

THE TONGUE AND THE REED: ORGANS AND INSTRUMENTS IN THE PHILOSOPHICAL PART OF HIPPOCRATIC *REGIMEN*

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Abstract: In the first book of Hippocratic *Regimen*, an unclear excursus explains how the *technai* imitate, and thus allow us to understand, human nature. It is argued here that the new polysemy of the word *organon* at the beginning of the fourth century is utilized by the author in his comparison, that this observation allows new understandings of some difficult passages and that such polysemy applies to a specific *organon*, the *glotta* ('tongue' and 'reed').

Keywords: Medicine, music, cookery, Hippocrates, *technē*

Medicine is one of the *technai* that promotes the idea of human superiority over animals. It applies to the human body, and doctors have compared the working of the human body to other technical operations. Nowhere is this comparison so systematic as in a difficult excursus on *technai* in the philosophical part of *Regimen* I, a Hippocratic treatise probably written before Plato's *Timaeus*.¹ There, nature and art are carefully intertwined.² The aim of this excursus is explained at the very beginning, where the author focuses on human nature:

Οἱ δὲ ἄνθρωποι ἐκ τῶν φανερῶν τὰ ἀφανέα σκέπτεσθαι οὐκ ἐπίστανται· τέχνησι γὰρ χρεώμενοι ὁμοίησιν ἀνθρωπίνῃ φύσει οὐ γινώσκουσιν

Men do not understand how to observe the invisible through the visible. For though the arts they employ are like the nature of man,³ yet they know it not (*Reg.* I.11, 134.21–22 J-B).

This human misunderstanding will be corrected by the author. Various affections (παθήματα, 12, 136.5 J-B), visible or invisible, act upon men: in his characteristic Heraclitean style⁴ he claims he can show that these affections are similar to technical procedures. In the debate between those who think that it is not possible to observe what is not visible (φανερὸν) and those who assert that it is possible to understand it, even when we can not see it, the thoughtful physician has found his

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¹ *Reg.* I.11–24 Joly and Byl. Unless otherwise mentioned, I quote Jones' translation of *Regimen* (1931) and translate quotations from secondary literature. The influence of *Regimen* on *Timaeus* has been suggested independently by Olerud (1951) 64–66; Jouanna (2012) 195–228; see also Joly and Byl (2003) 46; already Joly (1960) 52, 70–71.

² See Bollack (1965) 300 n.4, also 299 (with n.4).

³ The transition from nature as a whole to human nature is not entirely clear. Fredrich (1899) thinks that

the version of *Regimen* we have was written by a 'compiler' who used another treatise, written by a 'physicist' (111–22, bibliographical survey of the 19th century on p. 90). Here he supposes that the adjective ἀνθρωπίνη has been added to a sentence about nature (of the whole world) and *technē* (144). But Joly correctly explains the limitation of the scope to human nature by 'a kind of a fortiori argument' asking 'how could men see that their body imitates the world? They don't even see that their *technai* imitate their own nature' (Joly and Byl (2003) 243–44). In the following chapters, Fredrich would like to separate the terms of the comparisons, each of them being in his opinion written by a different author.

⁴ Diels published this section in his *Vorsokratiker* as Heraclitean imitation (DK 22C1). Joly (1960) 26 shows that the main influences are Anaxagoras, Archelaos and Pythagoreans 19–22.

own way: if valid comparison can be made between *pathemata* and *technai*, we should consider that while some *pathemata* are visible and others are not, the *technai* are always visible. Thus we can assert the possibility of understanding even invisible *pathemata*.⁵

Ἐγὼ δὲ δηλώσω τέχνας φανεράς ἀνθρώπου παθήμασιν ὁμοίας εἰούσας καὶ φανεροῖσι καὶ ἀφανέσι.

But I will show that arts are visibly like to the affections of men, both visible and invisible (I.12, 136.5–6 J-B).

In this paper it will be argued that the author uses the polysemy of ὄργανον in his demonstration, particularly regarding one specific kind of ὄργανον, i.e. the γλῶττα. This argument could contribute to the resolution of difficult problems in the text.

Derivatives in -ανο- denote instruments or tools,⁶ and ὄργανον, being constructed from the root of ἔργον, means ‘instrument’, ‘tool’ with a general reference. Hence the word could be used for different kinds of tools or instruments (often musical instruments) and metaphorically with reference to ‘(bodily) organs’. When does this metaphorical connotation constitute a separate meaning? The answer is not easy. Plato often makes use of ὄργανον to refer to the sense-organs, especially in *Theaetetus* (184d4, 185a5, 185c7, 185d9), and the word still has the meaning of ‘instrument’ in the first occurrence, where the comparison is explicit (διὰ τούτων οἶον ὀργάνων, ‘by the means of these [the perceptions], as if they were instruments’). Again we find τῶν περὶ τὰς αἰσθήσεις ὀργάνων, ‘instruments [or organs?] related to perceptions’, in the sixth book of the *Republic*, opposed to ὀργανόν τι ψυχῆς, ‘instrument [or organ?] of the soul’ (508b4, 527d8). Also, in *Timaeus* (45a7), the ‘instruments’ (or ‘organs?’) for seeing, hearing, etc. are created ‘in order to let the soul prevent anything’. In this dialogue there are eight occurrences, sometimes quite novel, such as ὄργανα χρόνου or χρόνων, ‘instruments of time’, i.e. the planets). The word is also used for a ‘tool’ (or an ‘organ?’ – evidently the belly is referred to) for receiving food and expelling it once its *ikmas* has been extracted (33c4).⁷

The Hippocratics use the word for the instruments and tools of the physician, but there are also several occurrences in which the meaning ‘(bodily) organ’ seems to appear, in *Epidemics* VI and in *Regimen*. In the composite, and unclear, treatise *Epidemics* VI, Manetti and Roselli translate ἡ τῶν ὀργάνων κατάτριψις as ‘the wear and tear of the organs [l’usura degli organi]’⁸ because τῶν ὀργάνων is at the end of a list of bodily features (skin, belly, flesh, vessels, brain, hair and *organa*). Later, an obscure sentence about states of mind specifies χωρὶς τῶν ὀργάνων καὶ τῶν πρηγμάτων. Through a comparison with a section in *Humours*, Manetti and Roselli understand ‘regardless of the sense organs [organi di senso] and other actions.’⁹ There it seems that the word alone could denote bodily organs without any further specification.

Moreover a passage in the excursus of *Regimen* is most interesting:

Κεραμεῖς τὸν τροχὸν δινέουσι, καὶ οὔτε ὀπίσω οὔτε πρόσω χωρεῖ, καὶ ἀμφοτέρωσε ἅμα τοῦ ὄλου ἀπομμεῖται περιφορῆν. ἐν δὲ τῷ αὐτῷ ἐργάζονται περιφερομένῳ παντοδαπά, οὐδὲν ὅμοιον τὸ ἕτερον τῷ ἑτέρῳ ἐκ τῶν αὐτῶν τοῖσιν αὐτοῖσιν ὀργάνοισιν. Ἄνθρωποι ταυτὰ πάσχουσι καὶ ἄλλα ζῶα: ἐν τῇ αὐτῇ περιφορῇ πάντα ἐργάζονται, ἐκ τῶν αὐτῶν οὐδὲν ὅμοιον τοῖσιν αὐτοῖσιν ὀργάνοισιν, ἐξ ὑγρῶν ξηρὰ ποιέοντες καὶ ἐκ τῶν ξηρῶν ὑγρά.

⁵ Joly (Joly and Byl (2003) 244) quotes Anaxagoras DK 59B21a; Jouanna (2002) 229, on *Nature of Man* 1.1, adds Heraclitus DK 22B54 and *Breaths* 3.3; see also *Art* 11.

⁶ Chantraine (1979) 198.

⁷ Byl (1971) thinks there are in Plato six occurrences of ὄργανον as ‘sense-organs’ and one as ‘bodily organ’, without distinguishing meaning and reference. These texts may be posterior to *Regimen*.

⁸ *Epid.* VI 3.1, 52–53 M-R.

⁹ *Epid.* VI 8.10, 174–75 M-R (cf. *Hum.* 9, V.490 Littré). This passage is close to *Regimen* IV.86.2 (where ὄργανα do not appear), a parallel noticed by several scholars, especially Joly, whose conclusion is that *Epid.* VI ‘indeed is a pastiche, with alteration, of’ *Regimen* (Joly and Byl (2003) 40).

Potters spin their wheel, which shifts neither forward nor backwards, yet moves both ways at once, therein copying the revolution of the universe. On this wheel as it revolves they make pottery of every shape, and no two pieces are alike, though they are made from the same materials and with the same *organa*. Men and animals too are in the same case. In one and the same revolution they make all things, without two being alike, from the same materials and with the same *organa*, making dry from moist and moist from dry (I.22, 140.11–16 J-B).

This section first describes the work of potters as an imitation of the universal rotation of the world. This is related to the description of fire in the *kosmos* just before the excursus (chapter 10) and could be compared to the description of the ὄργανα χρόνου used for the creation of the world in *Timaeus*. Human nature is compared and narrowly linked to the nature of the whole universe.¹⁰ But this is not the main point. Here, although rolling, the potters' instruments remain the same during their work and nevertheless create different vessels. In the same way, men and animals always have the same *organa*, although through them they produce opposite things, 'making dry from moist and moist from dry'. Joly notes that this observation is very similar to the last observation of the previous chapter, which compares human bodies 'moistening the dry and drying the moist' to sculptors as they imitate the human body, 'drying the moist and moistening the dry' (chapter 21). Furthermore this expression was already used in chapter 17 about the architects imitating human diet:

Οικοδόμοι ἐκ διαφόρων σύμφορον ἐργάζονται, τὰ μὲν ξηρὰ ὑγραίνοντες, τὰ δὲ ὑγρὰ ξηραίνοντες, τὰ μὲν ὅλα διαιρέοντες, τὰ δὲ διηρημένα συντιθέντες· μὴ οὕτω δὲ ἐχόντων οὐκ ἂν ἔχοι ἢ δεῖ. Δίαιταν ἀνθρωπίνην μιμέονται· τὰ μὲν ξηρὰ ὑγραίνοντες, τὰ δὲ ὑγρὰ ξηραίνοντες, τὰ μὲν ὅλα διαιρέουσι, τὰ δὲ διηρημένα συντιθέασι. Ταῦτα πάντα διάφορα ἐόντα συμφέρει.

Builders out of diverse materials fashion a harmony, moistening what is dry, drying what is moist, dividing wholes and putting together what is divided. Were this not so, the result would not be what it should. It is a copy of the diet of man; moistening the dry, drying the moist, they divide wholes and put together what is divided. All these being diverse are harmonious (I.17, 138.9–13 J-B).

As Joly also notes, ταῦτὰ πάσχοισι ('are in the same case') is the standard formula after the description of a *technē* before explaining human physiology. Therefore I would agree with him that the word ὄργανα is used with the meaning '(bodily) organs', and not 'instruments' as Byl would prefer to interpret it.¹¹ More precisely, these organs may refer to the belly, where the digestion takes place, as they do in *Timaeus* 33c4 quoted above. The two uses¹² of ὄργανα in this chapter do suggest a quite conscious interplay between the references to 'instrument' and to '(bodily) organ'. The very existence of ὄργανα both in the *technai* and in the body justifies the method adopted by the author of *Regimen*.

There are two further uses of ὄργανον in *Regimen* I, but they are bracketed by Joly and others as glosses.¹³ I would like to discuss these occurrences again in their context.

In the excursus the comparisons between *technai* and *pathemata* are introduced by different kinds of beginnings, mainly by the name of the *technē*: divination (μαντική τοιόνδε, chapter 12), writing (γραμματική τοιόνδε, chapter 23), sport and gymnastics (ἀγωνίη, παιδοτριβίη, chapter 24) and the art of actors (ὑποκριτική, chapter 24); or by the craftsmen's name: fullers (γναφεῖς, chapter

¹⁰ This is related to the 'a fortiori argument' (n.3).

¹¹ Joly and Byl (2003) 248: Byl (1971) 124–26 'would think that here also it means tool, but admits that it could mean organ'. Jones (1931) translates in both cases by 'tools.'

¹² The word is present twice in θ and in the ancient Latin translation, once in M.

¹³ Byl (1971) does not consider them. Jones (1931) keeps one of these references in his text.

14), cobblers (σκυτεῖς, chapter 15), carpenters (τέκτονες, chapter 16), architects (οἰκόδομοι, chapter 17), tanners (νακοδέψαι, chapter 19), sculptors (ἀνδριαντοποιοί, chapter 21), potters (κεραμεῖς, chapter 22). Craftsmen are also twice introduced only by verbs, without any subject, that describe them working gold and preparing corn¹⁴ (chapter 20). Lastly, in the transmitted text, there are two occurrences where the author mentions the *organa* of a *techne*.

Divination is the first *techne* described (elliptically and without any link to the preceding sentence). This skill provides evidence for knowing the future through invisible signs. That it is indeed a *techne* is well known.¹⁵ That medicine is related to divination is also well known; the two crafts know past, present and future, with the help of signs not understandable by laymen¹⁶ and rather ‘fantastic’.¹⁷

After divination, the author takes the example of metallurgy, in a passage that is edited by Joly as follows (chapter 13):

[Σιδήρου ὄργανα]* Τεχνῖται** τὸν σίδηρον πυρὶ τήκουσι*** πνεύματι ἀναγκάζοντες τὸ πῦρ. τὴν ὑπάρχουσαν τροφήν ἀφαιρέονται, ἀραιὸν δὲ ποιήσαντες παίουσι καὶ συνελαύνουσι· ὕδατος δὲ ἄλλου τροφῆ ἰσχυρὸς γίνεται. ταῦτὰ πάσχει ἄνθρωπος ὑπὸ παιδοτρίβειω· τὴν ὑπάρχουσαν τροφήν πυρὶ ἀφαιρεῖται ὑπὸ πνεύματος ἀναγκάζομένω. ἀραιούμενος κόπτεται, τρίβεται, καθαίρεται· ὕδατων δὲ ἐπαγωγῆ ἄλλοθεν ἰσχυρὸς γίνεται.

* Σιδήρου ὄργανα secl. Diels-Kranz, Joly-Byl: Σιδήρου ἐργάται corr. Wilamowitz apud Fredrich¹⁸

** τεχνῖται Joly (cf. Jones: ‘perhaps we should read τεχνῖται’): τέχνησι θ (del. Wilamowitz Fredrich) τέχνης Μ

*** *farie (ferrarie Diels) artis hominis ferrum consumunt Lat.*

Here is another application of the author’s doctrine about fire and water as fundamental elements in the world. The first two words have been bracketed or corrected by editors because they seem to be inserted glosses, but not by Jones, although he suggests a correction. The introduction of ἐργάται (Wilamowitz) or of τεχνῖται (Joly) would be unparalleled in the excursus. I think that one should come back to the conservative attitude of Littré and Jones, and read:

Σιδήρου ὄργανα. Τέχνησι τὸν σίδηρον πυρὶ τήκουσι πνεύματι κτλ.

Iron tools. By their arts, craftsmen melt the iron with fire, constraining the fire with breath; they take away the nourishment it has already; when they have made it rare, they beat it and weld it; and with the nourishment of other water it grows strong. Such is the treatment of a man by his trainer. By fire the nourishment he has already is taken away, breath constraining him. As he is made rare, he is struck, rubbed and purged. On the application of water from elsewhere he becomes strong (I.13, 136.15–20 J-B).

The comparison is not between the craftsmen and men, but between iron and the human body; by observing the blacksmith’s technique, and its ability to harden and mould iron, one can understand

¹⁴ Joly’s translation is unclear: ἰσχυρῶ μὲν πυρὶ ἐν τῷ σώματι οὐ συνίσταται, μαλακῶ δέ, ‘avec un feu violent, il ne prend pas dans le corps, mais bien au feu doux’. The comparison seems to be between the preparation of gold and of corn on the one hand, and digestion on the other hand (συνίσταται sometimes being a synonym for τρέφεται, cf. Demont 1978): ‘in the body, it is not with a violent fire, but with a smooth one, that man takes his form’.

¹⁵ See Aesch. *Prom.* 476–500; with Lloyd (1979) 227.

¹⁶ Jouanna (1999) 100–03.

¹⁷ Lloyd (1966) 354. Divination ‘imitates the *physis* and the life of men’, in which men, when having sex with women (a visible act), know that they will have children

who will become adults (a yet invisible result). The second example (not commented on by Joly) is unclear, unless it alludes to (animal?) dissection: living beings are not the same alive and dead, but ‘one knows the living being (τὸ ζῶον) by means of the dead’ (my translation); about animal dissection with conclusions for human physiology, see *Sacred Disease* 11.3–4 (p. 22 Jouanna); *Internal Affections* 23 (Littré 7.225); with, for example, Lloyd (1979) 156–65; Boudon-Millot (forthcoming). Last example: the belly is not intelligent but it is nevertheless a means of knowing that we are hungry or thirsty.

¹⁸ Fredrich (1899) 117: ‘who thinks that τέχνησι comes from the *varia lectio* τεχνῖται’.

the way fire, water and breath also change and mould the human body. Remarkably, there is another *techne* with such observable results, that of the *paedotribes*: men can observe similar effects of their training upon athletes.

This choice is in my opinion strengthened if we notice that in the transmitted text there is another example beginning with ὄργανον, and comparing still more exactly a technical and a physiological ὄργανον.

Here a brief philological note on the text of *Regimen I* is necessary. It is based on two ancient manuscripts: M (*Marcianus graecus* 269, tenth century) and θ (*Vindobonensis medicus graecus* 4, 11th century). But, thanks to Joly and Deroux,¹⁹ it is also possible to use an ancient Latin translation (*Parisinus latinus* 7027, ninth century), a text that could go back to the sixth century. Therefore, this Latin translation is our earliest testimony. It is very obscure and sometimes even impossible to understand; often the translator simply copies the Latin word for the Greek word, without understanding what he reads.²⁰ Joly, who devotes a paper to it,²¹ thinks that the two ancient Greek manuscripts and this translation all go back to the same tradition and therefore have common mistakes, which should be corrected. Nevertheless in the *CMG* edition he recognizes that ‘at least [the Latin translation] did confirm important conjectures and allow Diels to suggest several others’.²² I would add that one should be cautious in suspecting common mistakes between Lat., θ and M; the Latin translation, of course, does reinforce the Greek tradition.

In my opinion,²³ this is the case in chapter 18, which concerns music and ... cookery. Here I would suggest retaining the transmitted text, as Littré does, although Fredrich, Jones and Joly bracket a whole sentence at the beginning of the chapter, ‘as a marginal note which has been incorporated into the text’ (Jones). Here is the beginning of the chapter, as it is edited and translated by Joly, with partial apparatus, and the text of the Latin translation with Deroux’s apparatus:

[Μουσικῆς ὄργανον ὑπάρξει δεῖ πρῶτον, ἐν ᾧ δηλώσει, ἃ βούλεται.] Ἀρμονίης συντάξεις ἐκ τῶν αὐτῶν οὐχ αἱ αὐταί, κτλ

Des compositions musicales sont diverses, tout en provenant des mêmes (notes) ...

Μουσικῆς ... βούλεται M θ: secl. Fredrich, *Hippokratische* ... (p. 118), Joly-Byl || ἀρμονίης θ Jones Joly-Byl: ἀρμονίη M || συντάξεις M : σύνταξις θ

[De musicis] Musicum organum sic debet esse: primo erit in ea compaginationem ut quod uult illud significet concentu harmonie et coniecture ex semet ipsis dissimiles, non eaedem, ...

erit: ergo P || concentu harmonie: concerto sermone P || coniecture: coniecturam P

Again, such a beginning as the bracketing leaves us would be unparalleled in the excursus. Moreover, the reference to an ὄργανον is in accordance with the beginning of chapter 13. The Latin translation, which adds the title *De musicis*, does insert Μουσικῆς ὄργανον in the first sentence. The author is now going to compare a musical instrument (and not music in general) with some physiological process. As in other chapters, the logic of the argument is difficult to grasp. Let us first read the explanation about this instrument. The Latin translation (*compaginationem*) seems to show that the Greek word ἀρμονίη or ἀρμονίης belongs to the first part of the sentence, so that I will try to translate the text of M:

Μουσικῆς ὄργανον: ὑπάρξει δεῖ πρῶτον ἐν ᾧ δηλώσει ἃ βούλεται ἀρμονίη: συντάξεις ἐκ τῶν αὐτῶν οὐχ αἱ αὐταί, ἐκ τοῦ ὀξέος, καὶ ἐκ τοῦ βαρέος, ὀνόματι μὲν ὁμοίων, φθόγγῳ δὲ οὐχ ὁμοίων. τὰ πλεῖστον διάφορα μάλιστα συμφέρει, τὰ δὲ ἐλάχιστον διάφορα ἤκιστα συμφέρει: εἰ δὲ ὁμοια πάντα ποιήσει τις, οὐκ ἔνι (θ: οὐκετι M *om. Lat*) τέρψις: αἱ πλεῖσται μεταβολαὶ καὶ πολυειδέσταται μάλιστα τέρπουσιν.

¹⁹ Deroux and Joly (1978); see Joly and Byl (2003) 81–83.

²⁰ See Deroux in Deroux and Joly (1978) 131.

²¹ Joly (1975).

²² Joly and Byl (2003) 83.

²³ See already Demont (2004).

A musical instrument: firstly, that by which the meaning of harmony is made clear. Chords coming from the same elements are different, from the high and from the low, alike in name but not alike in sound. Those that are most diverse make the best harmony, those that are the least diverse make the worst. If somebody makes everything similar, it would fail to please; it is the greatest changes and the most varied that please the most (I.18, 138.14–18 J-B).²⁴

The author has an excellent command of music, as is shown in the difficult chapter 8 of book I about correct harmonies. This chapter recalls a quotation of Philolaos (and proves that this quotation preserves authentic material), whose musical terminology, Barker writes, is here ‘transposed into the Attic dialect’ (DK 44B6a); in *Regimen*, such harmony is ‘the principle which must govern relations between diverse elements in the developing foetus if it is to become a living whole, and a structure spanning the compass of an octave, properly organised into substructures spanning a fourth and a fifth’.²⁵ Without such harmony there would be no more *tonos* and no possibility for the instruments to be in agreement with voices. Barker’s observations on *tonoi* are worth quoting: ‘In the fifth and early fourth century, conceptions of *tonoi* and of the ways in which they were related arose directly from the observation of current musical practice, rather than constituting a body of theory from which practices were derived. Extensive modulation was particularly characteristic of music performed on wind instruments (*auloi*)’.²⁶ And he notes that the reed-blown pipes called *auloi* were the main reference for the *harmonikoi*.²⁷ This importance of practical knowledge for *techne* is attested by Plato in his *Republic*, when he speaks about the discussions between harmonists upon string instruments.²⁸ Here *Regimen* refers to a kind of instrumental music that is looking for the utmost pleasure, by means of complex, surprising and various harmonies. This is exactly, in my opinion, the same new music that was mocked in comedy and strongly criticized by Plato: in his Callipolis, there would not be any such depraved music.

‘Ἄλλ’, ἧ δ’ ὅς, οὐκ ἄλλας αἰτεῖς λείπειν ἢ ἅς νυνδὴ ἐγὼ ἔλεγον. Οὐκ ἄρα, ἦν δ’ ἐγώ, πολυχорδίας γε οὐδὲ παναρμονίου ἡμῖν δεήσει ἐν ταῖς ψδαῖς τε καὶ μέλεσιν. Οὐ μοι, ἔφη, φαίνεται. Τριγώνων ἄρα καὶ πενταγώνων καὶ πάντων ὀργάνων ὅσα πολυχόρδα καὶ πολυαρμόνια, δημιουργοὺς οὐ θρέψομεν. Οὐ φαινόμεθα. Τί δέ; ἀύλοποιούς ἢ ἀύλητάς παραδέξει εἰς τὴν πόλιν; ἢ οὐ τοῦτο πολυχорδότατον, καὶ αὐτὰ τὰ παναρμόνια αὐλοῦ τυγχάνει ὄντα μίμημα; Δῆλα δὴ, ἧ δ’ ὅς.

– Then, I said, if these and these only are to be used in our songs and melodies, we shall not want multiplicity of notes or a panharmonic scale? – I suppose not. – Then we shall not maintain the artificers of lyres with three corners and complex scales, or the makers of any other many-stringed curiously-harmonised instruments? – Certainly not. – But what do you say to flute-makers and flute-players? Would you admit them into our State when you reflect that in this composite use of harmony the flute is worse than all the stringed instruments put together; even the panharmonic music is only an imitation of the flute? – Clearly not (Pl. *Rep.* 3.399c5–d9, translation Jowett).

²⁴ Slightly different from Jones’ translation.

²⁵ Barker’s summary in Barker (2007) 280–81. He quotes a very useful note that Fr Duysinx wrote for Joly’s Budé edition of *Regimen* (Joly (1967) 111–14) and which is summarized in the *CMG* edition 239–40. Cf. (more cautiously) Huffman (1993) 152: ‘In this passage it could well be that it [*lege* he?] is drawing on Philolaos’.

²⁶ Barker (2007) 55.

²⁷ Barker (2007) 56–59, also 26: ‘Archytas does refer to the reed-blown pipes called *auloi* and to Panpipes’ and not to string instruments, in his fr. 1; cf. Huffman (2005) 103–07.

²⁸ ‘–The teachers of harmony compare the sounds and consonances which are heard only, and their labour, like that of the astronomers, is in vain. – Yes, by heaven! he said; and ‘tis as good as a play to hear them talking about their condensed notes, as they call them; they put their ears close alongside of the strings like persons catching a sound from their neighbour’s wall – one set of them declaring that they distinguish an intermediate note and have found the least interval which should be the unit of measurement; the others insisting that the two sounds have passed into the same – either party setting their ears before their understanding (Pl. *Rep.* 7.531a4–8, translation Jowett); with Barker (2007) 23.

One might wonder how the *Regimen's* description of *organa* and harmonics could explain anything in the human body and about its *pathemata*. The author then brings in another *techne*, as in the example quoted above about metallurgy and gymnastics, and introduces it by the name of the craftsmen, the cooks. However, this addition is absolutely necessary in order to understand the reference to music, and it should not be printed as a separate paragraph, as Jones does, but as a continuation of the paragraph about this musical instrument.²⁹

Μάγειροι ὄψα σκευάζουσιν ἀνθρώποισι διαφόρων, συμφόρων, παντοδαπὰ συγκρίνοντες, ἐκ τῶν αὐτῶν οὐ ταυτά, βρωσιν καὶ πόσιν ἀνθρώπων. εἰ δὲ πάντα ὁμοία ποιήσει, οὐκ ἔχει τέρψιν· οὐδ' εἰ ἐν τῷ αὐτῷ πάντα συντάξειεν, οὐκ ἂν ἔχοι ὀρθῶς.

Cooks prepare for men dishes of ingredients that disagree while agreeing, mixing together things of all sorts, from things that are the same, things that are not the same, to be food and drink for a man. If the cook makes all alike, there is no pleasure, and it would not be right either if he were to compound all things in one dish (I.18, 138.18–21 J-B).

The musical aspect of cookery is well suggested: it may have been a *topos* at the time. Aristophanes in his *Thesmophoriazousai* also mixes cookery (and its savours) and music when describing the new poets, who 'recently added good savours to harmony' (οἵπερ ἁρμονίαν ἐχύμισαν).³⁰ In a later comedy³¹ a cook who quotes Democritus and Epicurus is proud to explain his mastery in harmoniously mixing different humours:

– ἡ δ' ἀπειρία / τῶν νῦν μαγείρων κατανόει, πρὸς θεῶν, / οἷα 'στίν. ἄλμην ὅταν ἴδηις ἐξ ἰχθύων / ὑπεναντίων αὐτοῖσι ποιοῦντας μίαν (...) τί γὰρ ἂν εὖ γένοιτο ἔτι, / τῆς ιδιότητος πρὸς ἑτέραν μεμιγμένης / καὶ συμπλεκομένης οὐχὶ συμφώνους ἀφάς (...) – ἁρμονικός, οὐ μάγειρος.

– But just look at the crass inexperience of today's cooks! Mind, when you catch them pickling in one and same brine fishes which are absolutely opposite (...). What good can there be, when a specific taste is mixed and combined with its contrary, in non-consonant touches? (...) – You are a *harmonikos*, not a cook! (Damoxenus 1 K-A, v. 34–36, 40–42, 49).

The cooks of *Regimen* are not far from this 'boastful chef'. Then the Hippocratic doctor becomes still more precise, as he comes back to music while keeping cookery in mind, through the mention of the *γλωσσα*. Here again I edit a text differently from Joly.

Κρούεται τὰ κρούματα ἐν μουσικῇ τὰ μὲν ἄνω, τὰ δὲ κάτω. γλωσσα μουσικὴν μιμεῖται διαγινώσκουσα* μὲν τὸ γλυκὺ καὶ τὸ ὀξύ τῶν προσπιπτόντων, καὶ διάφωνα καὶ σύμφωνα. κρούεται δὲ τοὺς φθόγγους ἄνω καὶ κάτω, καὶ οὔτε τὰ ἄνω κάτω κρούμενα ὀρθῶς ἔχει οὔτε τὰ κάτω ἄνω. καλῶς δὲ ἡρμοσμένης γλώσσης, τῆ συμφωνίῃ τέρψις, ἀναρμόστου δὲ λύπη.

*γλωσσα μουσικὴν ... διαγινώσκουσα θ [a seclusimus] *lingua musicam imitatur [imitatum cod.], sciens* Lat. (Deroux-Joly) Jones: γλωσσα μουσικὴ ... διαγινώσκουσα Μ γλωσσαν μουσικὴ ... διαγινώσκουσαν Koller, Joly-Byl.

The notes struck while playing music are some high, some low. The *glossa* copies music in distinguishing, of the things that touch it, the sweet and the acid, the discordant from the concordant. The *glossa* strikes high- or low-pitched sounds, and it is well neither when the high notes are struck low nor when the low are struck high. When the *glossa* is in perfect accordance with harmony, pleasure comes from the accordance, but when it is not in accordance, pain (I.18, 138.18–21 J-B, Jones' translation with alterations).

²⁹ This point is aptly made by Joly (1960) 57. I add arguments in favour of his interpretation.

³⁰ V. 162, cf. Taillardat (1965) 441.

³¹ See Roselli (2000) 155–69; Wilkins (2000) 403–06.

Joly explains: ‘Music is first compared to cookery (...) Then, a connexion is made with the tongue, center of the taste (τὸ γλυκὺ καὶ τὸ ὀξὺ). Nevertheless, there remains a kind of ambiguity, because afterwards the tongue is again quoted, but this time, it seems, about the voice, i.e. music’.³² But at the beginning of the chapter, the transmitted text sets out to consider a musical instrument that could explain the physiological affections of men. We saw that the music alluded to in the first part of the chapter is this new music which Plato vehemently condemns, especially criticizing the newer stringed instruments and *auloi*. When introducing the tongue, is the author really thinking of singing? Even if ‘voices’ are alluded to, voices, in Greek, may be voices of instruments.³³ And it is the case that *glossa* does not only mean the tongue of a man, but also the reed of the *auloi*. I suggest that the doctor here compares two *organa*, one technical, the reed, and one physiological, the tongue (which could of course also be used in music as a technical means of producing the voice). The technical importance of the reed for producing sound in the *auloi* is, for example, explained in the pseudo-Aristotelian treatise *De audibilibus*.³⁴

Δῆλον δ’ ἐστὶ κάπτι τῶν αὐλῶν. τὰ γὰρ ἔχοντα τῶν ζευγῶν [Barker: δευτέρων cod.] τὰς γλώττας πλαγίως μαλακωτέραν μὲν ἀποδίδωσι τὴν φωνήν, οὐχ ὁμοίως δὲ λαμπράν· τὸ γὰρ πνεῦμα φερόμενον εὐθέως εἰς εὐρυχωρίαν ἐμπίπτει, καὶ οὐκέτι φέρεται σύντονον οὐδὲ συνεστηκός, ἀλλὰ διεσκεδασμένον. Ἐν δὲ ταῖς συγκροτωτικαῖς [Barker *ut vid.*: συγκροτέραις cod.] γλώτταις ἢ φωνὴ γίνεται σκληροτέρα καὶ λαμπροτέρα, ἂν πίεση τις αὐτὰς μᾶλλον τοῖς χεῖλεσι, διὰ τὸ φέρεσθαι τὸ πνεῦμα βιαίωτερον.

It is plain too in the case of *auloi*. For those mouthpieces that have their tongues angled obliquely give out a softer sound, but that is not equally bright; for as the breath travels, it falls directly into a wide space, and no longer travels under tension or compression, but is scattered. But in tongues that are closely united, the sound is harder and brighter, if one presses on them more firmly with the lips, because the breath travels more violently (801b33–42, translation Barker).

Δεῖ δὲ καὶ τῶν αὐλῶν εἶναι τὰς γλώττας πυκνὰς καὶ λείας καὶ ὁμαλὰς, ὅπως ἂν καὶ τὸ πνεῦμα διαπορεύηται δι’ αὐτῶν λείων καὶ ὁμαλῶν καὶ μὴ διεσπασμένον.

The reed-tongues of *auloi* should be dense and smooth and even, so that the breath may pass through them in a smooth and even state, without being dispersed (802b20, translation Barker).

Long before this text, fragment 1 of Archytas of Tarentum had already compared voice, *aulos* and reed, but in a different way (explaining the sound by the strength of the breath and the length of the channel) and with a different vocabulary (the reed being named *kalamos*).

Τὸ αὐτὸ δὲ καὶ ταῖς φωναῖς συμβήσεται· τᾶ μὲν ὑπὸ τῷ ἰσχυρῷ τῷ πνεύματος φερόμενα μέγιστα τε εἶμεν καὶ ὀξεῖα, τᾶ δὲ ὑπ’ ἀσθενέος μικρὰ τε καὶ βαρῆα. Ἀλλὰ μὲν καὶ τούτῳ γὰ κα ἴδοιμες ἰσχυροτάτῳ σαμείῳ, ὅτι τῷ αὐτῷ φθεγξαμένῳ μέγα μὲν πόρσωθεν κ’ ἀκούσασιν· μικρὸν δέ, οὐδ’ ἐγγύθεν. ἀλλὰ μὲν καὶ ἔν γα τοῖς αὐλοῖς τὸ ἐκ τῷ στόματος φερόμενον πνεῦμα ἐς μὲν τὰ ἐγγύς τῷ στόματος τρυπήματα ἐμπέττον διὰ τὴν ἰσχὴν τὴν σφοδρὰν ὀξύτερον ἄχρον ἀφήσιν, ἐς δὲ τὰ πόρσω, βαρύτερον· ὥστε δῆλον ὅτι ἂ ταχεῖα κίνασις ὀξὺν ποιεῖ, ἂ δὲ βραδεῖα βαρὺν τὸν ἄχρον. (...) ἀλλὰ μὲν καὶ ὁ γὰ κάλαμος, αἱ κά τις αὐτῷ τὸ κάτω μέρος ἀποφράξας ἐμφυσῆι, ἀφήσει <βαρεάν> τινὰ ἀμῖν φωνάν· αἱ δὲ κα ἐς τὸ ἥμισυ ἢ ὀπόστον <ᾶν> μέρος αὐτῷ, ὀξὺ φθεγξέεται· τὸ γὰρ αὐτὸ πνεῦμα διὰ μὲν τῷ μακρῷ τόπῳ ἀσθενὲς φέρεται, διὰ δὲ τῷ μείονος σφοδρόν.

³² Joly and Byl (2003) 247; cf. chapter 23 (p. 140.21 Joly-Byl).

³³ For example Pl. *Rep.* 3.397a6 (καὶ σαλπίγγων καὶ αὐλῶν καὶ συρίγγων καὶ πάντων ὀργάνων φωνᾶς).

³⁴ See Barker (1989) 99–109, esp. 103 n.17; Bélis (1984) 180, publishing Delphic *auloi*: ‘The texts explain how unstable was the aulos, and how important for the pitches were the player’s breathing, his fingering, the reed’s and pipes’ position’.

The same thing will also happen with vocal sounds. The one carried by a strong breath will turn out to be loud and high, the one by a weak one, soft and low. But indeed we can see this fact from this strongest sign, that we can hear the same man speaking loudly from far off but speaking softly not even from near at hand. But indeed also in flutes, the breath moving from the mouth and falling into the openings near the mouth produces a higher sound because of the great force, but that falling into the holes further away, produces a lower sound (...). But also indeed, a reed, if someone, having blocked the lower part of it, blows in it, he will, you know, produce a low sound. But if he blows into the half or whatever part of it, it will sound high. For the same breath is carried weakly through a long distance and strongly through a shorter distance (Archytas fr. 1, text and translation Huffman).

In this way we could perhaps answer the difficulty raised by Joly: ‘How would it be possible that the tongue imitates music? The tongue is part of human nature, in the same way as breath and food (...) It must be music that imitates the tongue, according to the argument’.³⁵ In my opinion it is not the tongue but the reed, when one plays the pipe, that copies music, for music, including harmony, constitutes that part of nature which is also copied in different ways by cooks, the human body and pipes.

There seems to be a difficulty in the use of the verb κρούεσθαι, which can be specific for stringed instruments (hence Jones’ ‘struck’ and Joly’s ‘les notes qu’on frappe’), but, as a matter of fact, this stem can also be used in a more general sense and even for playing the *auloi*: ‘One gives the name *kroumata* to the *aulemata*, an appellation taken from the lyre’, Plutarch says.³⁶ And there are such uses in Athenian classical comedy.³⁷ The sounds of both the voice and *auloi* are described by Pythagoreans as the result of a striking force and a thing struck (see n.40).

The meaning ‘reed’ of the word *glotta* was well known by Greek speakers. Aischines can make the Athenians laugh at Demosthenes by saying: ‘If one snatches his *glotta* off, as those of *auloi*, he will not have anything left!’³⁸ This joke, which remained famous throughout antiquity, was also made by Demades, it seems, about all Athenians: ‘Demades compared the Athenians to *auloi*: if one snatches their *glotta* off, there is nothing left.’³⁹

The *glotta* (or *glossa*) is then an *organon* with its two meanings: a part of a musical instrument, the *aulos*, and most important in playing it, as well as a human part, a bodily organ most important in speaking, eating and singing. The mouth is of course linked to the *arteria*, ‘windpipe’ in English, and this is a significant name: Porphyry, commenting on the chapter of Ptolemy’s *Harmonics* in which Archytas’ fr. 1 is preserved, explicitly ‘says [about vocal sounds] that the windpipe serves as a sort of natural *aulos*’ (ἀλλ᾽ ἄρ τινι φυσικῶ 9.6 Düring).⁴⁰ This *organon* is crucial for the author’s theory, as it is a means to create harmony: in music, in cookery and in the body. The medical associations of this comparison are not developed there, but could easily be guessed: health is also a matter of harmony, between humours, of course, as for Eryximachus in Plato’s *Symposium*.⁴¹ This is quite coherent with the Pythagorean touch that Joly emphasizes in *Regimen* (above, n.4). Human nature and physiology (the taste processes of the tongue) can be understood by observing the *technai* of music (the use of the reed and also human singing) and cookery (the appreciation of sweetness and bitterness).

³⁵ Joly (1960) 57: hence his correction γλῶσσαν, which he further justifies by the reading γλῶσσα μουσική ... διαγινώσκουσα in M (‘halfway between the authentic text and the corrupted one in the rest of the tradition’).

³⁶ *Mor.* 638C1.

³⁷ See Theopomp. Com. 51 K-A: ‘Why, she plays rotten tunes (ἀλλεῖ γὰρ σαπρὰ ... κρούματα) like those played in old Charixena’s time’ (translation Edmunds); cf. Eup. 121 K-A; Plb. 20.22.5.

³⁸ Aischines *Against Ctesiphon* 229.

³⁹ Stobaeus *Flor.* IV.69.

⁴⁰ Huffman (2005) 146–47, who adds: ‘I suggest that Archytas also drew a parallel between the *aulos* (or the reed) and the voice and described the movement of the voice as intervallic, insofar as it behaves in the same way as the movement of the sound of the *aulos*, where the pitch depends on distances between the striking force (breath) and the thing struck, the hole.’

⁴¹ 186d–87d; cf. Demont (2004).

There were to be further refinements of such a comparison, for example in Galen's *De usu partium*. There, however, the human reed is not the tongue, but the so-called *glottis* (the *arteria* being the *aulos* in which the air circulates), and he specifies the way in which the comparison should be made: *techne* imitates nature, nature does not imitate *techne*.⁴² Of course *Regimen* is not engaged in such late philosophical controversies. For the author it is evident that nature is prior to *techne* and that *techne* may help to understand both nature and diseases, thanks to his analysis. But it is a similar context of observations about nature and *techne* that paved the way for the development of the meaning '(bodily) organ' of the word *organon* at the beginning of the fourth century; I suggest that the doctor of *Regimen* exploited the polysemy of *glotta* in this context.

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⁴² For example Galen *On the Usefulness of the Parts of the Body* 7 (III 353, 561 Helmreich). *Glotta* and *glottis* seem to have been equally used for the reed of pipes. Cf. Oribasius *Medical Compilations* 62.27.5: 'It is remarkable that nature has achieved exactly the same kind of organ as the *glottis* in pipes'. For Christian authors, it became an example in order to celebrate God's Providence. Cf. Gregorius *On the Inscriptions of the Psalms* (5.33) on 'the organic structure of our body', 'technically

adapted by nature in order to realise music'. Meletius in his *Nature of Man* is especially precise in his description of 'the human organ' as a harmonious mixture of *aulos* and lyre: cf. Lachenaud (2013) 57–58. Theophilus Protospatharius explains that 'this part is called *glottis*, similar to the *glotta* and the *glottis* of the pipes: as a matter of fact, one gives those two names to them' (*On the Fabric of the Human Body* 3.15; p. 159 l. 24–26 Grimm-Stadelmann).

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