

Color and the Cosmic Order

**Color Theories in Medieval
and Early-Modern Europe**

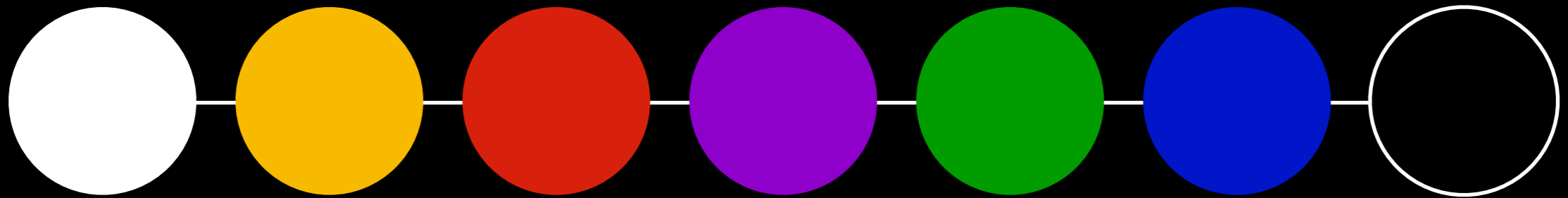
Peter Donahue
January 6th, 2024



color as Ratio

Of Sense and the Sensible

Linear color scale

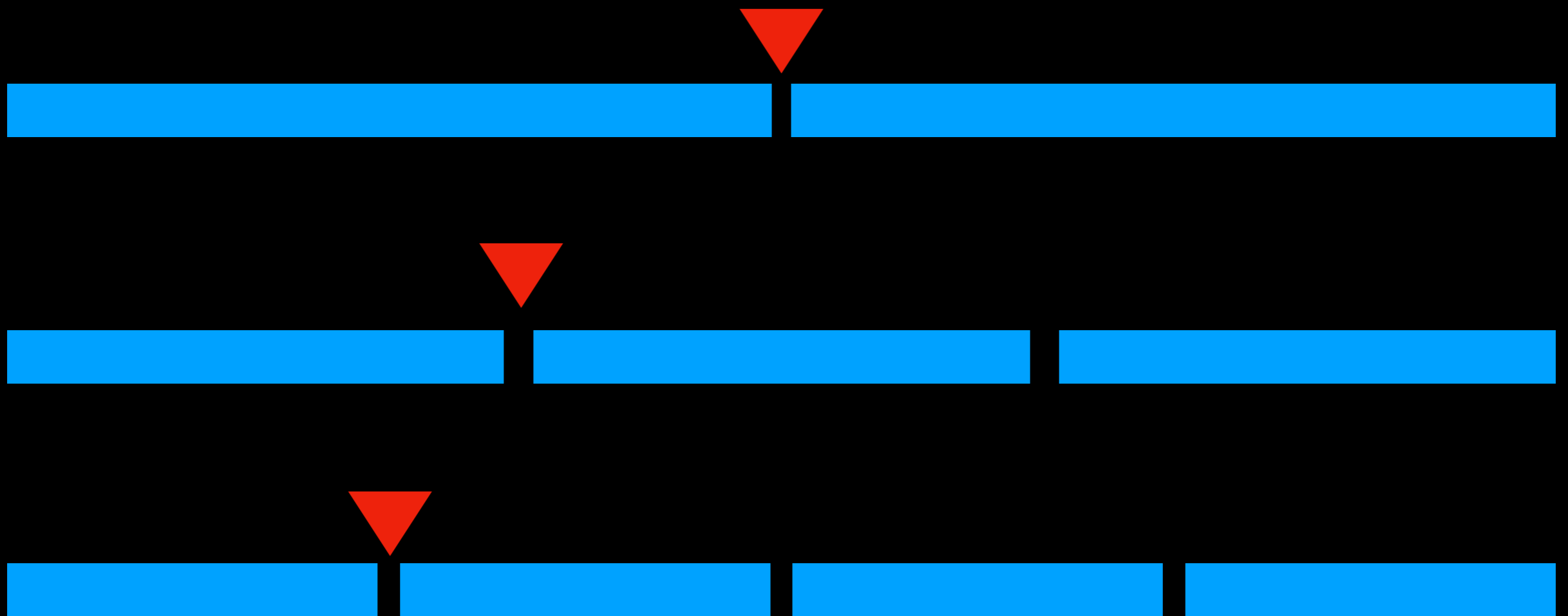


Aristotle, Of Sense and the Sensible

We may suppose that [of this plurality of colors] many are the result of a [numerical] ratio; for the black and white may be juxtaposed in the ratio of 3 to 2 or of 3 to 4, or in ratios expressible by other numbers; while some may be juxtaposed according to no numerically expressible ratio, but according to some relation of excess or defect in which the black and white involved would be incommensurable quantities; and, accordingly, we may regard all these colours as analogous to the sounds that enter into music, and suppose that those involving simple numerical ratios, like the concords in music, may be those generally regarded as most agreeable...

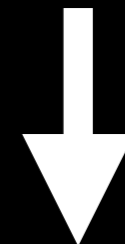
Pythagoras

2:1	Diapason	Octave
3:2	Diapente	Fifth
4:3	Diatesseron	Fourth

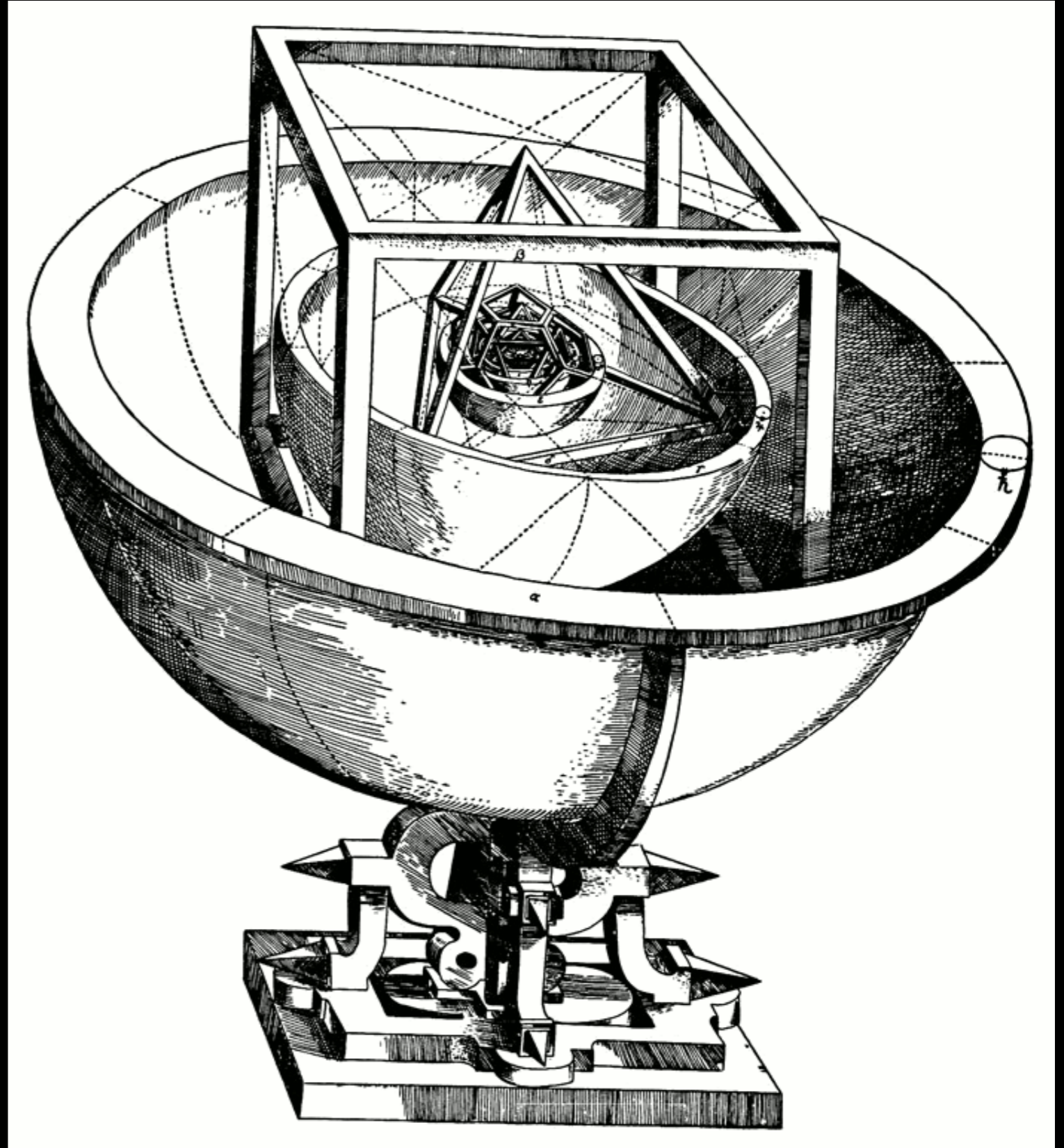


Pythagoras

Syntonic Comma



Kepler

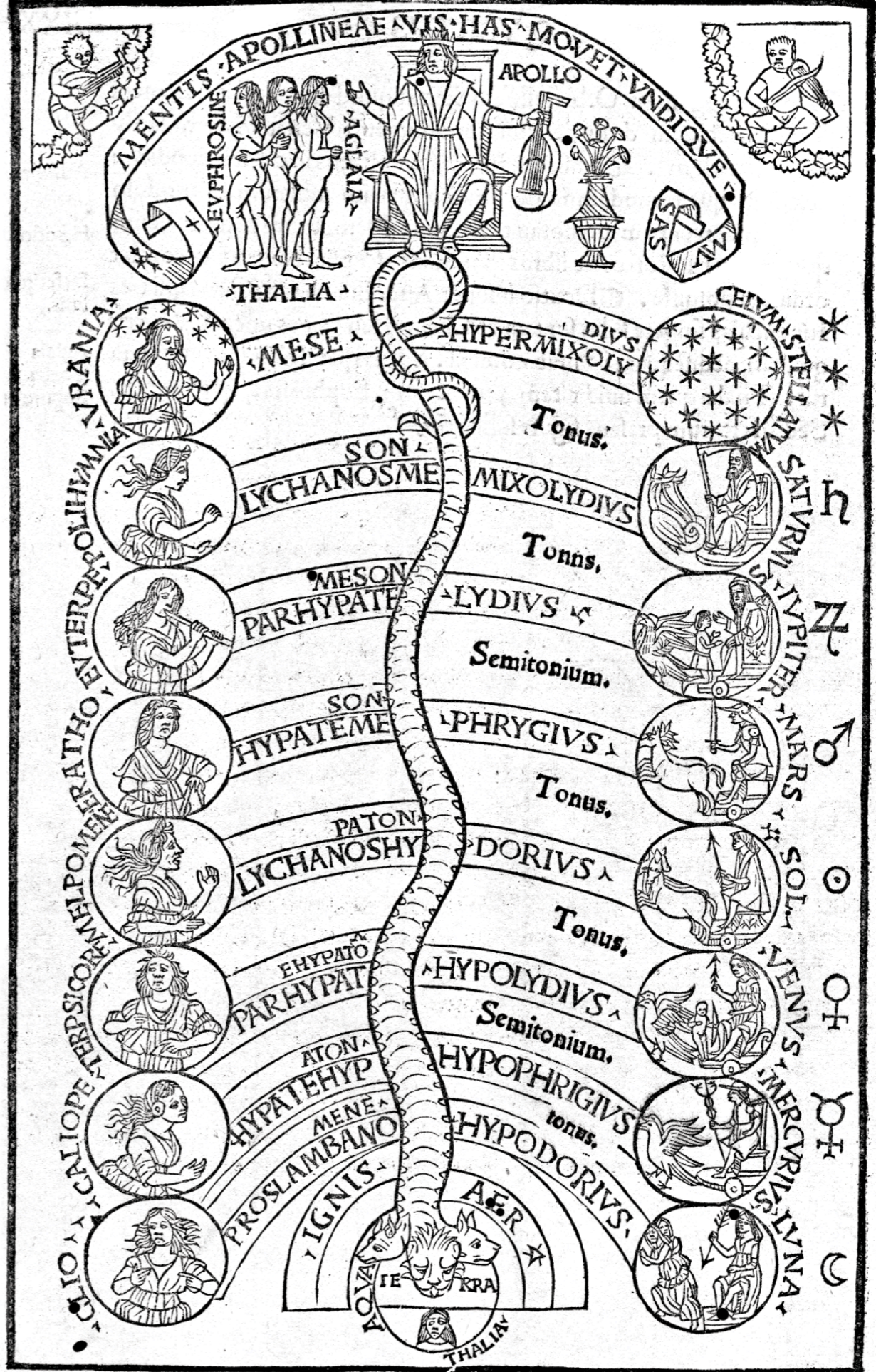


Galileo

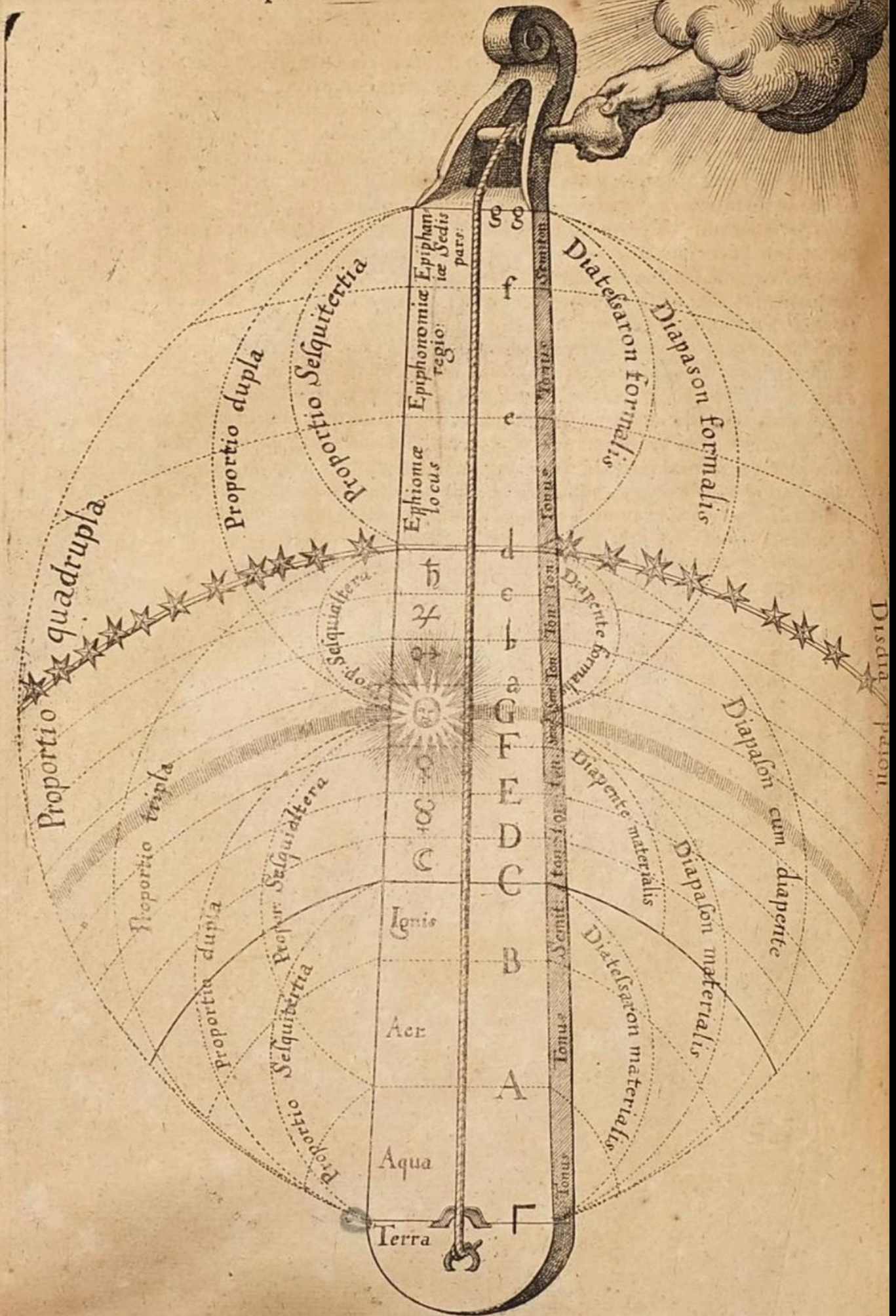


Gaffurio 1496

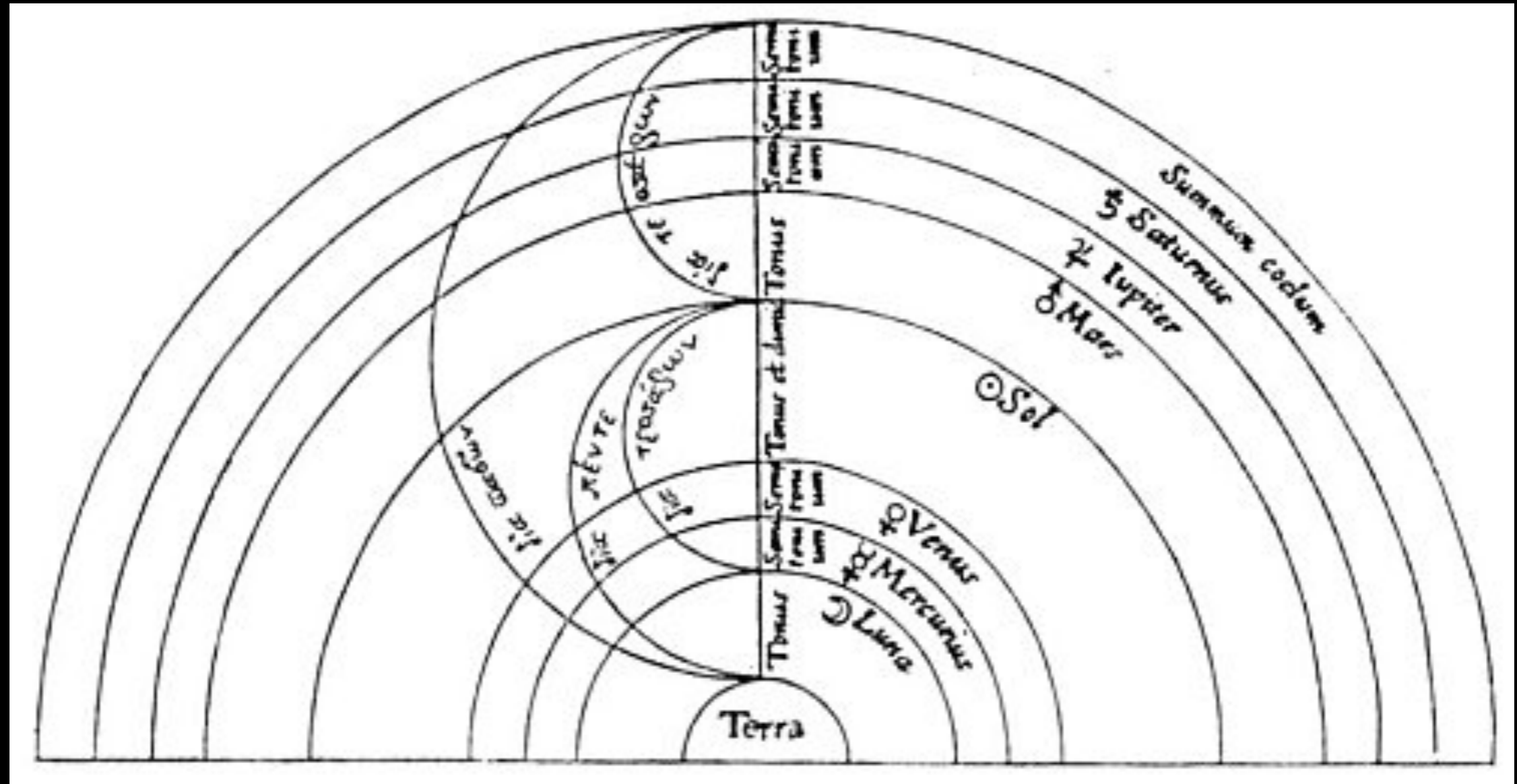
LIBER



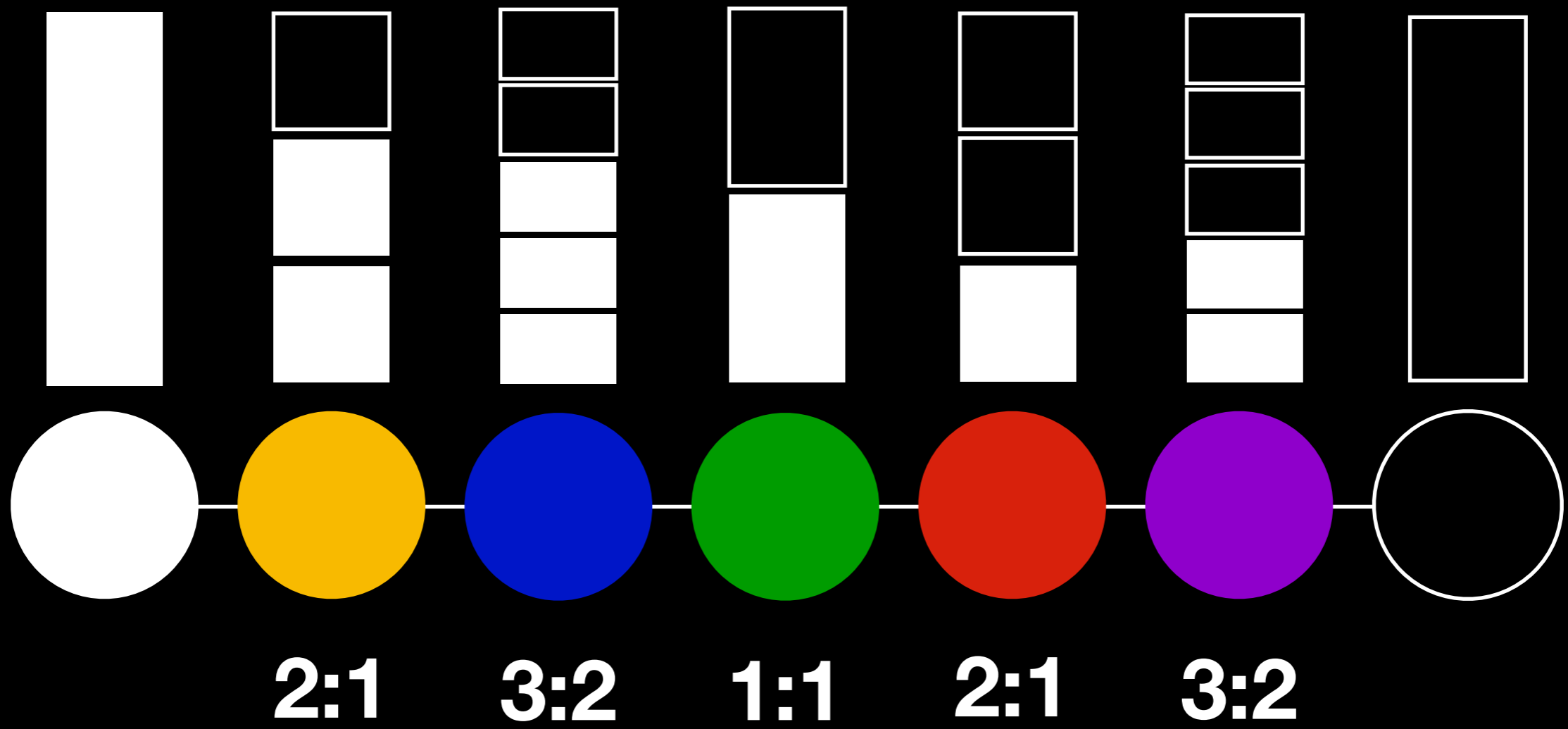
Fludd 1617



Stanley 1656



Mainetti 1555

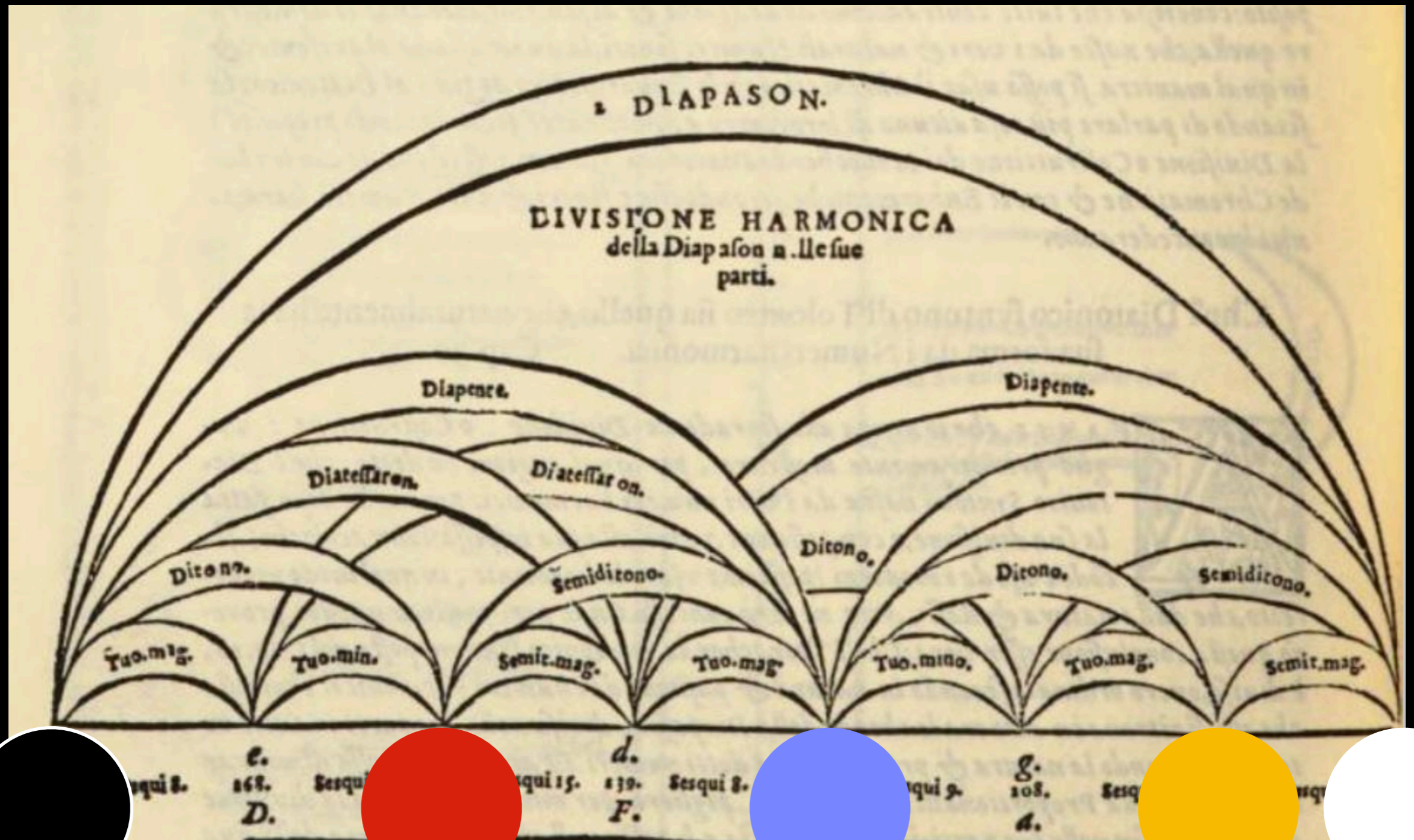


Zarlino 1558

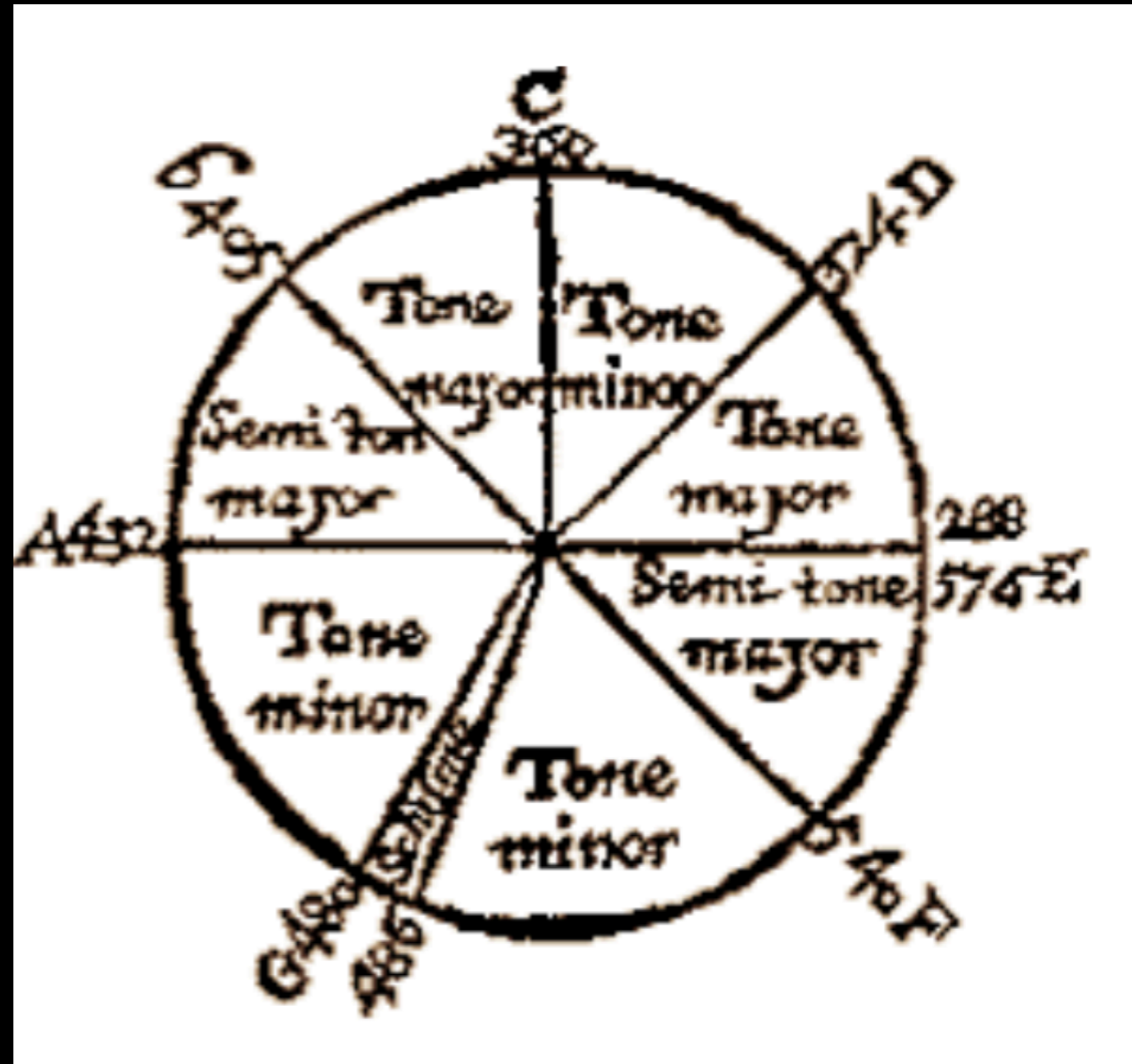
2:1	Diapason	Octave
3:2	Diapente	Fifth
4:3	Diatesseron	Fourth
5:4	Ditone	Major Third
5:6	Semi-Ditone	Minor Third

Zarlino 1558

Mocenigo 1581

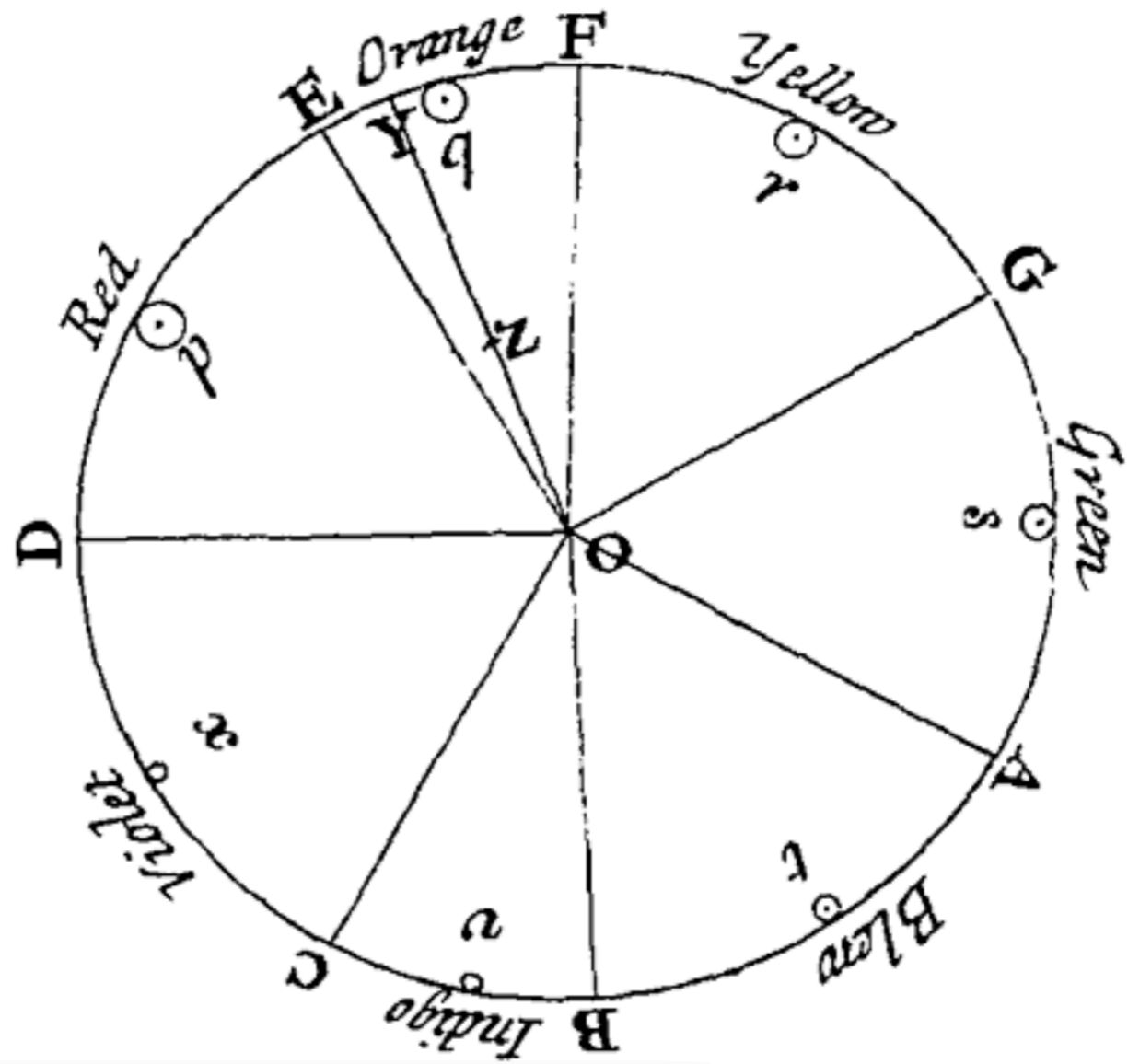


Descartes 1650



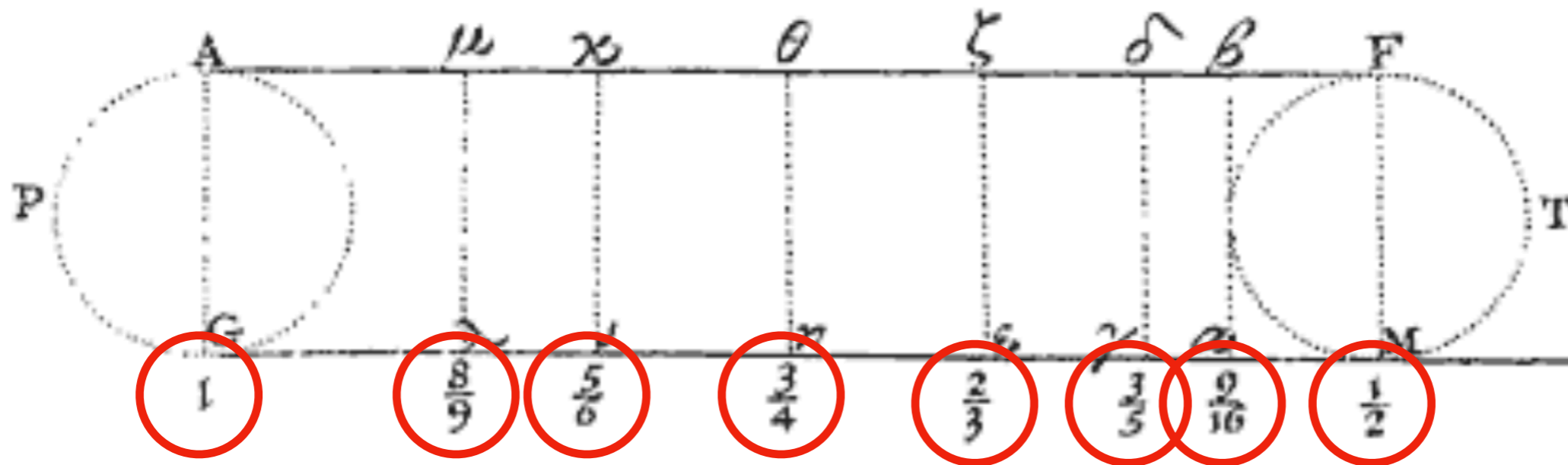
Newton 1704

Fig. 11.



Newton 1704

Fig. 4.



color as Divine Splendor





Because the new part rejoins the anterior
The room lit in its center gleams
Because what blends with the very clear clarity
And because a new light [*lux nova*]
Traverses it, the noble work shines forth.



Lux — the light itself, as a source.

Lumen — The aspect of light carried through space by a transparent medium.

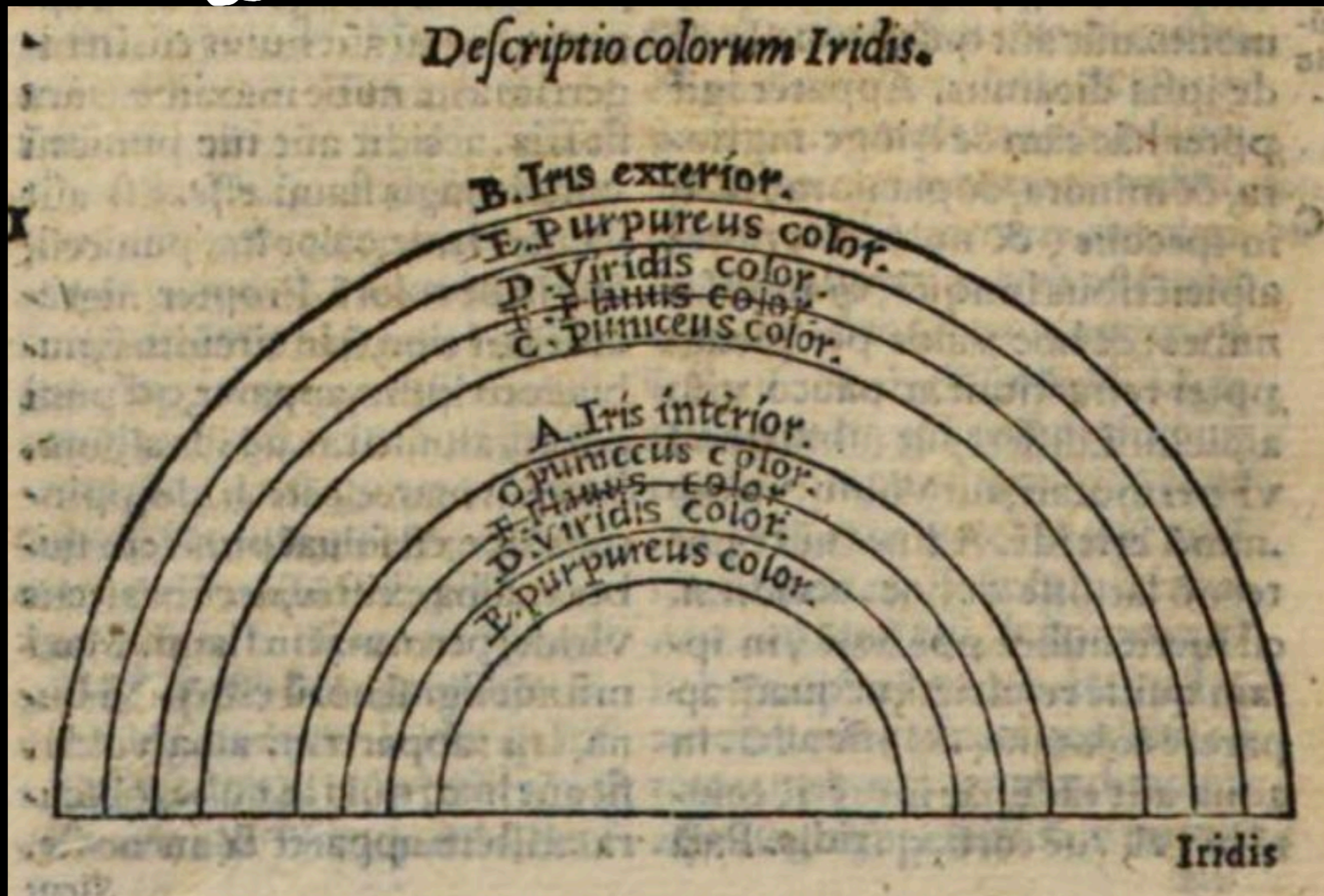
Splendor — the reflection of light by opaque bodies.

color Mixing

Aristotle, Meteorology

Each [bow of a double rainbow] is three-coloured; the colours are the same in both and their number is the same, but in the outer rainbow they are fainter and their position is reversed. In the inner rainbow the first and largest band is red; in the outer rainbow the band that is nearest to this one and smallest is of the same colour: the other bands correspond on the same principle. These are almost the only colours which painters cannot manufacture: for there are colours which they create by mixing, but no mixing will give red, green, or purple.

Meteorology



- From a Latin edition of *Meteorology*, 1562

Colores iridis primarii sunt tres:
Puniceus : viridis : purpureus.

Nicols 1652

cause. The *primarii colores*, or especiall colours which arise not from the commixtion of other colours are these.

White, black, blue or skie colour, yellow, red, *miniatus color*, or vermilion or fiery red. Almost

Boyle 1664

to you, that there are but few Simple and Primary Colours (if I may so call them)

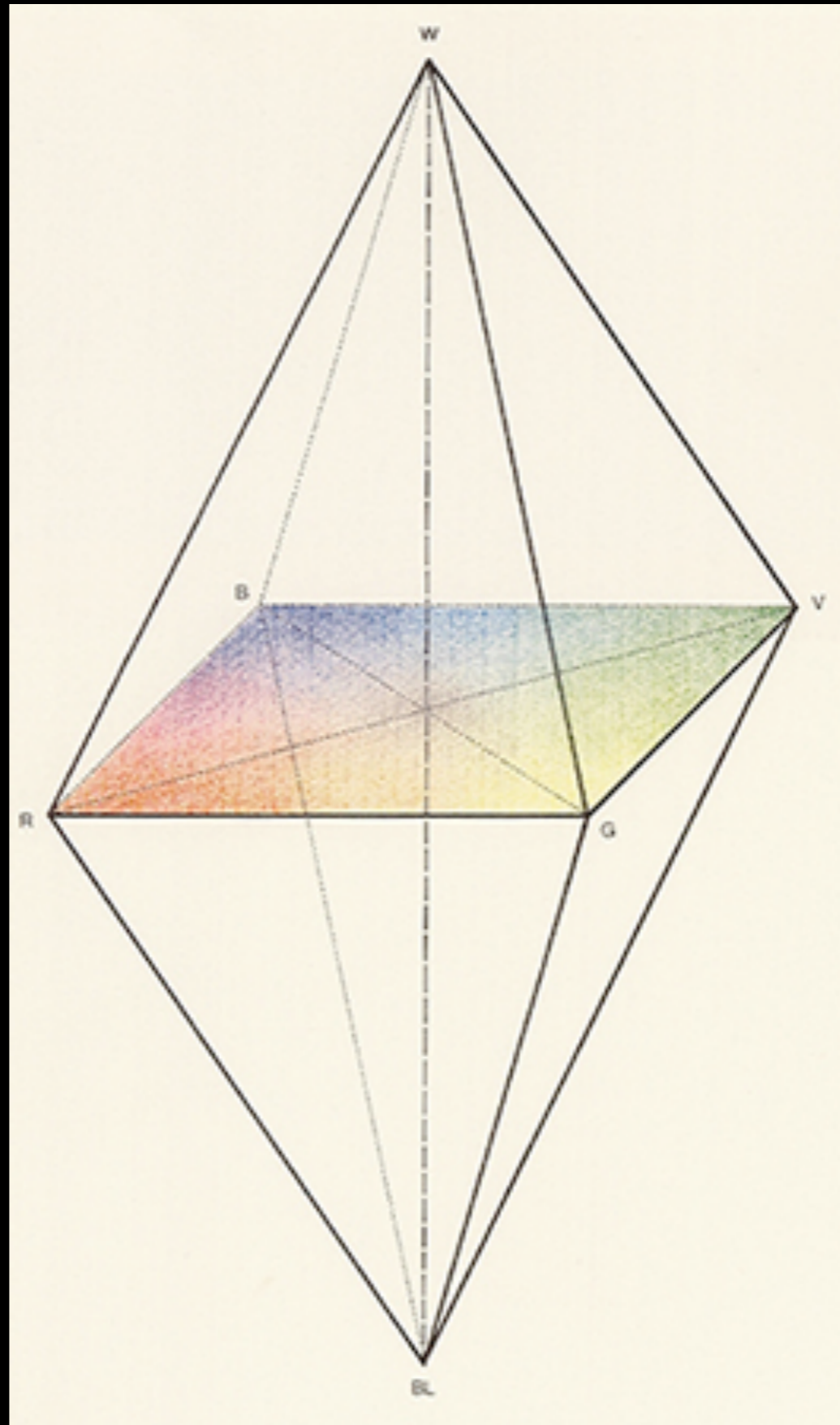


- **San Benedetto Altarpiece, 1407-9, Lorenzo Monaco.**



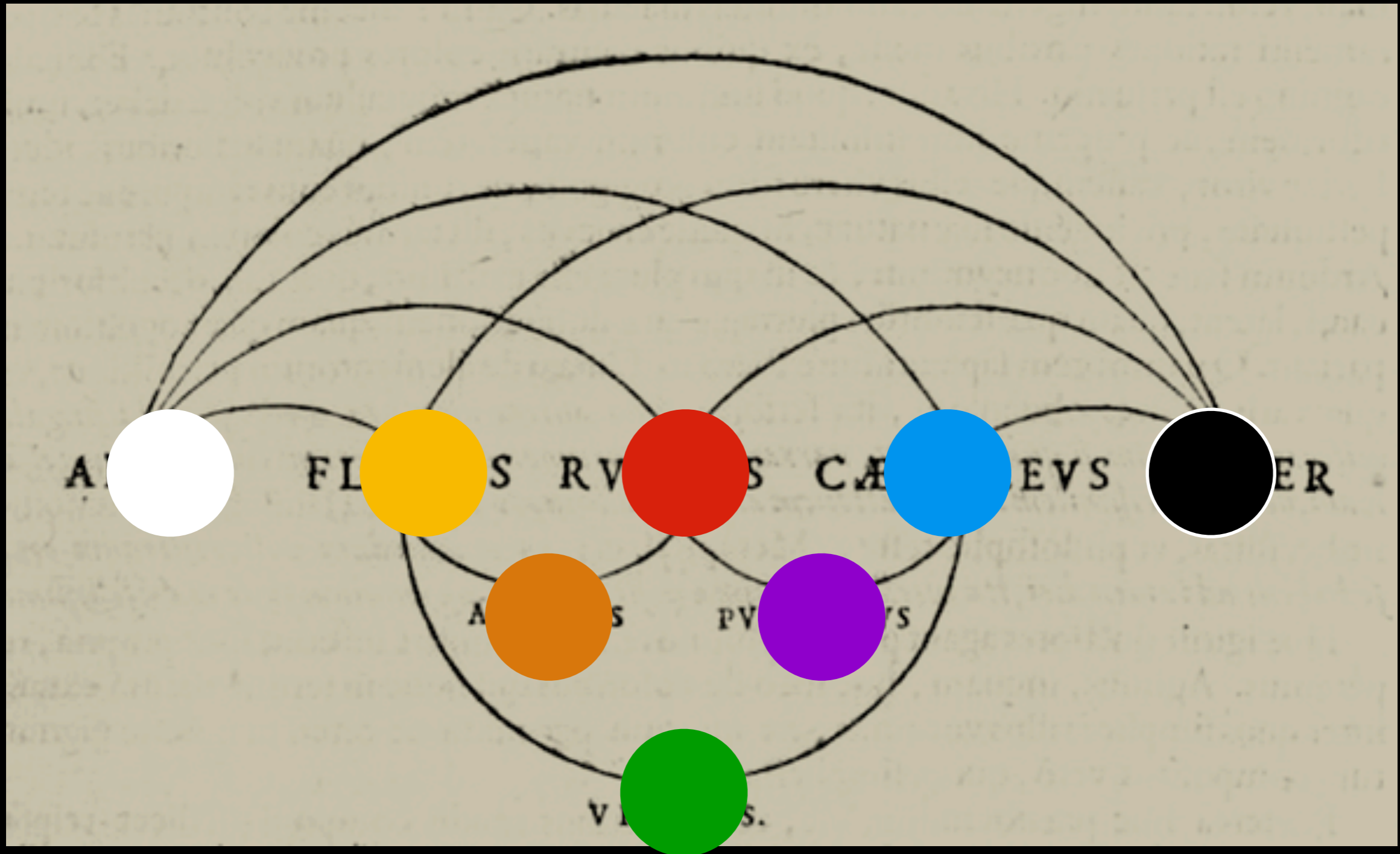
• Van Eyck, 1434

Alberti 1435

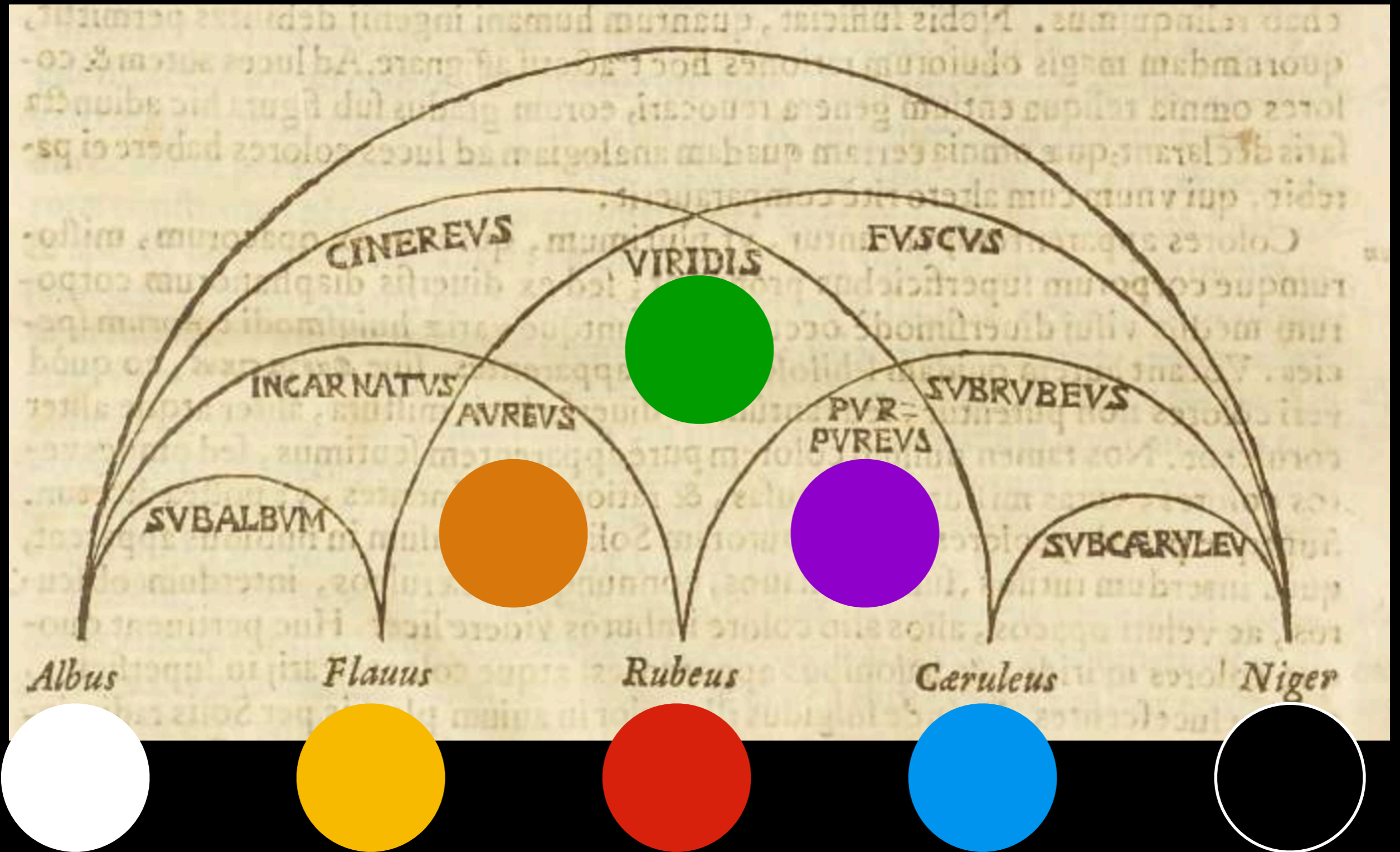


Modern interpretation
from colorsystem.com

D'Aguilon 1613



Kircher 1646



Boyle 1664

to you, that there are but few Simple and Primary Colours (if I may so call them)

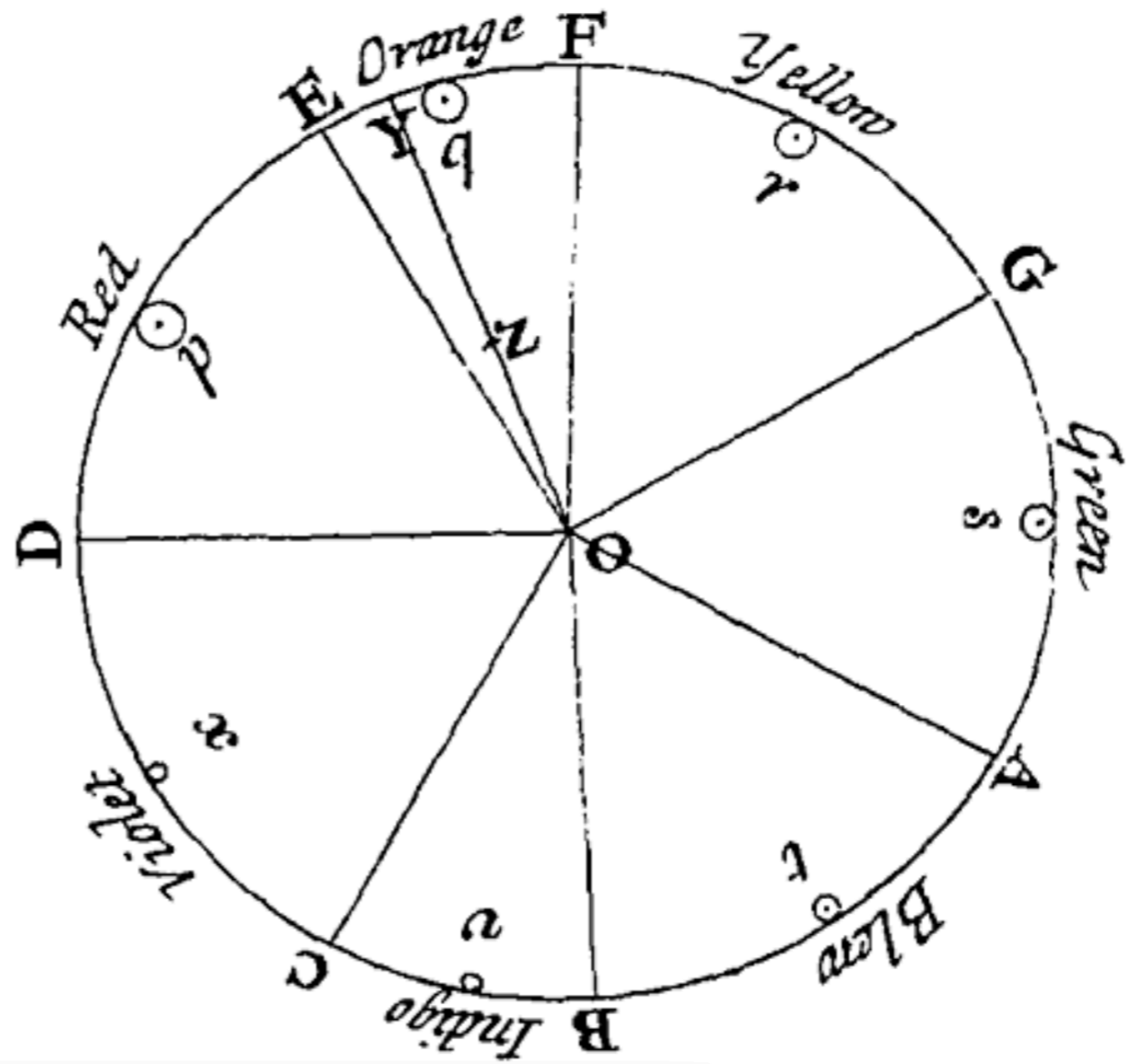
from whose Various Compositions all the rest do as it were Result. For though Painters can imitate the Hues (though not always the Splendor) of those almost Numberless differing colours that are to be met with in the Works of Nature, and of Art, I have not yet found, that to exhibit this strange Variety they need imploy any more than *White*, and *Black*, and *Red*, and *Blew*, and *Yellow*; these five, Variously Compound-

Petty 1667

“ But the *Colorantia colorata* are of three sorts, *viz.*
“ Blew, Yellow, and Red; of which Logwood, old
“ Fustick, and Mather, are the *Polychresta* in the pre-
“ sent & common practices, being one of each sort. The
“ Blews are Woad, Indico, and Logwood: The Yel-
“ lows are Weld, Wood-wax, and old Fustick, as also
“ Turmerick now seldom used: The Reds are Red-
“ wood, Brazel, Mather, Cochineel, Safflowrs, Ker-
“ mes-berries, and Sanders; the latter of which is
“ seldom used, and the Kermes not often. Unto these
“ *Arnotto* and young Fustick, making Orange colours,
“ may be added, as often used in these times.

Newton 1704

Fig. 11.



For the Rays to speak properly are not coloured. In them there is nothing else than a certain Power

and Disposition to stir up a Sensation of this or that Colour. For as Sound in a Bell or musical String, or other sounding Body, is nothing but a trembling Motion, and in the Air nothing but that Motion propagated from the Object, and in the Sensorium 'tis a Sense of that Motion under the Form of Sound; so Colours in the Object are nothing but a Disposition to reflect this or that sort of Rays more copiously than the rest; in the Rays they are nothing but their Dispositions to propagate this or that Motion into the Sensorium, and in the Sensorium they are Sensations of those Motions under the Forms of Colours.