

I. *Some Observations upon the Ruins of a Roman Wall and Multangular-Tower at York. By the Judicious Mar. Lister Esq;*

I carefully viewing the Antiquities of *York*, and particularly what might relate to the *Roman Empire*, of which this place had been a seate; and the dwelling of at least Two of the Emperours, *Severus* and *Constantine*. I found a part of a Wall yet standing, which is undoubtedly of that time; it is the South-wall of the *Mint-yard* being formerly an Hospital of *Saint Lawrence*, looking towards the River, it consists of a *Multangular-Tower*, which did lead to *Bootham Barr*, and about ——— yards of wall, which rann the length of *Coming-street*, as he who shall attentively view it on both sides may discern.

But the out-side, towards the River, is the most worth taking notice of, it is faced with a very small *Saxum quadratum* of about 4 inches thick, and laid in levels like our modern Brick-work: This sort of building *Vitruvius* (*lib. 2. cap. 8.*) calls after the Greeks, *Isodomum*, *cum omnia Choria æquâ crassitudine fuerint structa*; but the length of the stones is not observed, but are as they fell out in hewing: From the foundation 20 courses of this small squared stone are laid, and over them 5 courses of Roman Brick; these Bricks are laid some length waies, and some end-waies in the wall, and were called *lateres Diatomi*: After these 5 courses of Brick, other 20 courses of small square stone (as before described) are laid, which raise the wall ——— feet higher, and then 5 more courses of the same Roman bricks are over laid, beyond which the wall is imperfect, and cap't with modern building: Note, that in all this height there is no Casement or Loop-hole, but one intire and uniform

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wall, from which we guess the wall to have been built some courses higher after the same order.

The reason of this order of Brick-work intermixt with stone, the same *Vitruvius* gives, and in this particular the Romans after his time, and upon his admonition, and recommendation (in all probability) did imitate the Greeks, *longitudines Coriorum* (saies he) *alternis coagmentis in crassitudinem instruentes* : And a little further, *interponunt singulos perpetua crassitudine utraq; parte Frontatos (lateres) quos Diatonos appellant, qui maxime religando confirmant parietum soliditatem* : These Bricks were to be as *Throughs*, or as it were so many new Foundations to that which was to be superstructed ; and to bind the Two sides together firmly, for the wall it self is only faced with small square stone. and the middle thereof filled with Morter and Peble ; *frontibus serviunt* (saies the same Author) & *medio farciunt* ; which *Vitruvius* discommends in the Romans of his time, and therefore the later Romans (the builders of our wall) did, as I said, correct this Error, and imitate the Greeks.

And least it should seem strange, that Bricks should give a firmness to Stone buildings, the same *Vitruvius* testifies, and therefore commends brick building before stone (our men indeed for wholesomness, which also is true, and to be much considered in a cold and moist climate) even for the duration ; and therefore in *Rome* abatement was ever made for the age of stone building ; none for that of brick, provided it kept its level, and stood upright upon its foundation ; and therefore to excuse it, he at large gives a reason why the Romans suffered not brick buildings to be made within the City of *Rome*, as a thing not of choice, but necessity, these brick buildings being certainly (in that great Architects opinion) to be preferred : The Law saies he) suffers not a wall to be made to the street-ward for so give me leave to interpret *communi loco*) above a foot and a half thick, and partition walls the same, lest they should take up too much roome. Now brick walls
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of a foot and a half thick (unless they were *Diplinthij* or *Triplinthij*) cannot bear up above one Story; but in so vast and Majestick a City (as old *Rome*) there ought to be innumerable habitations, therefore when a plain Area, or building of one Story could not receive such a multitude to dwell in the City, therefore the thing it self did compel them to it, that the houses might be raised higher, and therefore they had strange contrivances of out jetting, and overhanging Stories, and Belconies &c; which reasons if rightly considered are great mistakes: Our men at this day have taught the world better things; and have demonstrated that a firm Building may be raised to many Stories height upon a foot and a half thick Wall; The Oversight of the *Romans* was the vast bigness of their Brick, for the lesser the Brick the firmer the work, there being much greater firmness in a multitude of Angles, as must be produced by a small Brick, then in a right line; and this is the reason of the strength of Buttresses, and Multangular Towers &c.

Those Bricks are about seventeen Inches of our measure long, and about eleven Inches broad, and two Inches and a half thick. This (having caused several of them to be carefully measured) I give in round numbers, and do find them to agree very well with the notion of the *Roman* foot, which the learned Antiquary *Greaves* has left us; viz. of its being about half an Inch less than ours; they seem to have shrunk in the bakeing, more in the breadth than in the length; which is but reasonable, because of its easier yeilding that way; and so, for the same reason, more in thickness; for we suppose them to have been designed in the Mould for three *Roman* Inches.

Now that this was properly the *Roman* Brick we have the Testimony of *Vitruvius*, and *Pliny*: of *Vitruvius*, "*fiunt Laterum tria genera, unum quod Græcè Didoron appellatur quo nostri utuntur &c*: And of *Pliny*, "*genera eorum tria; Didoron, quo utimur, longum sesqui pede, latum*

tum pede ; But we are to note, that the Coppy of *Vitruvius* ; where it describes the measures of the *Didoron* is vicious ; and is to be corrected by *Pliny*, and had not *Vitruvius's* Commentatour been more a friend to his Author than to truth, he had not perswaded the contrary, for the Bricks themselves do demonstrate at this day, *Pliny's* measures to be right, and not those of *Vitruvius*, as they are extant ; which makes me much wonder at the confidence of *Daniel Barbarus* affirming the Bricks now to be found, are all according to *Vitruvius* and not *Pliny's* measures ; for all that I have yet seen with us in *England* are of *Pliny's* measures as at *Leister* in the *Roman* Ruine there, called the *Jews Wall* ; at *St. Albans*, as I remember, and here with us at *York*. And to go no farther for Arguments than this very Chapter of *Vitruvius*, the *Diplinthij Parietes* in *Rome* were against law, and the single Brick wall was onely allowed as Standard, viz, a foot and a half thick Wall, or one *Roman* Brick a length, as was above noted.

Pliny lived sometime after *Vitruvius*, and being a professed Transcriber, and as it appears from this very place, having taken the whole business of Brick almost *verbatim* out of him and not differing in any one thing in the whole Chapter, but in this, or the measure of the *Didoron*. And the Bricks demonstrating the truth of that difference, it is but reasonable we should make *Vitruvius's longum pede latum semipede*, a fault of *Vitruvius* Coppyers.

I shall conclude this discourse with this remark, that proportion, and a plain uniformity, even in the minutest parts of building, is to be observed, as this miserable ruin of *Roman* workmanship shews ; In our Gothick Buildings there is a Total neglect of the measure, and proportion of the Courses as tho that was not much material to the beauty of the whole, whereas indeed in *Natures* works it is from the Symmetry of the very Grain, whence arises much of the beauty

beauty of the thing : Indeed, if I was never to come near a building, and to view it alwaies at such a distance, this might be excused as to me : and so in Artificial things, as in Pictures and Carvings to be seen on high : but yet, in my opinion, 'tis but an excuse of laziness to tell me such and such rude dashes will have a marvelous effect at a distance ; as though things Painted or Carved to adorn our comparatively low Roomes were distanced ; And this Noble Art, in my opinion, has of late in nothing suffered so much with us, as in admitting of this vile excuse ; whereas indeed, what is well done, and most exactly finished in the most minute parts of a thing Painted, I am sure if it please me near the eye, it will never displease me at a distance.

2. *Some probable thoughts of the Whiteness of the Chyle, and what it is after it is conveyed within the Arteries. By the Learned Martin Lister Esq;*

1. **I**N the digestion of meat in the stomach, there is made a separation or solution of Urinous Salts ; no otherwise than in the rotting of Plants or Animals.
2. The *Chyle* is highly impregnated with this Urinous Salt.
3. The *Whiteness* of the *Chyle* is from the Fermentation it has from its mixture with Urinous Salts, and that if diluted with fair water, it is wholly deprived of that colour, the Fermentation ceasing.
4. The Salt *Chyle* is conveyed into the Venal blood, and with it enters the heart ; and it is thence thrown out again *Chyle*, as it comes in, by a continual pulsation, into the *Arteries*.

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