There is no ſuch thing as giving any exact rule in re­gard to the distance which ought to be obſerved upon open­ing the trenches. On level ground this diſtance may be 800 or 900 fathoms ; but if there ſhould be a hollow way in the neighbourhood of the place, the besiegers are to take advantage of it, and open the trenches nearer. In general, they are to regulate themſelves upon this head according to the nature of the ground, more or leſs favourable to the opening of the trenches.—We ſhall ſuppoſe, in the preſent work, that the opening ought to be made within 800 fa­thoms of the covert way ; the first parallel within 300 fa­thoms, the second within 150, and the third at the foot of the glacis.

6. Care ſhould be taken to join the attacks ; that is, they ought to have communications, to the end that they may be able to ſupport each other.

7. Never to advance a work, unleſs it be well ſupported ; and for this reaſon, in the interval between the second and third place of arms, the besiegers ſhould make, on both sides of the trenches, ſmaller places of arms, extending 40 or 50 fathoms in length, parallel to the others, and constructed in the same manner, which will ſerve to lodge the ſoldiers in who are to protect the works designed to reach the third place of arms.

8. Obſerve to place the batteries of cannon in the con­tinuations of the faces of the pieces attacked, in order to ſilence their fire ; and to the end that the approaches be­ing protected, may advance with greater ſafety and expe­dition.

9. For this reaſon the besiegers ſhould always embrace the whole front attacked, in order to have as much ſpace as is requisite to plant the batteries on the produced faces of the works attacked.

10. Do not begin the attack with works that lie cloſe to one another, or with rentrant angles, which would expoſe the attack to the croſs-fire of the enemy.

**2.** *Of Investing.*

The first operation of a siege is inverting. The body of troops inverting a town ought at least to be as strong again as the garrison ; they are to divide themſelves into ſeveral parties, in order to take possession of all the avenues leading to the place. By day they ſhould keep themſelves out of the reach of cannon-ſhot ; but as soon as it is dusk they must approach much nearer, the better to be able to support each other.

The investing is generally made by cavalry ; but when the country is cut with ravins or hollow ways, or when there are woods in the neighbourhood of the place, then there must be likewiſe a body of infantry to guard all the avenues, and even to stop up, by a kind of retrenchments, ſuch as might be the easiest to penetrate.

A few days after the inverting, the army arrives, and is diſpoſed round the town, according to the ground taken up by the line of circumvallation, and assigned by the engineer who has the direction of the siege. As ſoon as the place is inverted, they begin to trace the line of circumvallation, and afterwards they ſet about its construction.

3. *To trace out the line of Circumvallation.*

Before a general begins the attack of a place, he must endeavour to have as exact a plan of it as poſſible, by which he forms a design of the circumvallation and the attacks. The plan is rectified after the inverting as much as the vi­cinity of the enemy will permit ; and thereby he may correct the design traced at first, as far as there may be occasion for correction. It is upon ſuch a plan, so rectified, that we ſuppoſe a general to proceed. We shall therefore begin with explaining or tracing the operations of the siege. We ſhall exhibit the progress of theſe operations from the invert­ing to the taking of the place, in the order they are really executed. The line of circumvallation being a fortification intended against the enemy from without, who ſhould at­tempt to ſuccour the town, its defences ought to be directed against that enemy ; that is, they ought to be oppoſite to the town ; and the beſieging army ſhould, as we have al­ready obſerved, be encamped behind that line, that is, between it and the town. The camp ſhould be, as much as poſſible, without the reach of cannon-ſhot : therefore, as the line of circumvallation ſhould be at a greater distance from the place than the camp, the reaſon is still stronger for its being alſo out of the reach of the cannon-ſhot ; which, whe­ther fired horizontally, or at an angle of 10 or 12 degrees, may be reckoned about 1200 fathoms. As the rear of the camp ſhould not be incommoded by the cannon, this part ought to be above 1200 fathoms distane from the place; and we ſhall ſuppoſe that the distance ought to be fixed at 1400 fathoms from the covert way. The depth of the camp may be estimated at about 30 fathoms. From the front of the line of circumvallation there ſhould be a space of 120 fathoms, to draw up the army in battalia behind the circumvallation ; which ſpace added to 30 fathoms, ſuppoſed for the depth of the camp, gives 150 fathoms; and this added to the distance from the covert-way to the rear of the camp, gives 1550 fathoms for the distance from the circumvallation to the covert-way.

This being laid down, if the place be a regular octagon, fortified according to Μ. Vauban’s first method@@\*, the ra­dius thereof will be 234. fathoms. This distance being add­ed to the 1550 fathoms, then we ſhall have 1784. Or we may make it a round number by adding 16 fathoms, which are here of no manner of conſequence, and we ſhall have 1800 fathoms for the distance from the centre of the place to the line of circumvallation.

The radius of the circumvallation being thus settled, from the centre of the place, with the distance of 1800 fa­thoms, you are to deſcribe the circumference of a circle round the place. The diameter being 3600 fathoms, the circumference will then take 11,314 ; then take the distance of 120 fathoms, which you are to carry to the circumfe­rence above described. This distance will be in this example 93 times, and ſomething over, which differs very little from 120 fathoms ; ſo that you may look upon the polygon of this circumvallation as a polygon of 94 sides, of 120 fathoms each.

The polygon of the circumvallation being traced, take on each of the extremities of its sides the lines BD and BE, each of 15 fathoms ; and from the points D and E, taken, for the centre and distance of 25 fathoms, deſcribe two arcs which cut one another at the point F ; from whence draw the lines FD, FE, for the faces of the redans of the line of circumvallation : thus it is we form the ſaliant parts EFD of this line, which serve to flank it. Perform the same operation on every side of the circumvallation, and then you will have its principal line traced.

The parapet within must be six or eight feet deep ; and without make a ditch parallel to all its parts, three or four fathoms in breadth. The parapet of the circumvallation will be seven feet and a half high, and the depth of the ditch equal to the height of the parapet.

To make the profile of the circumvallation, let AB fig. 2. be the line level with the country, and CD the ſcale of the profile. Let A be the side of the town, and B that of the country ; take AE, of six feet ; from the point E, raiſe the perpendicular EF, of three feet, and draw the line AF, which will be the talus of the banquette.

@@@[m]\* See Fortification.