

Bastion

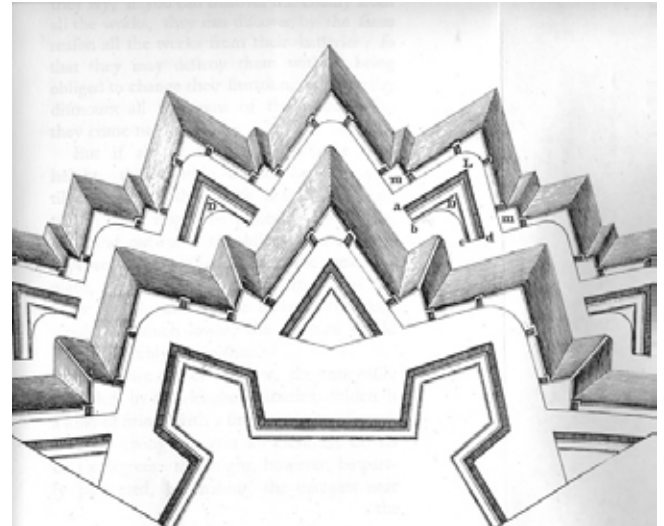
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The bastion is the distinguishing feature of gunpowder age fortification, only falling out of use in the middle of the 19th century. It has to be seen as part of the whole system of rampart, bastion, ravelin and glacis etc, but this essay deals only with the bastion.

A simple definition of a bastion is: *“a work consisting of two faces and two flanks, forming part of a major work and so designed that the whole of the main work’s wall face can be covered by firearms in the bastion and the faces of the bastion can be covered by firearms on the wall and in the adjacent bastion.”*

If we compare a bastion in its fully developed form with a mediaeval or Renaissance tower, we can see that the bastion is very different: the differences derive from an understanding of the potential both in attack and defence of gunpowder artillery and from a new scientific interest in fortification.

A bastion is lower than a tower, to reduce damage from increasingly powerful artillery; it is much larger in plan area, to allow the mounting and deployment of artillery. Perhaps most distinctively, the bastion is straight-sided and polygonal in plan, the walls facing the enemy, the faces, come to a point; guns mounted there can attack besiegers in the field. The two other sides, the flanks, allow fire not only along the ramparts (the curtain walls between the bastions,) but also along the faces of the adjacent bastions, leaving none of the blind spots that square and even round towers were perceived to leave. The bastion is often described as pentagonal: two faces, two flanks and the open face on the line of the ramparts, the gorge.



Two bastions, at the foot of the illustration, surrounded by other elements of the bastioned system. (from Muller)

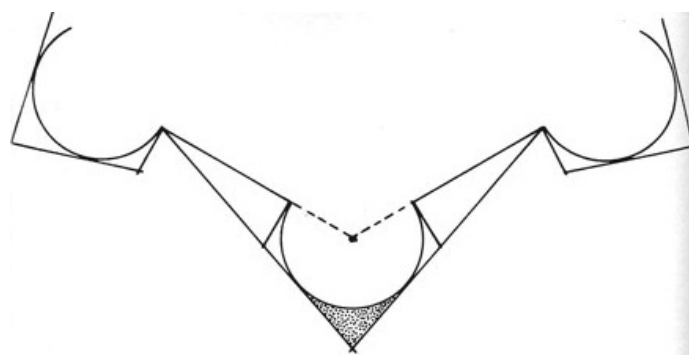
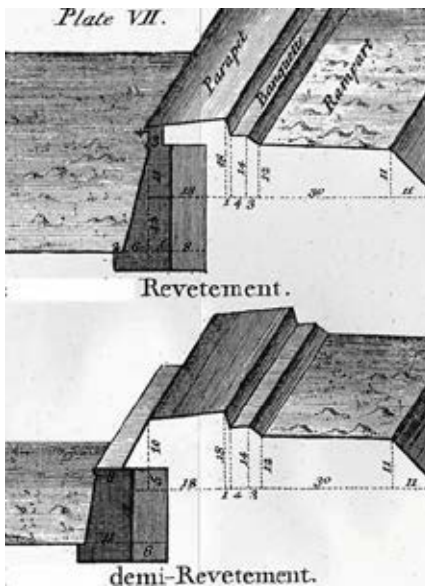


Diagram showing the areas of ground in front of a round tower not covered by fire from adjacent towers, and showing how the basic shape of a bastion is derived from this understanding

There is no certainty about where the first bastion was built or about the influences on its design, although much ink has been spilt in discussing the question.¹ Strongpoints definitely identifiable as bastions are found in Tuscany by the early 16th century.²

Perhaps the best examples of bastions at their finest can be seen in the surviving works of Vauban (1633-1707), in places such as the citadel at Lille or the town of Longwy.

Usually, a bastion will be a solid mass of earth and rubble and the ones that survive today are often faced with masonry. Many that have eroded away were earthwork only; there was dispute in the 16th century about whether the masonry facing had any function other than to protect the earth and rubble from the weather and it is certainly the mass that resists artillery. The bastion does not usually enclose rooms as a tower would, although there may be gun chambers, magazines and passages buried in it. A bastion will usually be



Profiles of construction in revetement and in demi-revetement. This drawing, from Muller, is of ramparts, but applies to the construction of bastions

battered, that is to say, sloping gently backwards from the base. This places the maximum of building material where the enemy will want to make a breach and it is also the profile that makes for stability in the mass of earthwork that forms the real strength of the construction, despite any retaining action provided by the external masonry skin. The batter makes scaling more difficult and means that a missile travelling horizontally hits the wall at an angle, doing less damage. This construction is the same as that of the ramparts. Brick was seen by some designers as resisting cannon balls better than stone, splintering and spalling less under impact. Cost and show played a part in the choice of material

In section, the masonry-faced bastion, like the ramparts on either side of it might be finished in what was known as revetment or demi-revetment, as shown in the illustrations, but in either case, the sloping top of the parapet was made of turf, to eliminate the risk of flying stone splinters.

Later engineers designed their bastions as part of a complicated system

of geometry determining the whole defensive system, using both theory and the terrain to determine the design. The spacing apart of the bastions is of course dictated by the effective range of the guns in the flanks: the whole length of the wall between bastions must be covered and fire must be able to clear attackers from the entire face of the adjoining bastion. The planform of bastions and the layout of the entire system was the subject of various geometrical theories and practices, associated with the different ideas of the various theorists and practitioners.

In the 17th and early 18th centuries, bastions were often designed with orillons: the faces of the bastion were extended to mask recessed (“retired”) flanks with batteries at one or more levels, protected from enemy guns by projecting “wings.” This was sometimes called the Old Italian manner. Excellent examples of this are to be found at Lucca (early 16th century) and Palmanova (from 1579) and elsewhere. Where the flanks were not retired, the angle at which the flanks met the ramparts differed according to the opinions of the designer and was sometimes a matter of theory rather than practicality.³



View of the orillon of a bastion at Lucca, seen from the rampart



View of a bastion without orillon at Peschiera del Garda

Usually, bastions have a quite obtuse angle between the faces, but in the 1580s in France, for instance at Antibes, some bastions were built with very acute angles, producing a spearhead-like plan. Such a plan restricted the deployment of cannon, both in the bastion itself and the batteries intended to enfilade the bastion faces.

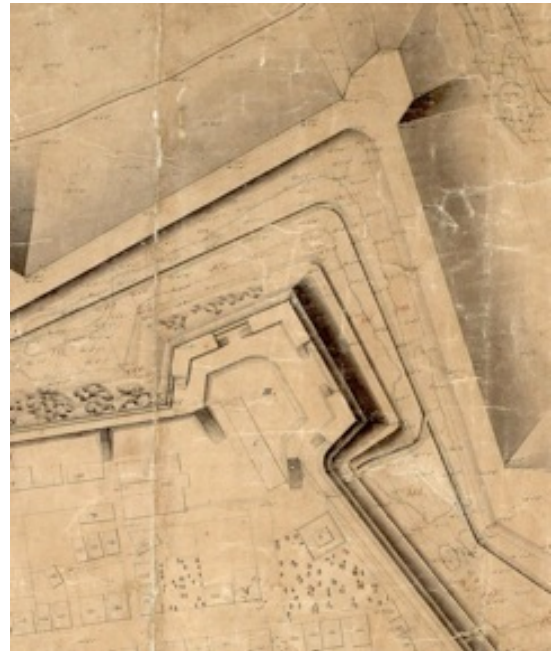
Apart from retired flank batteries, often known as “traditori,” from the 17th century, guns were generally only mounted on the parapets of bastions and not in casemates in the body of bastions.

Sometimes an earthwork structure known as a cavalier was raised in the middle of a bastion, to provide an extra and higher rank of guns.

In his most famous and accomplished work, Neuf Brisach, Vauban moves away from the bastion pure and simple and uses a combination of what he called a *tour bastionnée*, a bastion of reduced plan, detached from the rampart and containing guns within it as well as on the parapet, and a rampart set back twice, resembling the plan form of Sangallo’s Ardeatina bastions of 150 years earlier. He had used *tours bastionnées* before at Besançon.

Other variations on the bastion include especially the demi- or half-bastion, used where flanking fire is not required along one stretch of wall; two demi-bastions are used to make up a hornwork, for instance. The complicated kind of bastion used at the Porta Ardeatina is sometimes known as a double bastion.

The word “bastion” is of course used figuratively, as in “a bastion of respectability,” much as is the word “bulwark,” which is in many ways an English equivalent of bastion. “Bastion” is sometimes used for any strongpoint, even mediaeval towers which differ so much from bastions.



A survey drawing from 1818 of a bastion (in this case earthwork) at Karlovac

Reading

There are many books containing illustrations and descriptions of bastions. A good start might be “*Military Architecture*” by Quentin Hughes, “*Fire and Stone*” by Christopher Duffy, which describes the setting out of a bastioned front, or “*Fortress*” by Ian V Hogg. A new book in the area is “*Castles, A Global History of Fortified Structures, Ancient, Medieval and Modern*” by Charles Stephenson. An interesting read is “*Annals of a Fortress*” by E. Viollet le Duc, published in 1874, available in translations and with interesting introductions by Quentin Hughes and Simon Pepper in one edition and Christopher Duffy in another. Articles on bastions and bastioned fortification can be found in FORT, the journal of the FSG. Nos 2, 16, 26, 27 and 29 might be of especial interest.

Notes

1. For a discussion of this development, see J R Hale: “*The Early Development of the Bastion*” in “Europe in the Late Middle Ages.”(1965) and the chapter “Renaissance Fortification” in Quentin Hughes’s “*Military Architecture*” (1974 and 1991) which is possibly more easily found.
2. Two very different examples are at the citadel and town walls of Poggio Imperiale, designed between about 1490 and 1500, by Giuliano Sangallo and Antonio da Sangallo the Elder and the Porta San Viene bastion at Siena, from about 1530, designed by Baldassarre Peruzzi. An extraordinarily sophisticated system of bastions was started in 1542 at the Porta Ardeatina in Rome by Antonio da Sangallo the Younger, where, by stepping the wall between the bastions, double the weight of shot could be directed on an assault on the walls. (See FORT no 2.) All these examples differ in some ways from the bastion in its developed form.
3. The Frenchman Jean Errard (1554-1610) sometimes placed his flanks at right angles to the faces, no matter what angle this produced at the rampart. Others, including De Ville (1596-1656) perhaps more logically, said that the flanks should meet the rampart at right angles. Pagan (1604-1665) ruled that they should be at right angles to the “line of defence” an imaginary line drawn from the meeting of the flanks of one bastion with the rampart to the point of the adjacent bastion.