

Sébastien le Prestre de Vauban: Reflections on His Fame, His Fortifications, and His Influence

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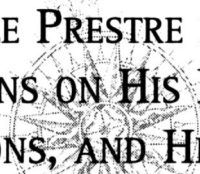
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SÉBASTIEN LE PRESTRE DE VAUBAN:  
REFLECTIONS ON HIS FAME, HIS  
FORTIFICATIONS, AND HIS INFLUENCE

A. J. B. Johnston

*Presque trois siècles après sa mort, l'ingénieur Sébastien le Prestre de Vauban reste remarquablement bien connu en France et, dans un moindre degré, en Europe et en Amérique du Nord. Pourquoi? Qu'est-ce qu'il a fait? Cet article explore quelques sujets qui lui regardent: sa vie et les efforts qu'il a accomplis; les raisons de sa réputation durable; son influence en Amérique du Nord (région qu'il n'a jamais visité). On le tenait en grande estime pour des qualités différentes d'une époque à une autre. Néanmoins, le lien constant était la définition de la France: à l'origine en termes géographiques, plus récemment en termes culturels. Les attitudes et les qualités de Vauban, et d'autres comme lui, sont remarquablement modernes. Elles indiquent que l'habitude de prendre les décisions au centre de l'administration, et l'autorité croissante des experts (avec une déférence à leur égard), ne sont pas des développements récents.*

**I**t is surely unusual for a military engineer to be among the best-known citizens in the history of a country. Yet that is the case in France. The seventeenth-century builder and besieger of fortifications, Sébastien le Prestre de Vauban (1633–1707), remains a highly recognizable name in the country of his birth. Nearly three centuries after his death—long after countless others who were once prominent in their own eras have largely faded from public memory—Vauban still possesses a broad name recognition in France. One explanation for that longevity is “parce qu’il [Vauban]

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baptise des choses . . . visibles: avenues, places, squares, écoles ou lycées, et même épiceries et cafés.”<sup>1</sup> The next question, of course, is why have features been named, and why do they continue to be named, after Louis XIV’s most renowned engineer and master besieger? After all, no similar memorialization or high regard is shown for the ministers, generals, or admirals of the Sun King.

### THE FAME OF VAUBAN

The reasons for the renown which Vauban enjoys in France, and to a lesser extent in other countries where his influence extended, are varied. His fame today is primarily based on the legacy (or legacies) he is perceived to have left behind. At the simplest and most patriotic level, there is the legacy of defending French territory during times of conflict. Physical evidence of the defense effort is not difficult to find. There are dozens of towns and cities along the borders and coasts of France in which are located highly visible fortifications either designed or improved by Vauban.<sup>2</sup> The masonry remains of his work still impress, and they possess an aesthetic all their own which has developed into a quite separate source of admiration for the engineer. Hundreds of thousands of citizens of the French Republic literally live within, below, or near constructions attributed to Vauban. Moreover, those same walls, bastions, *demi-lunes*, and gates, from Lille to Mont-Dauphin and from Camaret to Bayonne, attract millions of French and foreign tourists each year. One can only imagine how great Vauban’s celebrity might have become had the engineer been authorized to fortify Paris, which he proposed to do in 1689 and again in 1705.<sup>3</sup> But he was not given that project, nor was anyone else. Then again, the relentless Baron Haussmann probably would have swept away Vauban’s work—had there been any—just as he did so much else when he undertook his reconstruction of Paris.

Notwithstanding his lack of an impact on the capital, it is safe to conclude that Vauban marked more landscapes and more streetscapes in France than anyone before or since. That is no small claim by itself. One estimate is that he oversaw the new construction or the major renovation of 118 *places-fortes* along the frontiers of France.<sup>4</sup> Another historian writes that Vauban “built or re-modelled over 160 places.”<sup>5</sup> Whatever the actual number, it was certainly a large one for a single engineer. Only someone with a very long career, tireless energy, and a remarkable ability to direct several projects simultaneously could ever have undertaken and achieved what Vauban did during his lifetime. He was indefatigable. While supervising

work in one corner of France, he would correspond with subordinates in other parts of the kingdom about different projects.<sup>6</sup> That all this was accomplished during an era of less than rapid travel or communication is truly remarkable.<sup>7</sup> The scale of Vauban's achievements offers reason enough for one biographer to declare in the opening sentence of his book: "Nul homme n'a davantage marqué le sol de sa patrie."<sup>8</sup>

Impressive as Vauban's record was in the construction of strongholds—the primary source of his reputation today—his fame within his own lifetime rested more on his ability as a besieger of foreign fortresses than as a builder of French ones. He participated in over 150 sieges as an attacker.<sup>9</sup> The man was almost constantly on campaign, and those responsibilities were shouldered at the same time that many of the construction projects were being undertaken. The large number of sieges that he waged underscores that his era was one of almost continual warfare. During the seventeenth century, there were "only seven complete calendar years in which there was no war between European states."<sup>10</sup> In Vauban's youth, during the civil war known as the *Fronde*, he initially found himself in opposition to Louis XIV, but after he was taken prisoner, he was persuaded to change sides. In the years that followed, he became one of the king's staunchest and most valuable subjects, taking a leading role in the long succession of wars that Louis XIV fought with European rivals. The engineer gained unrivalled experience in the art of siegecraft from two perspectives: both inside and outside strongholds.

It was inevitable that the reputation of Vauban the besieger would fade in comparison with that of Vauban the builder. Military campaigns become an increasingly distant memory for the generations that follow. The triumphant sieges undertaken by Louis XIV's engineer are, after a few centuries, remembered mostly by specialists. More enduring reputations are produced when there are tangible objects that have a long lifespan, such as artistic works or built architecture. France, like other European countries, has an extensive list of paintings, sculptures, and buildings that are considered to be part of its *capital culturel et patrimonial*. Still, it was not until the second half of the twentieth century that the military installations known popularly as "Vauban fortresses" came to be considered in terms of their significance as enduring monuments of a bygone era of French history.

During his lifetime, Vauban enjoyed a reputation for success that any military engineer would have envied. Expressions such as "Ville fortifiée par Vauban, ville imprenable!"<sup>11</sup> circulated in the kingdom, at least in certain circles.<sup>12</sup> In truth, there was little that was revolutionary about either

his designs for defensive positions or his techniques of siegecraft. Rather, he *perfected* with a methodical thoroughness approaches which were more or less in common use by other engineers. "Borrow and adapt" was essentially what all engineers did during the era of bastioned trace fortifications.<sup>13</sup> Another reality of the period was that sappers, who did all the heavy toil during both the building and the attacking of strongholds, were more important than soldiers on a day-to-day basis.

Vauban moved steadily up the engineering hierarchy in France. He took *de facto* responsibility for fortifying the French frontiers before he was actually given the top position. Finally, in 1678, at the age of 45, upon the retirement of his titular supervisor, he claimed as his own the top position of *commissaire-général des fortifications*. He would hold the title for the rest of his life. Shortly before his death, Vauban received a last honor from Louis XIV when he was appointed a *maréchal de France*.

While the great engineer played a major role for roughly half a century in defending French interests and in helping to expand or firm up the boundaries of France, those were not his only achievements. He somehow found time among all his designing, supervising, and traveling to carry on an extensive correspondence. Most of the papers concerned technical questions relating to either the construction of or attack on fortified places. Yet there were also numerous thoughtful letters and memoirs on topics as far-ranging as future population growth in North America, the need for detailed census data, and the desirability of taxation reform within the society of the *Ancien Régime*. A treatise on that last subject, a suggested tax on all property, was published in 1707, the year of his death. The proposal was totally unacceptable to the nobility, so the book was confiscated, and Vauban fell into disgrace in the last months of his life. Yet the treatise on taxation and the reaction that followed turned the engineer into a "posthumous hero for the opposition movement to Louis XIV."<sup>14</sup> Not surprisingly, given the productive, successful, and many-sided life of Vauban, the man has been a subject for numerous biographers.<sup>15</sup>

#### VAUBAN AND THE DEFINITION OF FRANCE

As already mentioned, Vauban was a key figure in Louis XIV's ongoing struggle to push back the limits of the kingdom to secure the largest possible territorial expanse. The engineer's fortresses were crucial in the quest to set the boundaries of the "hexagon" that has become modern France. For that involvement alone, Vauban's accomplishments deserve to be justly

remembered. Yet over time, there has been a fascinating evolution in the way in which the so-called “Vauban fortresses” have come to be regarded. In the beginning, and for at least a century thereafter, they were seen as important defensive structures. In the nineteenth century and throughout the first half of the twentieth century, however, they were looked upon as the vestiges of an outdated approach to defense. Only in recent decades have they come to be valued again by a broad cross-section of the public. This time, the fortresses are seen as elements defining not the territorial limits but rather the cultural space occupied by the French nation. Such a transformation was a long time in the making.

When they were constructed, the Vauban-supervised fortifications were among the most sophisticated and most effective defenses erected on the European continent. The works themselves shaped the man’s reputation, since he did not produce published treatises on fortifications the way some other engineers did. Vauban was too busy besieging and building strongholds to write books.<sup>16</sup> Moreover, he was not a believer in theoretical approaches to fortifications, writing that “l’art de fortifier ne consiste pas dans les règles et des systèmes, mais uniquement dans le bon sens et dans l’expérience.”<sup>17</sup> Given the success that he had in both besieging and defending fortified places, Vauban’s intuitive grasp (“le bon sens”) and experience were second to none.

By the mid-1800s, however, the era of bastioned trace fortifications was finally over, after holding sway for about two centuries. The introduction first of rifled muzzle-loaders (RMLs) and then of breech-loading ordnance (BLs) meant that the masonry forts of the era of Vauban and his contemporaries were rapidly doomed to obsolescence. The improved accuracy and greatly increased distance of the nineteenth-century artillery meant that new forms of defense had to evolve, and quickly. The new fortifications had to be lower, so as to present less of a target to the explosive shells of the RMLs and BLs than did the old fortresses.<sup>18</sup> The technological changes in artillery would continue from then on, rendering each successive defense scheme more or less out of date soon after it was completed. In France as elsewhere, there was an urgent need to update defenses continually to combat the evolving threats that arose in the nineteenth and twentieth centuries. One consequence was that many of the onetime strongholds from the Vauban era fell into disrepair.<sup>19</sup> What is more, only a few of the constructions designed or supervised by Louis XIV’s great engineer remained in French military hands. The *citadelle* at Lille is the best example, though of course it functions strictly as an

administrative headquarters and has not had a strategic military role for a couple of centuries.

Though the military obsolescence of bastioned trace fortifications took its toll on the Vauban fortresses, there began to develop in France and in other European countries a new sensibility that would eventually lead to the walls, gates, and other features of the seventeenth century becoming more highly regarded. A major part of the new sensibility had links with Romanticism, which developed in response to the modernizing changes that industrialization and other influences were having on traditional societies beginning in the late eighteenth century.<sup>20</sup> By the early decades of the nineteenth century, many sensitive souls were showing an emotional affection for ruins and signs of decay. The ever-practical Vauban would likely have had little sympathy for the sentimentality, yet the fondness that Romantics developed for bygone times and symbolic landmarks helped to establish a mix of attitudes that would eventually save many of the engineer's otherwise obsolete fortifications.

The fields we have come to know as preservation and commemoration evolved, in part, out of the Romantic movement. The best-known "preservationist" figure in France in the nineteenth century was Eugène Emmanuel Viollet-le-Duc (1814–1879), who restored a number of major monuments from earlier eras, including Notre-Dame de Paris and the walled city of Carcassonne. Significantly, Viollet-le-Duc was far more influenced by Romantic concepts of what the past should have been like than by a scientific understanding of what it was like.<sup>21</sup>

Nonetheless, the preservation movement was far from an overnight success. For decades there was little interest in preserving the strongholds constructed by Vauban and his contemporaries along the borders and coasts of France. Perhaps if there had been fewer of them it would have been easier to save one or two examples. But the scale and scope of the engineer's achievement had been so enormous, there were literally dozens of projects waiting for attention. As a result, the first half of the twentieth century witnessed the continuing deterioration and in some cases the complete removal of a great many Vauban forts and fortresses.<sup>22</sup> Then, as the century wore on, a growing number of specialists, as well as members of the general public, came to be impressed by the massive "artifacts" left behind from the seventeenth century. Over time, the *architecture bastionnée* designed by Vauban and his fellow engineers was seen in a different light. By 1980 one could assert that the 300-year old fortifications "occupe[nt] quantitativement et qualitativement une place également remarquable" as

the long-admired religious architecture of the country.<sup>23</sup> In short, the fortresses and other strongholds constructed by Vauban and others had at last entered the cherished category of the *monuments patrimoniaux* of France.

What meaning or value do people of the early twenty-first century draw from the Vauban-era fortifications? To be sure, they do not look at the bastions, *échauguettes*, and other features in the same light as did the engineer who erected them. Nor do we see them in the same light as the people who lived within those walls long ago. The level of psychological comfort the fortifications then offered was that of a functioning defense that might actually save lives and property, or delay an advance by the enemy. The threats in today's world are not those of mortar bombs or infantry assaults. So what is the appeal, meaning, or value of the old walls now?

For many people, the bastioned trace fortifications—like Romanesque or Gothic religious architecture in a different context, or vestiges of Roman times in still another—evoke the time period in which they were constructed. In that sense, they carry with them strong associations of idealized glory and grandeur associated with the era of Louis XIV.<sup>24</sup> Yet there is more to their appeal than that. The bastions and other features were laid out with evident mathematical precision. The end result, as visible today as it was 300 years ago, is a man-made environment that is deliberately harmonious. Balance and proportion are the terms that come to mind. The overall effect of the angles and slopes of the masonry defenses is one of a self-conscious rationalism. This was, of course, the intended goal of the engineer who designed them, for geometry lay at the heart of seventeenth- and eighteenth-century fortifications.<sup>25</sup> The profession was both a science and an art. Yet when Vauban oversaw the construction of the many border or coastal strongholds to which his name is attached, he did so not for aesthetic but for strategic reasons. Admittedly, much thought was given to the appearances of the fortifications, for there was a strong requirement for engineers to make their military designs harmonious as well as functional.<sup>26</sup> With the passage of time, however, it is the aesthetics of bastioned trace defenses—a secondary though important concern at the time—that have come to the fore. Any book published on Vauban since the 1970s gives emphasis to that side of the engineer's work. A number of books include artistic photographs of the various features, taken from dramatic angles so as to highlight the geometry achieved with courses of stone.<sup>27</sup> The engineer would undoubtedly be surprised by the emphasis on aesthetics, but nonetheless happy that people still value his work.



## VAUBAN'S INFLUENCE ON NEW FRANCE

Vauban never crossed the Atlantic Ocean. Thus he never had a direct hand in any of the French fortifications erected in New France and in the West Indies. Nonetheless, such is the reputation of the man that his name is often invoked in connection with forts and fortresses in North America. In some instances, there is no direct link. "Vauban fortress" simply sounds impressive to historic site guides, and they use the term much as they would a brand name applied to a commercial product. In other cases there is a justifiable relationship between Louis XIV's engineer and a given fortification, even though Vauban never saw it in person.

Vauban showed a definite interest in the development of France's overseas colonies. He even made a prediction in 1697 as to what Canada's population would be in 1970! Until his death in 1707, Vauban was involved in selecting the engineering personnel sent to Acadia and Canada, and perhaps to the West Indies as well. That is not to suggest, however, that he was willing to send the most talented on his staff to the colonies. One naturally assumes he preferred to keep the best engineers in France, where they could assist him with the top priority projects of defending the mother country.<sup>28</sup> Nonetheless, Vauban took the defense of the colonies as seriously as he could, given the limitations of more pressing concerns at home. He gave close scrutiny to the fortification designs which crossed the ocean for his review and critical comments, and he certainly offered his own thoughts on how the colonies should be protected and developed.<sup>29</sup>

The first complete bastioned trace fort constructed in New France was erected at Port-Royal in Acadia, based on a design thought to have been drawn up in 1690.<sup>30</sup> The project was a symmetrical earthwork with bastions at each of the four corners of a square. The design had to have Vauban's approval before construction could begin. He was similarly involved in reviewing the various projects of adding fortification elements at Québec.

As for Louisbourg, where would eventually be constructed some of the most elaborate masonry defenses erected by the French in North America, it was founded six years after the death of the great engineer. Still, the initial tracing and subsequent construction of the fortifications there were carried out by a succession of *ingénieurs du roi* who followed the fundamental approaches and practices that Vauban had refined in the preceding generation. As impressive as Louisbourg's fortifications were in the North American context, they were simple in comparison with strongholds the master engineer had developed in France. The Louisbourg defenses can be

considered as an example of the so-called “first system,” even though Vauban did not see his own work in terms of such a classification system.<sup>31</sup>

There was more in the strongholds of New France that illustrated the influence of Vauban than the bastioned trace fortifications of the places. The general layout of the urban space inside the walls at Québec, Montréal, Louisbourg, and elsewhere also showed the influence of his engineering ideas. Vauban always recommended maximum orderliness for the inside of fortified places,<sup>32</sup> and that was achieved to differing degrees in each of the major communities. As a general rule, the later a center was established, the more symmetrical and orderly was the urban area. Thus, the layouts of Louisbourg and New Orleans were much more “regular” than Québec and Montréal. At Louisbourg, the local engineers, beginning with Verville, “respected the major principles of military urbanism as defined by Vauban.”<sup>33</sup> This meant, among other things, the establishment of a rectilinear grid, straight streets leading to and from military positions, and the creation of distinct military sectors set apart from civilian areas.<sup>34</sup> Not all of the qualities recommended by Vauban were introduced at Louisbourg,<sup>35</sup> but enough were for one to include the capital of *Ile Royale* as one of the places that reflected the broad sweep of ideas and practices he had advocated.

Census-taking is another area in which the influence of Vauban can be discerned in the colonies. The military engineer was a proponent of frequent and detailed population counts, so that the leaders of society would have reliable statistics upon which they could base their decisions and policies. There is reason to believe that Vauban’s writings on the topic reached Governor Denonville shortly before he set sail for Canada.<sup>36</sup> Certainly, soon after Denonville arrived in New France, the approach to census-taking in the colony became more detailed and closer to collecting the types of information that Vauban recommended. By the time a colony was founded on Cape Breton Island in 1713, Vauban’s ideas on the importance of gathering useful census data were more broadly accepted. As a result, the Cape Breton colony (known as *Ile Royale*) found itself the object of frequent censuses. The methods used to count the population, as well as vessels and animals, were never exactly the same, but they typically included many of the categories the engineer had advocated in his 1686 treatise on the subject.

The reasoned and statistical approach that Vauban recommended for census-taking was entirely typical of the man, who epitomized rationalism. That quality was most evident in his fortification work, which reflected practical designs and construction approaches that incorporated geometric

precision. The same careful, rationalist quality manifested itself in other areas of his life and work as well. Such beliefs and such an approach to problem-solving were a part of the age in which he lived, an age in which one of the highest ideals was order and another was service to the king. Vauban stood above most of his contemporaries by being able to master both the details and the broader vision involved in the domains in which he toiled. Those abilities, coupled with indefatigable work habits, brought him renown in his own lifetime and a long-lasting influence in both France and in its colonies.

Vauban, and other military engineers like him, also represent key figures in the transition to a recognizably “modern” age. André Corvisier has made a convincing case that the creation of standing armies in the different European nations played a fundamental role in shaping the modern state, by setting examples and working out approaches in such areas as record-keeping and placing limitations on individual freedom.<sup>37</sup> It seems that the military engineers played a somewhat similar role in bringing about our modern world. Their rationalism, their approaches to work, and their achievements accelerated the trend toward the development of a coterie of professional experts to whom society turned to solve fundamental problems. The *ingénieurs du roi* in France and its colonies, with Vauban at the top of that pyramid, were among the first professionals to gain high status and to be accepted into the power structure of the *Ancien Régime*. Their approaches to problem-solving did more than create strongholds that are now heritage monuments. Just as importantly, engineers like Vauban showed the value of an increased reliance upon centralized decision-making. When the monarchy eventually disappeared, the reliance upon professional experts did not. Vauban and what he represented can therefore be seen as having been pivotal in the emergence of what would become two of the dominant features of life in the nineteenth and twentieth centuries: centralized decision-making and professional experts.

## NOTES

1. Michel Parent and Jacques Verroust, *Vauban* (Paris: Éditions Jacques Fréal, 1971), 5. “. . . because [Vauban] baptized visible . . . things: avenues, plazas, squares, schools or *collèges*, even grocery stores and cafés.”
2. The locations where Vauban built or improved fortifications in France are depicted on maps in Parent and Verroust, *Vauban*, 122, and Robert Bornecque, *La France de Vauban* (Paris: Éditions Arthaud, 1984), 31.

3. Jean Chagniot, *Paris et l'armée au XVIIIe siècle: Étude politique et sociale* (Paris: Economica, 1985), 47.
4. Bornecque, *La France de Vauban*, 10.
5. Ian Hogg, *The History of Fortification* (London: Orbis Publishing, 1981), 122.
6. One biographer writes of the "souci minutieux" and of the "expérience infinie" of Vauban. "Du fond de la Catalogne, Vauban instruit les entrepreneurs qui construisent un bastion dans les Flandres, et leur dit de quel bois seront les pilotis de leurs fondations; du fond de la Bretagne, il instruit les entrepreneurs qui fortifient un rocher savoyard, et leur dit quel sable ils devront prendre pour durcir leur ciment." Daniel Halévy, *Vauban* (Paris: Bernard Grasset, 1923), 3.
7. Anne Blanchard elaborates on the constant movements and shifting preoccupations of Vauban: "Depuis de très nombreuses années il a sillonné les routes de France . . . , allant des plaines inondables des Flandres aux trouées de la Sambre ou de la Moselle; des bords du Rhin impétueux aux rives paisibles de la Saône . . . quittant les cieux lumineux de Languedoc ou de Cerdagne pour les embruns de l'Océan . . . . Et recommençant une nouvelle inspection, l'autre à peine terminée." Blanchard, *Les Ingénieurs du "Roy" de Louis XIV à Louis XVI: Étude du corps des fortifications* (Montpellier: Université de Paul-Valéry—Montpellier III, 1979), 75–76.
8. Halévy, *Vauban*, 1. "No man has more marked the ground of his country."
9. Bornecque, *La France de Vauban*, 10.
10. Sir George Clark, *The Seventeenth Century* (New York: Oxford University Press, 1961), 98. The years without warfare were 1610, 1669–71, and 1680–82. Thanks to John T. O'Connor of the University of New Orleans for drawing my attention to this reference.
11. Cited in Bornecque, *La France de Vauban*, 13. "A city fortified by Vauban is an impregnable city."
12. Vauban himself knew better than to claim that any place was untakeable. He recognized that with time, "une place devra toujours finir par se rendre." The secret of a successful defense rested in how strong the position was, where it was located, the size of the defending force, and the actions taken by that force in the course of the siege. The objectives of the defenders were the practical ones of gaining time "pour rassembler des troupes, manoeuvrer et livrer bataille dans les meilleures conditions." Bornecque, *La France de Vauban*, 12–13.
13. To illustrate, during a campaign in the Low Countries, Vauban improved the way in which attacks were carried out: "The Netherlandish fortifications were found to be singularly unfit to resist the forms of artillery attack which were perfected by Vauban in the later decades of the seventeenth century. The ricochet batteries discovered ideal targets in the long, easily-enfiladed branches of the hornworks and the faces of the sharply-pointed bastions, while the guns which were planted on the counterscarp could make short work of any defenders who were holding out in the low faussebraye." Christopher Duffy, *Siege Warfare: The Fortress in the Early Modern World, 1494–1660* (London and Henley: Routledge & Kegan Paul, 1979), 92–93.

14. Lionel Rothkrug, *Opposition to Louis XIV: The Political and Social Origins of the French Enlightenment* (Princeton: Princeton University Press, 1965), 355–56, n. 17. Thanks to John T. O'Connor of the University of New Orleans for drawing my attention to this reference.
15. In addition to biographies by Parent and Verroust (note 1) and Halévy (note 6) cited above, see Georges G.-Toudouze, *Monsieur de Vauban* (Paris: Éditions Berger-Levrault, 1954) and Gérard Walter, *La Vie glorieuse de Vauban* (Paris: Éditions Albin Michel, n.d.).
16. He did write, or at least supervise the writing of, some manuscripts. There is a three-volume original manuscript in the holdings of the Fortress of Louisbourg National Historic Site; it includes a volume on the construction of fortified places, another on defending them, and a third on how to attack them. The manuscript contains many watercolor fold-out illustrations.
17. Vauban, cited in the exhibition catalogue, *Bastions de la mer, qu'êtes-vous devenus? Vauban et l'apogée de l'architecture bastionnée sur les côtes d'Aunis-Saintonge et de Nouvelle-France* (Rochefort and La Rochelle: Centre de Documentation et d'Animation Poitou-Charente, 1980), 33. "The art of fortification does not consist of rules and systems, but only of good sense and experience."
18. For the broad strokes of the history of fortifications, see Hogg (note 5) and Duffy (note 13) mentioned above; Christopher Duffy, *Fire and Stone: The Science of Fortress Warfare, 1660–1860* (Vancouver: David & Charles, 1975); and Colonel Rocolle, *2000 ans de fortification française*, 2 vols. (Limoges and Paris: Charles-Lavauzelle, 1973).
19. The state of repair, or non-existence, of all the Vauban fortresses is provided in the legends for the maps in the books by Parent and Verroust, *Vauban*, 122, and Bornecque, *La France de Vauban*, 31.
20. Oliver Goldsmith's *The Deserted Village* is a prime example of how some were lamenting the passing of the traditional society. Composed in 1770, the poem went through five editions during its first year.
21. There is a voluminous literature on the commemoration and preservation movement which developed in Europe and North America in the late nineteenth century, and which subsequently grew much larger in the twentieth century. For a recent study of Viollet-le-Duc and the first major project which he undertook, see Kevin D. Murphy, *Memory and Modernity: Viollet-le-Duc at Vezelay* (University Park: Penn State University Press, 1999)
22. For example, the fortifications surrounding Rochefort, the great arsenal originally established by Colbert, were systematically destroyed during the 1920s. I was informed in June 1996, during a visit to the museum located in the house of novelist Pierre Loti, that the demolition began soon after Loti's death in 1923. Loti had been one of the few voices advocating the preservation of the walls and other seventeenth-century features.
23. The cited words come from Jean Verney in his introduction to the book produced as a catalogue for a 1980 exhibition which had showings in Rochefort and La Rochelle before touring Canada, *Bastions de la mer, qu'êtes-vous devenus?* 3.
24. Such sentiments might be dismissed by cynics as little more than a misplaced nostalgia for an epoch that witnessed grave social and economic injustices.

25. Anne Blanchard writes of the *ingénieurs du roi* that they could “se laisser à leur inspiration géométrique suivant les cas réalisables ou non, réalisée ou non, toujours inspirée de Vauban.” *Les Ingénieurs du “Roy” de Louis XIV à Louis XVI*, 432.
26. Cf. Josef Konvitz, *Cartography in France, 1660–1848: Science, Engineering, and Statecraft* (Chicago and London: University of Chicago Press, 1987). Konvitz studies how engineers used maps and plans, and the accompanying measurement, as a way to “domesticate” and “conquer” territorial space. Such mapping endeavors paralleled what was going on in urban areas where rationalist and geometric approaches were being applied to the design and construction of fortified towns.
27. The aesthetic aspect is featured in the book by Parent and Verroust, which contains striking black and white photos of the fortresses taken from some unusual angles. See, for instance, the photographic essays entitled “L’Espace géométrique” and “Éperons de la Terre.”
28. André Charbonneau, Yvon Desloges, et Marc Lafrance, *Québec, The Fortified City: From the 17th to the 19th Century* (Ottawa: Parks Canada, 1982), 114–17.
29. Louise Dechêne, *La Correspondance de Vauban relative au Canada* (Québec: Ministère des Affaires Culturelles, 1968). The same point is made in Charbonneau, et al., *Québec, The Fortified City*.
30. *Bastions de la mer, qu’êtes-vous devenus?* 26–27.
31. The so-called three systems of Vauban are terms or categories invented by writers after his death. On the subject of Louisbourg’s fortifications, see Bruce Fry, “*An Appearance of Strength: The Fortifications of Louisbourg*, 2 vols. (Ottawa: Parks Canada, 1984).
32. Vauban’s preference for orderliness in urban spaces was articulated clearly in a 1686 letter to Seignelay, in which he addressed the question of the *habitations* of Canada: “Il me paroist qu’elles ont esté basties au hazard et sans autre Egard que la Comodité particulière d’un chacun. Cependant Il est Certain que si vous ne donnez ordre à les rassembler et reduire en bourgs, villes et villages réglés, avec des lieux fermés d’espace en espace on ne viendra jamais à bout d’y établir une bonne police non plus que de les Conserver.” Cited in Dechêne, *Correspondance de Vauban*, 11.
33. Charbonneau, et al., *Québec, The Fortified City*, 348.
34. These and many other aspects of the urban scene at Louisbourg are discussed at length in A. J. B. Johnston, *Control and Order at French Colonial Louisbourg, 1713–1758* (East Lansing: Michigan State University Press, 2001).
35. For instance, the engineers did not give the town a perimeter street around the outside of the town grid, which would have facilitated movement of the military from one bastion to another. But in Louisbourg’s case, there was a shortage of available land on the peninsula where the settlement was constructed, and besides, the street alignments were such that such a perimeter road was not required.
36. According to Louis Dechêne, *La Correspondance de Vauban*, 4, “En 1686, il fit publier à Paris, sans nom d’auteur, la *Méthode générale et facile pour faire le dénombrement des peuples* et distribua des exemplaires aux secrétaires d’État, aux intendants et gouverneurs des villes et provinces. . . . Ceci nous amène à croire que Vauban remit à Denonville

une copie de sa *Méthode*, au moment où ce dernier partait pour le Canada—soit un an avant la publication.”

37. André Corvisier, “Armées, État et administration dans les temps modernes,” in *Histoire comparée de l’administration (IVe–XVIIIe siècles)*, ed. Paravicini and Werner (Munich: Artemis, 1980), 569.