places to show the cut trees as you find in all forests; [21] otherwise the woods or the forest will appear too organized which is the main fault and [can] make this part heavy.

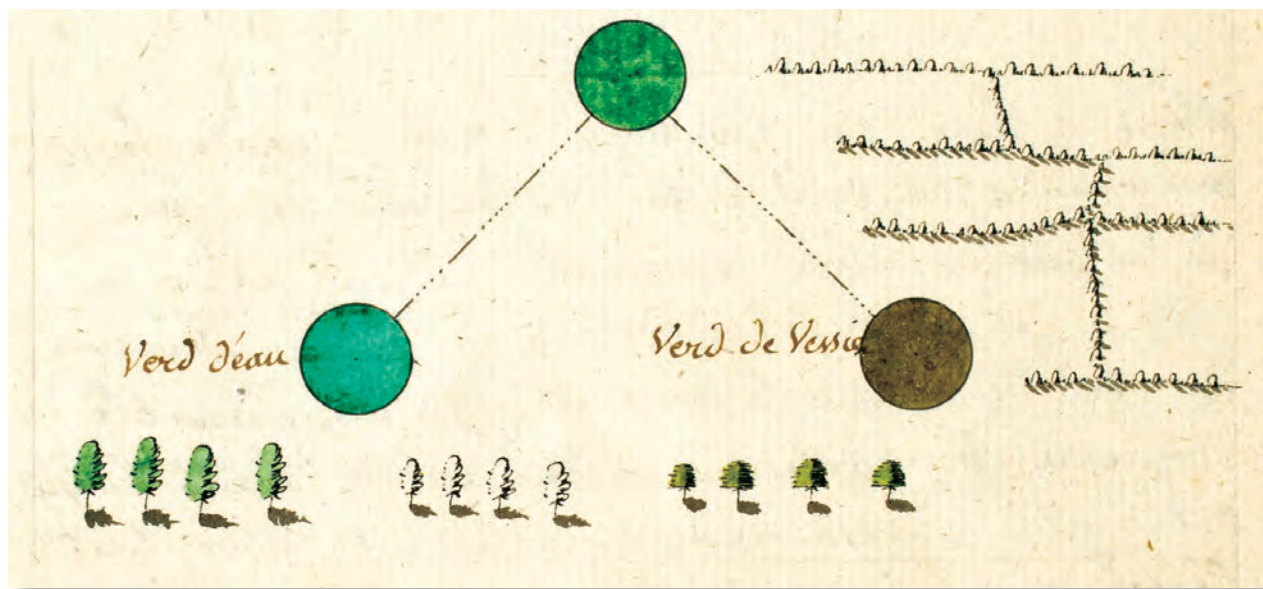
**Tint for the mountains
And how to draw them well**

For the way to express mountains well, which is a part of the plan that is the most difficult to manage, I am going to expand upon a method that I admit is a little long but indispensable for the clarity of the plan. Having thus marked with pencil the outline that the mountain ought to have, you take a very clear shade composed of red and yellow and thin China ink that you have mixed well together, being careful however that in this mixture the red dominates a little in order to have the true color of earth. You then put a line of this tint, thus prepared, a little broadly, along the outline of the mountain, [22] and shade it towards the base of the mountain up

until you have nothing left in the brush. Having finished the base of the mountain, you water color the interior of the mountain similarly with a dry brush in order to stop the watercolor from intersecting. When this first tint is dry, you pass over it a second or a third and even a fourth time if necessary, depending on whether the mountain is high or big. I say that it will be necessary to go over it when the first tint is dry, because you can watercolor the paper better when it is still a little damp than when it is dry. When the mountain will have the force required, you scatter some touches of the brush, but with taste, on its slope and without strict arrangement, being careful that these touches are scattered about with a pale shade and yet strong enough that they show up and that these scattered touches will express the different ravines and outcroppings of the mountain. Then [23] you spot about the trees and hedges on its slope *ad lib.*

Tint for trees and for hedges

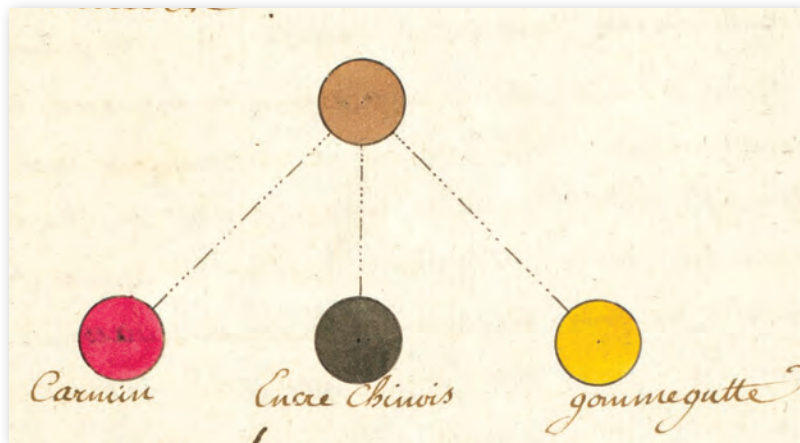
In order to make the color of trees and hedges you take watery green and bladder green and mix well together, i.e., for four brushfuls of watery green, take one of bladder green. The whole well mixed together will give the color of trees and of hedges, which is placed indistinctly on every tree or hedges. It is necessary, however, to remark that it [the color] not be too strong, for there are some draftsmen who believe that they have not missed [the mark] by making the trees too strong. This always results in a hardness, and a tree thus colored has the look of a billboard of green and not [that] of a tree. It is necessary therefore that the shade be rather strong without putting water in it and consequently should not be prepared except with these two colors, without mixing water in. [24] For the shade of vines, you prepare [the color] in the same way, except with two brushfuls of watery green to one brushful of bladder green, so that the tint becomes a little more yellow.



you do not want any diversion in your favour I can therefore very well spare him 1500 men I shall try something certainly towards the close of the year not later at any rate. It may be done before you that I am sure.

Tint for rocks and quarries

In order to prepare the tint of rocks and quarries you make a mixture as for the banks of rivers with the exception that you mix in a little more China ink. And as we have said, it would be necessary to take [25] one brushful of weak China ink, two of dark red and one of dark yellow. For the rocks, two brushes of weak China ink, two of dark red and one of dark yellow, the whole well mixed together will give the color of rocks and quarries.



Observation

It is necessary to be careful, just as with the banks of rivers or for mountains, to pass many times over the rocks, i.e., after having drawn with pencil the escarpment that a rock must have, you take a brushful [26] of this tint, thus prepared, and mix in 3 or 4 brushfuls of ordinary water and with this tint you begin to watercolor your rock. Then after having marked from the side of the shadow the different crevasses with pencil, you go over the same crevasses with a shade a little stronger that you gradually lighten, with a nearly dry brush, being careful to begin to mark with this second tint the crevasses which are found in the stone of the rock. This second tint being still nearly dry, you go over it with the tint at full strength a third time, but it is necessary that this last tint be given and scattered boldly, without any order or arrangement, it being especially necessary to carefully mark well with this last tint all the crevasses, all the holes and escarpments. As for the rest, it is to the taste of the draftsman that all this be connected and that he must judge his rock.

[27]

Tint for expressing sand

The color of sand is made by mixing red with yellow, i.e., for two brushfuls of dark red you take a brushful of light yellow and a brushful of ordinary water. This color being thus prepared you dot or stipple with a thin quill pen all the bank of sand, being careful

that after having filled all the bank *en pointe* to mark or stipple some places more than others in order to express the different elevations that water causes in a bank of sand. Likewise to dot or stipple the middle more than the edges because ordinarily water throws more sand towards the middle than on the edges and makes piles of sand in the form of little mounds. It is still to the taste of the draftsman to [28] settle on the part that he wants to color as sand.

Observation

It will be necessary before stippling to put indistinctly on every island of sand a shade of very light red to express the base of the sand and when this tint is very dry, only then to begin to dot or stipple.



The quarries are dotted also in certain places in order to express the crevasses or places of the quarry which are empty, as you similarly express the banks of rivers. You stipple over the different crevasses of the quarry as if there were none, it being thought that there is sand in all [29] parts of the quarry with the exception of roads which lead there, the which will be marked like all the other roads by two parallel lines.

Observation on the watercolor of the plan

All work which will be water colored in red whether dark or light will always express a work in masonry and which will remain standing.

All work colored in black will always be of clay or brick and will remain standing.

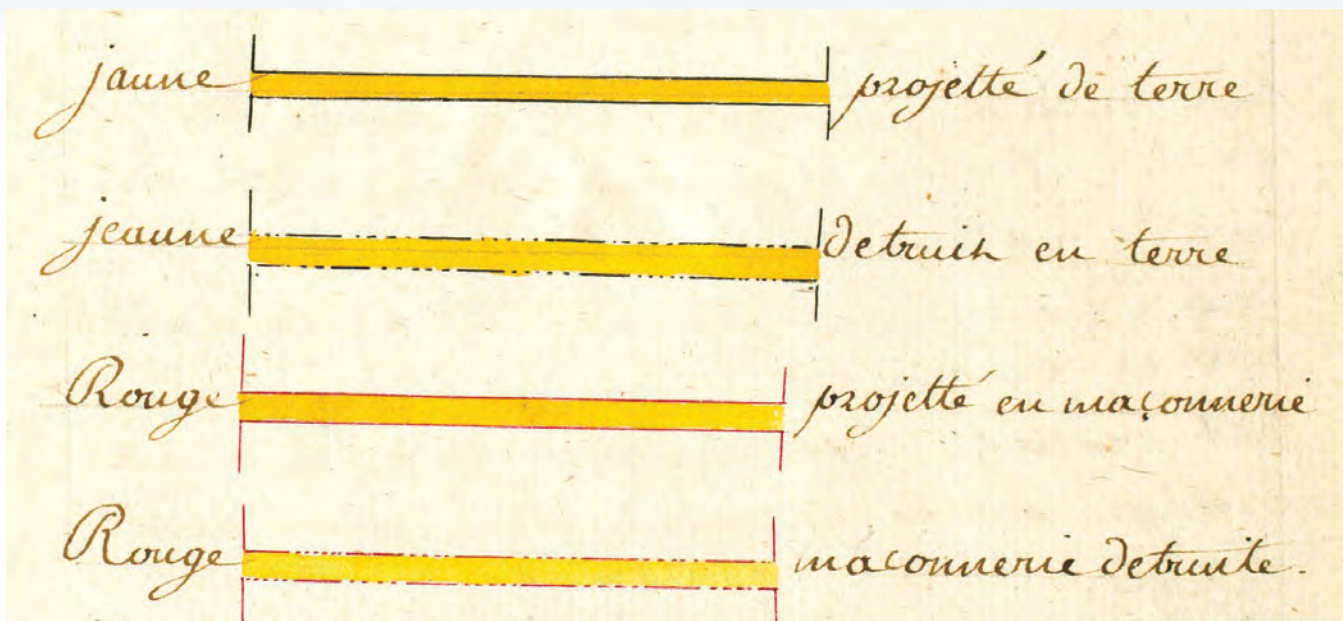
All work colored in yellow will express a projected work which is not yet built.

If the outline is dotted in black, the work which is colored in yellow between the dots will mark a projected and still uncertain work.

If the outline is punctuated in red and filled in with yellow it is a mark that the works [30] were of masonry and have been destroyed.

If the outlines are punctuated in black and filled in with yellow, it is a mark that they are of clay and have been destroyed. Therefore in general if the outlines are drawn in solid lines, they ought to be built, but if they [are drawn] with dotted lines, they have been destroyed.

you do not want any diversion in your favour I can therefore very well spare him 1500 men I shall try something certainly towards the close of the year but then at any rate it may be of use to inform you that



A work of any nature that is in a plan ought to be colored with a tint much darker according to whether it is raised; thus the talus, the glacis, the rooftops ought to be colored more darkly at their summits than at their base, being careful only [31] that this tint ought to diminish imperceptibly to nothing in descending toward the bottom.

**Of parts of the plan in the whole
And generally all which is included**

The arsenals are drawn and colored in red being careful to leave in white all which will be or will express the roof. For what regards the barracks or royal buildings, you color them in blue, being careful always to put the very dark tint at the top of the roofs and lightening it imperceptibly to the bottom. The buildings of

general officers are marked and drawn like the barracks, taking care always to treat the light and shade, as we will speak more of it later.

[32]

How to draw ferries

In order to express a ferry well you draw a little line in black or in earth color, which you make traverse across all the width of the river, giving it a curve from the direction of the water's current. You then mark a stake at each end. This curved line expresses the cord which draws the ferry. To express the ferry-boat even better, you draw a little boat in the middle of the river that you attach to the cord with a sort of zero shape (0) which marks the part that joins the boat to the cord.



you do not want any diversion in your favour I can therefore very well spare him 1500 men I shall try something certainly towards the close of the year not later at any rate. It may be of use to inform you that



Auguste Blondeau, a student at the *École Militaire* in 1810, probably crafted this imaginary topographical landscape as an exercise. Although drawn in the early nineteenth century, it demonstrates the continued use of every one of the color rules as laid down in Panseron's broadside and in the "Mélange" notebook. Maps 8-N-1810-BL.



PLAN OF FORT ONTARIO

Shewing such Part of the Works as are finished and such as yet remains to be done to complete the Fort.

REFERENCES

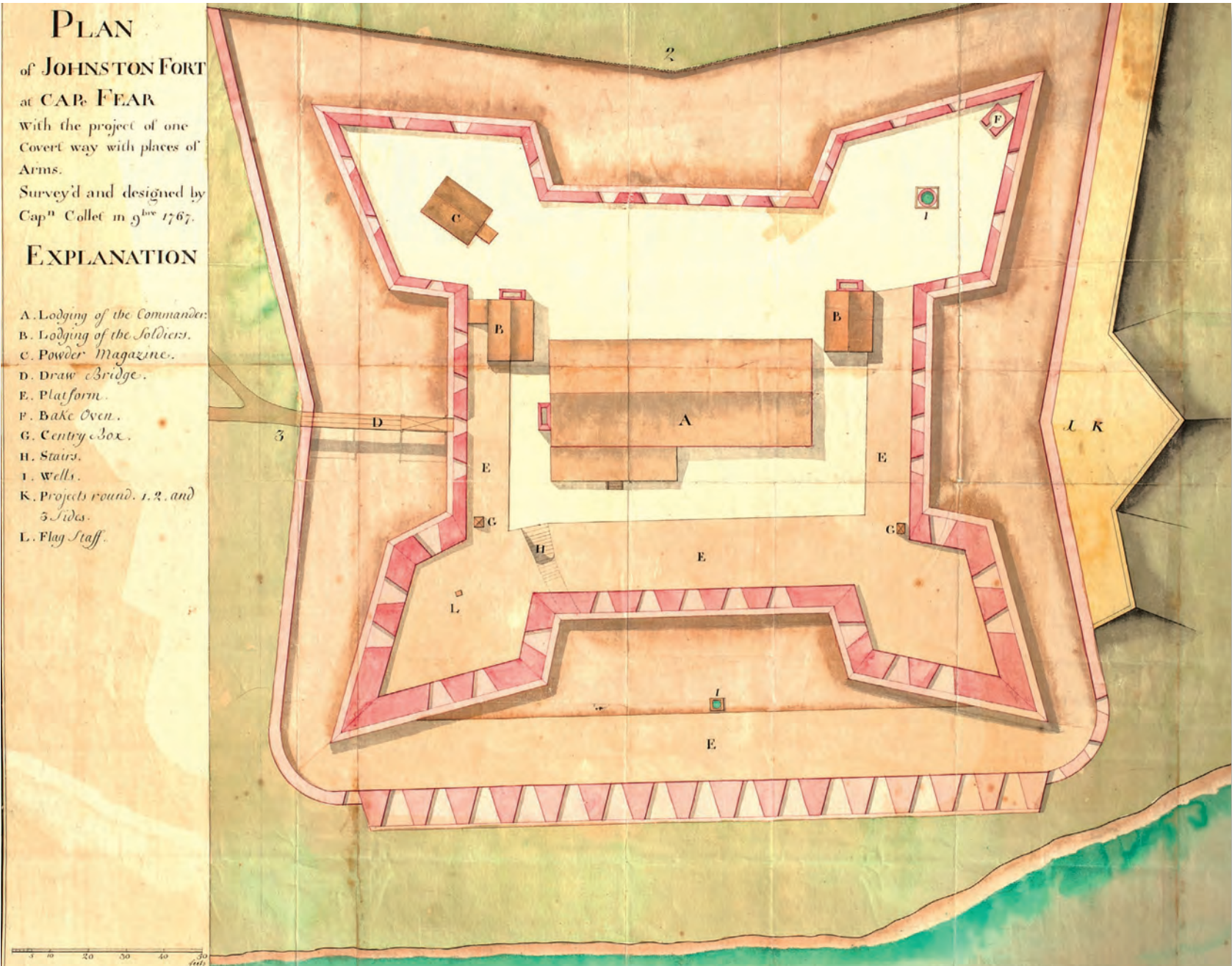
- A The Battery of two Guns and the Travers opposite is not as yet begun.
- B The Parapet on the Right and left is Raised to the height of the Cordon and wants, about two Feet of Earth to fill up its Merlons to be made with Logs, and them to be filled with Earth.
- C The Barracks for Officers on the Right and Left are not as yet begun.
- D The Magazine Bastion wants the Merlons on two of its Faces and one Flank, and them to be filled with Earth, and half the inside of this Bastion wants near five Feet of Earth to bring it to its proper height, and the Slope into the Bastion Soded.
- E The Merlons on this Curtain wants near two Feet of Earth of being full, and the Flank near as much.
- F This Casemate wants near six inches of Earth laid on its top.
- G This Bastion wants the Slope into it Soded.
- H This Bastion wants about one Foot and half to bring it to its proper height with inside, and its Slope Soded.
- I This Bastion is to be Casemated for Provisions and will take near 1000 Logs to complete it, and Ten Feet of Earth laid on the top of the Logs to bring it to its proper height, its Merlons to be made with Logs and them to be filled with Earth.
- K This Casemate wants four Feet of Earth Laid on its top, and its Front Logs for keeping the Earth on top.
- L This Casemate wants four Feet and half of Earth on its Top to be to its proper height.
- M This space in Ditch wants one foot of Earth taken out of it, and y Scarp and Counter scarp Soded.
- N This space of the Ditch wants three Feet of Earth taken out of it.
- O This space of the Ditch wants One Foot of Earth taken out of it.
- P This space of the Ditch wants One Foot and half taken out of it.
- Q These two Traverses are Reveted with Brick and are intirely Finished.
- R This space of the Covert-way and Glacis is not yet begun.
- S This space of the Covert-way and Glacis is finished, and the Part edged of the Parapet with Green shews such part of the Parapet of the Glacis and Foot banks which are intirely Compleat.

Such part of the Works as are Coloured with Green shew such part of the Works as are Compleat with its Soil Work.
 Such Works as are Coloured with Indian Ink are Compleat.
 Such Works as are Coloured with Pale Yellow is not as yet Finished.
 Such Works as are Coloured with Deep Yellow are not as yet Begun.

Scale for the Plan 100 Feet to an Inch. The Two Redoubts of Five Guns each on the South and North sides of the Fort are not as yet Begun. Tho: Sowers Engineer 1764

British and provincial troops began to construct a pentagonal, log and earth fort at Oswego on Lake Ontario in the summer of 1759. Five years later "Fort Ontario" remained a work in progress. Engineer Thomas Sowers used color on this plan to identify which parts of the fort were complete ("Indian" ink), not yet finished (pale yellow), or not yet begun (deep yellow). Maps 4-K-1764-So.

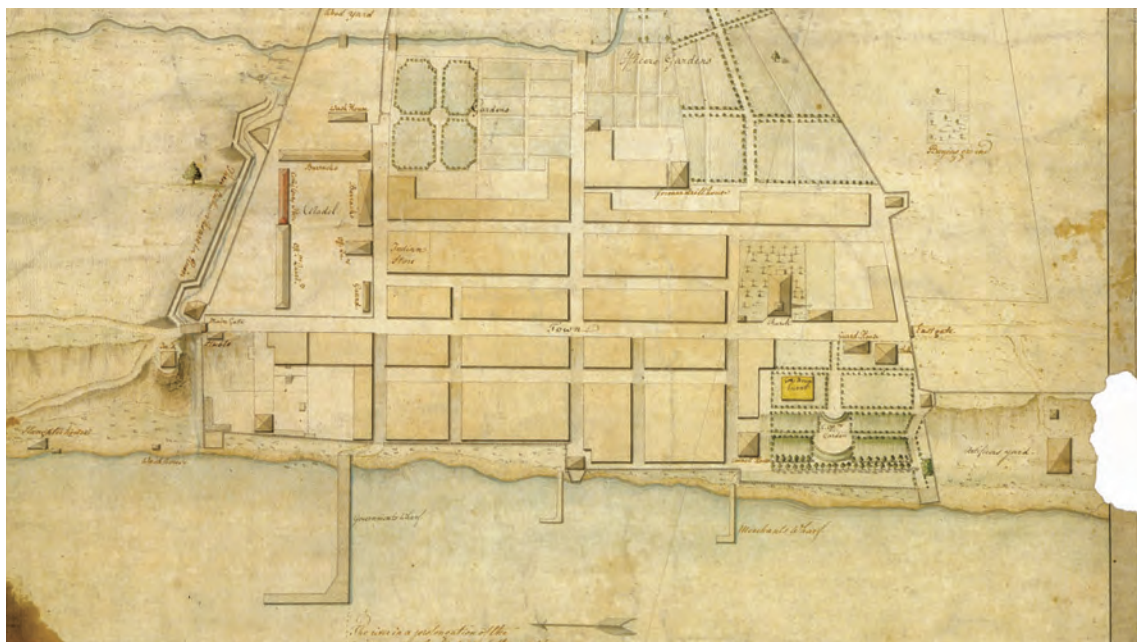
you do not want any diversion in your favour I can therefore very well spare him 1500 men I shall try something certainly towards the close of the year not later at any rate. It may be of use to inform you that



John Collet followed all the rules for his 1767 plan of Fort Johnston at Cape Fear, North Carolina. Masonry is red; turf is green; the bottom of the ditch is brown as are the wooden bridge and buildings (with red [masonry] chimneys). At right the letter "K" marks projected improvements and is therefore colored yellow. Maps 6-H-1767-Co.



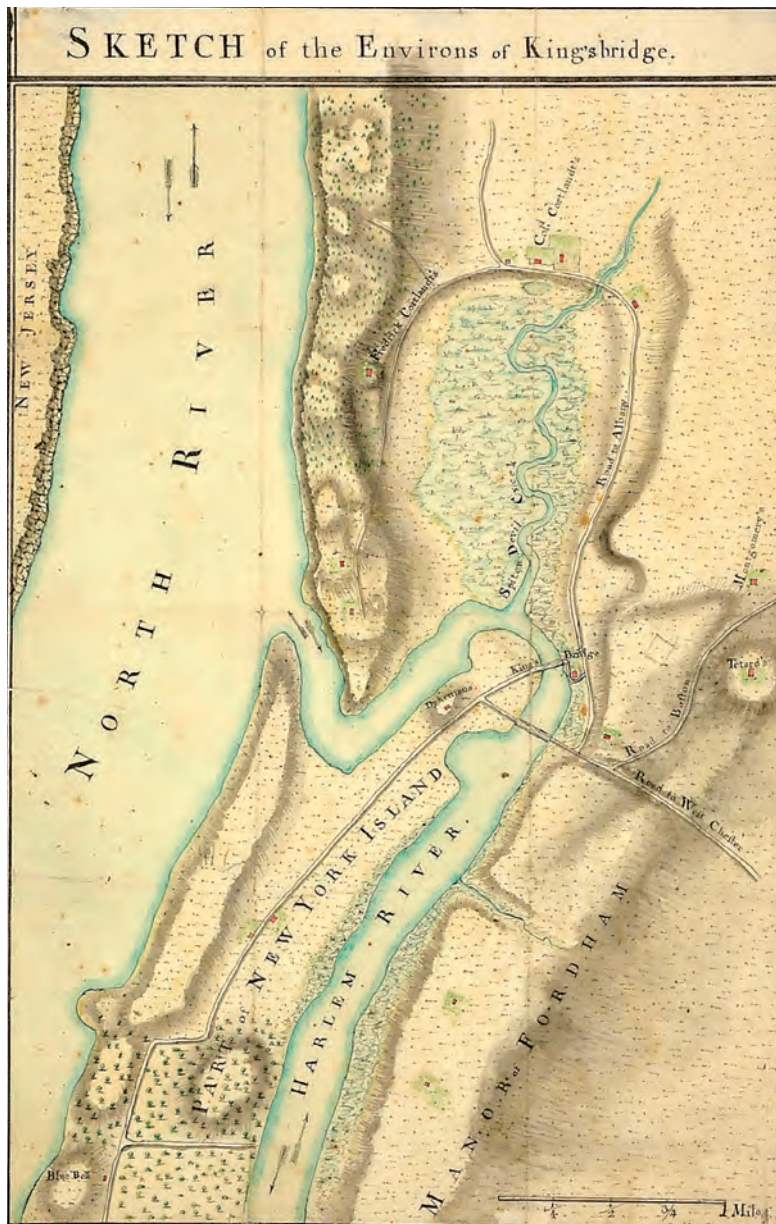
“Plan de New-York et des environs,” a French manuscript copy of British engineer John Montrésor’s 1775 survey of the city and its surroundings, includes some of the Manhattan countryside just north of town. Details of the urban area and of suburban features such as fields, roads, trees, and elevations all follow the coloring rules. Maps 4-O-1775-Mo.



In 1799 Major John J. U. Rivardi prepared a detailed plan of Detroit as it was when U.S. troops took possession of the place in July 1796. This detail of the town distinguishes a brick storehouse (left) with red and includes realistic roof shapes and shading. A yellow rectangle at lower right represents a “destroyed” building—the commandant’s house that burned about 1790. A single tree at left casts its shadow from left to right. An arrow at the bottom indicates the flow of the Detroit River. Maps-6-N-1799-Ri.

Coloring Manuscript Maps in the Eighteenth Century

January 2017



Color greatly enhances the effect of drawn details of a topographical map (hachures showing elevation, for instance). This circa 1779 rendering of the northern tip of Manhattan Island recorded the "lay of the land" in great detail to guide British officers charged with defending this critical position. Note the pair of opposing arrows in the North (Hudson) River at upper left. They express the tidal flow of the river. *Small Clinton Maps 150.*

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