

$g = yy, h = 0, i = 0.$ in utroque casu fiet $Z =$

$$Z = \frac{yy}{n} + \frac{y^3}{n^4} + \frac{3y^5}{n^7} + \frac{12y^{11}}{n^{10}} \&c.$$

V.

*An Account of the Appearance of several Unusual
Parhelia, or Mock-Suns, together with several
Circular Arches lately seen in the Air by E. Halley.*

ON the Eighth of *April*, this present Year, 1702, walking in *London* Streets about ten in the Morning, the Air being clear, I observed the Sun to shine faintly, or as we call it, waterish; whereupon casting up my Eye, I perceived several Arches of Circles about him. I made what hast I could to get on the top of a House, which I did at Mr. *Mordens* by the Royal Exchange, and found the Appearance as is described in Figure 4. *Tab. 3°* wherein

S is the true Sun, Z the Zenith.

$STPP$ a great white Circle passing through the Sun, and as near as I could judge, parallel to the Horizon. It was very distinct and entire, about two Degrees broad in the *Northern* part about T ; and held much the same breadth in the *East* and *West*, but grew narrower towards the Sun, its edges were not very well defined, the whole appearing like a faint white Cloud, and a part of it would have been taken for such, but the whole Circle seen in the pure Azure Sky was a very surprizing sight.

$VNXI$ a Halo, or rather *Iris*, that was likewise an intire Circle, having the Sun for its Center. I measured the Semidiameter of this to be much about 22 Degrees: the breath of this Arch which was well defined, was by estimate equal to the Suns Diameter, and it was coloured with the Colours of the *Iris*, but nothing near so *vivid* as in the common Rainbow. The *Reds* were next the Sun, and the *Blews* in the outward Limb. Within this Circle the Sky appeared somewhat obscure, especially near the Arch; and I take it, that the cause of
that

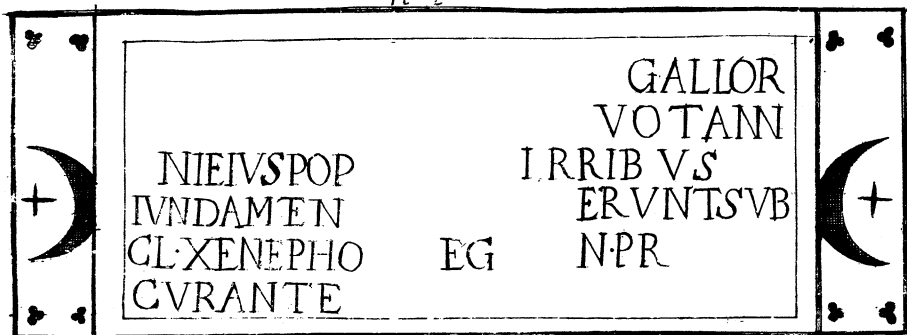
that Obscurity was likewise cause that the Sun shone so faint and waterish. I expected two *Parbelia* at *X* and *T* in the Intersections of this with the white Circle, having often seen them at that distance and position from the true Sun, but at this time none such appeared.

P V P. an arch of another Circle, of which only the upper part appeared, it was in all respects, both for breadth and Colours like the Circle *V N X T* which it touched in the Vertical Point *V*, but its Center was below at *N*, or near it. In the Intersections of this Arch with the white Circle on both sides were two very bright *Parbelia*, so luminous, that I do not remember to have seen the like, which were also tinged with Colours, especially on the side next the Sun, where they were very red. I measured their distance from the true Sun, and found it $31\frac{1}{2}$ Degrees. About *V* where the two Arches were coincident, it was very bright likewise, and the *Red* on the inside very strong, that some might have imagined another Sun there also, but the *Species* thereof was drawn out so in length, that it could not properly be called a *Parhelion*: This Arch *P V P* broke off on both sides, about five or six Degrees below the *Parbelia P. P.*

At *N*, or the lower part of the Circle *V N X T*, there appeared likewise a small piece of an Arch, which touched it there, after the same manner as *P V P* touched in *V*; it seemed to have its Center in *V*, and about *N* there appeared another longish red *Species*, such as at *V*, but not altogether so bright.

The height of the Sun, during the Observation, was from 40 to 45 Degrees, when Clouds interposing, no more was to be seen; the Weather was cooler than ordinary, with a gentle *NW* Wind. And it was plain that the Vapour which caused this Appearance, was higher than the Clouds, for they were seen to drive under the Circles.

Nº. 1.



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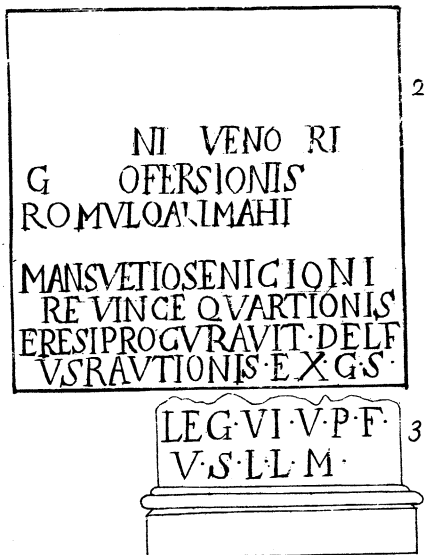
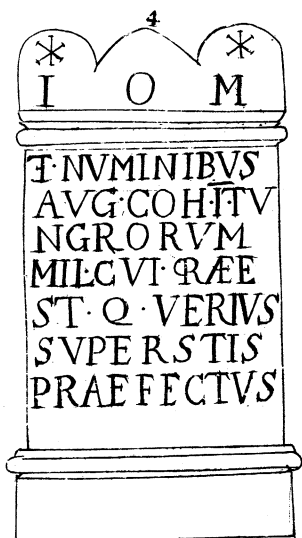
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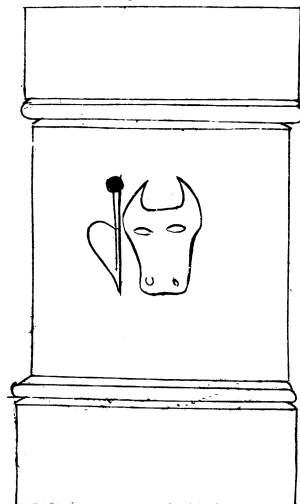
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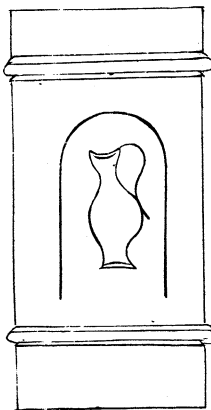
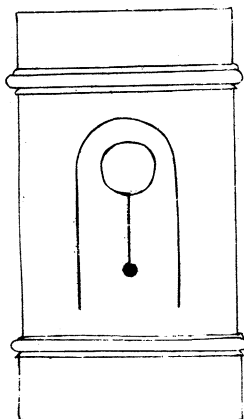
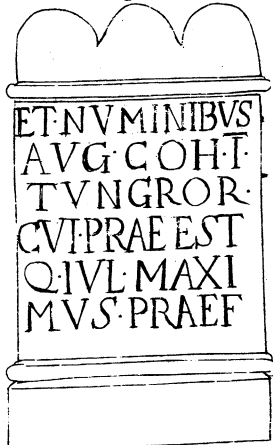
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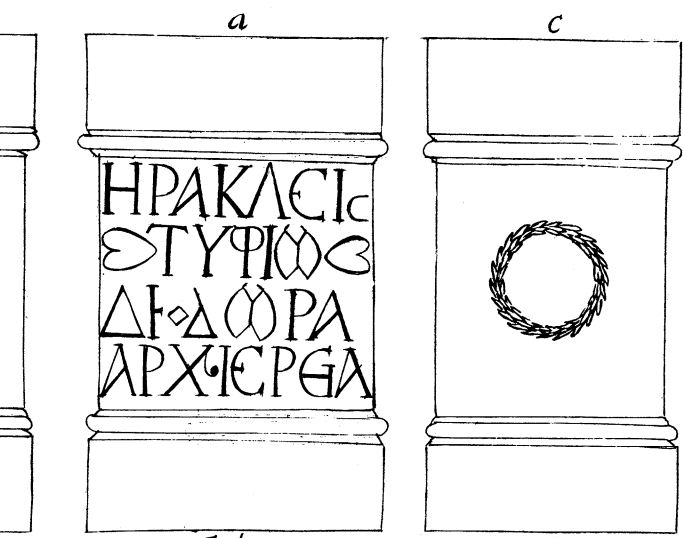
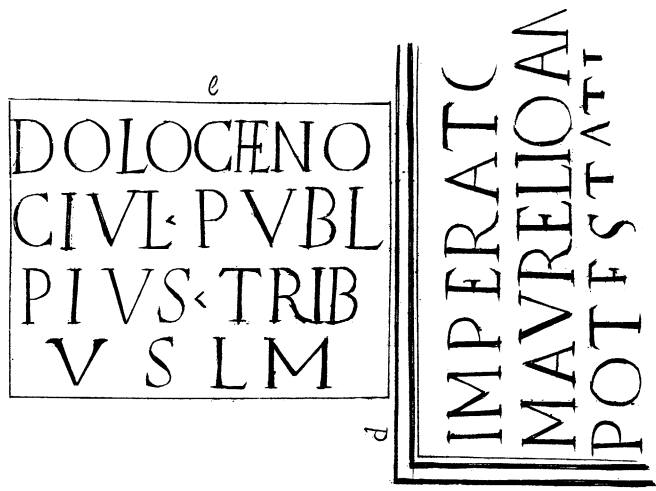
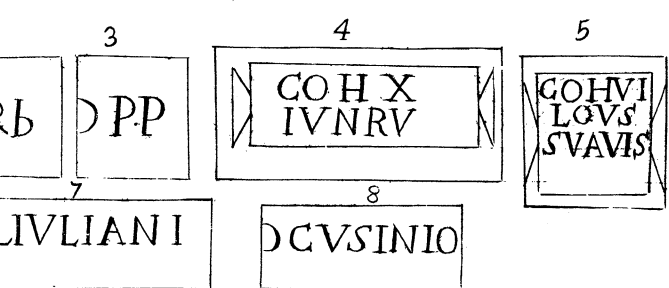
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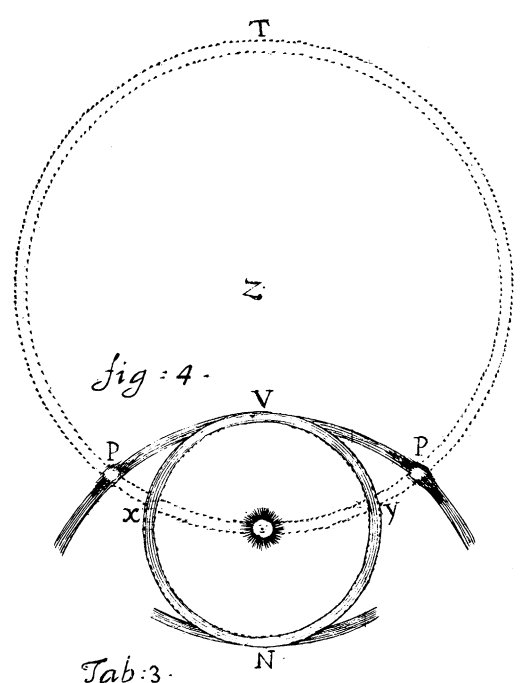
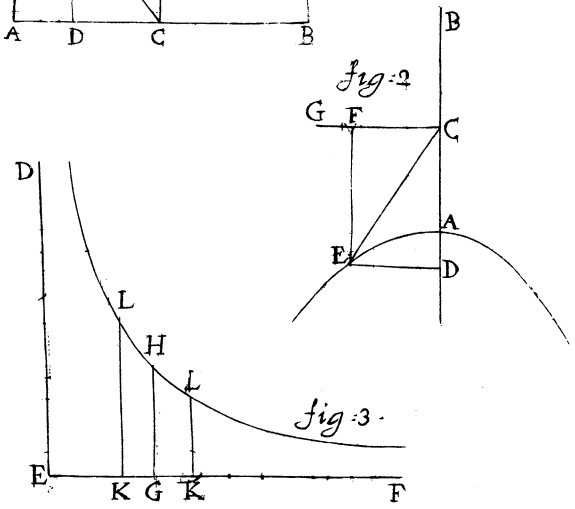
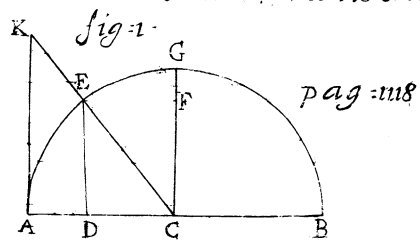
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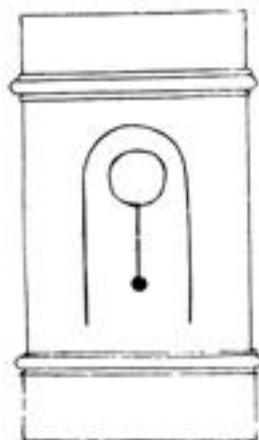
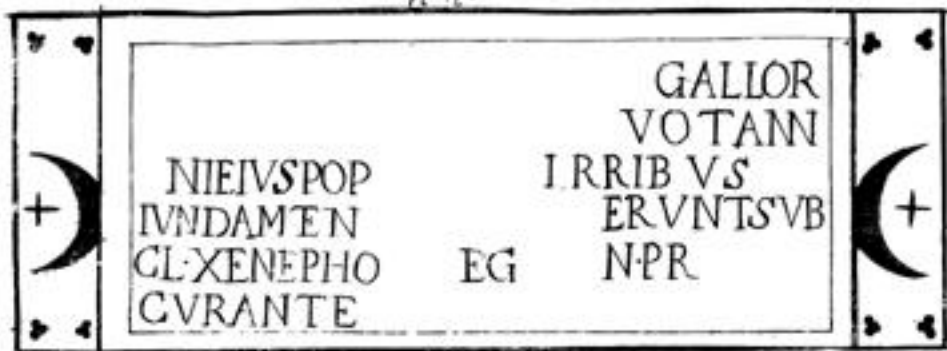
Tab. 1.



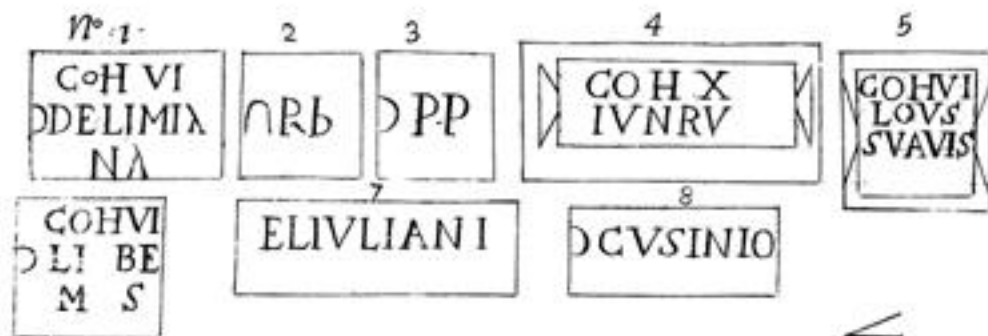
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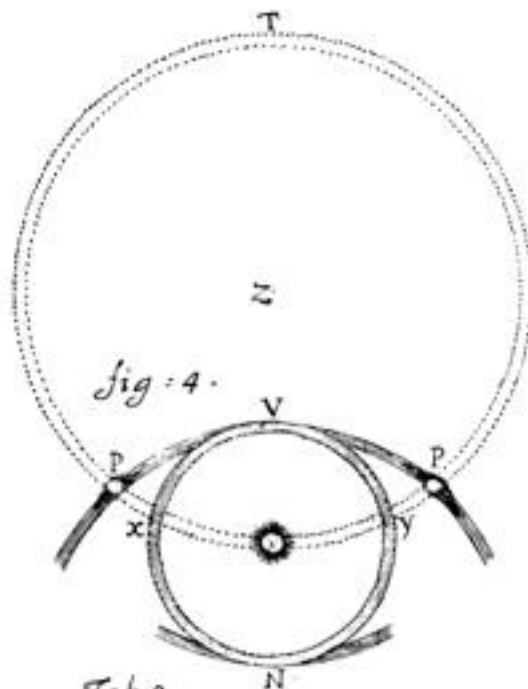
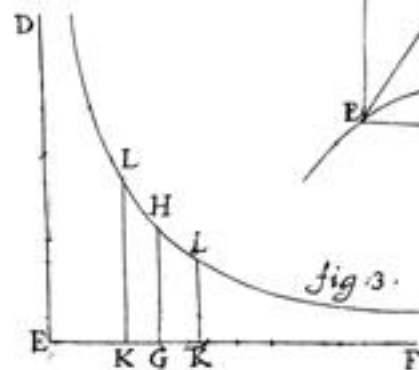
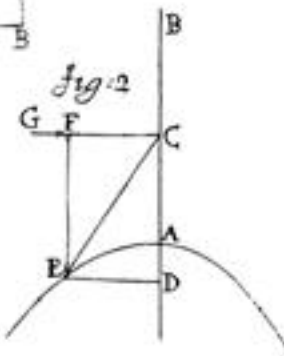
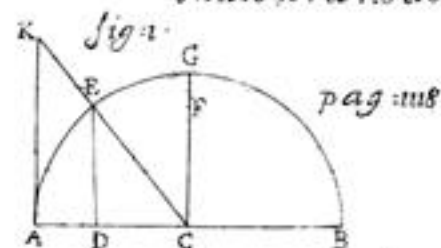
Tab:3.



Tab. 1.



Tab. 2.



Tab. 3.