

48-747 Shape Grammars

THE PALLADIAN GRAMMAR

analytic shape grammars
are intended for a
particular style

criteria for authoring a
successful analytic grammar
for style were spelled out
by Stiny and Mitchell

clarify the underlying **commonality of structure** and appearance manifest for the buildings in the corpus;

supply the **conventions and criteria** necessary to determine whether any other building not in the original corpus is an instance of the style; and

provide the **compositional machinery** needed to design new buildings that are instances in the style.

language → **style** ← shape grammar

Andrea Palladio *I Quattro Libri dell' Architettura*

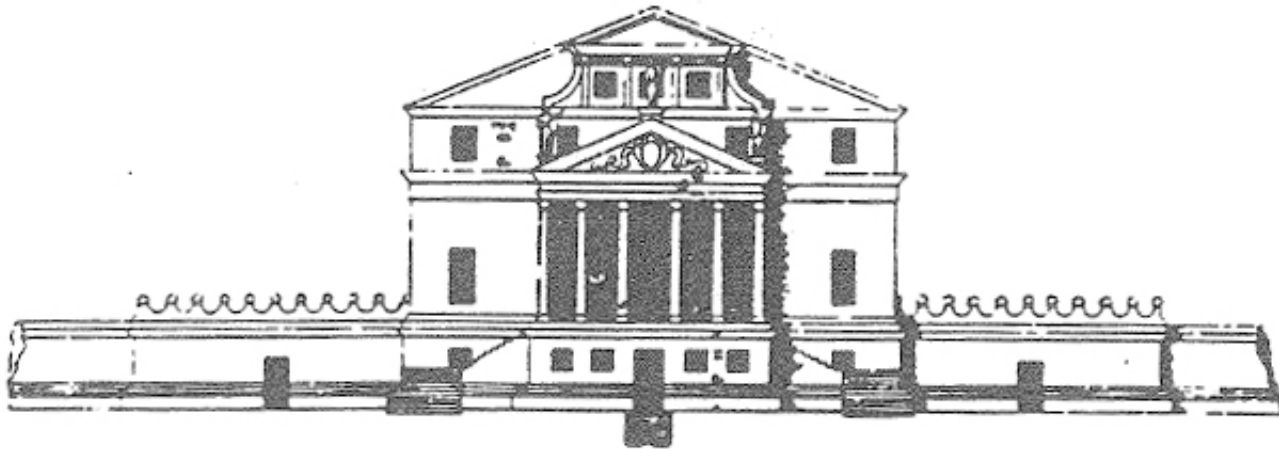
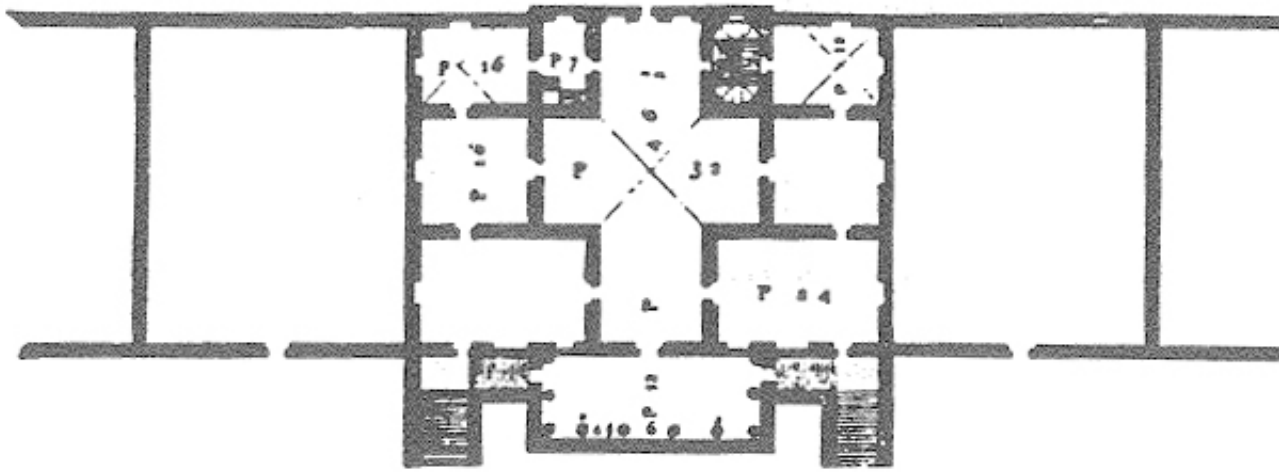
The Four Books of Architecture, tr. Issac Ware, 1737

The Four Books on Architecture, tr. Robert Tavernor and Richard Schofield, 2002

the sources

“And though variety and novelty may please everybody, one should not, however, do anything that is contrary to the laws of this art, and contrary to what reason makes obvious; so we can see that the ancients also made variations, but they never departed from certain universal and essential rules of this art, as we shall see in my *book of antiquities*.”

Andrea Palladio, *The Four Books on Architecture*, pp 56
tr. Robert Tavernor and Richard Schofield

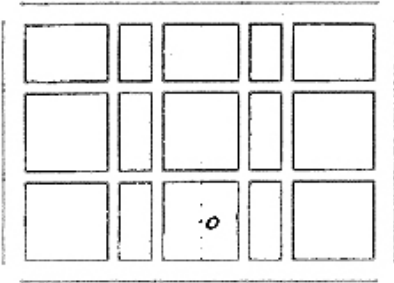


exemplar – the villa Malcontenta

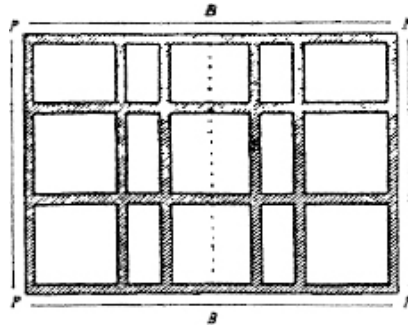
grid definition
exterior wall realignment
room layout
interior wall realignment
principal entrances-porticos and exterior wall inflections
exterior ornamentation- columns
windows and doors
termination

stages in shape grammar

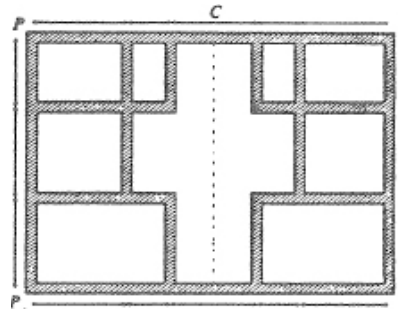
1 grid



2 exterior wall

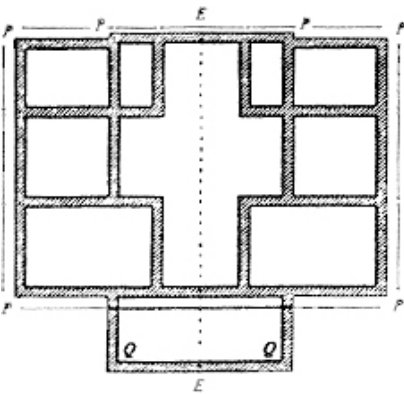


3 room layout

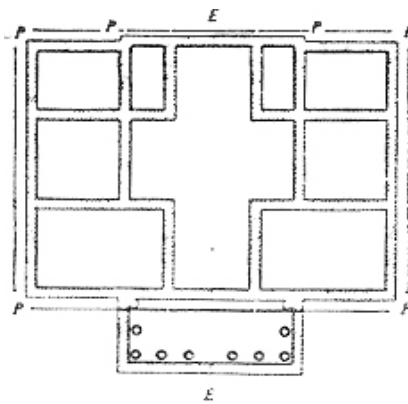


4 realignment

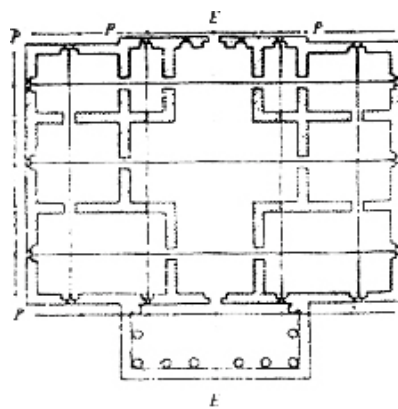
5 entrances



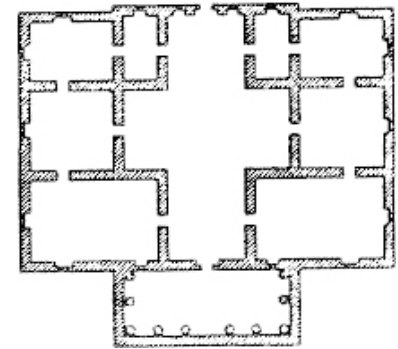
6 exterior ornament



7 windows + doors



8 termination



the stages pictorially

A vicentine foot

“This line with which the following buildings are measured is half a Vicentine foot [*piede vicentino*]. The foot is divided into 12 inches and each inch into 4 minutes [*minuto*]”

Palladio, pp. 79

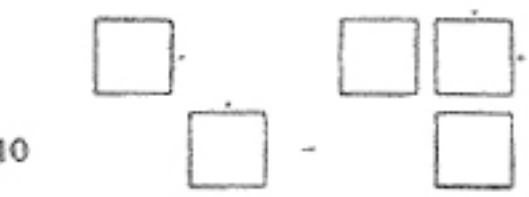
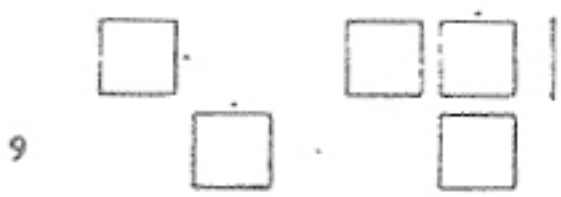
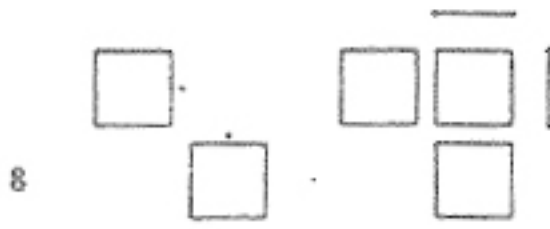
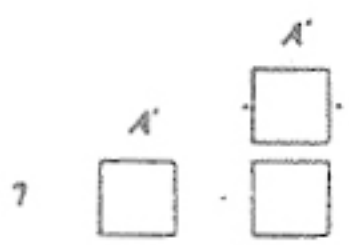
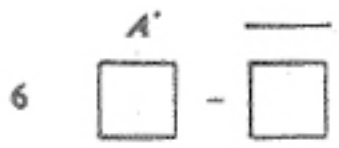
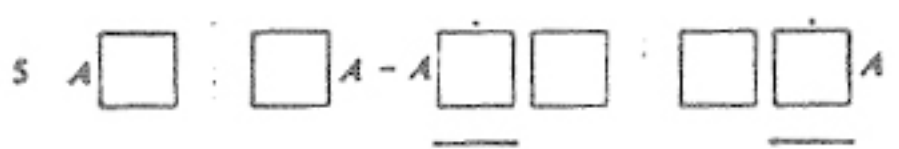
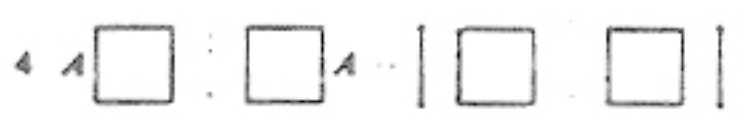
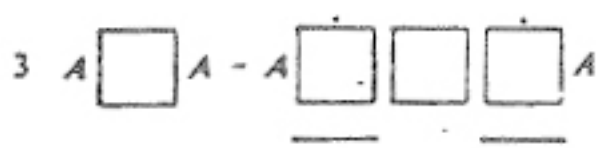
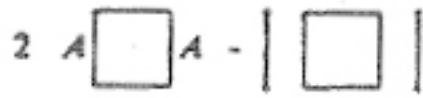
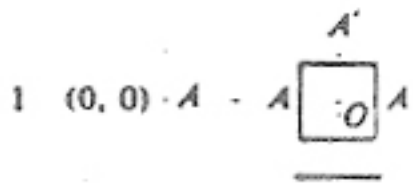
system of measurement

axial symmetry

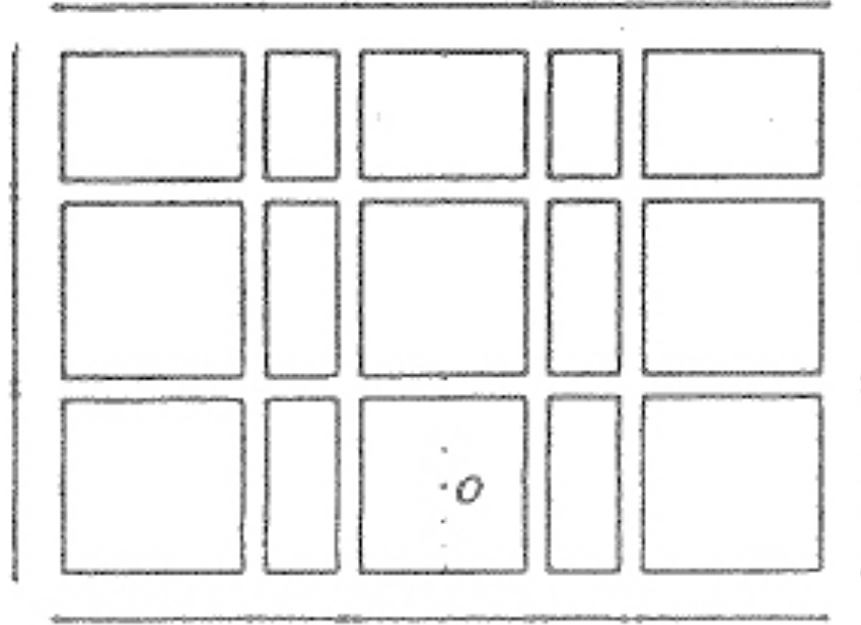
“Rooms [*stanza*] must be distributed at either side of the entrance and the hall, and one must ensure that those on the right correspond and are equal to those on the left so that the building will be the same on one side as the on the other and the walls will take the weight of the roof equally; ...”

Palladio, pp. 57

grid definition



1. the rules for generating a tartan grid



“There are seven types of room that are the most beautiful and well-proportioned and turn out better; they can be made circular [*ritundo*], though these are rare; or square [*quadrato*]; or their length will equal the diagonal of the square [*quadrato*] of the breadth; or a square [*quadrato*] and a third; or a square [*quadrato*], and a third; or a square and a half; or a square and two-thirds; or two squares.”

1. grid definition

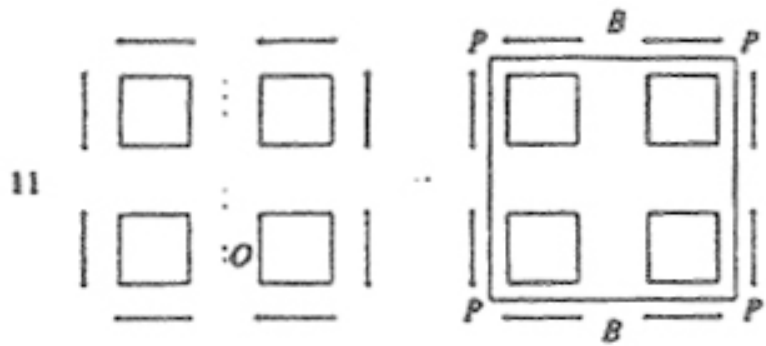


Figure 5. Rule for the generation of exterior walls.

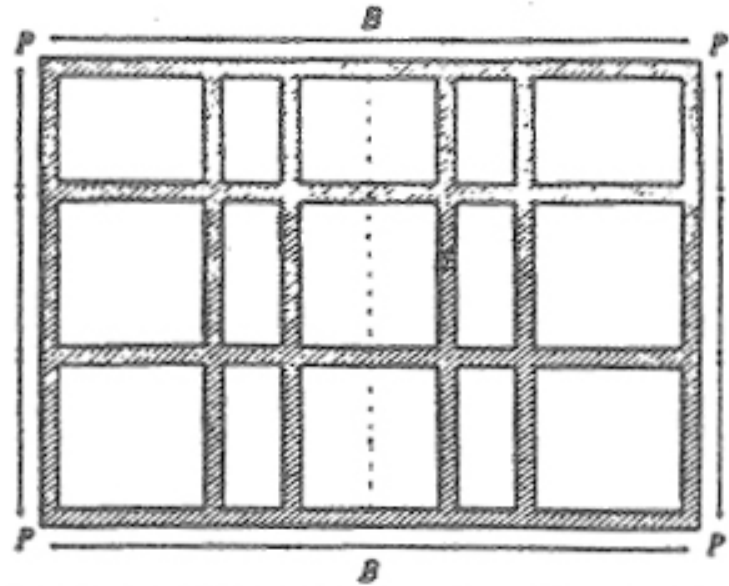


Figure 6. The underlying wall pattern for the Villa Malcontenta.

2. exterior wall definition

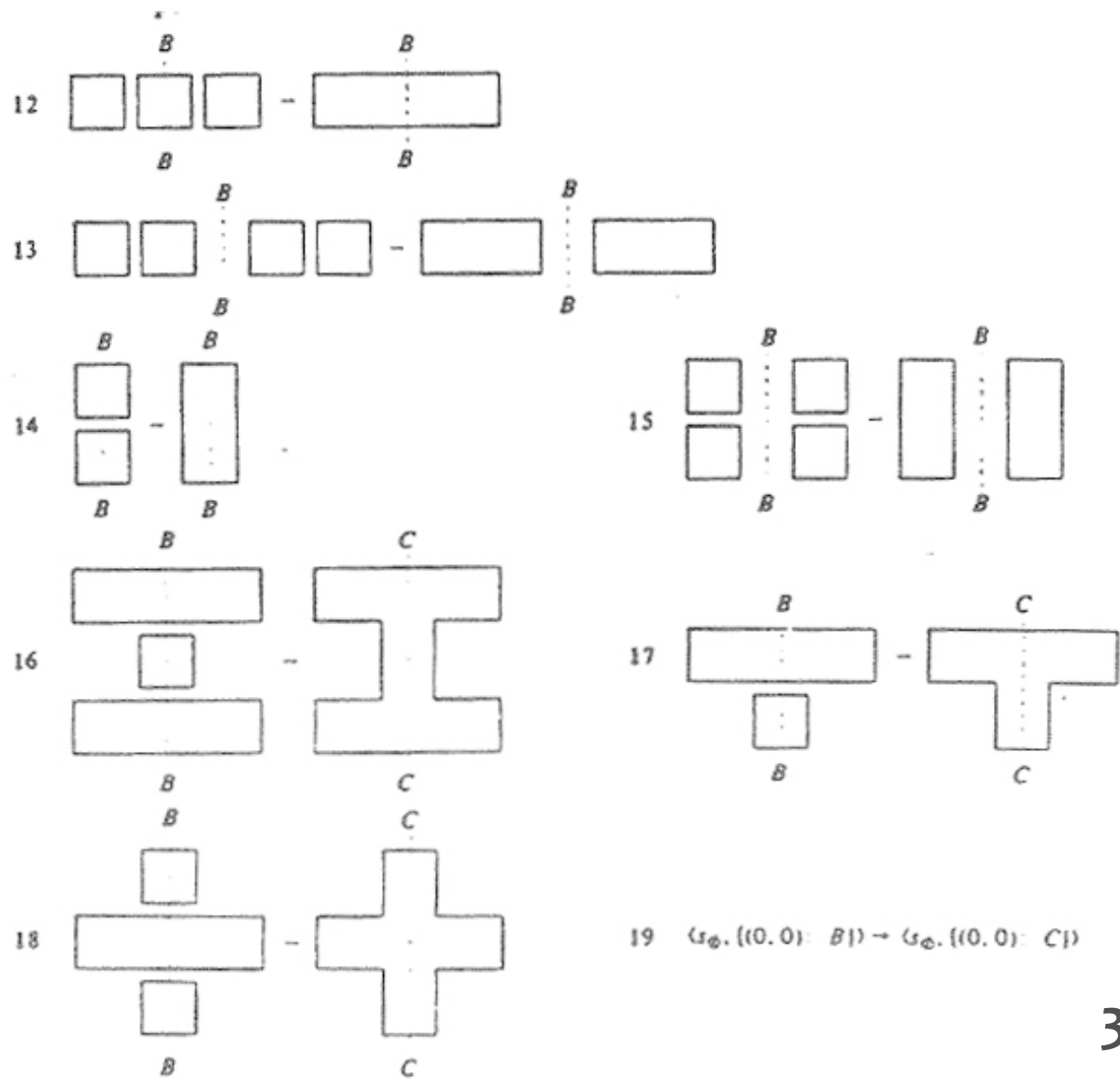
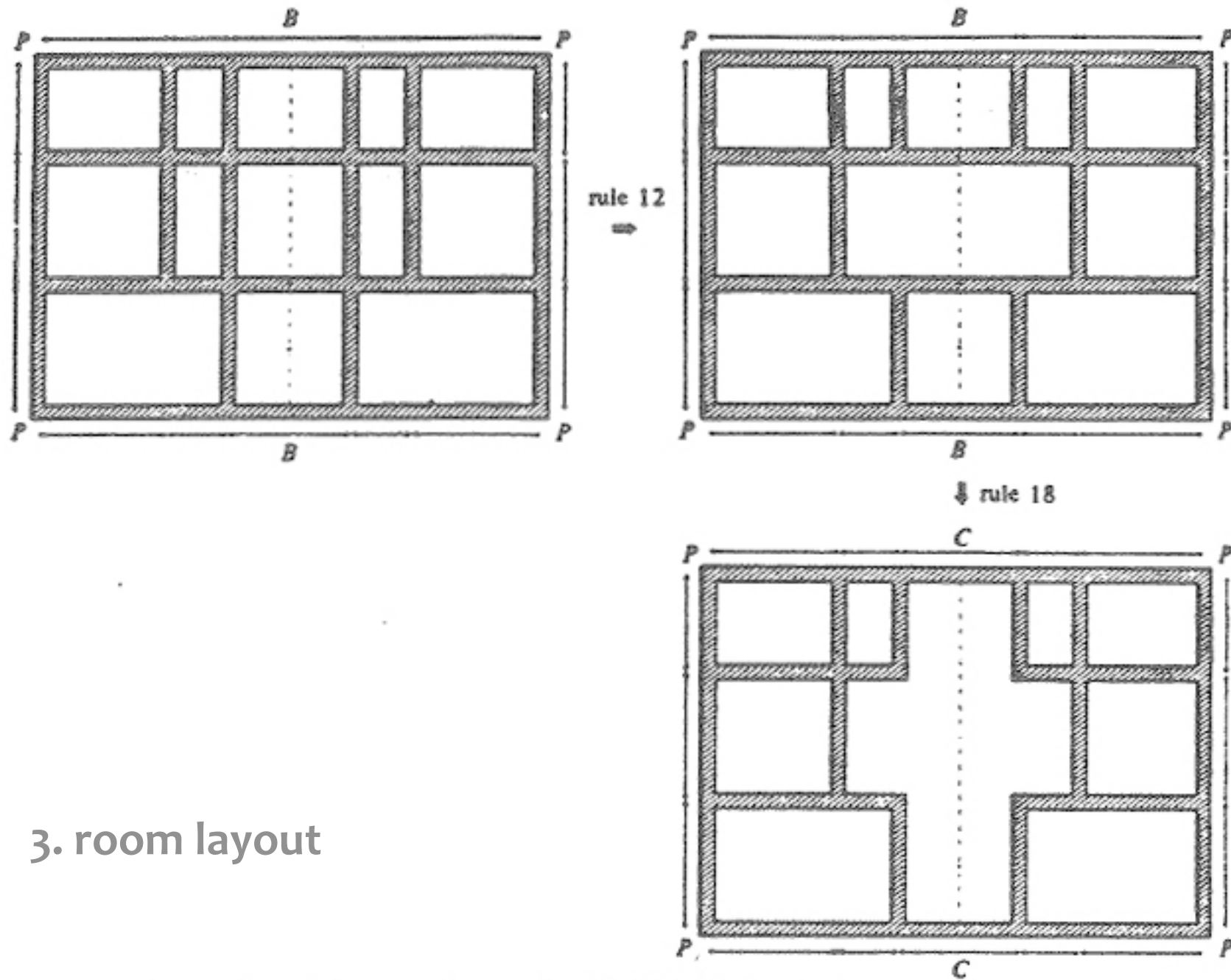


Figure 7. Rules for room layout.

3. room layout



3. room layout

Figure 8. Generation of the room layout for the Villa Malcontenta.

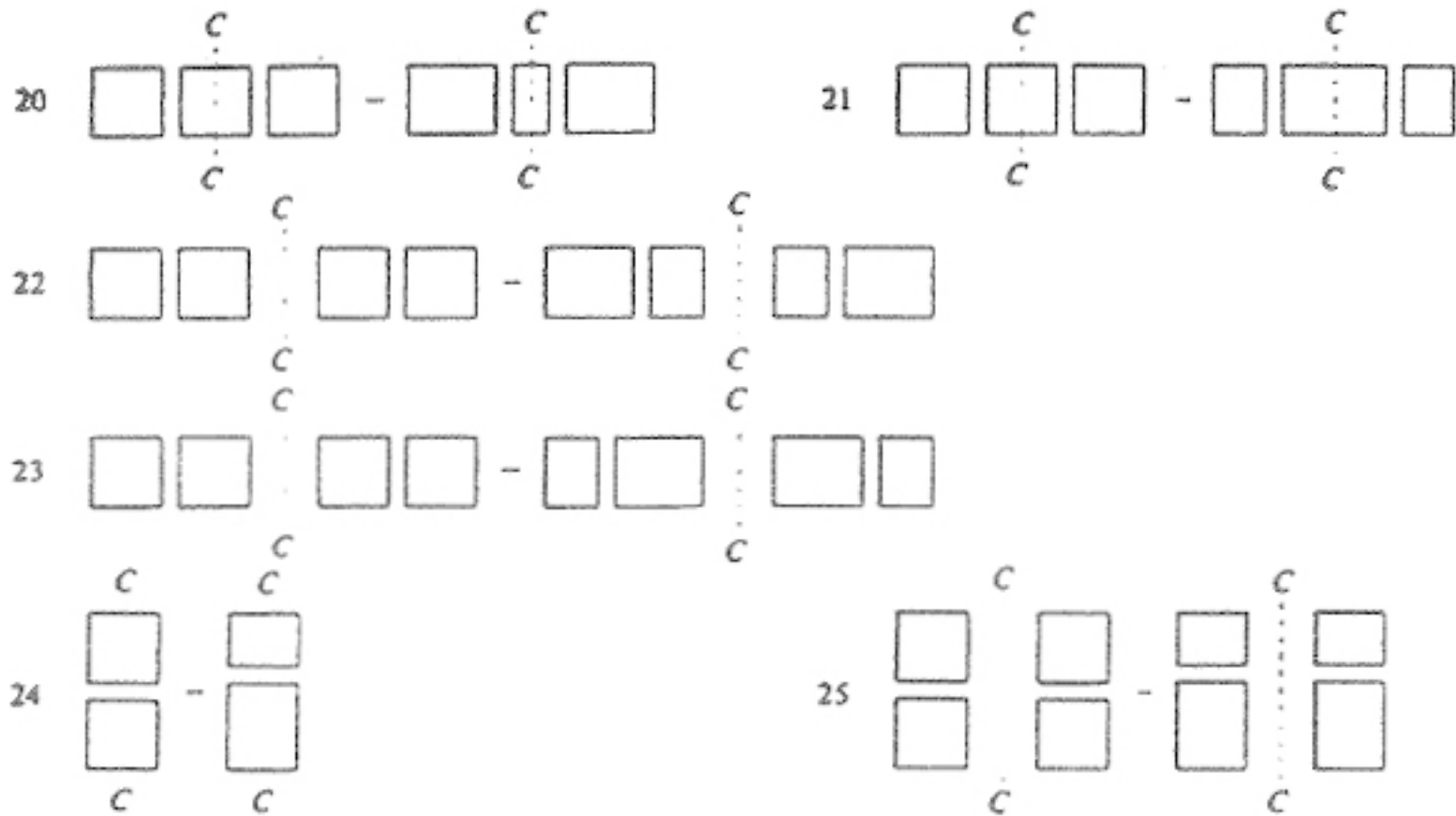


Figure 9. Rules for realigning interior walls.

4. interior wall realignment

5. principal entrances porticos and inflections

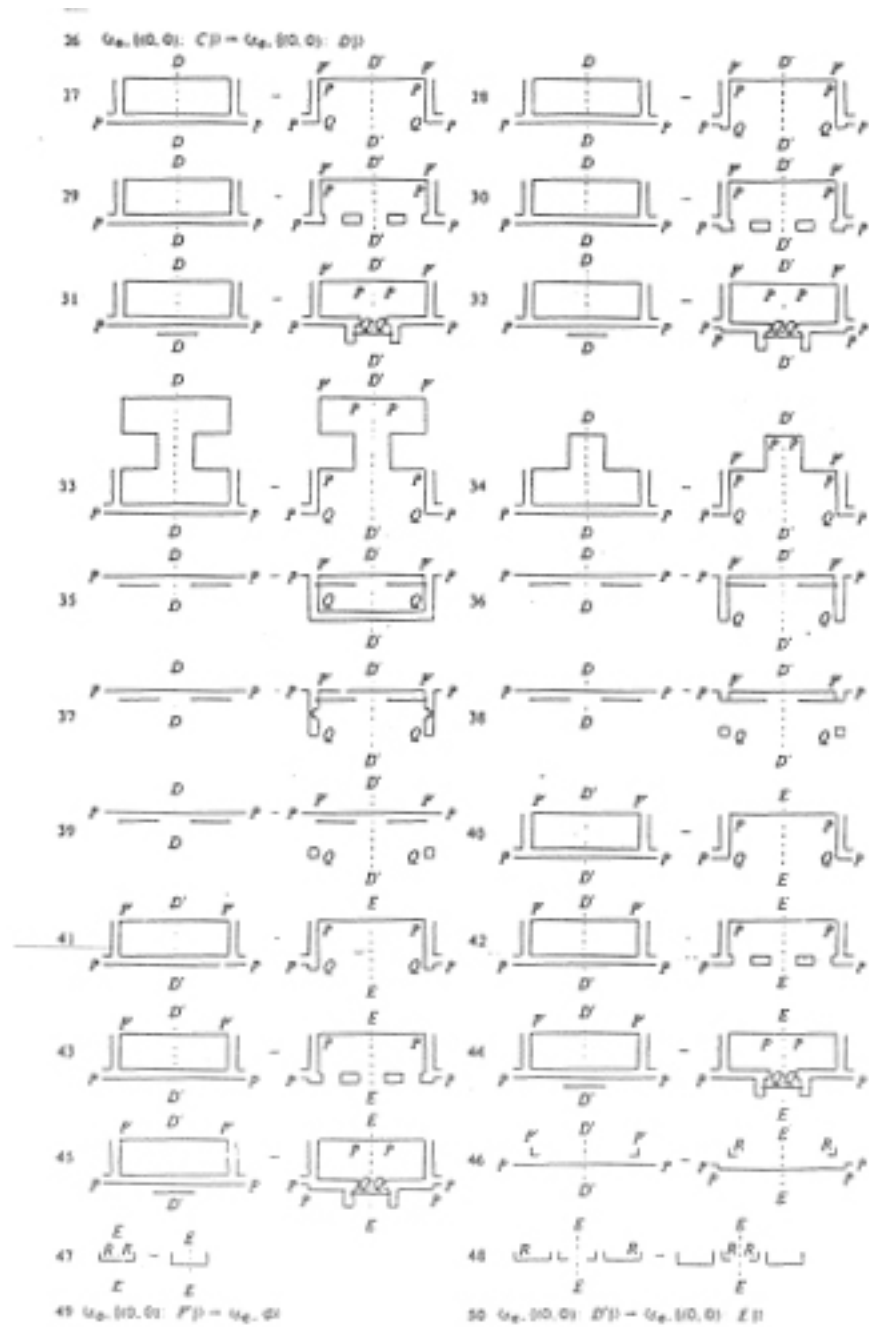
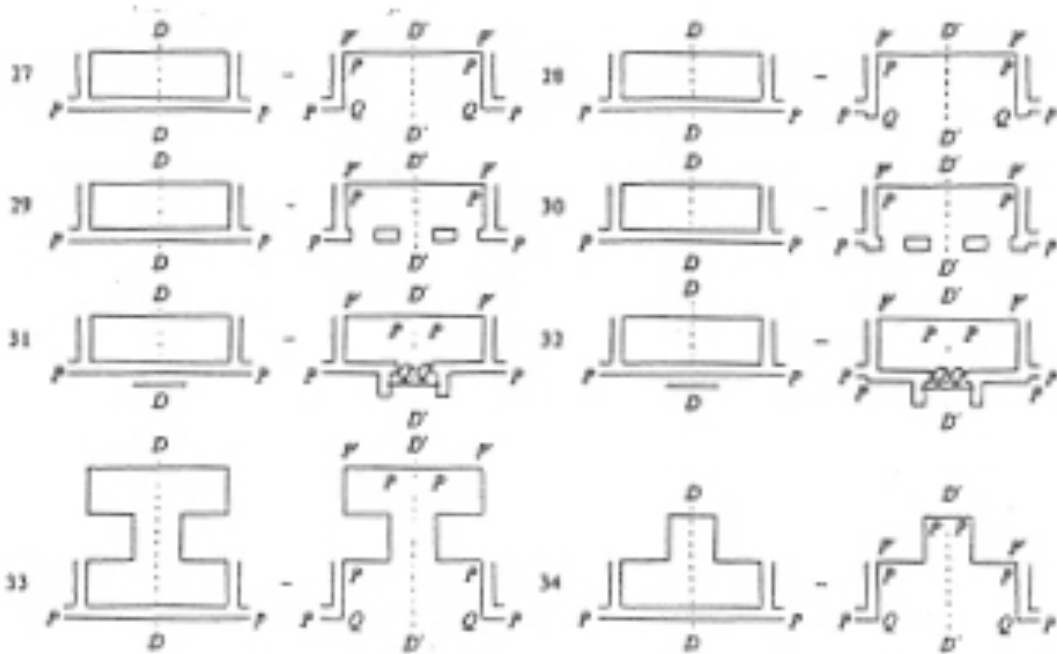
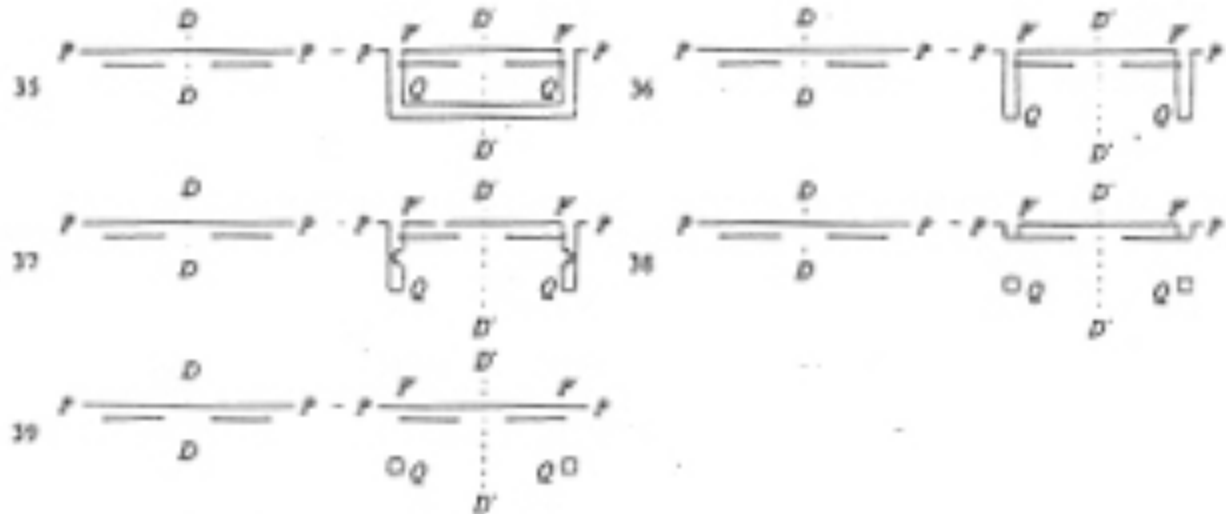


Figure 10. Rules for adding porticos and wall inflections to the principal entrances of a villa.

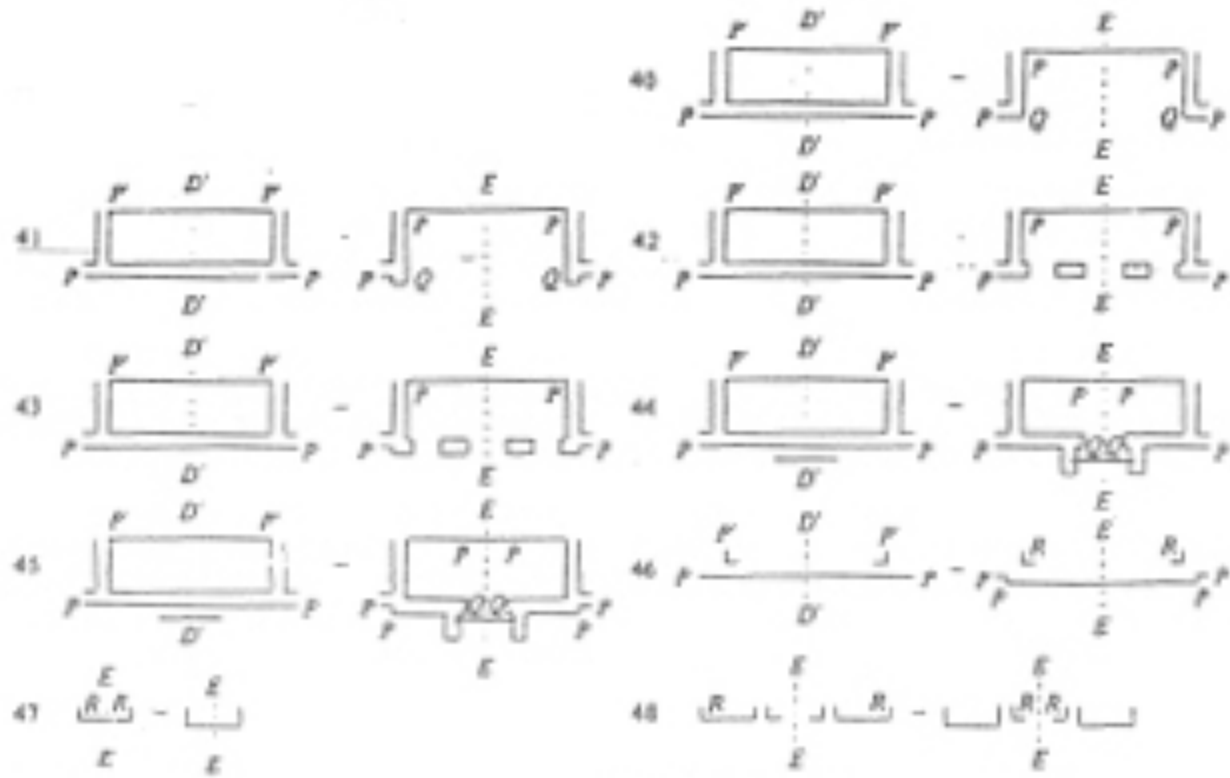


portico *in antis*

portico *prostyle*

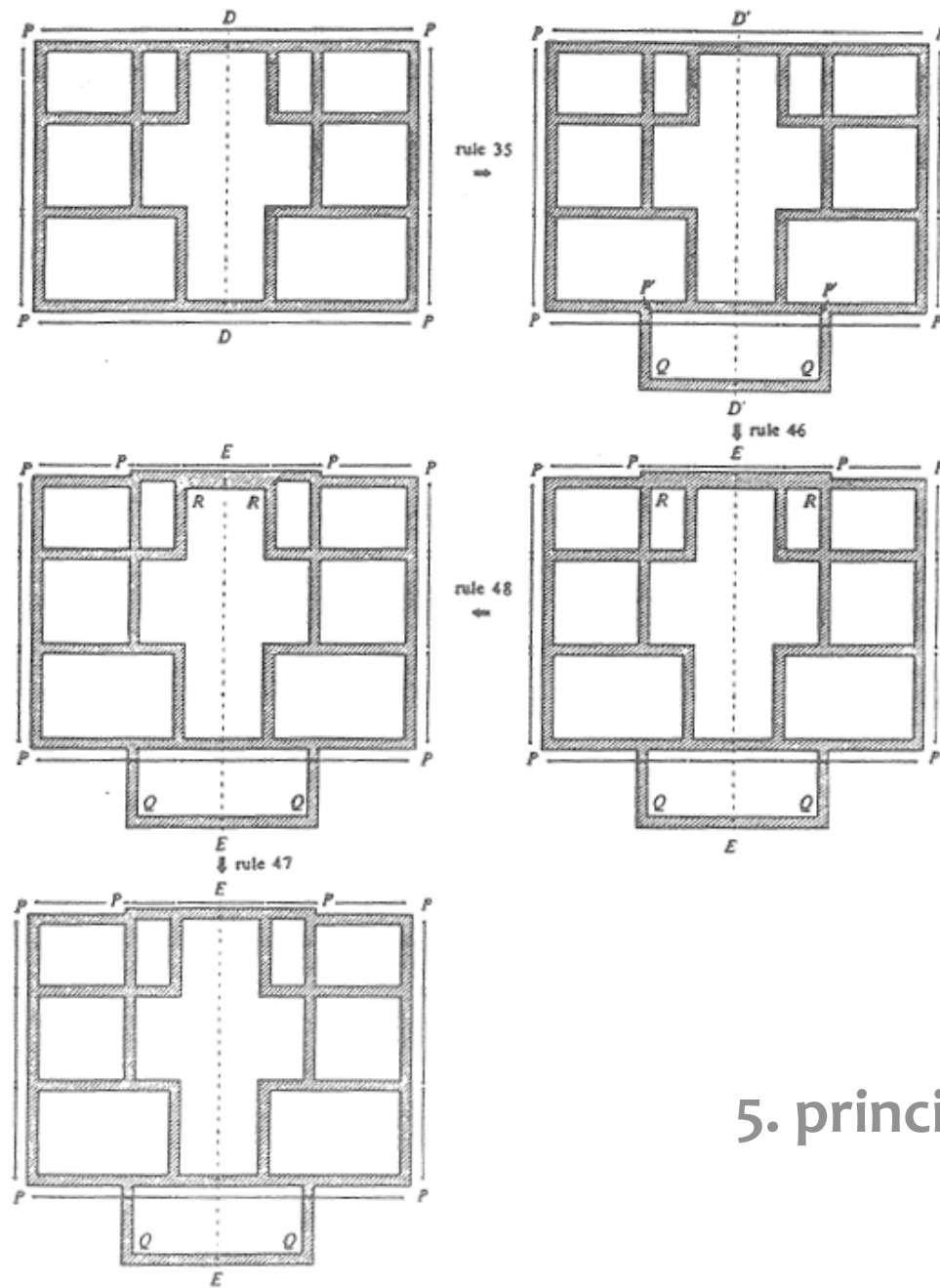


5. principal entrances



a second portico *in antis*

5. principal entrances



5. principal entrances

Figure 11. Generation of the portico and wall inflection for the Villa Malcontenta.

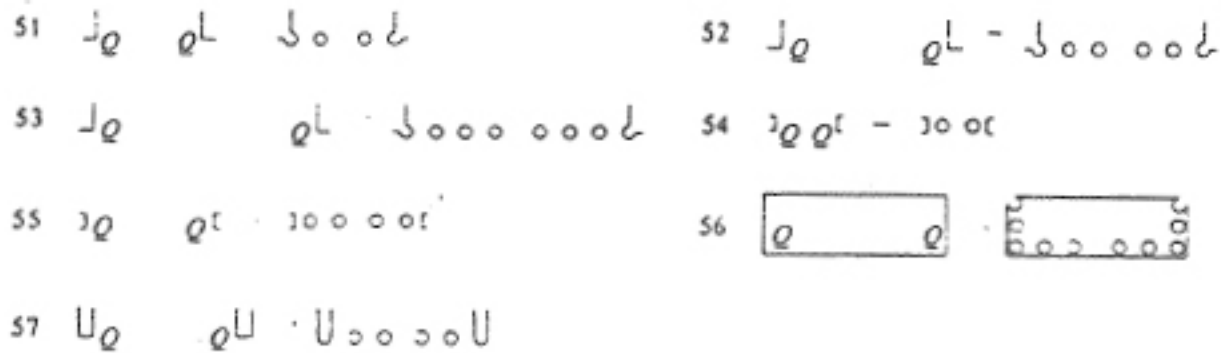


Figure 12. Rules for finishing porticos by the addition of columns.

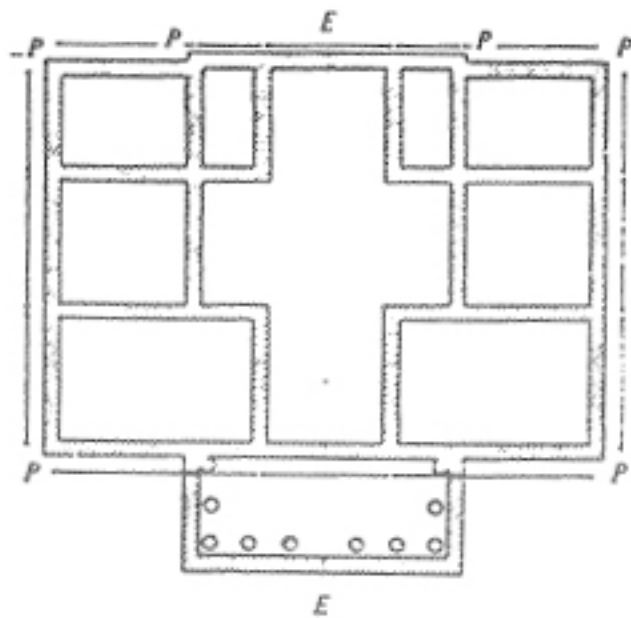


Figure 13. Addition of columns for the Villa Malcontenta.

“Now that we have talked of walls by themselves [*muro semplici*], it is appropriate to move on to their ornaments, of which columns, when located properly and in proportion to the whole building, are by far the most important that can be applied to a building.” (pp. 17)

6. exterior ornamentation

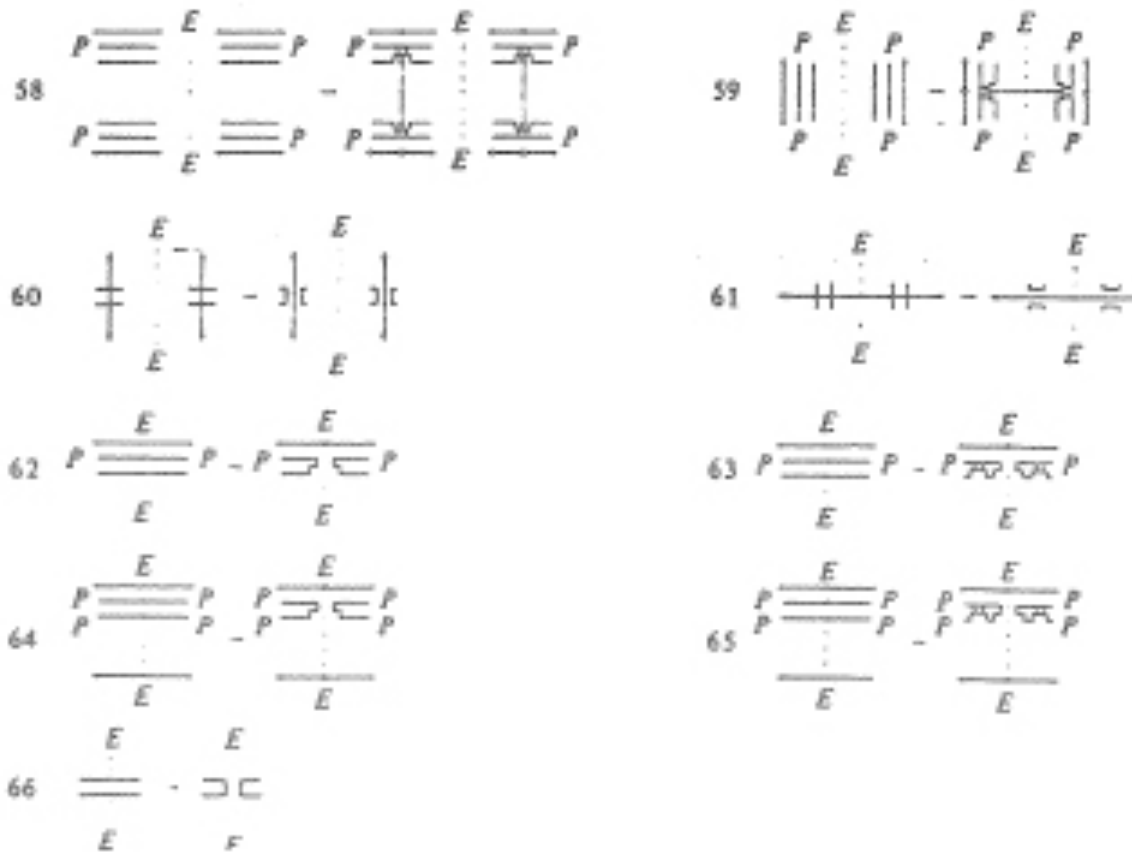


Figure 14. Rules for locating windows and doors in villa plans.

7. windows and doors

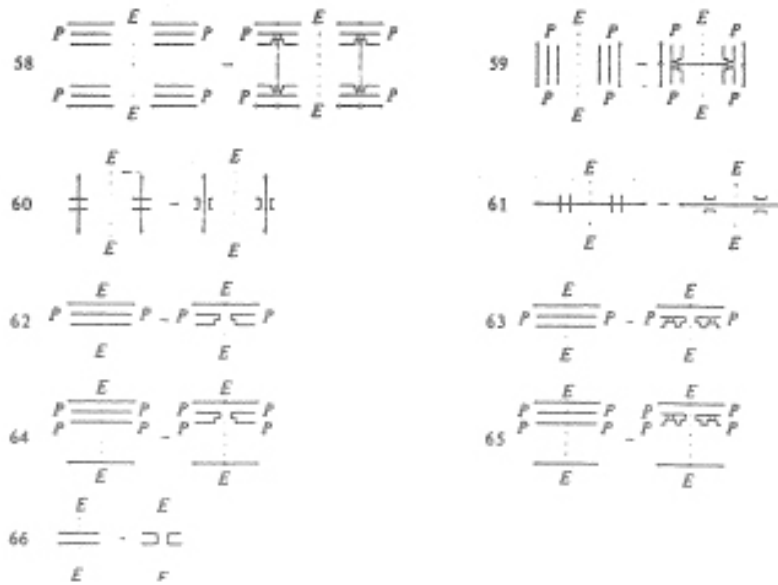


Figure 14. Rules for locating windows and doors in villa plans.

7. windows and doors

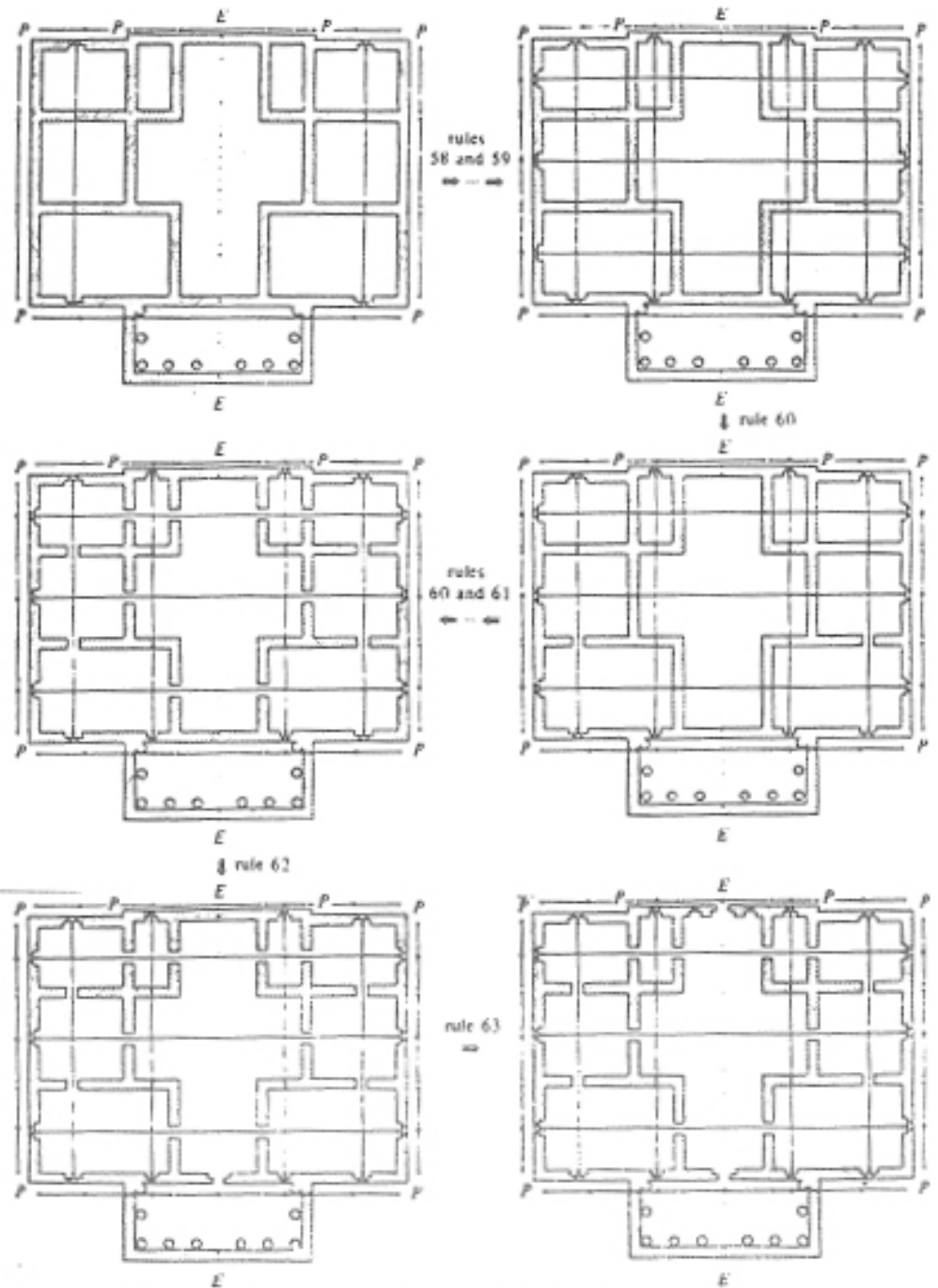


Figure 15. Generation of the windows and doors in the Villa Malcontenta.

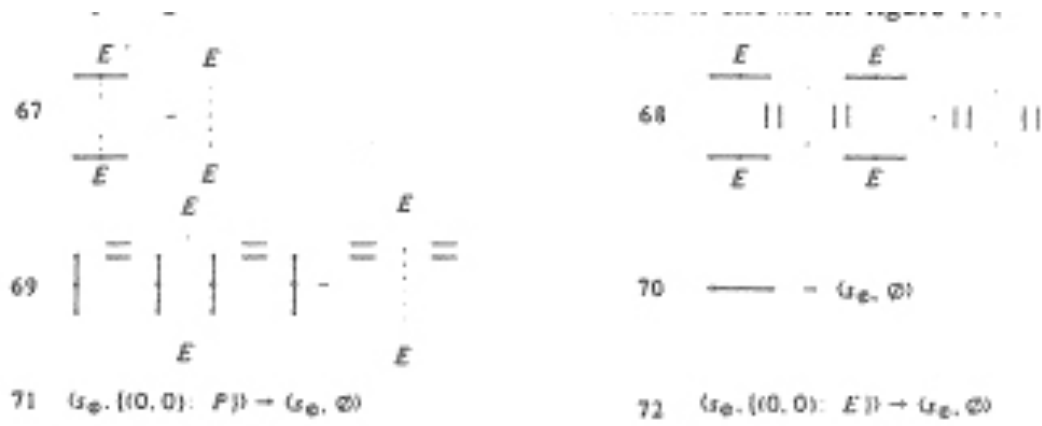


Figure 16. Termination rules.

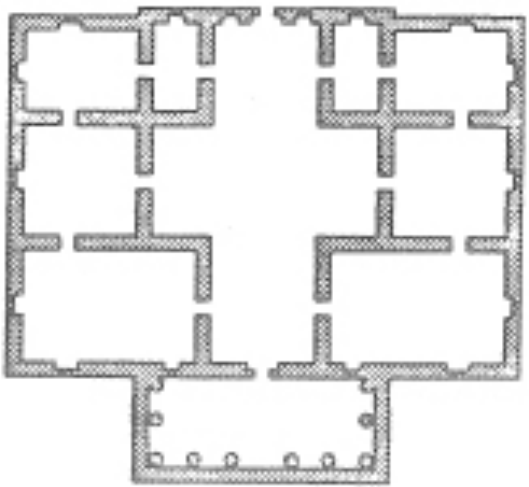
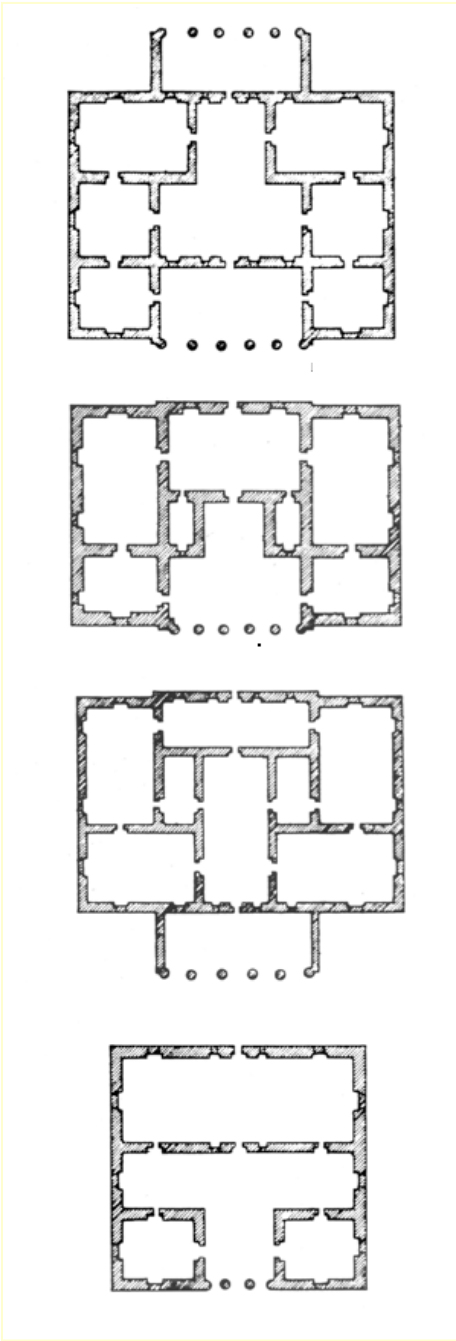
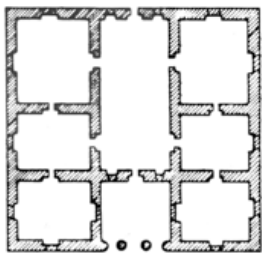
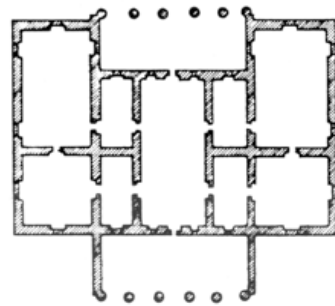
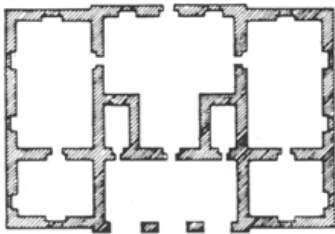
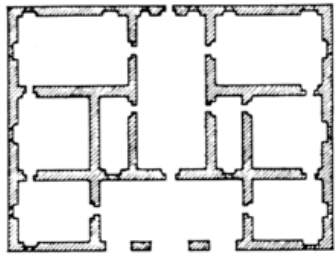


Figure 17. The final plan generated for the Villa Malcontenta.

8. termination



real or fake?