

Syriation & Satyriafin *iisdem fere literis scribantur, neq;* multum transpositis: deinde quod particula ista & Copulativa potius videatur, ac Syriation morbi nomen in Accusandi casu innuat; quam quod pro etiam Intendendi Adverbium ponatur, ac Syriation sit nomen Medici cujusdam obscuri. Voce vero Vomica hic peculiariter utitur Plinius, non pro Apostemate, sed pro fluore quodam Uteri, id quod ex alio Plinii dicto patet. Est lapis in Venis cujus Vomica liquoris æterni Argentum vivum dicitur, venenum rerum omnium. *Lib. 33. cap. 6. Ubi Vomica pro fluore è Lapide manante dicitur. Quod autem Mentha has etiam vires habeat, audiamus Raium nostrum Botanicorum præstantissimum, Hist. Plant. pag. 532. Mentha Menses & album Mulierum profluvium efficaciter compescit. An vero de alio quodam Mulierum effectu hæc Plinii verba capienda sint ad Medicos referendum est.*

*An account of the Measure of the thickness of Gold upon Gilt-Wire, together with a demonstration of the exceeding minuteness of the Atoms or constituent Particles of Gold; as it was read before the R. Society, by E. Halley.*

**W**Hat are the Constituent parts of Matter, and how there comes to be so great a diversity in the weight of Bodies to all appearance equally solid and dense, such as are Gold and Glafs, (whose specific Gravities are nearly as 7 to 1) seems a very hard question to those that shall rightly consider it: For from un doubted experiment, Gravity is in all Bodies proportionable to the quantity of Matter in each, and there is no such thing as a propension of some more others less, towards the Earths Center; since the Impediment of the  
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of the Air being removed, all Bodies descend, be they never so loose or compact in texture, with equal velocity. It follows therefore, That there is 7 times as much matter in Gold as in a piece of Glass of the same Magnitude; and consequently, that at least six parts of seven in the bulk of Glass, must be Pore or Vacuity: This some favourers of the Atomical Philosophy have endeavoured to Solve, supposing the primary or constituent Atoms of Gold to be much larger than those of other Bodies, and consequently the Pores fewer; whereas in other Bodies, the great multitude of the interspersed Vacuities does diminish their Weights.

Being desirous to examine this Notion of the Magnitude of Atoms of Gold, I bethought my self of the Extreme Ductility of that Metal, which is seen in the beating of it into Leaf, and above all in the drawing fine Gilt-Wire; by means whereof, I believed I might most exactly obtain the true thickness of the Coat of Gold that appears even with the Microscope, so well to represent Gold itself, that not the least point of Silver appears through it. In order to this, I inform'd my self among the Wire-Drawers, what Gold they us'd to their Silver, and they told me, That the very best double Gilt-Wire, was made out of Cylindrick Ingots 4 Inches in circumference, and 28 inches long, which weigh 16 Pounds Troy; on these they bestow 4 Ounces of Gold, that is, to every 48 Ounces of Silver one of Gold: and that two Yards of the super-fine Wire weighs a Grain. Hence at first sight it appear'd, that the length of 98 Yards is in weight 49 Grains, and that a single Grain of Gold covers the said 98 Yards, and that the 10000th part of a Grain is above  $\frac{1}{3}$  of an Inch long; which yet may be actually divided into 10, and so the 100000th. part of a Grain of Gold is visible without a Microscope. But being desirous to compute the thickness of the Skin of Gold: by means of the specifick

Gravities of the Metals, *viz.* Silver  $10\frac{2}{3}$ , and Gold  $18\frac{2}{3}$ , I found the Diameter of such Wire the  $\frac{1}{386}$  part of an Inch, and its circumference the  $\frac{1}{23}$  part; but the Gold in thickness not to exceed the  $\frac{1}{13450}$  part of an Inch; whence it may be concluded, that the Cube of the hundredth part of an Inch would contain above 2433000000, (or the Cube of 1345) of such Atoms. And it may likewise be marvelled at, that Gold being stretcht to so great a degree as is here demonstrated, should yet shew itself of so even and united a Texture, as not to let the white Colour of the Silver under it appear through any the least Pores; which argues that even in this exceeding thinness, very many of those Atoms may still lie one over the other: Which is a Consideration may merit the Thoughts of this Honourable Society, as tending to examine that renowned Atomical Doctrine, which has of late much obtained among the Learned.

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