**Palace Geometry**

**Gioffredo's Project**

Caserta was a geometric temple of government within which the visitor, whether ambassador, petitioner, or official of the kingdom, was to proceed through a geometric labyrinth to the ultimate goal: whichever secretary, officer, or member of the royal family, including the king himself, could be of help.\(^1\)

Along the way the visitor would encounter heroes, gods, and allegories. Both the geometric and the mythical aspects of the visit continue the themes of the river-road.

The first architect to design a project for the palace at Caserta was Mario Gioffredo (figs. 6.1–6.5). Gioffredo's designs date from 1750 or 1751.\(^2\) Hence they were drawn up fifteen years or so before he published his treatise on architecture; yet each reveals a lot about the other. Gioffredo's project embodies precisely the notions of Ancient Near Eastern sublimity, of vast palaces configured into geometric logic by the orders, that he was to praise in his book.\(^3\) From the perspective view in fig. 6.1, which contains human figures, the total length of the palace appears to have been about 760 feet (c. 900 Neapolitan palmi). So it was not the supercolossus some have said it was, though certainly its area would have been not quite one-third greater than that of Vanvitelli's present building, which is huge enough: 926 by 696 palmi (1111 by 819 feet). The difference in total area would be about 81,000 palmi as opposed to about 65,000.

Gioffredo's palace was to have been built around nine courts, each square like the perimeter of the whole and composed of uniform ranges flanked by exterior loggias. The central court
Mario Gioffredo.
Project for the royal palace and town of Caserta, perspective, c. 1755. Naples, Biblioteca Nazionale
6.2
Gioffredo. Early site plan for Caserta. Naples, Biblioteca Nazionale

6.3
Gioffredo. Site plan for Caserta. Naples, Biblioteca Nazionale

6.5 Gioffredo. Plan of upper floors of the palace of Caserta. Naples, Biblioteca Nazionale
was to have been filled with a cruciform structure one story higher than the others, whose crossing was marked by a large octagonal staircase, possibly a double helix. The outer perimeter was marked by double ranges of buildings separated by immensely long, narrow courts crossing at each corner to form small, square pavilions. Two of the four pavilion towers thus created contained apartments, the other two a theater and a church. The former is set into a frame borrowed from the shape of the Neapolitan Renaissance villa of Poggio Reale, with tetra-style chambers (chambers with four columns in a square at the center) at the corners. The auditorium is a horseshoe of boxes inserted into a domed cylinder. Also to be housed in the palace, according to the program, were the royal family, the court, the upper bureaucracy of the kingdom, and, in the top floors of the octagon, a museum (perhaps including both the Farnese and Portici collections), a Parliament chamber, and a theological seminary (fig. 6.5). This “veritable Kremlin” as Venditti calls it, in its nine-square plan, its scale, and immense corner bastions, evokes not only Gioffredo’s Near Eastern prototypes but also specific attempts to reconstruct such buildings, such as Villalpando’s essay on the Temple at Jerusalem (fig. 6.6). Note particularly the little penthouses at each juncture of the wings, as well as the arcaded courts. Although Carlo did not erect Gioffredo’s palace intended to house whole components of the machinery of state and culture, in keeping with his penchant for building, abandoning, and then building anew, he did construct separate edifices to house most of the functions. Seven large royal residences were built (two of which, Capodimonte and Portici, contained museums) as well as a library addition to the Palazzo Reale and the Università degli Studi (a long series of remodelings initiated by Carlo, 1738–1818)—all of which echo Gioffredo’s program.6

The perspective view of Gioffredo’s scheme in the Biblioteca Nazionale gives an idea of the whole (fig. 6.1). The view is from the town side. The blocks of smaller buildings, barracks, erected to what is probably the south, provide an orientation and indicate that the architect intended not just a palace but a city as well, as Vanvitelli had. The bastions and moats are fairly low, probably not much higher than the familiar ones that surrounded the Castel Nuovo (fig. 4.9). 7 Not merely ornamental, these bastions are lined with cannon, thirteen to a side. Several of the outbuildings are shown and on the main front a central superbastion whose moat is completed by a wall with two arched entrances flanking it. Beyond there are three gardens at three different scales, and wooded hills (fig. 6.2).

Gioffredo’s design proceeds from the concept of the One and spreads eventually into mathematical series. Indeed this plan, like the Canevari-Medrano plan of Capodimonte, is susceptible to full modular analysis. The site layout, for the part of the complex set within the bastioned square that forms the palace’s setting, is an axial, regular grid with the octagon at its center (figs. 6.2, 6.3). All the openings in the grid are squares or multiples of squares. This is made clear when the concentric squares are drawn out and crisscrossed by extensions of the vectors.
formed by the entrances—the latter of a type most familiar in the Louvre guichets but also found at Capodimonte (fig. 3.22)—and by the Palladian tetrastyle pavilions located throughout the plan.

The result is what mathematicians call a “plaid graph” (fig. 6.7). Indeed the building is a mosaic of modules and micromodules. The outer circumference is formed by a hollow square made of 32 smaller rectangles, 8 to a side. The corners are squares, and the interior shapes are 6:5 rectangles of the same width as the corner squares. The 9 squares, set 3 by 3, within the frame, all have sides 2 times the length of the surrounding rectangles. The ranges of rooms in the inner courts that make up the ground floor are double squares, and throughout the rest of the building they are 6:5 rectangles. These then are the two different micromodules, marked a and b in figure 6.8, that measure out all rooms and establish the distribution of the inner and outer colonnades. The omnipresent column grid makes the plan into a plaid-grid hypostyle measuring 6 by 8 (for the ranges) = 48 + 9 × 4 (for the tetrastyles) = 36, or 84 columns per side, 84² in total—except that of course those columns are “removed” that would stand within some of the rooms, walls, or courts.

The smaller micromodules or a-types comprise several elements, such as the pavilions that are formed of 16 such a-micros. The b-micros are not integral components of the tetrastyles in the rest of the palace but are determined by the edges established
by the corner squares. All the gates are 3 intercolumniations wide (3 times the width of 1 b-micro). There are two types of tetrastyle. The only geometrical dissonance in the scheme is that the colonnades established by the corner blocks are set closer than those in the rest of the building. This is particularly noticeable in the long bays in the center of each side, whose ends consist of 6-column colonnades with shafts more closely set than those along the long sides. (Incidentally, these immense 52-column colonnades are early instances of a Boullée-like, or Durand-like, Neoclassicism; see figs. 1.6, 6.2) Though Gioffredo’s columns are inaccurately marked, his scheme consists of a hypostyle sweep of inner and outer columns, as figure 6.8 makes clear.

The plan is more intricate and thorough than that of Capodimonte (fig. 3.25). But there is no indication in Gioffredo’s drawings of the purposes of these rooms. It all remains as mysterious as the layout of a Cretan palace. Nonetheless Vitruvius’s well-known principle of the subtractive layout, beginning with a hypostyle grid and then theoretically “removing” columns to form inner spaces, seems to have been followed.

Two of the four corner pavilions—those exceptions with double-square rooms, seven to a range—frame plain open courts. The other two, as noted, have a cruciform church (on the upper left) and a theater (on the upper right) plugged into them, a dense contraction of the tetrastyle principle in the case of the church, whose central rotunda has the same diameter.
as the rotunda of the staircase. Off the church’s central cylinder, which was to have been topped by a dome, are four subcylinders located at 12, 3, 6, and 9 o’clock. These are one-quarter the size of the main cylinder and are articulated by tetrastyles. The corners are filled with tetrastyle cubic sacristsies (fig. 6.3). The basic scheme goes back through Juvarra to Leonardo. Less idiomatically the theater’s horseshoe has a box tier one row deep, with the stage projecting back to the outer corner of the building. Only these three elements—church, stair, and theater—soften Gioffredo’s essay in *architectura recta*.

To telescope somewhat the procedure used in chapter 3, I will reduce Gioffredo’s grid thus (since the dimensions are unknown the Scamozzi/Caramuel system cannot be used):

Facade of Gioffredo’s Project

\[
\begin{array}{cccccccccccc}
5 & 4 & 3 & 2 & 1 & 3 & 4 & 5 \\
T & R & T & R & E & R & T & R & E & R & T & T \\
3 & 7 & 3 & 6 & 3 & 6 & 3 & 6 & 3 & 6 & 3 & 7 & 3 \\
1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 \\
.5 & 2 & 1 & 2 & .5 \\
a-type & b-type & a-type
\end{array}
\]

The upper row of figures enumerates the projecting pavilions in mirror symmetry. In the next row, \( T = \) closed tetrastyle, \( R = \) range, and \( E = \) entrance gate. In the third row come the micromodules, both the \( a \) and the \( b \) types. In the fourth row are the modules proper, and then in the fifth are the macros. The latter reduce everything to \((.5)(1,1,1)(.5)\), which equals 4, three central complete macromodules flanked by half-macros. There are totals of 4 macros, 8 modules, and \( 77 \ a \) or \( b \) micros on each side of the palace. All four sides are the same. The whole structure hence reduces to 1.

Let us move beyond this level, which is based on Gioffredo’s rather small drawings, to the mathematical necessities underlying the arrangement. If we redraw the outer bays of figure 6.8 at larger scale (fig. 6.9), we find that Gioffredo must have wanted to overlay each gate and type 2 tetrastyle with \( a \)-micros, such that \( 4a = 3b \). At the same time the sides of the type 1 tetrastyles are not integrally measurable in \( a \)-modules but nonetheless equal \( 3a \). How can this be? Figure 6.9 shows us: the two systems overlap. In the type 1 tetrastyles the walls obey the rhythm of the \( a \)-modules, the columns that of the \( b \)-modules. In the type 2 tetrastyles and in the gates, that situation is reversed. Thus Gioffredo defeats or avoids the famous “thickness problem.”

The bastions and moat, the garden parterres flanking the sides, and the barric buildings and bastions to the south are all set along the edges or coordinates established by the palace grid, though in a configuration much less dense than the palace’s. The garden pavilions make use of the same geometric constructs and the same scales as does the palace itself, for example in the configuration of central octagon and surrounding ranges vis-à-vis the upper and lower quincunx-parterres on the right-hand side (fig. 6.3). The small square in the center of
6.8
The upper left-hand corner of Gioffredo's ground-floor plan

6.9
Redrawn detail from fig. 6.8 showing the outer row of pavilions and ranges and the interpenetrations, within them, of a-modules and b-modules.

- closely spaced, a-micromodule columns
- widely spaced, b-micromodule columns
each quincunx has the same width as the central octagonal void of the main stair and as the smaller courts. Each main court is three times this distance; it is also the same as the width of the little temple in the center of the hemicycle in the north garden.

All this relates to the building's geometry. In terms of distribution the plan of Caserta can be analyzed briefly as shown in the table:

**Distributions of Gioffredo's Project**

<table>
<thead>
<tr>
<th>Feature</th>
<th>Number</th>
<th>Location</th>
<th>Stories</th>
</tr>
</thead>
<tbody>
<tr>
<td>Octagon</td>
<td>1</td>
<td>Center</td>
<td>6</td>
</tr>
<tr>
<td>Central court</td>
<td>1</td>
<td>Center</td>
<td>4</td>
</tr>
<tr>
<td>Octagon transepts</td>
<td>4</td>
<td>Center</td>
<td>5</td>
</tr>
<tr>
<td>Towers</td>
<td>4</td>
<td>Corners</td>
<td>3</td>
</tr>
<tr>
<td>Outer fronts</td>
<td>4</td>
<td>Margins</td>
<td>3</td>
</tr>
<tr>
<td>Exterior courts</td>
<td>8</td>
<td>Margins</td>
<td>3</td>
</tr>
<tr>
<td>Tetrastyles</td>
<td>12</td>
<td>Inner axes</td>
<td>2</td>
</tr>
<tr>
<td>Gates</td>
<td>12</td>
<td>Outer axes</td>
<td>2</td>
</tr>
<tr>
<td>Porticoes</td>
<td>16</td>
<td>Corners</td>
<td>2</td>
</tr>
<tr>
<td>Cupolas</td>
<td>26</td>
<td>Towers</td>
<td>1</td>
</tr>
</tbody>
</table>

This breakdown shows a relation between the frequency of a given feature and its distance from the center. Thus the closer a feature is to the octagon, the One, the rarer it is, and also the greater its height. These relations can be stated in simple numerical series. The series are not perfect (there are more stories to the transepts than to the surrounding central court, while there are four of these transepts and only one such court). But the trend is unmistakable.

Gioffredo's source, aside from the Villalpando possibility, is easy to trace. The basic layout is a 9-square extension of Capodimonte (fis. 3.25–3.27, 6.10). This can be shown by declaring the areas marked A in figure 6.10 to be equivalent to Gioffredo's corner a-micro courts, while the rooms marked B are tetrastyles and those marked C the entrances. The projecting bays marked D suggest the long narrow courts that frame Gioffredo's plan. Remembering that Gioffredo had been Medrano's apprentice, it is probable that the mathematical principles apparent in both plans are derived from military engineering. 

Let us now look at the vertical organization of Gioffredo's palace. A pencil plan of the ground floor in the Biblioteca Nazionale shows each range filled with uniform rooms, the range itself being two rooms deep. The final ink plan of this same floor makes the ranges only one room deep (fis. 6.2, 6.3). Whatever their size, these ground-floor chambers were probably intended for stables, storage, guards, and the like.

In the next two floors terraces appear between the corner towers. The lesser wings cease to rise. Only the inner, greater parts of the palace continue upward (fis. 6.4, 6.5). The church, theater, and two apartments also rise upward in their respective corners. The distribution within the ranges becomes more diverse, with large halls along the arms of the inner Greek cross of the building and smaller suites elsewhere. In the third floor the beehive articulation returns. But the interstices are smaller,
6.10
Plan of Capodimonte
redrawn as a nine-court palace

6.11
Buen Retiro at the beginning of the eighteenth century.
Paris, Bibliothèque Nationale
three rooms deep. Corridors down the centers of the ranges and external arcades provide circulation. These are probably living quarters for servants and lesser courtiers.

This ascent, like the plan itself, is an essay in subtractive geometry. On the fourth floor only the central elements continue. The roof plan is marked out at the junctures of the coordinates by the round temples mentioned, so that all these outer, lesser components of the palace end in temples. There are twenty-four, each dedicated to one of the patron saints of Naples. Fountains and an astronomical observatory are situated at the top of the dome. In the centers of the ranges leading outward from the middle court are small penthouse stair heads composed of four square units each. The central court meanwhile continues to rise, now divided into many small rooms. The octagon continues too. In the remaining two plans, finally, all surrounding elements are lopped off except the octagon, the One, which rises on alone into a step-pyramid roof.

Not only are the geometrical order of this plan and its two- and three-dimensional hierarchy related to Capodimonte, but so is the architectural style (figs. 3.22, 3.23, 6.1). Both are possessed of the same austere near-Neoclassicism, the same close-set giant pilasters (probably in both cases of gray piperno), the same tall, windowed rustic basement and parapet. There is also the same Louvre-like grouping of arch entrances in threes, which Vanvitelli would studiously avoid and talk about avoiding at Caserta. And there are the same square mezzanine panels, the same slight jogs to mark conjunctions, and the same flat protrusions for axial entrances. On the other hand the square overall shape, the surrounding margin of ranges punctuated at the corners by projecting square pavilions, and the Greek cross of ranges forming the central element with a massive stair-and-octagon complex, all seem to have come from Buen Retiro (fig. 6.11). This shows the palace before de Cotte began to propose remodelings. De Cotte’s projects for the Spanish crown were studied in Naples; indeed Vanvitelli’s early plan for Caserta palace, like his plan for the garden, seems directly derived from the French architect’s Spanish work (fig. 6.12). Carlo di Borbone would have known of this plan, for he was living in Spain when his father commissioned it.12

Gioffredo, then, has succeeded in creating a fully absolutist palace scheme that is also fully geometric. He has reinscribed Capodimonte at the scale of Versailles or the Louvre. His project caps the climax of the tradition we examined in chapter 3. As a study of masses his palace is almost comparable to Khorsabad, Persepolis, even Jerusalem, as these complexes lived in the eighteenth century’s dream of the Sublime. Yet, to paraphrase Gioffredo himself, the palace is also Greco-Roman: “ordered” and rationalized. It might even be said that it is explained, harmonized, and surveyed by the orders, by its hypostyle architecture. The porticoes do not merely provide entrances, they establish the building’s rhythms and dictate its mode of composition. They code the geometry into its components, which in turn resolve into the binary number system that leads down to 1.
Vanvitelli’s “Ideal Royal Palace”

In 1750, while he was still in Rome, Vanvitelli wrote out an unillustrated program entitled “Idea of the Plan of a Royal Residence for Monarchs.” It may have been composed when he was still unaware of Gioffredo’s scheme. And yet it can be read as a comment on that scheme and as an axial splitting-up, with triumphal spaces, of Gioffredo’s relentless grid.

Vanvitelli writes: “Firstly, the entrance system (entrata) of the royal palace must be magnificent, the stairs ample, grandiose, well lighted, and unimpeded by any inconvenience.” This says that Gioffredo’s scheme lacks a dramatic entrance. Another departure from Gioffredo occurs when Vanvitelli describes the entrance complex of his ideal palace as if it were a classical temple, which it is, of course, in his finished building. He thus reinforces the separation of circulation space from the palace proper. The entrance temple is to be Ionic, higher than the rest of the palace, and with 3-diameter tetrastyle columns. There are two minor entrances, one on either side of the main opening. Each entrance leads to a courtyard. The courtyards are correspondingly major or minor, matching their respective entrances in the main front. In short Vanvitelli is calling for a central large court flanked by smaller courts or perhaps by pairs of courts. He thus has in mind a scheme quite unlike Gioffredo’s and also unlike Caserta as built, for, in both of these, all courts are exactly equal.
From this central trunk two parterres or raised courtyards are to be erected, one for the king's apartments and the other for the royal heirs. Each is approached by a magnificent stair symmetrically situated in a courtyard. One stair is for the king and queen, the other for the crown prince and princess and for visiting princes. This aspect of the scheme differs sharply from what Gioffredo had planned. Gioffredo's palace had consisted of one single great stair and hives of small geometrical chambers. Vanvitelli's scheme even in this preliminary form divides the building via multiple staircases into zones for the royal family's older and younger generations. In his final version of the plan Vanvitelli would unite his zone divisions with Gioffredo's conception of the great single stair.

A similar sense of a sequential hierarchy fills Vanvitelli's descriptions of the rooms in the Biblioteca Nazionale manuscript. The king's official apartment consists of a series of vestibules and waiting rooms, each accommodating a different type of guardian military personnel: the sergeant of the guard, 100 halberdiers in two "wings," 200 royal guards also in two wings; "two rooms with anterooms, and one [other] for the brigadier of the guard"; so the ideal palace's royal parterre is a sort of architectural dress parade.¹⁵

The same goes for the "civilian" sequences described in his text. Specific chambers and antechambers are designated for people with titles, people without titles, officials of the kingdom, gentlemen of the king's chamber, ambassadors, and secretaries of the state. In some instances men and women are segregated (for example the women, but not the men, had secret access to the confessionals). Networks of servants' corridors, often like the main corridors restricted by class and sex, bind the whole composition together.¹⁶ There are a grand gallery for the baciamano and dressing rooms and bedrooms for ceremonial levées. There is a domestic chapel with its private stair, and so on down to the minutest details. The same arrangements, mutatis mutandis, are provided for the queen, for the crown prince, and for other members of the court. In the center of the whole, as in Gioffredo's scheme, was to be the One, a public chapel with a tribune for the royal family and other tribunes for servants and retainers.

Above all, and unlike Gioffredo's scheme, Vanvitelli's ideal palace and the real, rather different one that was built were buildings for royal ceremonies and audiences. The ladies and gentlemen in waiting literally did wait, in waiting rooms, segregated by status, to be called on for whatever it was they provided, from conversation to chocolate to the chaise percée, or to present a petition, a complaint about a pension, or to suggest a candidate for office. And not only the ladies and gentlemen but the rooms themselves wait in line. They comprise flights of anterooms, evaluated by their numerical and topological distance from that royal One, who circulates, resides, and presides in the Throne Room, or in the bedroom, or at the baciamano, and who is the fountainhead from whom all change, all recognition, all success, proceed.¹⁷
The Definitive Design

Now let us turn to Vanvitelli’s published plans (figs. 6.13–6.15). These were in essentials carried out as presented in the Dichiarazione, except for the central dome and four corner towers. The engravings illustrate the principles of sequence and subdivision used by Vanvitelli to describe the ideal palace, but they do so with a geometry less rigorous than Gioffredo’s.

Vanvitelli’s plans can nonetheless be reduced to number by the binary process. Indeed he has really only reinscribed Gioffredo’s scheme within the narrower bounds Gioffredo’s biographer said Carlo wanted. Recall that Gioffredo’s palace appears to have been designed on a square approximately 900 palmi in width. Vanvitelli’s palace occupies a rectangle 936 by 696 palmi—a reduction of about 25 percent. In other words he has shrunk Gioffredo’s square to a 4:3 rectangle by the process outlined in the three sections of figure 6.16. The ranges within that rectangle are 96 palmi wide. The whole can be mapped, without significant distortion, onto a grid as in figure 6.17, where the exact measurements, taken from Vanvitelli’s published plan, show that the horizontal ranges equal 306 palmi in length, or about 3.5 times the width of the porticoes, which is 88 palmi. At the same time the 206-palmo vertical ranges equal 2.33 times 88. The inner courts, as noted, are about 200 by 300 palmi. The whole outer 4:3 rectangle is subdivided by uniform ranges into four equal courts. The grid comprises 67 by 52 micros (fig. 6.17), each equaling 14 palmi. Other such mappings are no doubt possible, and we probably will never know which one Vanvitelli actually used. But whatever his actual micro, the principles illustrated here would have prevailed.

Let us turn to the facades. The windows, regularly set in vertical rows, and often between pilasters, extend the vectors established by the pilaster and column systems on the building (figs. 6.18, 6.19). These bays dictate the modular apparatus of the exteriors. They consist, as in Gioffredo’s plan, of cubic projecting pavilions marking the junctions of the ranges at the corners, the centers, and the crossings of the palace. However, Vanvitelli has eliminated the crisscross of axial entrances Gioffredo had installed throughout.

Not only is Vanvitelli’s Caserta a telescoping of Gioffredo’s Capodimonte-derived courts into four related rectangles, it borrows these ideas in consonance with contributions from Buen Retiro. Vanvitelli’s facades reflect two of de Cotte’s projected elevations for Buen Retiro (figs. 6.20, 6.21), a fact made all the clearer if Vanvitelli’s unbuilt towers and drum are removed from the plan as in figure 6.22. In this sense Vanvitelli simply regularized de Cotte’s more baroque temple front and set the lateral pavilions one bay in from the ends of the facade. De Cotte’s section (fig. 6.23) shows that the handling of the octagon and stair hall in his plan were very similar to what Vanvitelli was to do (fig. 6.24), though the French architect has an open two-story atrium while Vanvitelli’s atrium consists of four separated stories. Nor should we forget that behind these more recent schemes there is the same sequence of tower, range, dome, and temple that existed at the Escorial (fig. 3.9). On the
6.13
Vanvitelli. Plan of the ground floor of the palace at Caserta, 1756. From the Dichiarazione.

6.14
Vanvitelli. Plan of the main floor, or piano reale, of the palace at Caserta.

6.15
Vanvitelli. Plan of upper floor of the palace at Caserta.
6.16 Transformation of four of Gioffredo's courts (fig. 6.3) from squares (A) to overlapped squares (B) to Vanvitelli's proportions of 4:3 (C).

6.17 Caserta, Vanvitelli's plan mapped onto a 14-palmo grid. The ranges are 96 palmi wide; the porticoes are 88 wide and project 30; the lateral ranges are 206 palmi long; the front and rear ranges 306.
6.18
Vanvitelli. Garden facade of the palace at Caserta, 1756, from the Dichiarazione

6.19
Vanvitelli. Town facade of the palace at Caserta, 1756. From the Dichiarazione
6.20
Robert de Cotte.
Garden façade of first project for Buen Retiro, 1712-1714. Paris, Bibliothèque Nationale

6.21
Robert de Cotte.
Buen Retiro, court façade. Paris, Bibliothèque Nationale
6.22
Figure 6.19 with drum and towers removed

6.23
Robert de Cotte.
Section of an alternative project for Buen Retiro. Paris, Bibliothèque Nationale
Vanvitelli. Section through the palace at Caserta, showing the stair hall in horizontal section. From the Dichiarazione.

Vanvitelli. Study for Caserta façade. Caserta, Reggia.
other hand the idea of stretching out the octagonal vestibule, stair, and chapel all along the northern interior stem is, in Vanvitelli, transposed to the central part of the east–west stem, which contains the sequence chapel/vestibule/stair. Thus seen, the French component in the design of Caserta is sharpened and increased. But, since the French architect de Cotte was working on Spanish projects, we also see the project’s Spanish-Bourbon side more completely.

One more link between Gioffredo and Vanvitelli may be mentioned: Vanvitelli’s towers and dome reflect, in a solider, nobler fashion, Gioffredo’s little pepperpot cupolas (fig. 6.1). Indeed one of Vanvitelli’s preliminary drawings has a particularly Gioffredesque cupola (fig. 6.25). And, just to make the interlinkings even more complicated, Vanvitelli’s “Buen Retiro” plan, so to call it (fig. 6.12), has an octagonal complex almost exactly like Gioffredo’s. The overlappings in the two architects’ styles and careers are particularly intense at Caserta.

Let us reduce Vanvitelli’s bay system. First of all, counting the bays uniformly, we get the following subdivisions (see figs. 6.18, 6.19):

<table>
<thead>
<tr>
<th>Portico</th>
<th>Arch</th>
<th>Arch-Portico</th>
<th>Arch</th>
<th>Portico</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>3</td>
<td>4 5 2 5</td>
<td>4 5 2 5 4</td>
<td>1</td>
</tr>
<tr>
<td>3 3 1</td>
<td>3 3 3 1</td>
<td>3 3 3</td>
<td>1 2 1 2 1</td>
<td>1</td>
</tr>
</tbody>
</table>

In this array the top row of numbers lists the distribution of pilaster groups separating bays, where the second and third rows give the differences between these groups and the bottom row counts the magnitudes of these “differences” in each subdivision of the bay. Not only does Vanvitelli’s series reduce to 1 in the center (at the point of the arch-portico), it is also a numerical palindrome. In this it is like the remodeled facade of the Palazzo Reale and Gioffredo’s project for Caserta. But another sort of reduction explains a relative novelty in this facade: there are three porticoes and three arches, but only in the center, only in that “One” situation where a portico stands directly over an arch, do temple and triumphal motif coincide. The scheme is based on reflected symmetry.

Meanwhile the side facades are:

\[ \begin{array}{cccc}
4 & 8 & 4 & 8 \\
4 & 4 & 4 & 4 \\
\end{array} \]

These facades are without entrances. Note that there is a total of 38 bays across the front and 28 down the sides, and that \(38:28\) is just about 4:3; so Vanvitelli’s bay division echoes the geometry of the plan. Put differently, the 67 by 52 grid in figure 6.17 may be considered as mapping out a potential hypostyle, since it corresponds to the main internal and external subdivisions of the building, with intercolumniations of 14 palmi. The total count of hypostyle “columns” is 68 by 53 = 3604, a figure unrelated to the values for length and depth in palmi. Caramuel Lobkowitz’s formula therefore cannot be applied as he used it for the Temple of Diana. But Caramuel was not simply interested in the relationships between column distribution and area.
He also evolved a geometric series out of his hypostyle. And Vanvitelli’s facade contains just such a series, one that is in fact more elegant than Caramuel’s:


This is neater and more significant than Caramuel’s; neater because it is done by using the number 3 in each of its arithmetical operations and more significant because the series begins and ends with 1.

The side elevations are simpler variants of this idea:


The 4s and the 8s can be reduced to 1s and 0s, thus achieving binary access to the One.

Finally, on the question of bay dimensions a number of inconsistent measurements have been published for Caserta, some based on Vanvitelli’s preliminary drawings. I have used those printed in the *Dichiarazione*. Looking at Vanvitelli’s facade elevations and measuring the chief magnitudes, shows the facade to be divided into six types of bay:

1. Having 14-palmo pilasters
2. Having 7-palmo windows
3. Having 21-palmo pilasters

These correspond to the 14-palmo module extrapolated in figure 6.17. They create all areas except those forming entrance features. And the entrances are composed of the following types of bay:

4. With 10-palmo piers with pilasters or columns
5. With 10-palmo arches

All this may be arrayed as follows: Let \( a = \) a half-micro of the 14-palmo type and \( b = \) the 10-palmo type. There are 75 bays made up of these modules. The scheme can be condensed as follows:

Left wing:

\[
(2a + a) \quad \text{(Group A)}
\]

\[
[(2a + a)(3a + a)] [2a] \quad \text{(Group B)}
\]

\[
[(a + 2a)] [a] \quad \text{(Group C)}
\]

\[
[(h^2 b^2 b)] \quad \text{(Group D)}
\]

(C Group C)

Central section (Group E):

\[
[3b|2b|3b]
\]

Right wing (a mirroring of the left), where \( A = \) the jogs at the exterior corners, \( B = \) the temple fronts without entrances, \( C = \) the main wings separated by \( D, \) the lateral entrances, and \( E = \) the central section. The superscripts represent repetitions of the modular clusters in the parentheses. Reduced to a series of bay groups it comes out to

\[
2/7/11/3/11/7/11/3/11/7/2
\]

and to the following dimensions in palmi:

\[
21/91(7 \times 13)/112 (7 \times 10)/40/112/80/112/40/112/91/112/21.
\]
So within the micro system of 7 and its multiples established for the plan, there is a 10 system as well, one that is used compatibly with it, in Gioffredo's manner, and that exists throughout but appears only in the center of the facade. It is composed of 7 elements but adds up to 80 [10 × 8]. Thus does the number system perform the same tasks performed by the array of temples and triumphal arches mentioned earlier: it is woven separately throughout the whole and then coincides at one central point and one only.

So much for Caserta's geometric structure. As to function, more is known about Vanvitelli's ideas than about Gioffredo's, since Vanvitelli in the Dichtarazione explains the purposes of the planned rooms and spaces (figs. 6.13–6.15). After entering on the ground floor at A, the porta reale (fig. 6.13), the visitor traverses the first vestibule, B, with its monolithic marble shafts of bigia siciliana, and then chooses between going directly ahead into the triumphal corridor, C, or turning left or right, diagonally, into one of the two front courtyards, N. At point D is the principal vestibule, where a similar choice awaits: directly north into the gardens, northeast into the right-hand rear court; east to the royal stair, southeast back into the right-hand front court; southwest to its mate; or northwest to the left-hand rear court. The visitor cannot go directly west, for that arch is blocked by a statue, F. He or she thus stands at the point of maximum possible choice. 20

The courts themselves are three-and-one-half stories high, with rusticated basements treated with alternating one-story and story-and-a-half arches, a variant of Vanvitelli's treatment of the Palazzo Reale exterior in Naples (fig. 3.19). But these wrap around the offset corners of each court, somewhat as at Buen Retiro. Originally the piano nobile was to have been treated with blind arches alternating with open pilastered bays containing temple fronts (fig. 6.26), but this was abandoned for the simpler present scheme (fig. 6.27). As volumes, each court is 3:2 in plan, and 2:2 in elevation on the short side, 3:2 on the long, measuring from ground level to rooftop. The cornices are set at four-fifths of the height of the whole. In other words the values in palmi are 200 (short side, plan), 300 (long side, plan), 160 (cornice height), and 200 (height of roof); see figure 6.28.

Aside from the main staircase other, smaller staircases can take the visitor to other destinations within the geometric temple. In general the central crossed arms of the palace consist of guardrooms, circulation space, and chapel; the southwest L-shaped arms of the king's apartments, both public and private; the northwest L of corresponding apartments for the queen, and the northeast and southeast arms for the royal offspring, including the crown prince and his family. In a more general sense the entire piano reale may be said to consist of sets of family living quarters, each divided into male and female halves and also into halves separated by generation. In other words the southwest corner of the palace is devoted to the king, the
6.26
Vanvitelli. Drawing for longer facade of typical court, with temple front for the palace. Caserta, Reggia

6.27
Caserta, narrower court facade of the palace. Photo Ente Provinciale per il Turismo
6.28
Caserta, section along main axis of the palace. From the Dichiarazione
northwest to the queen, the northeast to the crown princess, and the southeast to the crown prince. The king’s and queen’s apartments meet only in their joint bedroom. The apartments of the two younger members of the family are joined together in the procession of guardrooms and anterooms along the horizontal eastern inner range of the palace but split into separate northern and southern apartments when the eastern edge of the building is reached (fig. 6.29). Vanvitelli’s piano reale therefore realizes Vico’s idea that the family unit is the module of a monarchy, dilating that family pattern to the scale of modern “humane and civil monarchy”.

Figure 6.13 shows more. The left gate, M, takes the visitor to the quarters of the lesser royal children; the right gate, M, to those of the crown prince. The main entrance, A-E, leads to the king’s and queen’s apartments. Those of the adult children are located in the areas of the front and rear wings not occupied by major apartments. The fourteen rooms marked K, embedded in the family apartments that govern the whole perimeter, are offices for the four secretaries and for certain other government ministers. (The four secretaries are not named. There would probably have been offices also for the secretary of the sacred royal council; there were also the heads of the army and navy and the heads of the central tribunals, Camera di Santa Chiara, Vicaria Criminale, and Vicaria Civile.) Special tribunals, giunta and sopragiunta, might also have been provided for as there were both a giunta and a sopragiunta for the palace of Caserta itself.
The structure of the Bourbon government did not remain static, and the changes that occurred were probably reflected in Carlo's decision to give up the idea of a new capital city at Caserta with all important functions under one roof. From 1734, to 1737, for example, there was a single secretariat for the royal house. This was then split into the four secretariats of state mentioned. At first these were respectively devoted to grace and justice, commerce, the royal house, and war. Other secretariats or ministries were added, including economic affairs, the navy, ecclesiastical affairs, and foreign affairs. Often a single minister or secretary supervised more than one department. All these officers and their staffs, however, were thought of as the king's personal servants, and at Caserta their business quarters were embedded in suites of other servants' chambers. The Ls mark the kitchens and wardrobes, respectively, beneath the second-floor chapel and the royal stair; O is the theater; and Ps mark the portals to the gardens.

Having ascended the royal stair visitors find themselves in an upper vestibule (fig. 6.14). Directly to the west are the chapel entrance, 1, and the chapel, 4. The diagonal vaulted passages, imitated from those below that lead up to the four main courtyards, here lead to the nicchione in the inner corner of each courtyard, which in each case serves as a window of appearances. Cs mark the large halls for halberdiers with anterooms for the officers; Ds, halls for the bodyguards, with similar anterooms. Then at the end come the first true waiting rooms, both marked E. For untitled petitioners or guests, these have their own side rooms and give asymmetrically on the windows of appearances, the queen's looking north into the garden and the king's south to the town. With its great half-oval, designed to accommodate crowds of his subjects, the piazza too was a kind of waiting room.

The king's and queen's apartments (fig. 6.14) now move to the left in identical sequences, through rooms marked F–K and then toward each other, maintaining mirror symmetry, to meet in the form of a long hall, the queen's corridor, which leads to the bedroom. In this sequence the rooms marked F are for titled people, barons of the kingdom, military officers, and foreign guests. Next in line, G is for gentlemen of the king's chamber, ambassadors, and secretaries of state; H is the great royal salon for public audiences and the baciamento. This has several exits and entrances to avoid congestion. All these rooms have access to small anterooms provided with fireplaces and private stairs.

Other families of rooms were focused in other ways on the central family. I, at the end of this southern suite, is the public dining room, where privileged guests could watch the king and queen dine or even on occasion join them for a meal. K begins the western sequence of private and government rooms. At each corner, K is a dressing room, L a private chapel, Ms mark various council rooms, N is the king's private study. O is the private stairs for secretaries of state, P is the king's bedroom, Q marks two bathrooms, R another private stair, S service rooms, T still another private stair, this one leading up to the third
floor. Xs mark the bedrooms of the royal infants and various minor chambers. Z, along the northern wing, marks separate apartments for the older royal children, more guardrooms, and sets of antechambers, chapels, and so on corresponding to similar apartments on the next floor and reached by private stairs. Y represents yet other sets of stairs including those that lead to the theater on the ground floor and to the garden.

The central east side of the palace, devoted to the T-shaped suite of apartments of the crown prince and princess, is a miniature family sequence within the greater family complex of the whole: I, halberdiers’ hall; II, bodyguards’; III, first antechamber; IV, second; V, third; VI, audience hall; VII, dining room; VIII, conversation room leading to the crown princess’s apartment; IX, chapel; X, bedroom; XI, dressing rooms; XII, childrens’ room.

The major interior spaces of the palace, like its courts, are shaped by simple mathematical series. The upper vestibule is 50 palmi in diameter and 60 high. Rooms C–H are 50 palmi wide by 120 high with cornices at 40. Rooms F and G are 70 long, H is 130 long, C and D are 90 long, and E is 70 long. I is 40 × 80 × 120 high. The stair hall is 80 × 100 × 120 high, a 4:5:6 series; the chapel has the same dimensions, and the theater 50 × 50 × 80 high, with the stage area the same. A very select number of dimensions, derived from the series 4, 5, 6, 7, 8, 9, 10, 12, and 13, construct all the major spaces.

The upper floor (fig. 6.15) is devoted to servants’ quarters. It includes stairs, dumbwaiters, six kitchens, D; access to the loggias at the corners of the palace, F; a “tribune” for Mass, G; and skylights for the lower-floor corridors, O.

All of these arrangements follow the micromodule grid (fig. 6.17). But they do not, as Gioffredo’s rooms do, obey the implications of the major exterior geometric divisions. The porticoes do not even give symmetrically on interior spaces, and the spaces they do give on can be small and unimportant. The king’s dressing rooms are behind the two lateral temple fronts on the main facades, while the temple fronts on the palace’s sides stand before servants’ stairs. Only in the cases of the central northern and southern porticoes are there major rooms situated behind major porticoes—and, as is often noted, these rooms are not on axis.23 If Vanvitelli has borrowed his unsuccessful rival’s approach, he has tampered with Gioffredo’s rigor.

More important, Gioffredo’s idea of a city under one roof is clearly not present in Vanvitelli’s final scheme. No mention is made of a library, a seminary, a museum, or an observatory, or of any of the other provisions in Gioffredo’s written program. All this was presumably to be included in the new city. The palace Vanvitelli built, like the one described in his Biblioteca Nazionale manuscript, consists of courts or parterres corresponding to the main figures in the royal family. Hence the building is not absolutist in Gioffredo’s sense; it does not house a complete national bureaucracy. That quality comes,
rather differently, from the embodiment, or embedding, of certain bureaucratic offices within the geometric pattern of a four-part royal family.

Vanvitelli's less than perfectly geometric plan loses its perfection largely because of the small, sometimes irregular armatures of service space that run alongside the regular cubic volumes of the antechambers. The feature is found also in Buen Retiro (fig. 6.11). This off-center pattern is given emphasis and a sudden powerful rhythm when one of the greater spaces opens up vertically, for example the royal stair itself or the upper vestibule (A and B in fig. 6.13), which would have been a lantern of light crowned by two further central spaces, designed but not executed, and climaxing in the dome uniting the whole (fig. 6.24). I have mentioned de Cotte and could again mention Gioffredo. But Vanvitelli's dome, which is his own, is unforgettable (figs. 6.18, 19). It has the helmeted ferocity of one of Carlo's medieval ancestors patrolling his lands in the Bourbon d'Archambault. The other "great" spaces, rising through two floors like giants, are the chapel, the theater, and the sequence of royal chambers and antechambers on the west (marked E-I in fig. 6.14). Thus both the plan grid and that of the elevation are syncopated into climactic emphases by the asymmetrical doubling of volumes. These moments of peak assertion are only the more prominent in the orderly rhythms of the lesser rooms, including the two-level cellars. And they point up the dominance of the overall hive; one now understands Mazzocchi's description of Carlo as a drone seeking sustenance in his honeycomb prison. The heavy basement piers rise slowly and solidly, lightening and lengthening as they go through the horizontal section to flatten into the pedestals of the chapel columns, thereafter to pair off into marble shafts, while the chapel windows become wider and higher than the windows below; the system divaricates into a rib vault to return to its columnar form on the other side (fig. 6.24). The same thing happens, more soberly, in the stair hall and in the royal salon series and more frivolously in the theater, which balances that series, lower down, in the center of the northeast side, O. Meanwhile, again in section, the dome separates itself out like a spindle around which all the rest revolves. It is an interruption in the beehive, yet one that is also its motor, or rotor, displaced upward in the scheme like Gioffredo's octagon. This central unity, or One, is not rooted like everything else in a hived underworld but floats over the underground river that was to flow beneath the palace, bearing the traffic of time, fertility, and justice to Naples.

One final element in Vanvitelli's geometrical temple is the octagon, which sets up powerful symmetries of focus. The room shapes of the palace, like those of the 1756 gardens, are based on radial and dihedral symmetries (fig. 5.11) that contrast with the mirror and translational symmetries of the facades. In a way not true of the other plans discussed here, Vanvitelli uses his octagonal elements to plot out crisscrossing paths from vestibule to courts and across the courts to each corner nicchione.
6.30
Caserta, palace courtyards seen from central octagon.
Photo Ente Provinciale per il Turismo
The junctures of the massive vaulted corridors and entrances thus formed, the angled triumphal arches plus the shadows of the interiors against the light-filled courts create effects similar to those in the theatrical scene designs of the Bibiena, or, for that matter, in Vanvitelli’s own scene designs (figs. 6.30, 8.45). They throw a beckoning cave of shadow and deep perspective over the whole. They continue, extend, and double into labyrinths the pathways of the garden and river-road. By being purely visual and suggestive, by being optical thrusts across open space rather than remaining tactile and exact like the rectilinear sequences of the interior hive, they affirm the hive and its hierarchies all the more. These Baroque biases were to be fulfilled in the final moment of Casali’s inauguration, the 1773 production of Metastasio’s Didone abbandonata. Meanwhile these diagonal elements suggest also that the distances of the palace were struck off with a pair of compasses. And indeed we have already heard that this is precisely what happened, and that it was the king himself who did so. He can almost be envisioned as a Blakean god kneeling on the floor of his majesty and ruling his universe.

As the foregoing chapter implies, there was held to be a connection between rule and rulers of the governmental sort and those of the architectural sort. Vico says that geometry and geometrical thinking not only form the basis of justice and monarchy but are the basis of human thought itself. Geometry, he says, is the principal origin of man’s virtues and arts. And the arts, in turn, including architecture, must be subject to “irrefragable geometric proofs.” Writing, drawing, and design are “geometrical syntheses,” modes of establishing magnitude. Works of art must therefore be visible, visualizable, measurable. They must be forms that can be constructed and deconstructed logically. Gioffredo’s and Vanvitelli’s geometrical constructs, like all ambitious geometrical plans, are such Vichian temples. Their symmetries, uniformities, and repetitions bespeak absolute hierarchy, measure, and harmony. They express a justice that is meted out arithmetically and geometrically; and architectural symmetry is not merely architectural but organizational and taxonomic. It fortifies the judicial. Or, to alter Carlo’s meaning only slightly when he commanded Vanvitelli to create four absolutely equal courts rather than one large and several small ones: “the union and the symmetry of things reinforce one another.” Here I think he means by “union” a One that is also unity and unison. The construction (or analysis) of such a building is a mode of reducing it to its principle or origin and to the identical principal or origin of the law pronounced or administered in the building. The proofs of geometry, as Vico does not explain but as we can easily supply, are then simply complex and elegant tautologies, achieved by translating form into number and refining, simplifying, reducing, the numbers in accordance with mathematical series. By extension a nongeometric building could not similarly embody justice. Justice might be done in it and governing might be done in it, but they would not be seen to be done.