



I. Prolusion: Theater Design

I began my thesis with a question: How do I design a theater? Before I started graduate school I had read the Ten Books on Architecture by Vitruvius. Remembering that he gave an exercise in theater design, I decided this would be a good place to start. Doing this preliminary exercise helped me understand that there is order and harmonic proportions to theaters and that it should be adhered to as a student of architecture. According to Vitruvius here are the eight steps that I followed:

1. This is how to make the configuration of the theater itself. Whatever the size of the lower perimeter, locate a center point and draw a circle around it, and in this circle draw four triangles with equal sides and at equal intervals. These should just touch the circumference of the circle. (By these same triangles, astrologers calculate the harmonies of the stars of the twelve heavenly signs in musical terms.) Of these triangles, take the one whose side will be closest to the performing platform. There, in that area that cuts the curvature of the circle, lay out the *scaenae frons*, and draw a parallel line from that place through the center of the circle; this will divide off the platform of the proscenium and the area of the orchestra. 2. Thus the platform will have been made deeper than that of the Greeks, because all the artists do their work on it. In the orchestra, on the other hand, are the places reserved for the senators' seats. The platform itself should not be more than five feet high, so that those seated in the orchestra will be able to see all of the actors' gestures.

The wedges of seats in the theater should be divided like this. Have the angles of the triangles that run around the circumference of the circle determine the direction of the rise of the stairways in between wedges up to the first transverse aisle. Above this, the midlines of the upper wedges serve to direct the staircases in a staggered pattern.

3. The angles at the base of the theater, the ones that serve to orient the stairways, will be seven in number, and the remaining five mark off the design of the platform. The center angle should have the palace doors opposite it, and those to the left and right mark off the placement of the door to the guest quarters, while the two outermost angles will face the paths of the rotating panels.

Make the steps up to the viewing areas (where the seats are to be laid out) no less than one palm high and no more than a foot and six digits. Their depth should be set at no more than two and one-half feet and no less than two. 4. The roof of the portico that will be put on the highest step should be completed on a level with the height of the scene building, for the reason that the voice will swell uniformly and so reach the top rows and the roof. If the theater is not level, then wherever it is lower, the voice will be interrupted at that point, because it has arrived there first.

5. As for the orchestra, whatever diameter it will have between its lowermost steps, take one-sixth of that measure. On each end of the theater, right by the entrances, make a perpendicular cut of this dimension along the lower rows of seats, and wherever the cut is, there place the lintels of the entrance passages. In this way their vaults will have enough height.

6. The length of the platform ought to be twice the diameter of the orchestra. The height of the podium from the level of the platform, including its cornice and crowning molding, should be one-twelfth the diameter of the orchestra. Above the podium, the columns with their capitals and bases should have a height of one-fourth the same diameter, while the epistyles and the ornaments of these columns should be one-fifth their height. The attic (*pluteus*) above with its wave molding and its lower cornice should be half the size of the podium. Above this attic make the columns smaller by one-fourth than the lower set; the epistyles and ornaments for these columns should be one fifth their height. If there is to be a third *episcaenos*, then have the upper attic be half the size of the middle attic, and the uppermost columns shorter by one-fourth than the middle columns. The epistyles and ornaments of these columns should likewise measure one-fifth the columns' height.

7. Now it is possible to have the proportional systems for every theater carried out according to every principle and to every effect. Instead, it is up to the architect to note in which dimensions it will be necessary to pursue symmetry and in which to make adjustments according to the nature of the site or the size of the project. There are things that, because of their function, ought to be made of the same size both in a very small theater and in a large one: things like rows of seats, transverse aisles, podia, passageways, stairs, performing platforms, tribunals, and whatever else might occur where necessity compels departure from symmetry so as not to impede function. This is no less the case if some shortage of supplies is going to occur in the project, that is, of marble, wood, or one of the other materials that have been assembled. Then it will not be out of place to subtract or add a bit, so long as this is not done too imprudently, but rather with good sense. This will happen, of course, if the architect has experience, particularly if he is not wholly devoid of a quick mind and ingenuity.

8. Scene buildings have their own principles, developed as follows: the central doors have the ornaments of a royal hall, and the doors to the guest quarters (*hospitalia*) to the right and left are placed next to the area prepared for scenery. The Greeks call these areas *periaktoi* because there are machines in these places that have rotating triangles. Each of these has three different sets of decoration; when there is going to be a change of setting in a play, or the epiphany of a god in a clap of thunder, then these are rotated to change the appearance of the decoration on the exterior. Alongside these places, their front panels should represent one entrance onstage from the forum, and one from abroad. There are three types of sets: one that is called tragic, one called comic, and the third satyric. Their ornamentation is unlike, and conceived on differing principles. Tragic sets are represented with columns and gables and statues and the other trappings of royalty. Comic sets look like private buildings with balconies, and the views from their windows are designed, in imitation, on the principles of private buildings. Satyric sets are ornamented with trees, caves, mountains, and all the other rustic features, fashioned to have the appearance of landscape.