

Orthios as a Quality of Sound

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An attempt to interpret the famous ancient musical composition known as ὄρθιος νόμος requires an analysis of all available evidence connecting ὄρθιος with sounds. The most extensive description of this nome (Dio 1. 1) ascribes it a military (or generally stimulating) character. This conforms with a number of passages, where an ὄρθιος sound ‘makes one stand up’ to help, or to fight, i.e. it stimulates dynamic activity. Perhaps, then, this was the initial meaning of the adjective, from which it eventually morphed to mean ‘sonorous’ or ‘piercing’. It seems that a sound could be made piercing and pervasive both by its volume and by its pitch, therefore ὄρθιος as a quality of sound frequently correlates with ‘loud’ and ‘high’. Nevertheless, a common interpretation that equates ὄρθιος with ὀξύς is unwary: the conventional metaphor in ancient Greek concerning a sound’s pitch is ὀξύς — βαρῦς (‘sharp’ — ‘heavy’), whereas the spatial metaphor of vertical (‘high’ — ‘low’) is not reliably attested. Another characteristic of sound that our sources correlate with ὄρθιος is ‘strained’ (ἔντονος, ἀνάτασιν ἔχων, ἀνατεταμένως), which in its turn likely indicates loudness (but does not literally translate as either ‘high’ or ‘swift’) and physical effort on behalf of the performers, or else the ethos of a musical piece, which transmitted tension to the audience.

Keywords: Ancient Greek music, nomes, *orthios*.

This paper continues my reflections on the famous ancient musical composition known as ὄρθιος νόμος, which could be both citharodic and auletic. I have already argued¹ that, in spite of what Pollux (4. 65), Hesychius (ο 1188 Latte) and the *Suida* (ο 575) claimed, this name was unlikely due to the piece’s rhythm. Modern scholars who do not accept Pollux’ explanation typically believe that ὄρθιος was a characteristic of pitch.² If true, then our understanding of the way in which pitch was indicated in ancient Greek must be called into question: the metaphor used for high pitch is generally agreed to be “sharp” (ὀξύς) — not “high”. Less numerous are those who link the name ὄρθιος to the overall character of the nome, and even here high pitch may be thought to form one of its characteristic features.³

¹ Almazova 2019.

² Graf 1888, 512–523; Smyth 1904, 167; Salazar 1954, 278; 302; Del Grande 1960, 424; Pintacuda 1978, 43; id. 1982, 17 n. 1; Barker 1984, 252.

³ Volkmann 1856, 70: corresponding in mood to Hom. *Il.* 11. 10–11; Crusius 1894, 52 n. 65: an elevated genre, ‘hohe Liede’ of Apollo; Weil–Reinach 1900, 105: “dans une tessiture claire, perçante, c’est-à-dire aiguë”; Wilamowitz-Moellendorf 1903, 90: “die laute Weise”; Olivieri–Pannain 1917, 122: “in una tessitura risonante, dignitosa, in un tono alto e solenne”; Schmidt–Stahlin 1929, 405 n. 7: “Plut. *De Pyth. or.* 6 deutet μουσικὰ ὀρθά ‘die strenge’, Aristid. *or.* 46 p. 383 Dind. ‘die richtige’ Musik”; van Daele 1960, 13: “un hymne guerrier”; 136 n. 3: “vif et entraînant”. Gevaert 1881, 317 accepts all the variants at once: the nome of Terpander was named by rhythm, other orthian nomes by high pitch and elevated character.

Let us analyse the testimonies which connect the word ὄρθιος with sounds. The most extensive description of the orthian nome is provided by Dio Chrysostomus (1. 1):

Φασί ποτε Ἀλεξάνδρῳ τῷ βασιλεῖ τὸν αὐλητὴν Τιμόθεον τὸ πρῶτον ἐπιδεικνύμενον αὐλῆσαι κατὰ τὸν ἐκεῖνου τρόπον μάλα ἐμπείρως καὶ μουσικῶς, οὐ μαλακὸν αὐλῆμα οὐδὲ ἀναβεβλημένον οὐδὲ τῶν πρὸς ἄνεσιν καὶ ῥαθυμίας ἀγόντων, ἀλλ' αὐτὸν οἶμαι τὸν ὄρθιον τὸν τῆς Ἀθηνᾶς ἐπικαλούμενον νόμον. καὶ τὸν Ἀλέξανδρον εὐθὺς ἀναπηδήσαι πρὸς τὰ ὄπλα τοῖς ἐνθέοις ὁμοίως· οὕτω σφόδρα ἐπαρθῆναι αὐτὸν ὑπὸ τοῦ μέλους τῆς μουσικῆς καὶ τοῦ ῥυθμοῦ τῆς αὐλήσεως.

The story goes that when the aulos-player Timotheus gave his first exhibition before King Alexander, he showed great musical skill in adapting his playing to the king's character by selecting a piece that was not languishing or slow nor of the kind that would cause relaxation or listlessness, but rather, I fancy, the orthian nome which also bears Athena's name and none other. They say, too, that Alexander at once bounded to his feet and rushed for his arms like one possessed, such was the exhalation produced on him by the tones of the music and the rhythmic beat of the rendering.⁴

Cf. *Suid.* s. v. Ὀρθιασμάτων (ο 573):

Τιμόθεος ὁ αὐλητὴς ἤλπει ποτὲ τῆς Ἀθηνᾶς τὸν ὄρθιον νόμον καλούμενον καὶ ἐς τοσόνδε ἐξέπληττεν Ἀλέξανδρον τοῖς μέλεσιν, ὡς μεταξὺ καὶ ἀκούσαντα αἴξει ἐπὶ τὰ ὄπλα. τὸν δὲ φάναί, ὅτι τοιαῦτα χρῆ εἶναι τὰ βασιλικά αὐλήματα.

Timotheus the aulete once played on his aulos the nome of Athena named *orthios* and stroke Alexander so much with the music that in the middle of the performance he rushed for his arms. And Timotheus said that royal aulos-music ought to be such.

This anecdote is first attested in Plutarch (*de Alex. fort. aut virt.* 335A), yet through a slip of memory⁵ he gets his names mixed up, identifying the aulete Antigenides instead of Timotheus and the chariot nome instead of the orthian. Shorter versions of the same story occur several more times in Byzantine literature,⁶ and the interpretation of ὄρθιος νόμος as martial is attested in the scholia to Aeschylus.⁷ The episode must have formed part of a more elaborate story of how Timotheus was able to manipulate Alexander's mood with his art and used it for the benefit of the king, preventing him from running to extremes.⁸ It certainly arose in philosophic circles, which adhered to the doctrine of an ethical impact of music, and can hardly claim any historical credibility. However, it cannot be ruled out that the story was invented by an author from the fourth or the third century BC who could still listen to the nomes being performed and judge them from personal experience,

⁴ Translation: Cohoon 1971, 3 with minor changes.

⁵ See Almazova 2014, 524.

⁶ *Suid.* s. v. Ἀλέξανδρος (α 1122); s. v. Τιμόθεος Θερασάνδρου (τ 620). Eustath. *Comm. ad Hom. II.* 3, p. 137. 10–13. Maximi Planudis in *Hermog. comm. in librum Περὶ ἰδεῶν* vol. 5 p. 458 Walz. Anonymi in *Hermog. comm. in librum Περὶ ἰδεῶν* vol. 7 p. 903 Walz. Anna Comnena, *Alexias* 4. 1. 16; 9. 5. 1; Euthymius Tornices, *Or.* 1. 2; Michael Choniates, *Or.* 4. 24, vol. 1 p. 101 Lampros; Nicolaus Mesarites, *Seditio Ioanni Comneni* p. 34 Heisenberg.

⁷ *Sch. Aesch. Sept.* 954b Smith: τὸν ὄξυν νόμον· τὸν ὄρθιον καὶ εἰς μάχην παρακλητικόν, ᾧ κατὰ τῶν ἀντιπάλων χρῶνται οἱ ἐν πολέμῳ.

⁸ This story is recounted below by Dio himself (1. 6–7), and besides by Himerius (*Orat.* 16. 3 [p. 104. 12–19 Colonna]) and Sopater (*Schol. ad Hermog.* 5, p. 21. 19–21 Rabe = vol. 4 p. 50. 28 Walz). Its source is unknown, see Wegehaupt 1896, 46; Brussich 1995, 150.

and he specifically chose the orthian nome because of its military (or generally stimulating) character.

Unfortunately, the interpretation of this nome in the Imperial period could equally be an αὐτοσχεδίασμα. Those who never heard it and possessed no information had to resort — just as we do now — to considering the name ὄρθιος, ‘making stand up’, to be suitable for an ‘incentive’ nome. Besides, the grammarians may have been influenced by the widely-known Homeric verse in which Eris inspires the Achaeans to courage with a loud cry (*Il.* 11. 10–11):

ἔνθα σταῶσ' ἤϊσε θεὰ μέγα τε δεινόν τε
ὄρθι'. Ἀχαιοῖσιν δὲ μέγα σθένος ἔμβαλ' ἑκάστω.

There stood the goddess and uttered a great and terrible shout, a shrill cry of war, and in the heart of each man of the Achaeans she put great strength...⁹

The shout of the goddess produced the same effect on the warriors as Timotheus' nome on Alexander — hence perhaps an understanding of the orthian nome as calling for battle.¹⁰ Indeed, the scholia explain one case with the help of the other: the scholiast of Aristophanes references Homeric lines in his explanation of the orthian nome, while Eustathius cites the anecdote about Alexander when reviewing the cry of Eris in Homer.¹¹

Late evidence on the orthian nome is inevitably conjectural: ancient commentators made the known meanings of ὄρθιος their point of departure and tried to choose one which would fit references to the orthian nome in classical texts.¹² There is nothing else left for us but follow their example and consider the attested occurrences of ὄρθιος in the acoustic sphere.

First of all, there are passages supporting the version that an ὄρθιος sound “makes one stand up”, i.e. stimulates dynamic activity. The earliest example of this is the passage from the *Iliad* cited above (*Il.* 11. 10–11). Scholiasts interpret ὄρθια as indicating loudness.¹³ However, volume is separately designated by μέγα, and if ὄρθι' and μέγα do not duplicate each other, it must follow that there was no implicit connotation of loudness in ὄρθιος — at least not in the language of early epic poetry. Whereas μέγα and δεινόν are used adverbially, the substantivated ὄρθια is rather an inner object: that is, a shrill cry

⁹ Translation: Murray 1924, 481.

¹⁰ Volkmann 1856, 70; 116 actually derived the name of the nome from this Homeric passage; their relation was also stated by Weil–Reinach 1900, 35; Olivieri–Pannain 1917, 116.

¹¹ *Sch. Aristoph. Ach.* 16a (cf. *Suid.* s. v. ὄρθιον νόμον [ο 575]). Eustath. *Comm. ad Hom. Il.* 3. p. 137. 9–15.

¹² Due to classical texts and subsequent commentaries, the expression ὄρθιος νόμος in Late Antiquity and in Byzance formed part of educated rhetoric. Some authors share Dio's idea that the orthian nome was an inspiration to battle (see n. 6 above), whereas for others it was simply an ancient classical piece of music. A song of Apollo's swans: Philostr. Maior, *Imag.* 1. 9. 4. A solemn, extensive and elaborate festive song (a metaphor for a rhetoric speech): Himer. *Or.* 4. 4, 38 (cf. Völker 2003, 323; 325); Nicetas Choniates, *Or.* 3, p. 18. 1–2 van Dielen. A song of virtue: Themist. *Ἐπὲρ τοῦ λέγειν* 330.α 6; Sopater ap. Stob. 4. 5. 51; *Anonymi miscellanea philosophica* 10, p. 27. 4 Pontikos; Georgius Tornices, *Or.* 1, p. 75. 10 Darrouzès; Manuel Gabalas, *Epist.* B 35, l. 123 Reinsch; Gennadius Scholarius, *Tractatus de processu spiritus sancti I*, pars 2, p. 53. 24 Jugie–Petit–Siderides. Nonnus rather mechanically applies ὄρθιος to musical sounds as an *epithetum ornans*: *Dionys.* 3. 242 ὄρθιος ἑπτατόνιο λύρης ἐλελιζετο χορδῆ; 7. 51 ἑπτατόνου φόρμιγγος ἀράσσειται ὄρθιος ἠχώ. Apparently, this evidence is of no use for studying the orthian nome of the classical period.

¹³ *Sch. Il.* 11. 11: <ὄρθια> ὀρθῶς, ἀνατεταμένως, μεγάλως. Apollonius *Lex. Hom.* p. 123, 13–14 Bekker: ὁ μὲν Ἀρίσταρχος ἀνατεταμένως, ὁ δὲ Ἀρχιγένης μάλλον ὀρθά. Hesych. *Lex.* ο 1180: ὄρθια ἀνατεταμένα. ἐξάκουστα. μεγάλα. Cf. Ebeling 1880, 73 s.v. ὄρθιος: “altus, de voce intenta”.

such as those which Homeric heroes often utter in a battle to inspire themselves and their companions.¹⁴ In fact it corresponds to a signal for combat.¹⁵

It seems that τὸ ὄρθιον did have this technical meaning in the classical period. A signal for starting a battle played on a salpinx is twice mentioned by Euripides (*Heraclid.* 830–831 ἐπεὶ δ' ἐσήμην' ὄρθιον Τυρσηνικῆι / σάλπιγγι καὶ συνήψαν ἀλλήλοις μάχην; *Tro.* 1266–1267 χωρεῖτε, Τρώων παῖδες, ὄρθιαν ὅταν / σάλπιγγος ἠχῶ δῶσιν ἀρχηγοὶ στρατοῦ). Appian describes the same practice when reviewing the era of Caesar and Pompeius (*BC* 2. 11. 78: σάλπιγγες αὐτοὺς ἐξώτρυνον ὄρθιοις κλαγγαῖς), and in Lucian, an analogous signal of alarm is given with a horn by a satyr in a disturbed Dionysian troop (*Bacch.* 4: εὐθύς δὲ τὰ τύμπανα ἐπαταγεῖτο καὶ τὰ κύμβαλα τὸ πολεμικὸν ἐσήμαινε καὶ τῶν Σατύρων τις λαβῶν τὸ κέρας ἐπηύλει τὸ ὄρθιον...)¹⁶

In the Homeric hymn to Demeter, ὄρθια means the shout of Persephone in the moment of kidnapping (*Hymn. Hom.* 2. 20: ἰάχησε δ' ἄρ' ὄρθια φωνῆ; 432: ἐβόησα δ' ἄρ' ὄρθια φωνῆ). The same epic expression is reproduced by Apollonius of Rhodes, as his heroine calls the Argonauts from the opposite bank of the river (4. 70–71: ὄξειν δῆπειτα διὰ κνέφας ὄρθια φωνῆ ... ἦπυε). In Pindar, Polydeuces appeals to Zeus in tears, praying to let him share his brother's fate (*Nem.* 10. 76: ὄρθιον φώνασε). In Aeschylus (*Cho.* 732) the nurse recalls her hard labour and wittily names the baby's crying ὄρθια κελεύματα. In the "Trackers" by Sophocles (fr. 314. 46 Radt) Silenus refers to the call of Apollo, [βοῶ]ντος ὄρθιοισι σὺν κηρύγμασ[iv].¹⁷ All of these noises are strident, calling, making one rouse oneself, jump to one's feet, come to aid, succour.

Connecting this precise meaning of the adjective to the orthian nome is possible due to a pun in Aristophanes (*Eccl.* 739–741): sounds that wake sleeping people at an ungodly hour — most probably the noise of a hand-mill¹⁸ — are called νόμος ὄρθριος,¹⁹ and the hand-mill itself, ἡ κιθαρωδός. The joke is clearly based on paronomasia ὄρθιος / ὄρθριος.²⁰ Admittedly the similarity of the word chosen to describe every-morning "music" to an actual musical term could in itself be amusing, never mind what the term actually meant. Still if the orthian nome was indeed similar to a reveille, the joke is much better. Thus, the

¹⁴ See *Il.* 5. 302, 591; 8. 159, 321; 11. 15, 344, 530; 12. 125, 252, 377, 439; 13. 149, 332, 540, 755, 834, 835, 837; 14. 4, 147–152, 393–401, 421; 15. 312–313, 321, 353, 355, 384, 506, 590, 658; 16. 78–79, 378, 566, 785; 17. 263–266, 723; 19. 41, 424; 20. 48–51, 285, 443.

¹⁵ Cf. Eustath, *Comm. ad Hom. Il.* 3, p. 137. 5–6: Δηλοῖ δὲ ἡ τοιαύτη τῆς Ἐριδος βοή τὰ τῶν στρατηγῶν κατ' ἔριν ἀγαθὴν ἐγκελεύσματα. 19–20: Ἄναρθρος δέ, ἦτοι ἀγράμματος, ἡ ῥηθεῖσα βοή τῆς κατὰ μῦθον Ἐριδος, καθάπερ εἰ καὶ σάλπιγγος ἦν.

¹⁶ Cf. also: Michael III, *Oratio editialis*, l. 509 Browning: τὸ ἐνούλιον ἐξηχεῖτο ὄρθιόν τε καὶ Δώριον; Nicephorus Basilaces, *Progymnasmata* p. 50. 48 Garzya: ἐπηύλει δὲ ὁ Βορράς ὄρθιον — εἶπεν ἄν τις περισαλπίζειν τὸ ἐνούλιον.

¹⁷ Cf. the description of Apollo's oracle in Aesch. *Cho.* 270–271: χρησμὸς κελεύων τόνδε κίνδυνον περᾶν, / κάξορθιάζων πολλὰ.

¹⁸ Meineke 1865, 201; Bachmann 1878, 16; Blaydes 1891, 171; Van Leeuwen 1905, 104; Huber 1974, 141–142. An allusion to a cock (Brunck 1783, *Notae* 42; Rogers 1902, 118–119; Ussher 1973, 179, 180) is impossible, since Aristophanes uses the feminine genus.

¹⁹ Grammarians ascribed not only a semantic, but also an etymological relationship to ὄρθρος and ὄρθιος (applied to getting up from the bed). (H)eren(n)ius Philo, *De diversis verborum significationibus* o 134: ὄρθρος μὲν ἢ πρὸ ἀνατολῆς ὥρα, καθ' ἣν ἐξ ὕπνου ἀναστάντες ὄρθιοι γινόμεθα. Eustath. *Comm. ad Hom. Il.* 2, p. 641. 8–9: ὄρθιους ἐν ἡμέρᾳ εἶναι χρῆ τούς σπουδαίους, ἀφ' οὗ καὶ ὁ ὄρθρος γίνεται, ὅς εἰς ἔργα ἡμᾶς ὄρθοι.

²⁰ Blaydes 1891, 171, 172; Ussher 1973, 180.

evidence of Aristophanes supports the characteristics of νόμος ὄρθιος in Dio, as well as the presumption that the auletic and the citharodic orthian nome shared the same quality.

Stretching from the concept of ‘making stand up’ to ‘stimulating’ when considering a sound is, of course, only a hypothesis.²¹ Yet we can take for granted that, whatever the ‘stretch’ was, in the end ὄρθιος obviously acquired the meaning ‘sonorous, piercing’.²² Examples at our disposal are not restricted to emergency situations, be it calling for aid, or a fight. In particular, the epithet ὄρθιος suits public announcements meant to attract general attention: Pindar applies it to praising the winner (*Ol.* 9. 109: ὄρθιον ὤρουσαι θαρσέων), and Sophocles and Euripides to the cry of a herald (*Soph. El.* 683: ὀρθίων κηρυγμάτων; *Eur. IA* 94: ὀρθίω κηρύγματι). In other cases it is used in deploring the dead (*Pind. Thren.* fr. 128e a2: ὄρθιον ἰάλεμι[ον; *Soph. Ant.* 1206: ὀρθίων κωκυμάτων).²³

It is clear that a sound can be made piercing and pervasive both through its intensity, and through its pitch. Remarkably, scholiasts and lexicographers mention tension, loudness and high pitch in describing the same sounds:²⁴ apparently these features often combine. Therefore, in almost all the cases considered above the meaning ‘loud’ could also be postulated for ὄρθιος, and only the passage from the *Iliad* provides a reason to doubt it.

Frequent correlation of this characteristic with high pitch is also understandable. Still a widespread interpretation simply equating ὄρθιος to ὀξύς²⁵ is unwary. As is generally known, conventional metaphor applied to sound pitch in ancient Greek is ὀξύς — βαρύς (literally ‘sharp’ — ‘heavy’),²⁶ and not ‘high’ — ‘low’. To adduce one manifest proof, the string of the lyre that produced the lowest sound was called ὑπάτη (‘the highest’), accord-

²¹ The verb ὀρθιάζω with its compounds ἐπορθιάζω and ἐξορθιάζω attested in Aeschylus (see nn. 17, 23, 34) may suggest an image of ‘raising’ = activating a sound, cf. Russian ‘поднять крик’, Greek γόν ὄρνυμι (*Od.* 17. 46). Crusius 1894, 52 n. 65 considered the name ‘orthian nome’ to be derived from this verb.

²² Pindar’s expression ὕβριν ὀρθίαν κνωδάλων (*Pyth.* 10. 35–36: εὐφαιμίας τε μάλιστ’ Ἀπόλλων / χαίρει, γελᾷ θ’ ὄρων ὕβριν ὀρθίαν κνωδάλων) might possibly mean cries of donkeys (Graf 1888, 513), but it is safer to exclude it from consideration, since this sense is not certain: Crusius 1894, 52 justly observes that ὄρων could hardly be said of sounds. For an alternative (most probably correct) interpretation see *Sch. Pind. Pyth.* 10. 55–56; Bernardini 1991, 155–159; Montanari 2004, s. v. ὄρθιος (‘lubricità degli animali che si erge’). The claim that ὀρθίαν is a metrical term here (Zielinski 1883, 626–627) is completely unfounded (Graf 1888, 513; Crusius 1894, 52).

²³ Cf. the related verbs in Aeschylus: *Pers.* 687 ὀρθιάζοντες γόοις (interpreted by the scholia as μεγάλως θρηνοῦντες) and 1050 ἐπορθιάζε νυν γόοις (explained as ἐπεκτεταμένως θρήνει and μεγάλως βόα).

²⁴ Phot. *Lex.* σ 543: Στήρνον· οἱ μὲν τὸ ὀξὺ καὶ τὸ ἀνατεταμένον· Νικόστρατος δὲ τὸ τραχὺ καὶ πρόσαντες τῇ ἀκοῇ φθέγμα; Hesych. *Lex.* ο 934: ὀξέα· μεγάλα· ἀνατεταμένα; ο 1180: ὄρθια· ἀνατεταμένα· ἐξάκουστα· μεγάλα; ο 1186: ὄρθιον· πρόσαντες· ἀνατεταμένον; Tzetzes, *Sch. Hes.* *OD* 566 bis Gaisford: ἡ ὀρθογῆ, ἡ μεγάλως καὶ ὀρθίως γοῶσα, φαίνεται χελιδῶν; *Sch. Aesch. Pers.* 389b: ὄρθιον· μέγα, ὀξὺ; *Sch. Pind.* *Ol.* 9. 163a, p. 305. 19 Dr.: ὄρθιον ὤρουσαι· ὀξὺ καὶ μέγα; b: βόησον ἀνατεταμένον; *Sch. Eur. Or.* 1384. 34–35 Schwarz: τὸν ὑπαζόνιον τῶν ἀρμάτων ἤχον ἀνατεταμένον τε καὶ ὀξὺν εἶναι; *Sch. Apoll. Rhod.* 322–323a, p. 152. 22–24 Wendel: στρηνὲς δὲ ἐστὶ τὸ ἀνατεταμένον καὶ μέγα καὶ ὀξὺ καὶ διάτορον; *Sch. Apoll. Rhod.* 70, p. 266. 18 Wendel: ὄρθια· ἀντὶ τοῦ ἐπιτεταμένως, μεγάλως; Sch. Lucian. *Bis Acc.* 11: πρὸς τὸ ὄρθιον· ἀντὶ τοῦ ἐπὶ τὸ μείζον καὶ ὀξὺ τῆς φωνῆς.

²⁵ Smyth 1904, 167; Lasserre 1953, 23; Del Grande 1960, 424; Pintacuda 1978, 43; Barker 1984, 251; 252.

²⁶ Figurative meaning of these definitions in music was not left unnoticed by Aristotle, *De anima* 420a29–b4: ταῦτα (sc. τὸ ὀξὺ καὶ τὸ βαρὺ) δὲ λέγεται κατὰ μεταφορὰν ἀπὸ τῶν ἀπῶν· τὸ μὲν γὰρ ὀξὺ κινεῖ τὴν αἴσθησιν ἐν ὀλίγῳ χρόνῳ ἐπὶ πολὺ, τὸ δὲ βαρὺ ἐν πολλῷ ἐπ’ ὀλίγον· οὐ δὴ ταχὺ τὸ ὀξὺ, τὸ δὲ βαρὺ βραδύ, ἀλλὰ γίνεται τοῦ μὲν διὰ τὸ τάχος ἢ κίνησις τοιαύτη, τοῦ δὲ διὰ βραδυτῆτα, καὶ ἔοικεν ἀνάλογον ἔχειν τῷ περὶ τὴν ἀφῆν ὀξεῖ καὶ ἀμβλεῖ· τὸ μὲν γὰρ ὀξὺ οἷον κεντεῖ, τὸ δ’ ἀμβλὺ οἷον ὤθει, διὰ τὸ κινεῖν τὸ μὲν ἐν ὀλίγῳ τὸ δὲ ἐν πολλῷ, ὥστε συμβαίνει τὸ μὲν ταχὺ τὸ δὲ βραδὺ εἶναι.

ing to its location while playing the instrument. So, the meaning ‘high-pitched’ is not natural for ὄρθιος.

Its supporters refer to Ps.-Aristot. *Probl.* 19. 37, 920b18–21.²⁷

Διὰ τί τοῦ ἐν φωνῇ ὀξέος ὄντος κατὰ τὸ ὀλίγον, τοῦ δὲ βαρέος κατὰ τὸ πολὺ (τὸ μὲν γὰρ βαρὺ διὰ τὸ πλῆθος βραδύ, τὸ δὲ ὀξύ δι’ ὀλιγότητα ταχύ), ἔργον μᾶλλον ἄδειν τὰ ὀξέα ἢ τὰ βαρέα, καὶ ὀλίγοι τὰ ἄνω δύνανται ἄδειν, καὶ οἱ νόμοι ὄρθιοι καὶ οἱ ὀξεῖς χαλεποὶ ἄσαι διὰ τὸ ἀνατεταμένοι εἶναι;

γὰρ om. Ap.^a | βραδύ Sylb. : βάρύ codd. et Gaza | δύνανται om. Ap.

Why is it, given that high pitch in sound goes with smallness and low pitch with large quantity (since what is low-pitched is slow because of the quantity, while what is high-pitched is swift because of the smallness), that it is harder work to sing high pitches than low ones, and few people can sing the upper notes, and the *Orthioi* and *Oxeis nomoi* are difficult to sing because they are tightly stretched?²⁸

However, the fact that the author found it necessary to use both words, ὄρθιοι καὶ ὀξεῖς, implies their semantic difference.²⁹ Perhaps it consists in ὄρθιος combining the notions of high pitch, loudness and tension. Besides, it has been noticed that τὰ ἄνω in this passage is applied to upper notes.³⁰ Yet H. Bonitz proposed a convincing explanation: by enumerating in succession τὰ ἄνω means items named at the beginning of the sequence,³¹ and the degrees of a scale were conventionally enumerated downwards.³² Thus the spatial metaphor of vertical used for pitch is not reliably attested in Greek and cannot be mechanically applied to defining ὄρθιος.

In the examples considered above the shouting of a girl and the crying of a baby are obviously high-pitched sounds. This meaning (though alongside with ‘loud’ and ‘piercing’) also suits the passage Aesch. *Ag.* 1153, where ecstatic outcries of Cassandra foreseeing her own death are metaphorically called ὄρθιοι νόμοι³³ — not only because a woman’s part is concerned, but also because high pitch was typical of lamentation.³⁴

²⁷ See also *Sch. Aesch. Sept.* 954f Smith: ὀξὺν τὸν ὄρθιον; Hesych. ο 1177: ὀρθέσιον ὄρθιον. μακρόν. ὀξύ. μέγα.

²⁸ Transl. Barker 1989, 94.

²⁹ Marengi 1957, 110: “dal presente problema si può desumere similarità tra i due, non assoluta uguaglianza”. Cf. the combination of these two adjectives in *Apoll. Rhod.* 4. 70–71: ὀξεῖη δῆριτα διὰ κνέφας ὄρθια φωνῇ ... ἤπνε.

³⁰ Exclusively on the base of this passage, Graf 1888, 514 claimed: “die Griechen hatten <...> dieselbe räumliche Vorstellung von der Tonreihe wie wir”, and Gevaert 1899, 100 with n. 2 even proposed an explanation of this common notion: while singing, high sounds allegedly seem to resound in the head, and low sounds in the thorax.

³¹ Bonitz 1870, s.v. ἄνω: “Translatum ad seriem quamlibet τὰ ἄνω id significant, quod ordine prius est, veluti in serie sonorum τὰ ἄνω idem quod τὰ ὀξέα”.

³² See e.g. Ps.-Aristot. *Probl.* 19. 33. In vocal notation alpha signifies the upper and omega the lower sound; the degree of the scale named τρίτη is the third from above: Gevaert 1899, 174.

³³ Graf 1888, 513; Smyth 1904, lxiii; Pintacuda 1978, 113.

³⁴ See *Plat. Resp.* 398e; *Sch. Eur. Or.* 176, p.116. 16–17 Schwartz; Ps.-Plut. *De mus.* 1136C; cf. οἱ κλαίοντες ὀξύ φθέγγονται in Ps.-Aristot. *Probl.* 11. 13, p.900a20; 15, 900b7; 50, 904b23. In three cases adduced above ὄρθιος is a characteristic of weeping: *Pind. Nem.* 10. 76; fr. 128e a2; *Soph. Ant.* 1206. Yet it should be noted that mournful character cannot be considered typical of ὄρθιος, as examples clearly show (festive context: *Sappho fr.* 44. 32 Voigt; *Pind. Ol.* 9. 109; cf. the related verb: *Aesch. Ag.* 28–29 ὄλολυγμὸν ... ἐπορθιάζειν, of Clytemnestra, and 1120 ἐπορθιάζειν, of Erinys). Curiously, Aelian when speaking of birdcalls

On the other hand, a herald or Apollo was hardly likely to be shrieking in tragedy. Sappho (fr. 44. 31–34 Voigt) also uses ὄρθιος when recalling a shout of men (apparently the ritual exclamation ‘ie paean’³⁵) at the wedding of Hector and Andromache:

γύναικες δ’ ἐλέυσσον ὄσαι προγενέστερα[ι·
πάντες δ’ ἄνδρες ἐπήρατον ἴαχον ὄρθιον
Πάον’ ὄνκαλέοντες ἐκάβολον εὐλύραν
ὑμνην δ’ Ἐκτορα κ’ Ἄνδρομάχαν θεοεικέλο[ις.

The elder women cried out joyfully, and all the men let forth a lovely ὄρθιον strain calling on Paeon, the Archer skilled in the lyre, and they sang in praise of the god-like Hector and Andromache.³⁶

Given that the exultant shout of men rings alongside that of women, ὄρθιον presumably implies loud volume, since it could be only relatively high-pitched (as well as a citharodic nome performed by a male singer). Actually, some parallels show that even a cry of men — namely of warriors — could be thought of as high, for the adjective ὄξύς characterizes it. Yet perhaps only one kind of cry — ἀλαλή — is implied.³⁷ Ὀρθιον is applied to an echo of such an ἀλαλή of the Greek sailors in Aesch. *Pers.* 389–391 (ὄρθιον δ’ ἄμα / ἀντηλάλαξε νησιώτιδος πέτρας / ἤχώ).

Therefore, I am inclined to believe that the sounds which could be called ὄρθιοι were frequently but not necessarily high-pitched.

While explaining the orthian nome, several times scholia to Aristophanes use words with the stem *ten-/ton-/tan-* which in their turn need interpretation:³⁸

1) *Sch. Aristoph. Ach.* 1042 (= *Suid.* ο 573): ὄρθιασμάτων· ἀνατάσεως ῥημάτων, τῶν μετὰ βοῆς κόμπων, ἢ τῶν μελῶν, παρόσον ὄρθιος νόμος κιθαρωδικός.

2) *Sch. Aristoph. Ran.* 1282: ἐκ τῶν κιθαρωδικῶν νόμων· Τιμαχίδας γράφει, ὡς τῷ ὄρθιῳ νόμῳ κεχρημένου τοῦ Αἰσχύλου καὶ ἀνατεταμένως.

3) *Sch. Aristoph. Ach.* 16a: ὁ δὲ ὄρθιος αὐλητικός νόμος οὕτω καλούμενος διὰ τὸ εἶναι ἔντονον καὶ ἀνάτασιν ἔχειν, ὡς δηλοῖ καὶ Ὅμηρος (quotation: *Il.* 11. 10–11).

→ *Suid.* χ 171: ὄρθιος δὲ αὐλητικός νόμος, οὕτω καλούμενος οἷον εὔτονος καὶ ἀνάτασιν ἔχων, καὶ Ὅμηρος· (quotation: *Il.* 11. 10–11).

→ *Suid.* ο 575: ὄρθιον νόμον καὶ τροχαῖον· τοὺς δύο νόμους ἀπὸ τῶν ῥυθμῶν ὠνόμασε Τέρπανδρος· ἀνατεταμένοι δ’ ἦσαν καὶ εὔτονοι· Ὅμηρος· (quotation: *Il.* 11. 10–11).

(*NA* 6. 19) opposes ὄρθια to mournful and ‘womanly’ (i.e. high?) sounds, but unites them with piercing ones: φθέγγεται δὲ αὐτῶν τὰ μὲν γοερά καὶ θηλύφωνα, τὰ δὲ ὄρθια καὶ διάτορα.

³⁵ Rutherford 2001, 56 translates: “All the men sang the lovely high-pitched paean”. Yet the lines 32–33 suit better a paean-cry than a paean-song: it is the cry that could sound without prejudice together with the women’s shout, while the song following it is first mentioned in line 34. The epithet ἐπήρατον does not contradict to this understanding: it can characterize the cry as harmonious and as prophesying fortune. ὑμνην is interpreted as *impf.* 3 *pl.* (Hamm 1958, 163) or as *inf. epexegeticus* governed by ἴαχον (Snell 1931, 73 n. 1; 368).

³⁶ Trans. Campbell 1990, 91.

³⁷ *Il.* 12. 125: ὄξεα κεκλήγοντες; 17. 88–89: ὄξυ βοήσας. Aesch. *Sept.* 953–954: ἐπηλάλαξαν Ἀραὶ τὸν ὄξυν, cf. Hutchinson 1985, 202: “the article indicates that ἀλαλή was in general ὄξύς”.

³⁸ Cf. *Sch. Aesch. Cho.* 271: ἐξορθιάζων ἀνατεταμένα βοῶν.

A. C. Cassio addressed these lemmata analyzing the meaning of ἐντείνεσθαι and ἔντονος.³⁹ In music ἐντείνεσθαι (sc. χορδῆν) was a technical term of citharists signifying ‘to strain (a string)’ and therefore ‘tune up’ (Ps.-Aristot. *Probl.* 19. 42, 921b26; Aristot. *Elem. harm.* p. 53. 9 Da Rios=43, 30 Meibom; Lucian. *Dial. deorum* 11. 4). Despite the obvious fact that the tighter the string, the higher the sound it produces, ἐντείνεσθαι taken alone does not imply an upper register, as is shown by Cassio (*pace* LSJ s.v.: ‘pitching high’). Besides it develops the figurative meaning ‘strain’ (extended in particular from the physical to the mental state: ἐντεινάμενος Plat. *Resp.* 7. 536; ἐντειναμένως Hdt. 1. 18; 4. 14; 7. 53; 8. 128). The adjective ἔντονος did not inherit the technical meaning ‘tuned up’, but means ‘vigorous, intensive, strained, violent’ (see Hdt. 4. 11; Soph. fr. 842 Radt; Eur. *Or.* 698; *Hipp.* 118; fr. 291. 1 Kannicht=N²).

Ἔντονος and εὔτονος are easily mistaken in manuscripts⁴⁰ (changing ἔντονος to εὔτονος is more probable than vice versa, since in the Hellenistic period εὔτονος was a common word, while ἔντονος became more and more rare⁴¹). According to the analysis of Cassio, εὔτονος means ‘strong, powerful’, Latin ‘robustus’, and in musical contexts, ‘loud’ (Arist. *Quint.* 1. 21, p. 43. 13; cf. 42. 26–27 W.-I.).⁴²

In the scholium to *Ach.* 16, as well as in both lemmata of the *Suida* quoting this scholium, Cassio proposed reading forms of ἔντονος ‘strained’, and referred to the passage of Dio (*Or.* 1. 1) describing the orthian nome as οὐ μαλακὸν αὔλημα ... οὐδὲ τῶν πρὸς ἄνεσιν καὶ ῥαθυμίαν ἀγόντων. This solution is possible (Dio as a representative of ancient book culture is likely to express the same opinion as the scholiasts). Yet further considerations of Cassio are inconclusive: he negates the connotation of loudness for the words with the stem *ten-*, and takes being ‘strained’ to imply high register (ἀνάτασις and ἀνατεταμένως) and swift tempo (ἔντονος).

To begin with, it is unconvincing that a nome pitched high, which is difficult to sing (χαλεπὸς ἄσαι), cannot be described as sonorous: high sounds can be perfectly loud and penetrating, which is proved by a series of cases using ὄρθιος, as well as a direct indication of Aristotle (*De gen. anim.* 787a2–5): ἐστὶν ἕτερον τὸ βαρὺ καὶ τὸ ὀξὺ ἐν φωνῇ μεγαλοφωνίας καὶ μικροφωνίας (ἔστι γὰρ καὶ ὀξύφωνα μεγαλόφωνα, καὶ μικρόφωνα βαρύφωνα ὡσαύτως).⁴³

Next, I can indicate no cases of ἀνάτασις and ἀνατεταμένως unambiguously indicating high register.⁴⁴ In musical treatises another compound, ἐπίτασις, is used as a technical term for increasing pitch (e.g. Cleonid. *Isag. harm.* 2, p. 181. 1–6 Jan). Cassio, to prove his understanding, cites the passage adduced above, Ps.-Aristot. *Probl.* 19. 37: καὶ οἱ νόμοι ὄρθιοι καὶ οἱ ὀξεῖς χαλεποὶ ἄσαι διὰ τὸ ἀνατεταμένοι εἶναι. However, here, in order to avoid the tautology (“high nomos are difficult to sing because they are high”) ἀνατεταμένοι should be taken to mean ‘strained’. On the contrary, it can be demonstrated that these words are related to loudness, which is a natural result of tension: it is not an

³⁹ Cassio 1971.

⁴⁰ LSJ s. v. εὔτονος; Monk 1857, 12, ad Eur. *Hipp.* 117; Pearson 1917, 124; Cassio 1971, 55–56.

⁴¹ Cassio 1971, 56 n. 2.

⁴² There is one instance (Aristot. *De gen. anim.* 786b7 sqq.) of εὔτονος in etymological meaning ‘well-pitched’, remarkably applied to the middle register — neither too high nor too low (on animals’ voices).

⁴³ See also an observation of Theophrastus (ap. Porph. in *Ptol. Harm.* p. 63. 1–6 Düring) that singers spend great forces both when singing high and low.

⁴⁴ In several cases tension combines with high pitch (see above n. 24).

accident that in comments to Homer⁴⁵ ἀνατεταμένως is a synonym of μεγάληως, i.e. means 'loudly'.⁴⁶

As regards ἔντονος, there are no convincing examples showing that it can mean 'in a swift tempo'. Cassio refers to Soph. fr. 966 Radt and Aristoph. *Ach.* 674, but in both cases, firstly, the reading is not certain, and secondly, the context allows not only the meaning 'swift' but also 'loud' and 'intense'. We seem to have no grounds at all to think that ἔντονος was ever used as a musical term.⁴⁷

That the Greeks felt a tie between high pitch and swift tempo is by no means obvious. Numerous evidence on correlation of pitch and speed (including *Probl.* 19. 37) has nothing to do with the duration of sound itself and consequently with the tempo. It concerns the most popular ancient acoustic theory, which suggested that a high sound was a result of swift movement of air, and a low sound, a result of slow movement.⁴⁸

Probl. 19. 21, 919a29–35 seems to stand apart at first glance: it is argued that mistakes are more evident in singing low, because the listeners have more time to notice them.

Διὰ τί τῶν ἀδόντων οἱ βαρύτερον ἄδοντες τῶν ὀξὺ ἀδόντων, ἐὰν ἀπάδωσι, μᾶλλον κατάδηλοι γίνονται; ὁμοίως δὲ καὶ τῶ ῥυθμῶ οἱ ἐν τῶ βαρυτέρῳ πλημμελοῦντες κατάδηλοι μᾶλλον. πότερον ὅτι πλείων ὁ χρόνος ὁ τοῦ βαρέος, οὗτος δὲ μᾶλλον αἰσθητός; ἢ ὅτι ἐν πλείονι χρόνῳ πλείω αἰσθησιν παρέχει, τὸ δὲ ταχὺ καὶ ὀξὺ λανθάνει διὰ τὸ τάχος.

Why is it that when people are singing, those who sing lower pitches, if they sing wrongly, do so more detectably than those who sing high? In rhythm, similarly, those who make mistakes in a slower rhythm do so more obviously. Is it because the time taken by something low-pitched is longer, and it is therefore more perceptible, since in the longer time it generates more sensation, while what is swift and high-pitched escapes detection because of its swiftness?⁴⁹

However, since it is undeniable that high and low sounds can last equally long,⁵⁰ this passage most likely does not concern the tempo, but the nature of sound.⁵¹ The author apparently shares the theory that every sound is discreet, that is, consists of a series of quick impacts separated by short spaces of silence, which blend with each other in our perception.⁵² A high sound is produced by more impacts in a certain period of time than a low

⁴⁵ See above n. 13.

⁴⁶ Cf. the same meaning: Philo, *De ebr.* 102 ἢ οὐχ ἡδονῆς μὲν ἀνατεταμέναι αἱ ἐκβοήσεις; *Schol. Hom. Il.* 10. 141–142 ἀνατεταμένη τῆ φωνῆ; *Sch. Pind. Nem.* 10. 61, p. 174. 1–2 Dr. ἀνατεταμένως τῆ φωνῆ; *Sch. Soph. El.* 1437 μὴ ἀνατεταμένως φθέγγεσθαι ἀλλ' ἑλαφρῶς ἐν ὧτι λαλεῖν.

⁴⁷ Cassio is aware (1971, 56) that ἔντονος in Aristides Quintilianus occurs only once, in a medical simile (2. 16, p. 85. 29 W.-I.).

⁴⁸ Archytas fr. 1 Diels–Kranz (Porphyry. *In Ptol. Harm.* p. 57 Düring = p. 196–198 Barker); Plat. *Tim.* 67b5–6; 80a3; Aristot. *De anima* 2. 8, 420a30–33; *De gen anim.* 5. 2, 786b25–787a28; *Top.* 107a15; Ps.-Aristot. *De audib.* 803a5–6; *Probl.* 11. 3, 6, 10, 13, 14, 15, 16, 34, 47, 53, 56, 61, 62; Theo Smyrn. *Expositio rerum math.* p. 50. 11–12 Hiller.

⁴⁹ Transl. Barker 1989, 92.

⁵⁰ Gevaert 1899, 210, who thought the *Problems* to be the authentic work of Aristotle and refused to ascribe such blatant ignorance to the Stagirite, even suspected that the problem was a false one: the master aimed to provoke his students to take a critical approach to a generally accepted, but erroneous statement. Louis 1993, 98 supposed Byzantine interpolations in section 19 of the *Problems*.

⁵¹ Barker 1989, 92 n. 48.

⁵² Ps.-Aristot. *De audib.* 803b34–804a8; *Probl.* 19. 39; Porph. *In Ptol. Harm.* p. 31. 6–21 Düring.

one.⁵³ The author implies that the organ of hearing thus has less time for perceiving every impact formatting a higher sound than for perceiving impacts creating the lower one, so one's perception of the high register is less clear.

Thus, in the scholia to Aristophanes considered here I can see no indications of either high pitch or swift tempo for the orthian nome. Rather, it is characterized as intense and perhaps loud.

What 'tension' in music means is in its turn subject to interpretation. First, the scholiasts could imply physical effort required for producing sound. An eloquent description of a philosophical dispute in Lucian (*Bis acc.* 11) shows what strain τὸ ὄρθιον demanded:⁵⁴

ἐπτείνουσι τὸ φθέγμα μέχρι πρὸς τὸ ὄρθιον, ὥστε ὑπερδιατεινομένων καὶ ἅμα λέγειν ἐθελόντων τὸ τε πρόσωπον ἐρυθρίᾳ καὶ ὁ τράχηλος οἰδεῖ καὶ αἱ φλέβες ἐξανίστανται ὥσπερ τῶν αὐλητῶν ὅποταν εἰς στενὸν τὸν αὐλὸν ἐμπνεῖν βιάζονται.

They raise their voices to a high falsetto, so that, with their excessive straining and their endeavour to talk at the same time, their faces get red, their necks get swollen, and their veins stand out like those of aulos-players when they try to blow into a close pipe.⁵⁵

An evident consequence of such tension was the loudness. On the other hand, peripatetic evidence claims that singing high required more effort⁵⁶ — presumably for a male singer (Ps.-Aristot. *Probl.* 19. 7, 918b18: τὸ ὄξυ δυνάμεως μᾶλλον, τὸ δὲ βαρὺ ῥᾶον φθέγγασθαι; *ibid.* 37, 920b20–21: καὶ οἱ νόμοι ὄρθιοι καὶ οἱ ὀξεῖς χαλεποὶ ἄσαι διὰ τὸ ἀνατεταμένοι εἶναι).⁵⁷

Second, the ethos of a musical piece could be implied, which in turn transmitted tension to the audience. In this case the question arises of what means might be used to give the impression of tension in music, but here we enter the sphere of guesswork. Maybe such an effect might be produced by sonority, as well as high pitch, for there is peripatetic evidence that it was perceived to be unstable: it was felt that a high register was not suitable for the ending of a musical piece; rather, a downwards procession was preferred (Ps.-Aristot. *Probl.* 19. 49: ὁ μὲν βαρὺς φθόγγος μαλακὸς καὶ ἡρεμαῖός ἐστιν, ὁ δὲ ὄξυς κινητικός). Tempo (ἀγωγή ρυθμική) might also be an important factor for creating an ethos:⁵⁸ Aristides Quintilianus claims that a swift tempo creates an energetic, vigorous ethos stimulating dynamic activity — exactly the mood ascribed to the orthian

⁵³ E. g. in a consonant of fourth the higher string makes four impacts to the lower's three. This theory need not imply that the pitch depends on the frequency of oscillation, and it does not contradict the former idea of the nature of pitch. It simply assumes that more numerous impacts are caused by quicker movement of a string: *De audib.* 804a2–4, see. Barker 1989, 95 n. 64; 107–108 n. 40.

⁵⁴ Cf. Plut. *Phoc.* 2: too harsh a course, opposed to everything the people desire, in administrating a city is called ὁ ὄρθιος ἄγαν τόπος.

⁵⁵ Translation: Harmon 1969, 103–105, with minor changes.

⁵⁶ At the same time it was noted (e.g. Marengi 1957, 103; Louis 1993, 98 — as a proof of a late interpolation) that *Probl.* 19. 26, 919b24=46, 922a39–b1 contains a contrary claim: ῥᾶον ὄξυ ἄσαι ἢ βαρὺ.

⁵⁷ See above n. 24. Already Graf 1888, 513 concluded that ὄρθιος combines the meaning 'high' and 'loud', since both aspects require the tension of the voice.

⁵⁸ Cassio 1971, 57.

nome by our sources.⁵⁹ The gradual increasing of several parameters such as volume and tempo might also help.⁶⁰

I conclude that ὄρθιος as a characteristic of sound means ‘attracting attention’, ‘penetrative’, ‘exciting’. It seems plausible that an orthian nome might be notable for its piercing sounding and tension, which could be achieved due to loudness, high pitch, and perhaps speed.

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⁵⁹ Ar. Quint. *De mus.* 2. 15, p. 84. 3–9 W.-I.: Ἐτι τῶν ῥυθμῶν οἱ μὲν ταχυτέρας ποιούμενοι τὰς ἀγωγὰς θερμοὶ τέ εἰσι καὶ δραστήριοι, οἱ δὲ βραδείας καὶ ἀναβεβλημένας ἀνεμμένοι τε καὶ ἡσυχαστικοί· ἔτι δὲ οἱ μὲν στρογγύλοι καὶ ἐπίτροχοι σφοδροὶ τε καὶ συνεστραμμένοι καὶ εἰς τὰς πράξεις παρακλητικοί, οἱ δὲ περίπλεω τῶν φθόγγων τὴν σύνθεσιν ἔχοντες ὑπτιοὶ τέ εἰσι καὶ πλαδαρότεροι...

⁶⁰ I owe this guess to Dr. M. N. Kazanskaya. However, this seems to be a peculiarity of another nome, called Boeotian, see Almazova 2015, 15–16; 24.

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