height should be one quarter less. If there is to be a third row, its height should be one fifth less than that below. In each case the height of the dadoes and the plinth should be one quarter that of the column they support. But when only one row of colonnading is required, it should follow the methods for public works of a temporal nature.

The pediment to a private house should not emulate the majesty of a temple in any way. Yet the vestibule itself may be ennobled by having its facade heightened slightly, or by being given a dignified pediment. The remainder of the wall may be crowned on either side with the slight projection of acroteria.[66] Acroteria standing just proud [of the roof] will add elegance, especially at each of the main corners. I do not approve of turrets and crenellations on the houses of private citizens; such elements are foreign to peaceful citizens and the well-ordered state: they belong rather to the tyrant, in that they imply the presence of fear or of malicious intent. Balconies along the front of a building may be a charming addition, provided they are not too large, lavish, or ungainly. ◆

Now I come to a matter with which we have promised to deal all along: every kind of beauty and ornament[67] consists of it; or, to put it more clearly, it springs from every rule of beauty. This is an extremely difficult inquiry; for whatever that one entity is, which is either extracted or drawn from the number and nature of all the parts, or imparted to each by sure and constant method, or handled in such a manner as to tie and bond several elements into a single bundle or body, according to a true and consistent agreement and sympathy—and something of this kind is exactly what we seek—then surely that entity must share some part of the force and juice, as it were, of all the elements of which it is composed or blended; for otherwise their discord and differences would cause conflict and disunity. This work of research and selection is neither obvious nor straightforward in any other matter, but it is at its most ambiguous and involved in the subject about to be discussed; for the art of building is composed of very many parts, each one, as you have seen, demanding to be ennobled by much varied ornament. Yet we shall tackle the problem to the best of our ability, as we have undertaken. We shall not inquire as to how a sound understanding of the whole might be gained from the numerous parts, but, restricting ourselves to what is relevant, we shall begin by observing what produces beauty by its very nature.

The great experts of antiquity, as we mentioned earlier, have instructed us that a building is very like an animal, and that Nature must be imitated when we delineate it. Let us investigate, then, why some bodies that Nature produces may be called beautiful, others less beautiful, and even ugly. Obviously, among those which we count as beautiful all are not such that there is no difference between them; in fact it is precisely where they most

differ that we observe them to be infused or imprinted with a quality through which, however dissimilar they are, we consider them equally graceful. Let me give you an example: one man might prefer the tenderness of a slender girl; yet a character in a comedy preferred one girl over all others because she was plumper and more buxom;[68] you, perhaps, might prefer a wife neither so slender of figure as to appear sickly nor so stout of limb as to resemble a village bully, but such that you might add as much to the one as you could take away from the other without impairing dignity. Yet, whichever of the two you prefer, you will not then consider the rest unattractive and worthless. But what it is that causes us to prefer one above all the others, I shall not inquire.

When you make judgments on beauty, you do not follow mere fancy, but the workings of a reasoning faculty that is inborn in the mind. It is clearly so, since no one can look at anything shameful, deformed, or disgusting without immediate displeasure and aversion.[69] What arouses and provokes such a sensation in the mind we shall not inquire in detail, but shall limit our consideration to whatever evidence presents itself that is relevant to our argument. For within the form and figure[70] of a building there resides some natural excellence and perfection that excites the mind and is immediately recognized by it.[71] I myself believe that form, dignity, grace, and other such qualities depend on it, and as soon as anything is removed or altered, these qualities are themselves weakened and perish. Once we are convinced of this, it will not take long to discuss what may be removed, enlarged, or altered, in the form and figure. For every body consists entirely of parts that are fixed and individual; if these are removed, enlarged, reduced, or transferred somewhere inappropriate, the very composition will be spoiled that gives the body its seemly appearance.

From this we may conclude, without my pursuing such questions any longer, that the three principal components of that whole theory into which we inquire are number, what we might call outline, and position. But arising from the composition and connection of these three is a further quality in which beauty shines full face: our term for this is *concinnitas*;[72] which we say is nourished with every grace and splendor. It is the task and aim of *concinnitas* to compose parts that are quite separate from each other by their nature, according to some precise rule, so that they correspond to one another in appearance.

That is why when the mind is reached by way of sight or sound, or any other means, *concinnitas* is instantly recognized. It is our nature to desire the best, and to cling to it with pleasure.[73] Neither in the whole body nor in its parts does *concinnitas* flourish as much as it does in Nature herself; thus I might call it the spouse of the soul and of reason. It has a vast range in which to exercise itself and bloom—it runs through man's entire life and government, it molds the whole of Nature. Everything that Nature produces is

regulated by the law of *concinnitas*, and her chief concern is that whatever she produces should be absolutely perfect. Without *concinnitas* this could hardly be achieved, for the critical sympathy of the parts would be lost. So much for this.

If this is accepted, let us conclude as follows. Beauty is a form of sympathy and consonance of the parts within a body, according to definite number, outline, and position, as dictated by *concinnitas*, the absolute and fundamental rule in Nature. This is the main object of the art of building, and the source of her dignity, charm, authority, and worth.

All that has been said our ancestors learned through observation of Nature herself; so they had no doubt that if they neglected these things, they would be unable to attain all that contributes to the praise and honor of the work; not without reason they declared that Nature, as the perfect generator of forms, should be their model. And so, with the utmost industry, they searched out the rules that she employed in producing things, and translated them into methods of building. By studying in Nature the patterns both for whole bodies and for their individual parts, they understood that at their very origins[74] bodies do not consist of equal portions, with the result that some are slender, some fat, and others in between; and observing the great difference in purpose and intention between one building and another, as we have already observed in earlier books, they concluded that, by the same token, each should be treated differently.

Following Nature's own example, they also invented three different ways[75] of ornamenting a house, their names taken from the nations who favored one above the others, or even invented each, as it is said. One kind was fuller, more practical and enduring: this they called Doric. Another was slender and full of charm: this they named Corinthian. The one that lay in between, as though composed of both, they called the Ionic; they devised these for the body as a whole. When they observed the particular contribution of each of the three factors mentioned above, number, outline, and position, in the production of beauty, they established how to employ them, having studied nature's works, basing their argument, it seems to me, on the following principles.

They realized that numbers were either odd or even; they employed both, but the even in some places, the odd in others. Taking their example from Nature, they never made the bones[76] of the building, meaning the columns, angles, and so on, odd in number—for you will not find a single animal that stands or moves upon an odd number of feet. Conversely, they never made openings even in number; this they evidently learned from Nature: to animals she has given ears, eyes, and nostrils matching on either side, but in the center, single and obvious, she has set the mouth.

Among the odd and even numbers, some are found more frequently in Nature and are particularly favored by the wise; these have been adopted by

architects when composing parts of their buildings, mainly because they have some property that distinguishes them as the most noble. That Nature is composed of threes all philosophers agree. And as for the number five, when I consider the many varied and wonderful things that either themselves relate to that number or are produced by something that contains it—such as the human hand—I do not think it wrong that it should be called divine, and rightly be dedicated to the gods of the arts, and Mercury in particular. And as for the number seven, it is clear that the great maker of all things, God, is particularly delighted by it, in that he has made seven planets to wander the heavens, and has so regulated man, his favorite creature, that conception, formation, adolescence, maturity, and so on, all these stages he has made reducible to seven. According to Aristotle, when a child was born, the ancients would not give it a name for seven days, as, until then, it was not certain to survive. For both the seed in the womb and the new born baby are at grave risk for the first seven days. Another popular odd number was nine, that of the orbs which provident Nature has set in the sky. Then again the physicians are all agreed that many of the most important things in Nature are based on the fraction one ninth. For one ninth of the annual solar cycle is about forty days, the length of time, according to Hippocrates, that it takes the fetus to form in the uterus. And we notice that as a rule it takes forty days to recover from a grave illness. Menstruation ceases forty days after conception, if the child is to be a boy, and starts again a similar period after the birth, if a boy has been born. And during the first forty days you will not see the child laughing or crying while he is awake, although he will do both while asleep—so they say. So much for odd numbers.

As for even numbers, some philosophers maintain that the fourfold is consecrated to divinity, and that the most solemn oaths should be based on it.[77] The sixfold is one of the very few which is called "perfect," because it is the sum of all its integral divisors.[78] It is clear that the eightfold exerts a great influence on Nature. Those born in the eighth month will not survive, we have observed, except in Egypt.[79] They say also that a pregnant woman who gives birth to a stillborn baby in the eighth month will herself soon die. If the mother lies with a man during the eighth month, the child will be full of thick mucus and will have a foul skin full of thoroughly unpleasant scabs. Aristotle thought the tenth the most perfect number of all; perhaps, as some interpret, because its square equals the cube of four consecutive numbers.[80]

Architects have used these numbers extensively; yet, especially in the temple, they have employed no even number greater than ten, in the case of openings, nor odd number greater than nine. Next we must deal with outline.

For us, the outline is a certain correspondence between the lines that define the dimensions; one dimension being length, another breadth, and the third height. The method of defining the outline is best taken from those objects in which Nature offers herself to our inspection and admiration as we view and examine them. I affirm again with Pythagoras: it is absolutely certain that Nature is wholly consistent. That is how things stand.

The very same numbers that cause sounds to have that *concinnitas*, pleasing to the ears, can also fill the eyes and mind with wondrous delight. From musicians therefore who have already examined such numbers thoroughly, or from those objects in which Nature has displayed some evident and noble quality, the whole method of outlining is derived. But I shall dwell on this topic no longer than is relevant to the business of the architect. Let us therefore pass over what relates to the modulations of a single voice or the rules of the tetrachord; all that concerns our work is as follows.

We define harmony as that consonance of sounds which is pleasant to the ears. Sounds may be low- or high-pitched. The lower-pitched a sound, the longer the string that emits it; the higher-pitched, the shorter the string. From the different contrasts between these sounds arise the varying harmonies which the ancients have classified into set numbers corresponding to the relationships between the consonant strings. The names of the consonants are as follows: the *diapente*,[81] also called the *sesquialtera*;[82] the *diatesseron*,[83] also called the *sesquitertia*;[84] then the *diapason*,[85] which is a double; and the *diapason diapente*,[86] which is a triple; and the *disdiapason*,[87] which is called the quadruple. To these they added *tonus*,[88] which was also called the *sesquioctavus*.[89] The relationships between the above-mentioned consonants were as follows. *Sesquialtera* is so called because the length of the longer string is one and a half times that of the shorter. The prefix *sesqui* used by the ancients we might interpret as meaning "and another," as in *sesquialtera*. Thus the longer string should be given the number three, and the shorter the number two. The term *sesquitertia* is used when the longer string is one and a third times the length of the shorter: thus the longer string is given the number four, and the shorter the number three. In the consonance called *diapason* one number is double the other, such as two to one, or one to a half; in the triple, three to one, or one to a third; in the quadruple, likewise, four to one, or one to a quarter. To sum up, then, the musical numbers are one, two, three, and four; there is also *tonus*, as I mentioned, where the longer string is one eighth more than the lesser.

Architects employ all these numbers in the most convenient manner possible: they use them in pairs, as in laying out a forum, place, or open space, where only two dimensions are considered, width and length; and they use them also in threes, such as in a public sitting room, senate house, hall, and so on, when width relates to length, and they want the height to relate harmoniously to both. ◆

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One piece of advice to the architect should not be neglected here. Do not offer your services to everyone who tells you that he is about to build, as do superficial people, those who are consumed with a greed for fame. I wonder if it might not be better to wait until you have been approached several times; people must show their confidence in you if they wish to make use of your advice. What can I gain if I explain my valuable and useful proposals to some completely untutored person, when I will not even receive any recompense for it? If you have gained some benefit from my experience, and this has saved you substantial expense or made a real contribution to your comfort and pleasure, do I not, for heaven's sake, deserve a substantial reward? A wise man will stand on his dignity; save your sound advice or fine drawings[124] for someone who really wants them.

Should you propose to supervise and execute the work, you will hardly be able to avoid having sole responsibility for all the errors and mistakes committed by others, whether through inexperience or neglect. Such projects require zealous, circumspect, and strict clerks of works,[125] to supervise the necessary work with diligence, application, and their constant presence.

I would also take care, wherever possible, to deal only with principal citizens who are generous patrons and enthusiasts of such matters: a work will be devalued by a client who does not have an honorable situation. How much, do you think, will the reputations of those outstanding men, to whom you would prefer to offer your services, contribute to your fame? For my part, I am one—aside from the fact that almost all of us are considered more sensible and better advised when we follow the opinion of the rich than is justified by reality—who would want the architect to have a ready and plentiful supply of all that is necessary for the construction of the work. Very often those of lesser means are not only less able but also less willing to do this. Moreover, it is obvious that of two buildings in which the workmanship, ingenuity, and application of the artists are equal, the one with the more precious and noble constituent materials will appear more graceful by far.

Finally, I advise you never to let greed for glory impel you to embark rashly on anything that is unusual or without precedent. Everything that is to be realized must be weighed and considered in the minutest detail. For to have others' hands execute what you have conceived in your mind is a toilsome business; and who is unaware of the complaints that always greet any proposal to spend someone else's money as you think fit?

I would urge you to avoid completely that common mistake which so often causes grave, much reproved errors in almost every major work; there will always be someone to criticize, instruct, and direct your life, your skill, your manners and practice. The brevity of human life and the scale of the work ensure that scarcely any large building is ever completed by the same man as begins it. While we, the innovative architects who follow, strive by

all means to make some alteration, and take pride in it, as a result, something begun well by another is perverted and finished incorrectly. I feel that the original intentions of the author, the product of mature reflection, must be upheld. Those who began the work might have had some motive that escapes you, even though you examine it long and thoroughly, and consider it fairly.

Finally, I advise you not to embark on anything without the advice or, better still, the instruction of the greatest experts; this will help not only the process of construction but also yourself, by shielding you from the attacks of critics.

We have spoken of public and spoken of private buildings, of sacred and profane ones, and of those for use, dignity, or pleasure. It now remains for us to consider how defects that results from the inexperience or carelessness of the architect, from the damage caused by time or man, or from some unfortunate and unforeseen accident might be corrected and restored. Look kindly on these studies, men of learning! ◆