

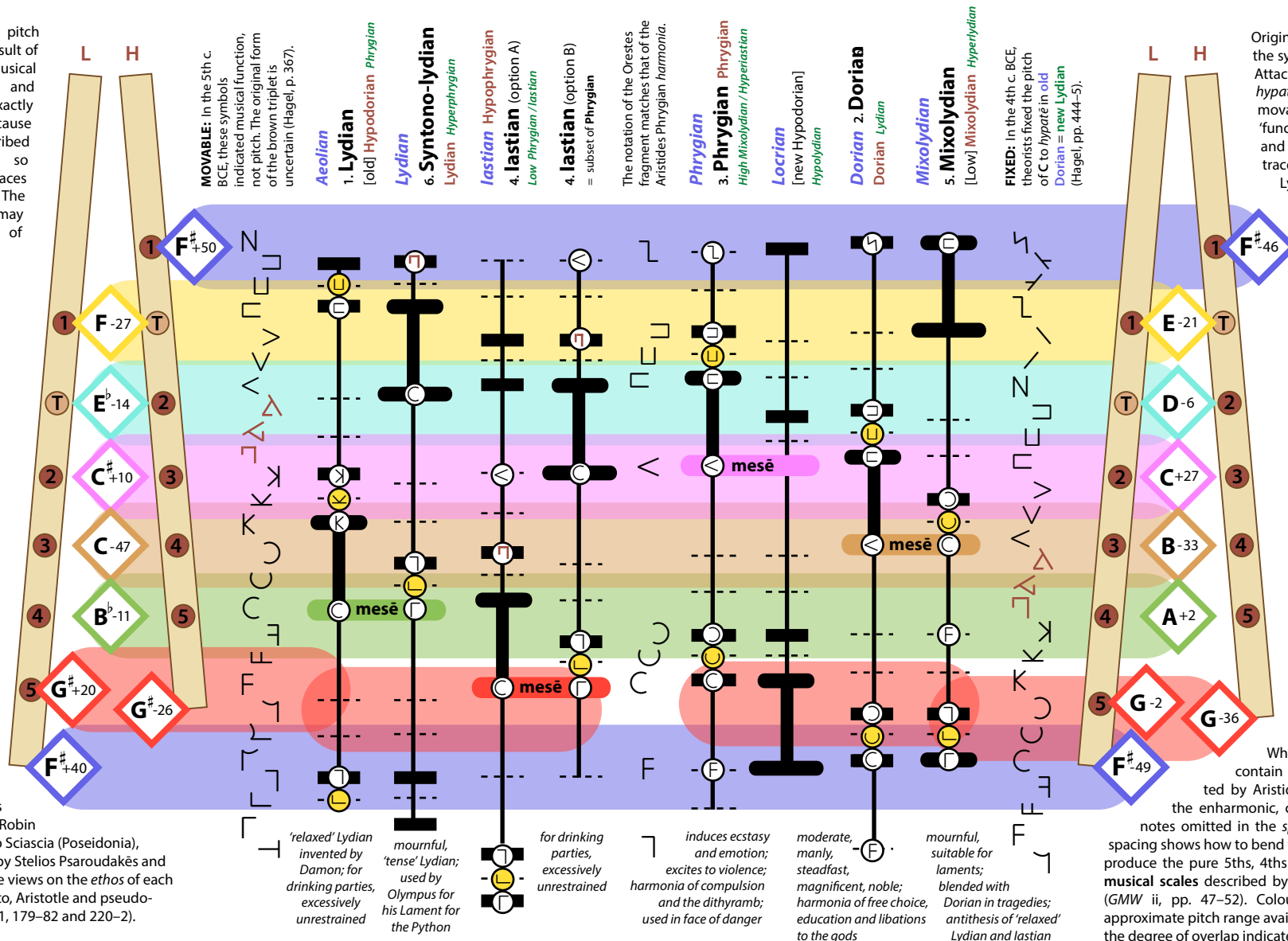
Key to an evolving nomenclature: Early 5th-c. names transmitted by Heraclides *et al.* experimentally attached to a tonal system compatible with the Poseidonia and Pydna auloi (see Diagram 1) | Late 5th-c. names transmitted by Aristides Quintilianus of 6 scales corresponding to the *harmoniai* of Plato's *Republic* (c. 380 BCE) | Early 4th-c. names used by aulos makers for a system of 7 *tonoi* in which Dorian and Phrygian are spaced a tone apart, the other *tonoi* a $\frac{3}{4}$ -tone apart | Late 4th-c. names used by Aristoxenus for a system of 13 *tonoi* all spaced a semitone apart. *Selected reading:* Stefan Hagel, *Ancient Greek Music* (2009), pp. 375–7 and 430–4; and Andrew Barker, *Greek Musical Writings* (GMW) i, pp. 163–9, 281–4; ii, pp. 153–4, 419–22.

The *harmoniai* of Plato's *Republic*: one of many possible auletic solutions

Scholars agree that the pitch drop of Dorian was the result of paradigm shift in musical behaviour between 450 and 350 BCE. What exactly changed is uncertain because the 12-tone system described by Aristoxenus proved so successful that few traces remain of its precursors. The best evidence for them may be the hole boring of 5th-century aulos.

Poseidonia aulos buried c. 480 BCE at Paestum, Italy found 1969

This diagram modifies Hagel's Diagram 11 (p. 42). Modifications were prompted by experiments playing reproductions by Robin Howell (Pydna) and Marco Sciascia (Poseidonia), based on measurements by Stelios Psaroudakēs and using reeds by Howell. The views on the *ethos* of each *harmonia* are those of Plato, Aristotle and pseudo-Plutarch (GMW i, pp. 130–1, 179–82 and 220–2).



Originally, the meaning of the symbol C was functional. Attached to either *mesē* or *hypatē*, its pitch was movable. Hagel calls this 'functional notation' (p. 383) and notes that 'we find traces of this 'transposing Lydian' approach well into late antiquity, especially in instrumental scores' (p. 445).

Pydna aulos buried 400–350 BCE at Pydna, Greece found 1996

Here the *harmoniai* are paired in four 'Unmodulating Systems,' each with its *mese* on a different fingering. White and gold circles contain the notation transmitted by Aristides. Dotted lines show the enharmonic, chromatic and diatonic notes omitted in the *spondeion* scale. Vertical spacing shows how to bend the instrument scale to produce the pure 5ths, 4ths and major 3rds of the musical scales described by Plato's friend Archytas (GMW ii, pp. 47–52). Coloured bands show the approximate pitch range available on each fingering; the degree of overlap indicates how far the hole-boring is from equi-heptatonic tuning. The bands are centred on the median pitches estimated in diamonds (Hagel, in preparation). On any pipe, one of the two lowest pitch bands is unavailable; which, depends on whether hole 5 is open or closed.

Barnaby Brown, *Descending Equi-heptatonic Circuits*. Diagram 2

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emaproject.eu/events/euterpe/resources | Updates & discussion: doublepipes.info/descending-equiheptatonic-circuits