CHAP. XI.

Of the diminution of walls, and of their ſeveral parts.

IT ought to be obſerved, that walls ſhould diminiſh in proportion as they riſe; therefore thoſe which appear above ground muſt be but half as thick as the walls in the foundations; thoſe of the ſecond ſtory half a brick thinner than the walls of the firſt; and in this manner to the top of the building; but with diſcretion, that the upper part be not too thin.

THE middle of the upper walls ought to fall directly upon the middle of the lower, which will give the whole wall a pyramidal form. But when you are willing to make the ſuperficies or face of the upper walls to fall directly upon the lower, it muſt be done towards the inſide of the building; becauſe that the floors, beams or rafters, vaults, and other ſupports of the fabrick, will keep them from falling or giving way.

THE diſcharged part, or ſet-off, which is on the outſide, may be covered with a faſcia and a cornice; which, ſurrounding all the building, will be both an ornament, and a kind of bond to the whole. And becauſe the angles partake of the two ſides, in order to keep them upright, and united together, they ought to be made very ſtrong and ſolid with long hard ſtones, holding them as it were with arms.

THE windows, and other openings, ought be as far diſtant from the angles as poſſible; or at leaſt ſo much ſpace muſt be left between the aperture and the angles as the width of the opening or void.

HAVING thus treated of plain walls, we ſhall next conſider their ornaments; among which none are more conſiderable than columns, when they are properly placed, and in a juſt proportion to the whole edifice.

CHAP. XII.

Of the five orders made uſe of by the antients.

THE Tuſcan, Dorick, Ionick, Corinthian, and Compoſite, are the five orders made uſe of by the antients. Theſe ought to be ſo diſpoſed in a building, that the moſt ſolid may be placed undermoſt, as being the moſt proper to ſuſtain the weight, and to give the whole edifice a more firm foundation: Therefore the Dorick muſt always be placed under the Ionick; the Ionick under the Corinthian; and the Corinthian under the Compoſite.

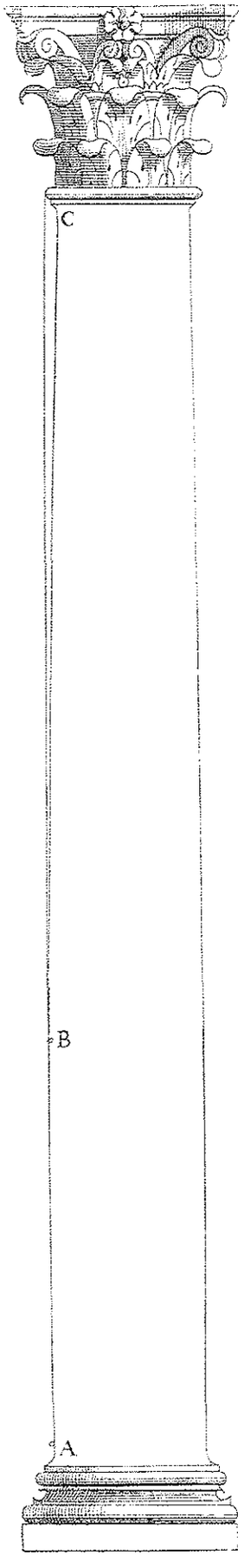
THE Tuſcan being a plain rude order, is therefore very ſeldom uſed above ground, except in villas, where one order only is employ'd. In very large buildings, as amphitheatres, and ſuch like, where many orders are required, this, inſtead of the Dorick, may be placed under the Ionick.

BUT if you are deſirous to leave out any of theſe orders, as, for inſtance, to place the Corinthian immediately over the Dorick, you may, provided you always obſerve to place the moſt ſtrong and ſolid undermoſt, for the reaſons above-mention'd.

THE meaſures and proportions of each of theſe orders I ſhall ſeparately ſet down; not ſo much according to VITRUVIUS, as to the obſervations I have made on ſeveral antient edifices. But I ſhall firſt mention ſuch particulars as relate to all of them in general.

CHAP. XIII.

Of the ſwelling and diminution of columns, and of the intercolumniations and pilaſters.



THE columns in each order ought to be form'd in ſuch a manner, that the diameter of the upper part of the column may be ſmaller than at the bottom, with a kind of a ſwelling in the middle.

IT is to be obſerved in the diminutions, that the higher the columns are, the leſs they muſt diminiſh; becauſe the height, by reaſon of the diſtance, has that effect.

THEREFORE, if the column be fifteen foot high, the thickneſs at the bottom muſt be divided into ſix parts and a half, five and a half of which will be the thickneſs for the top. If from fifteen to twenty foot high, divide the diameter at the bottom into ſeven parts, and ſix and a half will be the diameter above. The ſame muſt alſo be obſerved in thoſe from twenty to thirty foot high; the lower diameter of which muſt be divided into eight parts, and ſeven given to the upper. And ſo in proportion, columns of a greater altitude ought in the ſame manner to be diminiſhed, as VITRUVIUS tells us in the ſecond chapter of his third book.

As to the manner of making the ſwelling in the middle, we have no more to ſhew from VITRUVIUS but his bare promiſe; which is the reaſon that moſt writers differ from one another upon that ſubject.

THE method I uſe in making the profile of the ſwellings is this; I divide the ſuſt of the column into three equal parts, and leave the lower part perpendicular; to the ſide of the extremity of which I apply the edge of a thin rule, of the ſame length, or a little longer than the column, and bend that part which reaches from the third part upwards, until the end touches the point of the diminution of the upper part of the column under the *collarino*. I then mark as that curve directs, which gives the column a kind of ſwelling in the middle, and makes it project very gracefully.

AND although I never could imagine a more expeditious and ſucceſsful method than this, I am nevertheleſs confirmed in my opinion, ſince Signor PIETRO CATANEO was ſo well pleaſed when I told him of it, that he gave it a place in his Treatiſe of Architecture, with which he has not a little illuſtrated this profeſſion.

A B, *the third part of the column, which is left directly perpendicular.*
B C, *the two thirds that are diminiſhed.*
C, *the point of diminution under the* collarino.

THE intercolumniations, or the ſpaces between the columns, may be of one diameter and a half of the column (the diameter being taken at the loweſt part of the column.) They alſo may be of two, two and a quarter, three, or more diameters; but the antients never allow'd more to theſe ſpaces than three times the diameter of the column, except in the Tuſcan order, where the architrave was made of timber, the intercolumniations were then very large. Neither did they ever allow leſs than one diameter and a half, which was the diſtance they uſually obſerv'd, eſpecially when the columns were very high.

BUT, above all other, they approved of thoſe intercolumniations that were of two diameters and a quarter; and they reckon'd this a beautiful

beautiful and elegant manner of intercolumniation. And it ought to be obſerved, that there ſhould be a proportion and correſpondence between the intercolumniations or ſpaces, and the columns; becauſe if ſmall columns are placed in the larger ſpaces, the greateſt part of their beauty will be taken away, by the quantity of air, or the vacuity between the ſpaces, which will diminiſh much of their thickneſs. On the contrary, if large columns are placed in ſmall intercolumniations, the ſtraitneſs or narrowneſs of the ſpaces will make them appear clumſy, and without grace. Therefore if the ſpaces exceed three diameters, the thickneſs of the columns ought to be a ſeventh part of their height; as I have obſerved in the following Tuſcan order.

BUT if the ſpaces are three diameters, the columns ought to be ſeven and a half or eight diameters high; as in the Dorick order: If two and a quarter, the height of the columns muſt be nine diameters; as in the Ionick: If but two, the height of the columns ſhould be nine diameters and a half; as in the Corinthian: And, laſtly, if of one diameter and a half, the height of the columns muſt be ten; as in the Compoſite. In which orders I have taken this care, that they may ſerve as an example for the different intercolumniations mention'd by VITRUVIUS in the aforeſaid chapter.

AN even number of columns ought always to be placed in the fronts of edifices, that an intercolumniation may be made in the middle ſomewhat larger than the others, that the doors and entries, uſually placed in the middle, may be the better ſeen. And this is ſufficient as to ſimple colonades.

BUT if loggia's are made with pilaſters, they ought to be ſo diſpoſed, that the thickneſs of the pilaſters be not leſs than one third of the void or ſpace between pilaſter and pilaſter; and the thickneſs of thoſe placed in the corners to be two thirds of the ſaid ſpace, that ſo the angles of the fabrick may be both ſtrong and ſolid.

AND when they are to ſuſtain an exceeding great weight, as in very large buildings, they ought then to be made as thick as half the void, like thoſe of the theatre of *Vicenza*, and the amphitheatre at *Capua*; otherwiſe their thickneſs may be two thirds of the ſaid ſpace, as thoſe of the theatre of *Marcellus* at *Rome*, and that of *Ogubio*, now in poſſeſſion of Signor LUDOVICO DE GABRIELLI, a gentleman of that city.

THE antients ſometimes made them as thick as the whole void, as thoſe are in that part of the theatre of *Verona* which is not upon the Mountain. But in private buildings they muſt not be leſs in thickneſs than the third part of the void, nor more than the two thirds, and ought to be ſquare. But to leſſen the expence, and to make the place to walk in larger, they may be made leſs thick in the flank than front, to adorn which, half columns and pilaſters may be placed in the middle, to ſupport the cornice over the arches of the loggia's, whoſe thickneſs muſt be proportionable to their height, according to each order; as may be ſeen in the following chapters and deſigns.

FOR the better underſtanding of which, and to avoid my repeating the ſame thing often, it is to be obſerved, that in the dividing and meaſuring the ſaid orders, I would not make uſe of any certain and determinate meaſure peculiar to any city, as a cubit, foot, or palm, knowing that theſe ſeveral meaſures differ as much as the cities and countries; but imitating VITRUVIUS, who divides the Dorick order with a meaſure taken from the thickneſs or diameter of the columns, common to all, and by him called a module, I ſhall therefore make uſe of the ſame meaſure in all the orders.

THE module ſhall be the diameter of the column at bottom, divided into ſixty minutes; except in the Dorick Order, where the module is but half the diameter of the column, divided into thirty minutes, becauſe it is thus more commodious in the diviſions of the ſaid order.

FROM whence every one may, by either making the module greater or leſs, according to the quality of the building, make uſe of the proportions and profiles belonging to each order.

CHAP. XVI.

Of the IONICK ORDER.

THE Ionick order had its origin from *Ionia*, a province in *Aſia*, of which it is ſaid that the temple of DIANA at *Epheſus* was built. The columns, with the capital and baſe, are nine modules high. By a module is underſtood the lower diameter of the column.

THE architrave, frize, and cornice are a fifth part of the altitude of the column. In the deſigns of ſimple colonades, the intercolumniations are of two diameters and a quarter, which is the moſt beautiful and commodious manner of intercolumniations, and by VITRUVIUS called *Euſtilo's*. In the deſign of arches the pilaſters are a third part of the void, and the arches are two ſquares high.

IF a pedeſtal is to be put to Ionic columns, as in the deſign of arches, it muſt be made as high as half the width of the arch, and divided into ſeven parts and a half; two of which are for the baſe, one for the cimacia, and the remaining four and a half for the dado, that is, the middle plain.

THE baſe of the Ionick order muſt be half a module in thickneſs, and divided into three parts; one to be given to the plinth, whoſe projecture is the fourth and eighth part of the module; the other two are divided into ſeven parts, three of which are for the baſtone or torus; the other four are again divided into two, of one is made the upper cavetto, and with the other the lower, which muſt project more than the other.

THE aſtragal muſt be the eighth part of the cavetto. The cimbia of the column is the third part of the baſtone or torus of the baſe. But if the baſe is joined with part of the column, then the cimbia muſt be made thinner, as I have ſaid in the Dorick order. Theſe are the dimenſions of the Ionick baſe, according to VITRUVIUS.

BUT as in many antient buildings Attick baſes are ſeen placed under the columns of this order, and they pleaſe me better ſo, I have drawn the ſaid baſe upon the pedeſtal, with a little torus under the cimbia; but at the ſame time I have not omitted the deſign of that order'd by VITRUVIUS.

THE deſigns marked L are two different profiles, to make the impoſts of arches, the dimenſions of each of which are marked in numbers, ſhewing the minutes of the module, as it has been obſerved in all the other deſigns. Theſe impoſts are half as high again as the pilaſter is thick, which ſupports the arch.

A, *Shaft of the column.*
B, *Tondino or Aſtragal, with the Cimbia, and are members of the column.*
C, *upper Baſtone or Torus.*
D, *Cavetto.*
E, *lower Baſtone or Torus.*
F, *Orlo joined to the Cimacia of the pedeſtal.*
G, *the Cimacia in two different forms* } *of the*
H, *Dado* } *pedeſtal.*
I, *Baſe in two different forms* } *of the*
K, *Orlo or Plinth of the Baſe.*
L, *Impoſts of the arches.*

TO form the capital, the foot of the column muſt be divided into eighteen parts, and nineteen of theſe parts is the height and width of the abaco, half thereof is the height of the capital with the volute, which is therefore nine parts and a half high; one part and half muſt be given to the abaco with its cimacio, the other eight remain for the volutæ, which is thus made.

ONE of the nineteen parts is to be allowed from the extremity to the inſide of the cimacio, and from that place where the point was made, a line muſt fall perpendicular, which divides the voluta in the middle, called *catheto*. And where the point is upon the line which ſeparates the ſuperior four parts and a half from the inferior three and a half, the centre of the eye of the voluta muſt be made, whoſe diameter is one of the eight parts. And from the ſaid point a line muſt be drawn, which interſecting with the catheto at rectangles, divides the voluta into four parts.

THEN a ſquare ought to be formed in the eye of the voluta, half the diameter of the ſaid eye in bigneſs, and diagonal lines drawn. Upon which lines the points are marked whereon the fixed foot of the compaſſes muſt be placed in forming the voluta. Theſe are thirteen in number, including the centre of the eye of the ſaid voluta. The order that ought to be obſerved in them will plainly appear by the numbers placed in the deſign.

THE aſtragal of the column is in a direct line with the eye of the voluta. The thickneſs of the voluta in the middle muſt be equal to the projecture of the ovolo, which projects beyond the abaco juſt as much as the eye of the voluta is. The channel of the voluta is even with the ſhaft of the column.

THE aſtragal of the column goes quite round under the voluta, and is always ſeen, as appears by the plan: For it is natural, that a thing ſo tender as the voluta is ſuppoſed to be, ſhould give way to a hard one, ſuch as the aſtragal, from which it muſt always be equally diſtant.

CAPITALS are generally made in the angles of colonades and portico's of this order, with volutæ not only in front, but alſo in that part which, if the capital was made as uſual, would be the flank; by which means they have the fronts on two ſides, and are called angular capitals. I ſhall ſhew how theſe are made in my *book of temples.*

A, *Abaco.*
B, *Channel or hollow of the Voluta.*
C, *Ovolo.*
D, *Tondino or Aſtragal under the Ovolo.*
E, *Cimbia.*
F, *Shaft of the column.*
G, *The line called Catheto.*

IN the plan of the capital the ſaid members are countermarked with the ſame letters.

S, *The eye of the Voluta in a larger form.*

MEMBERS of the baſe, according to VITRUVIUS.

K, *Shaft of the column.*
L, *Cimbia.*
M, *Baſtone or Torus.*
N, *Firſt Cavetto.*
O, *Tondini or Aſtragals.*
P, *Second Cavetto.*
Q, *Orlo or Plinth.*
R, *Projecture of the baſe.*

THE architrave, frize and cornice are, as I have ſaid, a fifth part of the height of the column, the whole to be divided into twelve parts, of which the architrave is four parts, the frize three, and the cornice five.

THE architrave is to be divided into five parts; of one its cimacio is made, and the remaining four divided into twelve parts, three of which are given to the firſt faſcia and its aſtragal; four to the ſecond and its aſtragal, and five to the third.

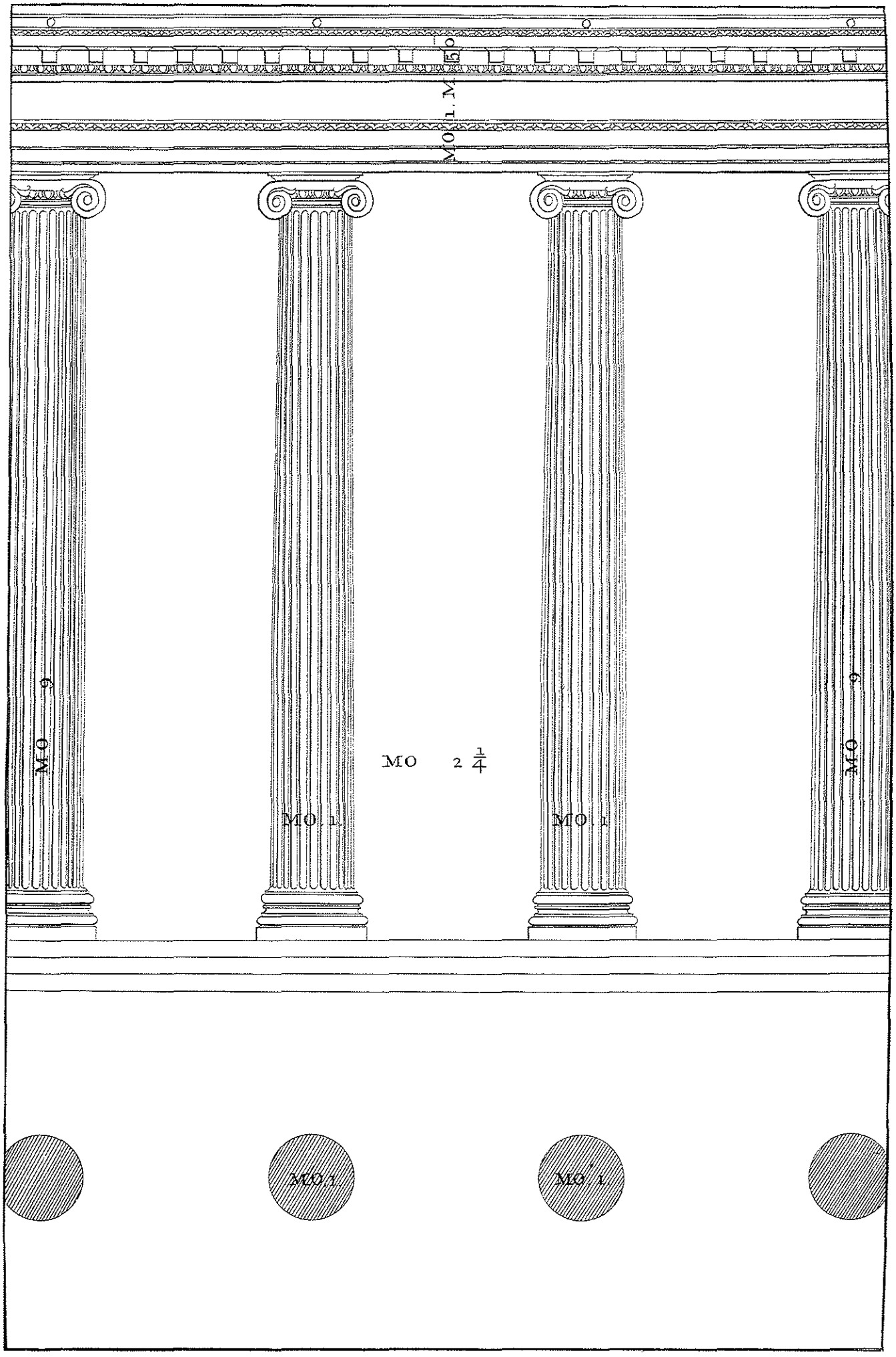
THE cornice is to be divided into ſeven parts and three fourths; two muſt be given to the cavetto and ovolo, two to the modiglion, and three and three fourths to the corona and gola or cima. Its projecture is equal to its height. I have deſigned the front, flank, and plan of the capital; as alſo the architrave, frize, and cornice, with their proper ornaments.

A, *Gola or Cima recta.*
B, *Gola, or Cima reverſa.*
C, *Gocciolatoio or Corona.*
D, *Cimacio of the Modiglions.*
E, *Modiglions.*
F, *Ovolo.*
G, *Cavetto.*
H, *Fregio or frize.*
I, *Cimacio of the architrave.*
K, *Firſt Faſcia.*
L, *Second Faſcia.*
M, *Third Faſcia.*

MEMBERS of the capital.

N, *Abaco.*
O, *Hollow of the Voluta.*
P, *Ovolo.*
Q, *Tondino of the column or Aſtragal.*
R, *Shaft of the column.*

THE ſoffit of the cornice is where the roſes are between one modiglion and the other.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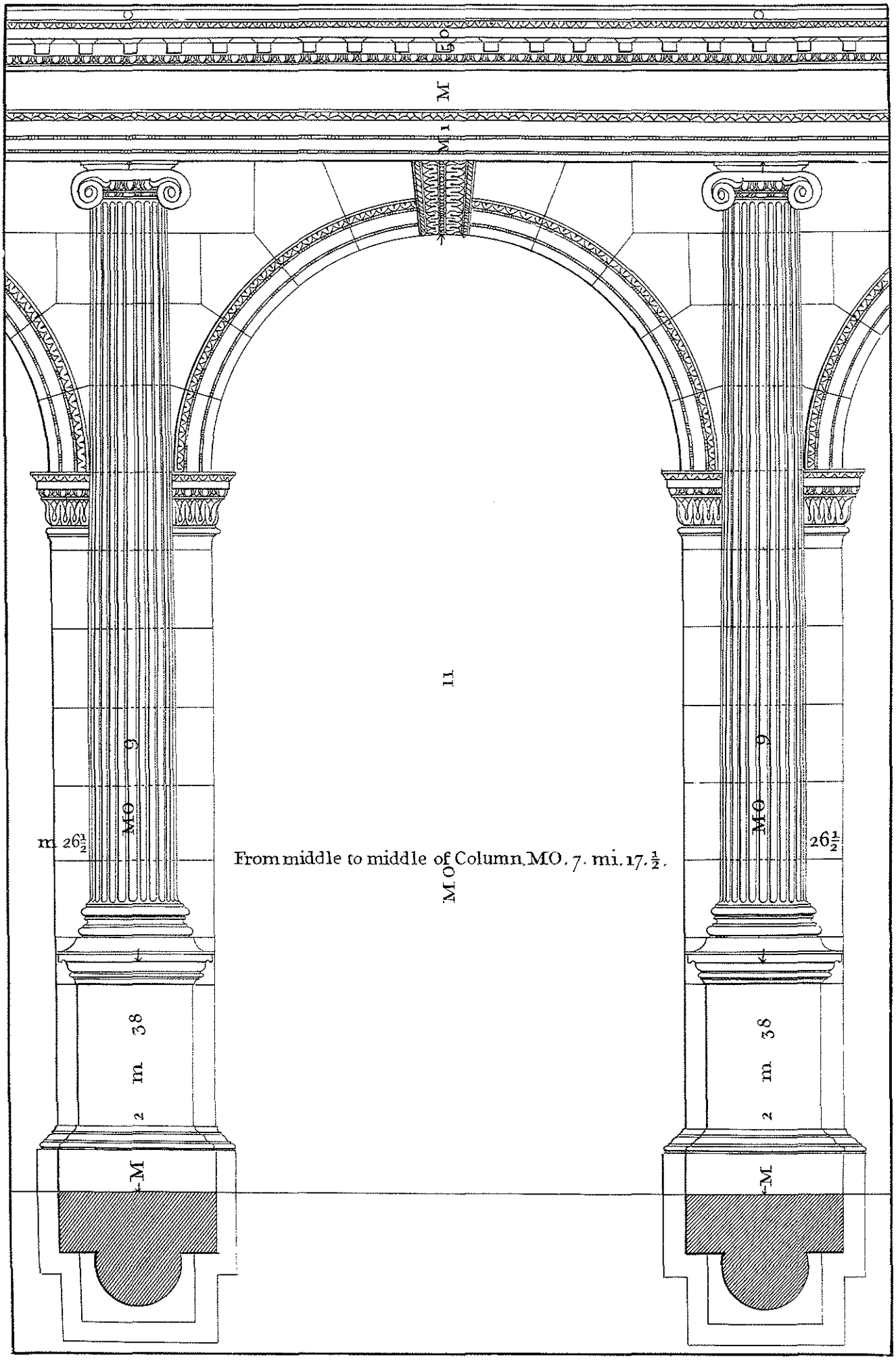
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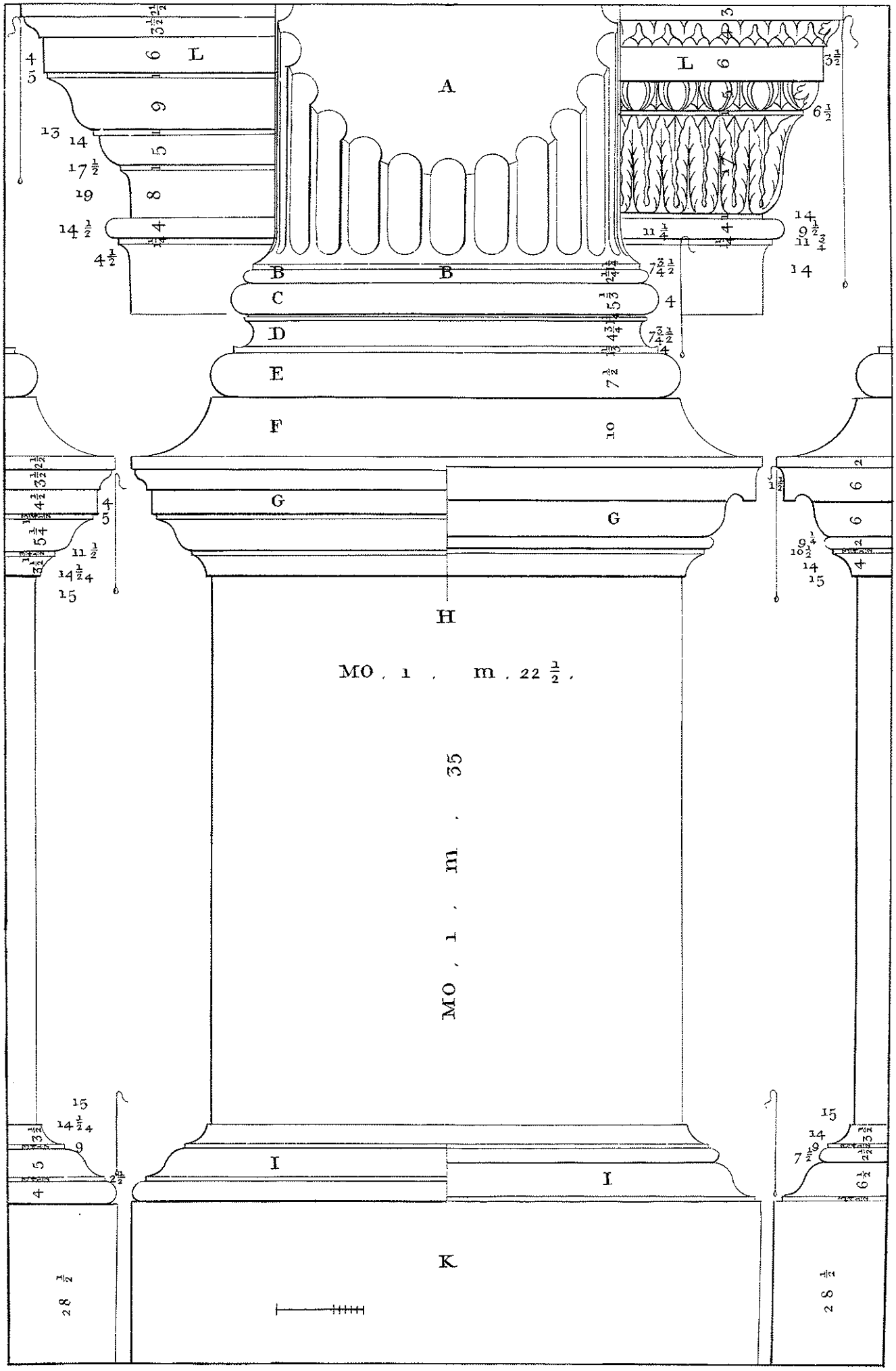
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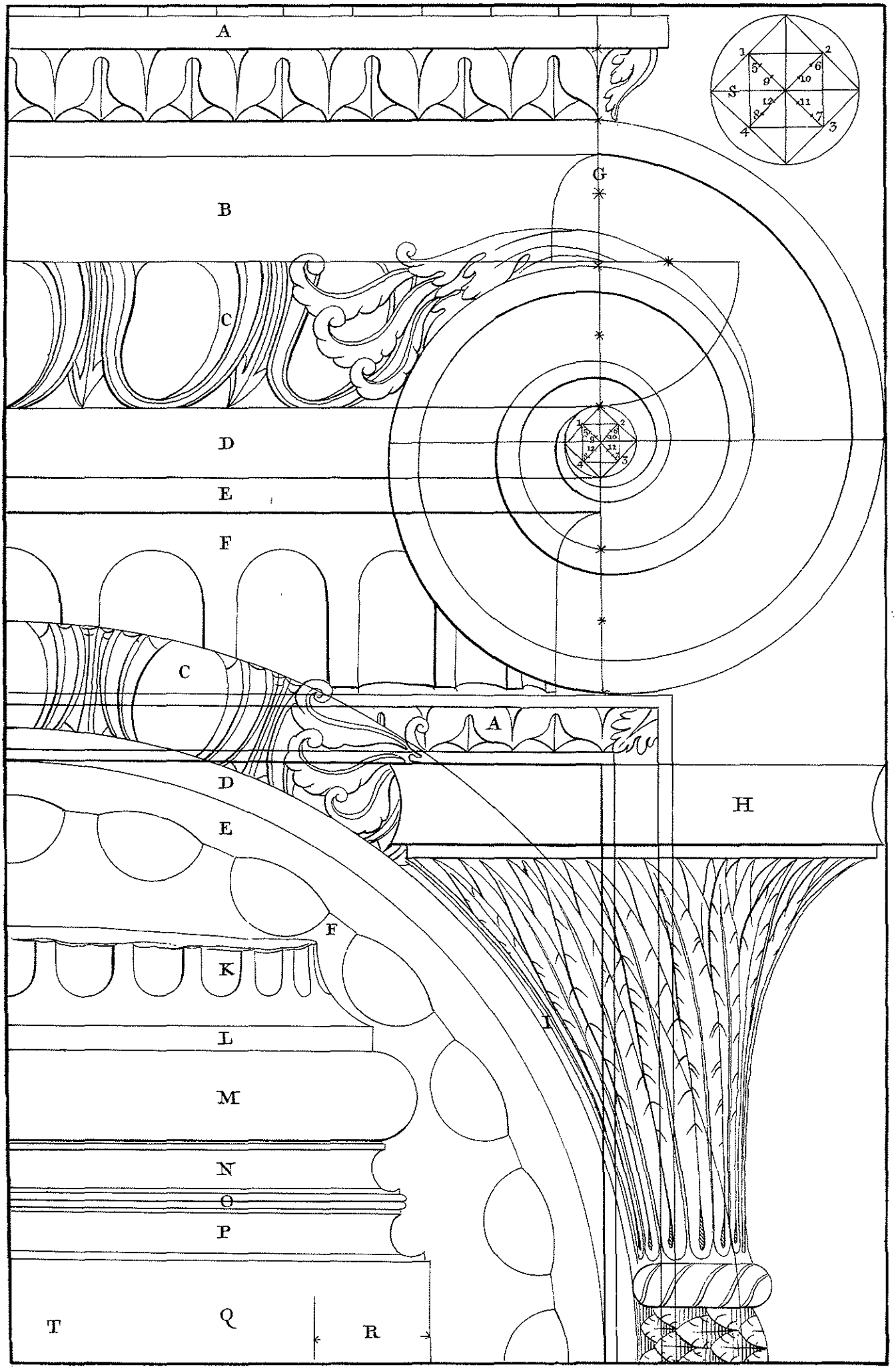
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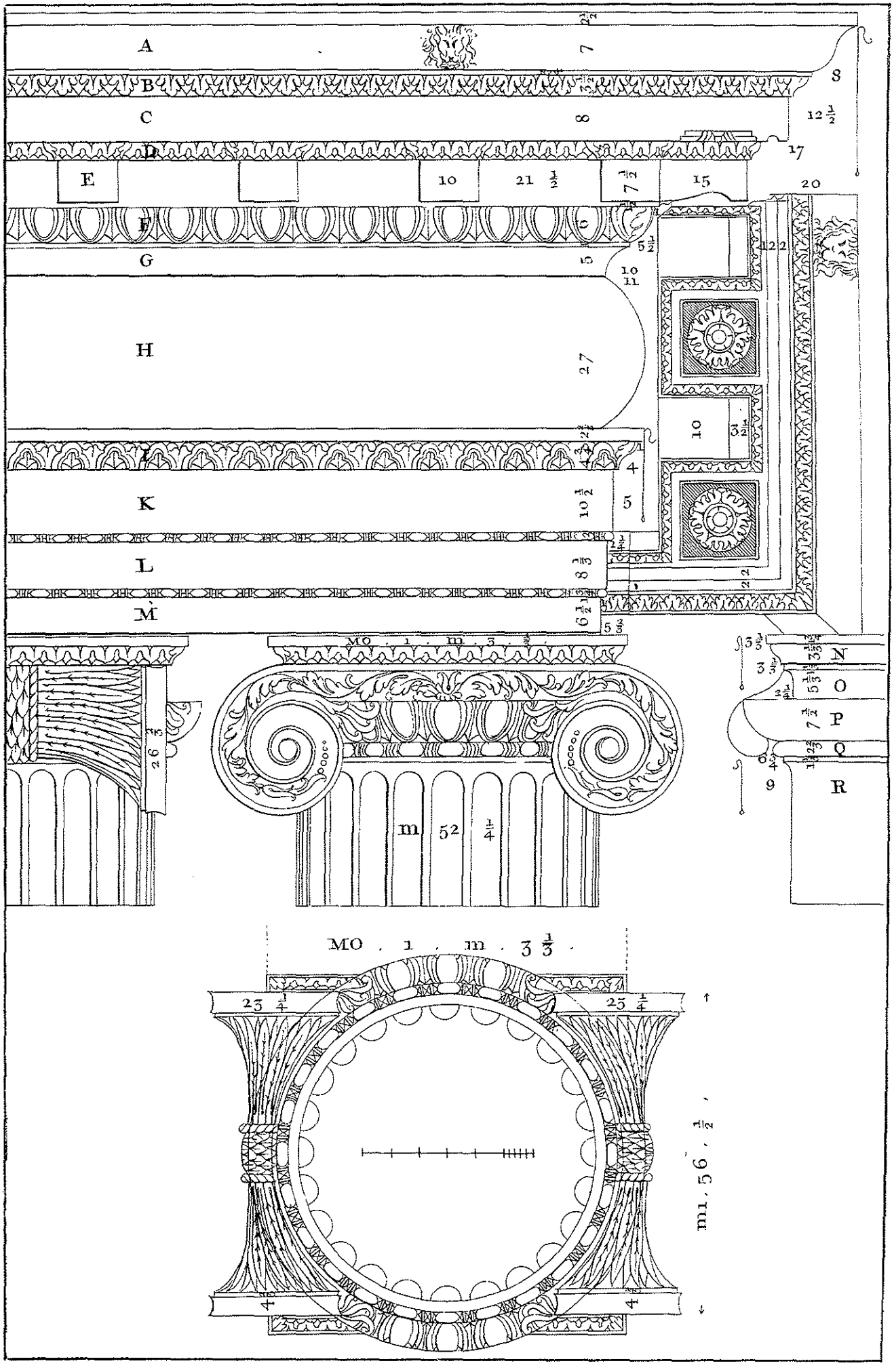
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CHAP. XIX.

Of PEDESTALS.

I HAVE hitherto ſaid as much as I thought neceſſary with reſpect to plain walls, and their ornaments; and have particularly touched upon the ſeveral pedeſtals that may be applied to each order.

BUT tho' the antients may ſeem to have had no regard to form a pedeſtal larger for one order than another; yet this member is a very great addition both in point of ornament and beauty when it is made with judgment, and in due proportion to the other parts.

IN order that the architect may have a perfect knowledge of pedeſtals, and be able to uſe them upon all occaſions; it is to be obſerved, that the antients made them ſometimes ſquare, equal in height and width, as in the arch of *Leoni* at *Verona*. Theſe I have given to the Dorick order, becauſe it requires ſolidity.

THEY ſometimes made them by taking the meaſure from the opening, as in the arch of *Titus* at *Santa Maria Nova* in *Rome*, and that of *Trajan* over the port of *Ancona*, where the height of the pedeſtal is half the void of the arch. Which kind of pedeſtal I have placed in the Ionick order.

THEY ſometimes took the dimenſion from the height of the column, as may be ſeen in an arch that was erected in honour of AUGUSTUS CÆSAR, at *Suſa*, a city ſituated at the foot of the mountains that part *France* and *Italy*; in the arch of *Pola*, a city in *Dalmatia*; and in the amphitheatre at *Rome*, in the Ionick and Corinthian orders; in which edifices the pedeſtal is one fourth of the height of the columns, as I have obſerved in the Corinthian order. In the arch of *Caſtel Vecchio* at *Verona*, which is exceeding beautiful, the pedeſtal is a third part of the height of the column, as I have placed it in the Compoſite order. Theſe are the moſt beautiful forms of pedeſtals, and ſuch as have a fine proportion to the other parts.

WHEN VITRUVIUS, in his ſixth book, ſpeaking of theatres, makes mention of the *poggio*, it is to be obſerved, that the poggio is the ſame as the pedeſtal, which is a third of the length of the column, placed as an ornament to the ſcene.

BUT pedeſtals that exceed a third part of the columns may be ſeen in the arch of *Conſtantine* at *Rome*, where the pedeſtals are two fifths of the height of the columns. And it was obſerv'd in almoſt all the antient pedeſtals to form the baſe twice as thick as the cimacia; as ſhall be ſeen in my *book of arches*.

CHAP. XX.

Of ABUSES.

HAVING laid down the ornaments of architecture, that is, the five orders, and ſhewn how they ought to be made; and having placed the profiles of every one of their parts as I found the antients did obſerve them; it ſeems to me not improper to inform the reader in this place of many abuſes introduc'd by the Barbarians, which are ſtill followed, that the ſtudious in this art may avoid them in their own works, and be able to know them in thoſe of others.

I SAY therefore, that architecture, as well as all other arts, being an imitatrix of nature, can ſuffer nothing that either alienates or deviates from that which is agreeable to nature; from whence we ſee, that the antient architects, who made their edifices of wood, when they began to make them of ſtone, inſtituted that the columns ſhould be left thicker at the top than at the bottom, taking example from the trees, all which are thinner at the top than in the trunk, or near the root.

AND becauſe it is very probable, that thoſe things are depreſſed upon which ſome great weight is put, baſes were placed under the columns, which, with their baſtoni and cavetti, ſeem to be cruſhed with the burden laid upon them.

SO likewiſe in the cornice they introduced the triglyphs, modiglions and dentels, which repreſent the ends of thoſe beams that are put for a ſupport to the floors and roofs.

THE ſame alſo may be obſerved in all the other parts, if they are conſider'd. Being thus, that manner of building cannot but be blamed, which departs from that which the nature of things teacheth, and from that ſimplicity which appears in the things produced by her; framing as it were another nature, and deviating from the true, good and beautiful method of building.

FOR which reaſon one ought not, inſtead of columns or pilaſters, that are to ſuſtain ſome great weight, to place *cartelli*, alſo called *cartocci*, being a kind of a ſcroll, which to the intelligent appear very ſhocking, and to thoſe that are not ſo it gives rather a confuſion than a pleaſure; nor have they any other effect beſides encreaſing the builder's expence.

FOR the ſame reaſon none of theſe cartocci ought to project from the cornices; for it is requiſite that all the parts of the cornices ſhould be made for ſome purpoſe and ſhew, like what they would ſeem to be if the whole work was of wood.

BESIDES, it is neceſſary that a great weight ſhould be ſuſtained by ſomething ſolid and ſtrong enough to ſupport it: now it is certain that thoſe cartocci would be altogether ſuperfluous, becauſe it is impoſſible that any beams or timber ſhould produce the effect repreſented; and ſince they are ſuppoſed to be ſoft and tender, I cannot conceive with what reaſon they can be placed under a thing both hard and heavy.

BUT, in my opinion, the moſt important error is that of making the frontiſpieces of doors, windows, and loggia's broken in the middle, ſince theſe were made to keep the rain from the fabricks, and which the antient builders, inſtructed by neceſſity itſelf, made to cloſe and ſwell in the middle.

I KNOW therefore nothing that can be done more contrary to natural reaſon, than to divide that part which is ſuppoſed to ſhelter the inhabitants and thoſe that go into the houſe from rain, ſnow, and hail.

AND altho' variety and things new may pleaſe every one, yet they ought not to be done contrary to the precepts of art, and contrary to that which reaſon dictates; whence one ſees, that altho' the antients did vary, yet they never departed from the univerſal and neceſſary rules of art, as ſhall be ſeen in my *books of antiquities.*

ALSO as to the projection of the cornices, and the other ornaments, the making them come out too much is no ſmall abuſe; becauſe when they exceed that which is reaſonably proper for them, eſpecially if they are in a cloſe place, they will make it narrow and diſagreeable, and frighten thoſe that ſtand under them, as they always threaten to fall.

NOR ought the making cornices which are not in proportion to the columns leſs to be avoided; becauſe if upon little columns great cornices are placed, or little cornices upon great columns, who doubts but that ſuch a building muſt have a very unpleaſing aſpect?

BESIDES which, the ſuppoſing of the columns to be divided, making certain annulets and garlands round them, that may ſeem to hold them firmly united together, ought as much as poſſible to be avoided; becauſe the more ſolid and ſtrong the columns appear, the better they ſeem to execute the purpoſe for which they were erected, which is to make the work thereon both ſtrong and ſecure.

I COULD mention many other ſuch abuſes, as ſome members in the cornices that are made without any proportion to the others, which, by what I have ſhewn above, and by that which has been already ſaid, may very eaſily be known.

IT remains now, to come to the diſpoſition of the particular and principal places of the fabricks.

CHAP.