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Aristotle on the Differences in Material Organisation Between Spoken and Written Language: An Inquiry into Part-Whole Relations

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Abstract: In this paper I aim at showing that, in Aristotle's view, spoken and written language differ in their material organisation, in particular in their respective part-whole relations. I argue that, according to Aristotle, written language is an additive system (i.e. a system whose parts exist and are produced prior to what they are parts of), whereas spoken language is a non-additive system (i.e. a system whose parts cannot exist and be produced prior to what they are parts of), and that, in his view, spoken language, *qua* non-additive system, is analogous to organisms. Further, I outline two possible implications of this hypothesis. The first concerns the relevance of Aristotle's conception of spoken language as a non-additive system to his account of human language's power to signify. I set out some reasons for thinking that Aristotle endorses the view that the form of human language (i.e. its power to signify) is matter-involving. The second implication concerns the syllable analogy that Aristotle employs in *Metaphysics* Z 17. I argue that the syllable Aristotle refers to is a spoken one, and I develop some consequences of this hypothesis for the meaning of the analogy and, more generally, of the chapter.

Keywords: Aristotle, spoken vs written language, part-whole relations, hylomorphism, *Metaphysics* Z 17

1 Introduction

Aristotle says very little on the relations between spoken and written language. One of the rare passages on this issue is *Int.* 1.16a4, where he describes written marks (*ta graphomena*) as *sumbola* of spoken language's phonic signifiers (τὰ ἐν τῷ φωνῆ). This passage is notoriously difficult and controversial, as is the entire chapter to which it belongs. But, notwithstanding the disputes over its exact

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meaning, it is generally agreed that, similarly to Plato,¹ Aristotle views written language as some kind of notation or representation of the spoken one,² which he therefore conceives of as prior to written language. This is arguably one of the reasons why Aristotle defines *logos* and its parts first of all as voice (*phone*).³

The written language Aristotle is referring to is the one accomplished by means of what we now call ‘alphabetic writing’. This is a system of graphic signs each of which represents a single sound of a language.⁴ It is based on the analysis of the spoken expressions of a language into a finite and small set of minimal units (phonemes). Each of these units is represented by a single graphic sign (grapheme), and any larger part of speech is represented by a combination of graphemes.⁵ Aristotle calls these minimal units *grammata* and *stoicheia*.⁶

Since it represents the phonic signifiers of spoken language by means of a finite and small set of graphemes, alphabetic writing is more effective, precise and economic than non-alphabetic writing systems. This however does not imply that the spoken system and the alphabetic written one are of the same kind, i.e. organised according to the same principles.

In what follows, I shall argue that they are not, in Aristotle’s view. Aristotle’s conception of spoken and written language implies, similarly to Plato’s,⁷ that spoken language is to written language as a living thing is to its artificial reproduction or image. Unlike Plato, Aristotle makes this distinction and sets

1 *Phdr.* 276a8–9.

2 See, for instance, Kretzman (1974) 5: “For x to be a symbol of y is for x to be a notation for y, to be a rulegoverned embodiment of y in a medium different from that in which y occurs”. Further, I take it that the hypothesis that, in Aristotle’s view, written language is a representation of spoken language can be endorsed also if the notion of ‘*symbolon*’ is interpreted differently from Kretzman. This is because Aristotle maintains that *logos* is essentially spoken (see below n. 3), which arguably implies that he views written language as some kind of secondary modelling system.

3 See *Int.* 2.16a19–20; 3.16b19–20; 4.16b26–28 (on *logos* and its parts); *Poet.* 20 (on the parts of *lexis*).

4 The Greek alphabet is the first writing system comprising distinct graphemes for vowels and consonants. On this issue, see Gelb (1952), Havelock (1976) II.2. Note, moreover, that often alphabets (apart from phonetic ones) are not such that each of their graphemes represents univocally a single phoneme.

5 The kind of analysis of spoken language from which the alphabet results is described by Plato in the *Philebus* (17b6–9, 18b6–d2), *Politicus* (277e–278d), *Theaetetus* (207d–208a). On this point, see Section 2.

6 Aristotle uses both terms to refer to phonemes and graphemes (see *Part. an.* III 1.661b14–15; *Poet.* 20.1456b20; *Gen. an.* I 18.722a33; *Metaph.* Δ 3.1014a26–31). The same holds for Plato (*Phlb.* 18c; *Cra.* 424c5–d4: on Plato’s use, see Druart 1975, 245). Further, Aristotle uses *stoicheion* also in the broader sense of ‘element’ (*Metaph.* Δ 3).

7 On Plato, see *Phdr.* 275d4–276a9, 276e3–277a4.

these analogies from the point of view of the respective organisations and part-whole relations of the two systems.

Broadly, in Aristotle's view, written language consists of parts that are prior to the compounds they are parts of. Just like composite artefacts, any compound of written signs is produced by putting its pre-existing parts together, i.e. by adding them to one another. In this sense, written language is an additive system. Instead, spoken language is not an additive system.⁸ Similarly to organisms, it consists of various levels of composition where the lower levels do not exist and cannot be produced prior to the higher ones. Hence the whole is not produced by adding parts. Rather, again as with organisms, the parts are formed together with each other and with the whole, by the progressive articulation of a unitary matter.

My inquiry here focuses on the differences in material organisation between spoken and written language, in particular on the part-whole relations between elements/letters, syllables, and the material whole they are parts of. It considers the issue of semantic organisation and power to a limited extent, i.e. to raise the question of their possible relations with the material organisation. In Sections 2 and 3 I tackle the material organisation of written and spoken language respectively, and I argue that they differ in that written language is an additive system whereas spoken language is a non-additive system. In Section 4, I outline two possible developments of the interpretation proposed in Sections 2 and 3. The first concerns the relevance of Aristotle's conception of spoken language as a non-additive system to his account of human language's power to signify. The second is about the syllable analogy that Aristotle employs in *Metaphysics Z* 17 (1041b11–33).

2 Written Language

As far as I know, there is no passage where Aristotle deals directly with the question raised here: are spoken and written language systems of the same or of a different kind? My inquiry, therefore, will consist in collecting and confronting data about spoken and written language scattered in various works of his, from which I will then draw some conclusions. I shall start with a passage from *Gen.*

⁸ I use the distinction between additive and non-additive systems, rather than distinctions from classical or more recent mereology, since I think that this is the distinction that Aristotle himself employs in his treatment of the material organisations of written and spoken language, as well as in his biological inquiry (see Sections 2 and 3).

an. I 18 (722a30–33) where Aristotle employs an analogy to the written name (*onoma gegrammenon*) to tackle issues about part-whole relations.

First, I have some general remarks about the context in which this analogy occurs. Aristotle employs the written-name analogy in *Gen. an.* I 18 while inquiring into the nature and origin of the seed, in particular while criticising what scholars generally call the ‘pangenetic theory’.⁹ The pangenetic theory – as Aristotle presents it – is primarily aimed at explaining resemblances between parents and their offspring.¹⁰ It is based on several data and on the assumption that the parts of an organism are prior to (*protera*: 722a24–25) what they are parts of.¹¹ On this basis, it claims that the seed is a compound or a set of parts¹² deriving, by separation, from the corresponding parts of one or both parents; it is formed by adding pre-existing parts together. Broadly, this means that, according to the pangenetic theory, the formation of the seed is a process comprising several numerically distinct processes: each part is formed by itself – i.e. through a process of separation that is numerically distinct from the processes of separation whereby the other parts are formed – and the whole is formed through a process of composition that is numerically distinct from the processes whereby the parts are formed.

Aristotle’s criticism of the pangenetic theory comprises several arguments.¹³ The most powerful arguments are those that challenge the basic assumption of the theory (i.e. the idea that the parts of an organism are prior to what they are parts of).¹⁴ This, however, does not hold for the argument where the written-

9 Arguably, the so-called ‘pangenetic theory’, which Aristotle tackles in *Gen. an.* I 18, is not a single theory formulated by a single author or by a single school. Rather the pangenetic theory is a collection of different theories that share the idea that the seed derives, by separation, from all the parts of the parents and is formed by adding these pre-existing (bits of) parts together. On this point, see Louguet (2015).

10 *Gen. an.* I 17.721b13–722a1; I 18.722b1–3.

11 *Gen. an.* I 17.721b13–722a1. I take the assumption of the pangenetic theory to be stated at 721b25–27, where Aristotle maintains that the pangenetic theory rests on the claim that, if the whole has a seed, each part has a seed of its own. Later it is shown that, according to the pangenetic theory, the seeds of the parts are generated prior to the whole (722a16–b3, 722b17–24).

12 The seed is a set if the parts are divided from each other, whereas it is a compound if the parts, after separating from the corresponding parts of the parents, come together, become united and so forming a small organism (722b3–5).

13 Some arguments show that the data on which the pangenetic theory is based are insufficient (722a4–16); others highlight facts that contradict it (722b6–8); others are theoretical arguments aimed at challenging its implications and assumptions (722a16–b3). For an analysis of Aristotle’s whole criticism of the pangenetic theory, see Furth (1988) 113–115, 141–145 and especially Louguet (2015).

14 I shall tackle these arguments shortly.

name analogy occurs. This is rather aimed at showing that the pangenetic theory implies a consequence that undermines its explicative power and makes the theory itself pointless. In particular, this argument is aimed at showing that the pangenetic theory is unable to account for *any* resemblance between parents and their offspring or for the formation of *any* organic part.

Aristotle accomplishes this result first of all by stressing that: 1) even if organisms were additive systems of parts (as the pangenetic theory assumes), they would not only be parts but parts combined or arranged in a certain way,¹⁵ and that, 2) since the composition (*sunthesis*)¹⁶ is not itself a (material) part,¹⁷ there cannot be any seed of the composition (according to the pangenetic theory); from this it follows that 3) the pangenetic theory is unable (at least by itself) to account for the composition (*sunthesis*) of the parts, and therefore for how the parts are formed and for the resemblances between parents and their offspring (722a16–b3).

Further, in order to show that the pangenetic theory is unable to account for *any* resemblance between parents and their offspring or for the formation of *any* organic part, Aristotle applies the basic assumption of the pangenetic theory to the parts themselves. Thereby, he uses the distinction between non-uniform, uniform and elemental parts (i.e. the idea that the non-uniform parts are composed of the uniform ones, which in turn are composed of the elements, which are not further analysable into parts): if it is true that an organism is (reducible to) its non-uniform parts plus¹⁸ their composition, it is also true that each of the non-uniform parts is (reducible to) its uniform parts plus their composition, and that each of the uniform parts is in turn (reducible to) the simple elements plus their composition. Since the elements are not further analysable into parts, and since there is no seed of the composition, it follows

¹⁵ Thereby, Aristotle assumes that an organism is a whole (*holon*), not a total (*pan*). Unlike a *pan*, a *holon*, is such that the relative position of its parts makes a difference (*Metaph.* Δ 26). On this point, see also n. 16.

¹⁶ At least insofar as the composition of the non-uniform parts into the whole organism and of the uniform parts into the non-uniform one are concerned, the composition (*sunthesis*) seems to be conceived of as a mere juxtaposition, which only provides the parts with spatial relations to each other, without changing their respective (predetermined) nature (see *Gen. an.* I 18.722b26–29 and the notion of *sumbolon* employed at 722b11; for this meaning of *sunthesis*, see also *Gen. corr.* I 10).

¹⁷ The hypothesis that here the *sunthesis* is not conceived of as a material part is suggested by the fact that, unlike the material parts, it is not called ‘*morion*’ and (according to the pangenetic theory) does not derive from the parents. From this it follows that the *sunthesis* is something that is added to the material parts without changing their nature (see above n. 16) and without itself being a material part.

¹⁸ Here ‘plus’ translates ‘*kai*’ at 722a30, 33.

that the seed must derive from the elements alone (without composition), and hence that the pangenetic theory is unable to account for any resemblance between parents and their offspring or for the formation of any organic part (or, therefore, for the formation of the organism as a whole).

In sum, the mistake of the pangenetists, which Aristotle stresses in this argument, is that of neglecting the issue of the composition of the parts into the whole and that of the compositional relations between the parts themselves. To stress this mistake, Aristotle develops the pangenetic theory until it approaches a model that is very similar to that of the dream theory tackled in Plato's *Theaetetus*: a whole is composed of pre-existing parts, which can in turn be analysed into further pre-existing parts, until one reaches parts that are no longer analysable into parts; any whole thus composed is nothing else than its pre-existing parts combined in a certain way.¹⁹ As we shall see shortly, this connection with the dream theory of the *Theaetetus* is particularly significant, since both Plato (in the dream theory of the *Theaetetus*)²⁰ and Aristotle (in the above-mentioned argument against the pangenetic theory) employ a linguistic analogy.

Let us now consider the structure of Aristotle's argument in more detail. Aristotle introduces the argument using a dilemma: the seed derives either from the uniform parts alone or from both the uniform and the non-uniform parts (722a16–18). In the course of the argument, however, this dilemma is replaced by a trilemma: the seed derives either from the uniform parts alone (722a18–19) or from the non-uniform parts alone (722a23–24) or from both the uniform and the non-uniform parts (722a27).

First, Aristotle tackles the hypothesis that the seed derives from the uniform parts alone, and rejects it for the following reasons: the resemblances between parents and their offspring (which is the main *explanandum* of the pangenetic theory) concern also and especially the non-uniform parts; if the resemblances in the non-uniform parts are not due to the fact that the seed derives from them, this could also hold for the resemblances in the uniform parts (722a21–23). This means that a pangenetic theory claiming that the seed derives from the uniform parts alone, besides not really being a pangenetic theory, does not account for all the resemblances between parents and their offspring, and does not provide sufficient reasons to believe that the theory is true in the case of the resemblances in the uniform parts.

¹⁹ In the *Theaetetus*, while tackling the dream theory, Socrates underlines that the elements are first (201e1, 202b1, 205c5), that they must be known prior to what they are parts of (203d8), that they are not further analysable into parts (203b2–7, 205c7, d1–2), and that what is composed of them is reducible to them (203c4–7, 205a8–9).

²⁰ *Tht.* 202e6ff.

Secondly, Aristotle tackles the hypothesis (not included in the initial dilemma) that the seed derives from the non-uniform parts alone (722a23). As we are now going to see, this hypothesis is problematic in that it goes against the basic assumption of the pangenetic theory.²¹ If the non-uniform parts are composed of the uniform ones,²² and if any compound of parts is (reducible to) its parts (plus their composition),²³ claiming that the seed derives from the non-uniform parts *alone* makes no sense. It would make sense only if the non-uniform parts were conceived of as not composed of parts and as not analysable into parts (like the *ἰδέα ἀμέριστος* of the dream theory).²⁴ Accordingly, Aristotle does not consider the hypothesis that the non-uniform parts are not themselves composed of parts. Rather, he stresses that they are and that the uniform parts they are composed of are prior to them (*protera*: 722a24–25). From this and from the fact that there are also resemblances between parents and their offspring in the uniform parts, he concludes that it would make more sense (for the pangeneticists) to claim that the seed derives from the uniform parts (722a24).

As we have just seen, while tackling the second hypothesis (i.e. that the seed derives from the non-uniform parts alone), Aristotle introduces the issues of the composition of the parts and of the priority of the parts with respect to what they are parts of. These issues are employed in the treatment of the third hypothesis: the seed derives from both the uniform and the non-uniform parts (722a27). Thereby, the third hypothesis is reduced to the idea that the seed derives from the uniform parts plus their composition (into non-uniform parts). In other words, claiming that the seed derives from both the uniform and the non-uniform parts amounts to claiming that the seed derives from the uniform parts plus their composition, since the non-uniform parts are just uniform parts composed in a certain way (722a28–30).

Aristotle could conclude his argument here: he could show that, since there is no seed of the composition, the pangenetic theory does not account for the composition of the uniform parts into the non-uniform ones, i.e. for the resemblances between parents and their offspring in the non-uniform parts. He does not conclude his argument here, though. Rather, he introduces a further level of parts, by analysing the uniform parts into the simple elements (which he does,

²¹ Arguably, this is why this hypothesis is not included in the initial dilemma.

²² The idea that the non-uniform parts are conceived of as composed of the uniform ones can be inferred from the formulation of the second hypothesis: the seed derives from the non-uniform parts alone, i.e. *not from all the parts* (722a23–24).

²³ Actually, the issue of the composition (*sunthesis*) is not yet present here. Aristotle introduces it at 722a25, while tackling the third hypothesis. That said, according to the pangenetic theory a whole comprising parts is nothing more than its parts.

²⁴ See *Th.* 205c2.

as we shall see shortly, by means of the written-name analogy: 722a30–35). He thereby aims at showing that the pangenetic theory is unable to account for any resemblance between parents and their offspring. By analysing the uniform parts into the simple elements, and by conceiving the relation of composition as transitive, Aristotle draws the conclusion that the seed derives from the elements alone (722a34–35). Thus, Aristotle's argument shows that the pangenetic theory implies a consequence (i.e. the seed derives from the elements alone) that undermines completely its explanatory power and makes the theory itself pointless: if the combination of the parts is not accomplished in the seed but in a subsequent phase, the resemblances between parents and their offspring would be explained by what causes the combination in this subsequent phase, not by the fact that the seed derives from (some or all) the parts of the bodies of the parents (722b1–3).

Further, is the seed drawn from each of the non-uniform parts alone, such as flesh and bone and sinew, or also from the non-uniform ones, such as face and hand? For, if it is drawn from the former alone, [it can be objected that] the resemblance occurs more in the non-uniform parts such as face, hands, and feet. Therefore, if even these [*scil.* the resemblances in the non-uniform parts] are not due to the seed coming from all the body, what prevents also the resemblances in the uniform parts from not being due to the seed coming from all the body, but to another cause? If, instead, the seed comes from the non-uniform parts alone, then it does not come from all the parts. But it is more fitting that it should come from the uniform parts, for they are prior to the non-uniform parts and the non-uniform parts are composed of them; and as children are born resembling their parents in face and hands, so they resemble them in flesh and nails. If the semen comes from both the uniform and non-uniform parts, what would be the manner in which generation takes place? For the non-uniform parts are composed of the uniform ones, so that coming from the non-uniform parts would come to the same thing as coming from the uniform parts plus their composition. It is just as if something came to be from a written name²⁵: if it came from the whole name, it would also come from each of its syllables, and if from these, from the elements and their composition. And so, if indeed flesh and bone are composed of fire and things of this sort, the seed would rather come from the elements,²⁶ for how can it come from the composition? But, without the composition the parts would not have the resemblance. So, if there is something that accomplishes the composition later, this something would be the cause of the resemblance, not the semen's coming from all the body (722a16–b3).

As already noted, this argument does not attack directly the basic assumption of the pangenetic theory: the idea that the parts of an organism are prior to the whole. This is done with subsequent arguments where Aristotle employs one of the central principles of his biology: the so-called homonymy principle.

²⁵ Reading ἀπῆι τι (OCT) at 722a31.

²⁶ Reading μᾶλλον (OCT) at 722a35.

According to this principle,²⁷ organisms are complex dynamic wholes and are such that both the identity and the existence of their parts depend on the whole they are parts of and on the activity of the whole to which they contribute with their own activities: if separated from the whole, a part is not what it is except homonymously;²⁸ it has the name but not the essence of that part, just like the image of a human being has just the name but not the essence of a human being.²⁹ Hence, in Aristotle's view, the pangenetic theory is fundamentally untenable, because its core (i.e. its basic assumption) is untenable. Organisms are not additive systems: they are not formed by putting pre-existing parts together, for their parts cannot exist and be produced prior to the whole. Rather, insofar as they are non-additive systems, their formation is the progressive articulation of a unitary matter (the female menses) accomplished by a form-giving principle of change (the male semen):³⁰ the process of formation of

27 Arguably, it would be more accurate to say 'according to the version of the homonymy principle that applies to organisms'. This is because there is also a homonymy principle that holds for artefacts (see, e.g. *De an.* II 1.412b13–15), but its meaning is different from the homonymy principle that holds for organisms. For instance, as we shall see shortly, in the case of organisms, the homonymy principle implies that they cannot be generated in an additive way: the parts are formed together with each other and with the whole by means of a numerically unitary process whereby a unitary matter is progressively articulated into parts. Instead, composite artefacts are produced in an additive way: the construction of, e.g. a house is a process comprising several numerically distinct processes whereby the parts of the house are produced, and one or several numerically distinct processes whereby the parts are combined.

28 The so-called homonymy principle is based on the empirical observation that the parts of organisms, if separated from the whole, are not able to carry out their activities and are progressively destroyed. This also holds for organisms (such as insects) whose parts, if separated from the whole, are capable of carrying out the activity they performed before separation: these capacities and activities last only for a limited time (*De long. vit.* 6.467a20–21). The case of plants is different but does not undermine the homonymy principle: if separated from the whole, their parts can continue to live just because they become complete organisms (on this issue, see below Section 4.2).

29 In *Gen. an.* while inquiring into generation and embryogenesis, Aristotle employs repeatedly the homonymy principle (see e.g. *Gen. an.* I 19.726b22–24; II 1.734b24–27, 735a6–8; II 4.740a13–15). In his criticism of the pangenetic theory clear references to the homonymy principle can be found at 722b3–4, 722b17–723a1.

30 On the female menses as matter, and on the semen as form-giving principle of change, see e.g. *Gen. an.* I 20.729a12–14. On embryogenesis as a progressive articulation (*diarthrosis*), see *Hist. an.* I 3.489b9–10, III 19.521a9–10, V 19.550b28–30, VI 11.566b15; *Part. an.* III 4.667a6–8; *Gen. an.* II 6.742a3, 5–6, 744b9–11. Broadly, this kind of formation (i.e. articulation of a unitary matter) avoids the homonymy of the parts since it preserves the unity of the form: the form is present potentially in the menses (*Gen. an.* II 3.737a22–24), and *qua* principle of change in the semen (*Gen. an.* I 20.729a12–14). Further, Aristotle also tackles the order of embryonic

each part is not numerically distinct from that of the other parts and of the whole;³¹ rather, each part is formed *together with the others and with the whole* by a numerically unitary process, which is caused by a single principle of change acting on a unitary matter.

Let us now consider the written-name analogy in more detail. The principal aim of the following analysis is to understand whether Aristotle conceives of the written name as an additive system and whether the qualification of the name as written is relevant, i.e. whether the name is an additive system *qua* written. This issue is complicated by the fact that the analogy has an imaginary aspect, expressed using a counterfactual (722a30–31): Aristotle imagines that something (*ti*: 722a31) derives from a written name and that this process of derivation is analogous to that whereby, according to the pangenetic theory, the seed (or part thereof) derives from the parent(s) (or from a part of the parent(s)).³² Hence, presumably, Aristotle imagines a written name from which it derives (or should derive) its miniature replica (i.e. the analogue of the seed or part thereof, as conceived of by the pangenetic theory), which is what the *ti* at 722a31 refers to. The focus of the analogy, however, is not on this imaginary process of derivation and its result. It is rather on the written name *qua* analogue of what the seed comes from. In particular the focus of the analogy is on the fact that the written name is composed of parts (the syllables), which are prior to what they are parts of, and which in turn are composed of further parts (the elements/letters) that,

development in such a way as to avoid the homonymy of the parts and of the whole (*Gen. an.* II 4.740a13–19; on the relation between the order of embryonic development and the homonymy principle, see Quarantotto forthcoming).

31 Aristotle criticises the hypothesis that each part of an organism is formed by itself also in *Gen. an.* II 4.740b12–18.

32 Perhaps, Aristotle's written-name analogy is inspired by one of the facts on which the pangenetic theory is based, according to Aristotle: the case of the man from Chalcedon who was branded on his arm and whose child bore the same letter (*gramma*), though somewhat confused and indistinct (721b32–34). Aristotle might be building on this case, by considering an imaginary possibility that involves a compound of *grammata* (an *onoma*) rather than a single *gramma*, and that thereby introduces the issue of the composition. Further, perhaps Aristotle is also making implicit reference to the various biological analogies that Plato employs in the *Phaedrus*. There, Plato speaks of the written *logos* as having a father (275e4), as the brother of the spoken *logos* (276a1–3), which is compared to a living thing (276a8–9). Plato also uses the analogy of the seed (276b–277a): the written *logos* is analogised to a seed that has been placed in a land unsuitable to produce good fruit, whereas the opposite holds for the spoken *logos*, which is described as fertile and immortal. That said, whereas Plato analogises the written *logos* (as well as the spoken *logos*) to a seed, Aristotle analogises the written name to what the seed comes from. Further, whereas Plato's argument is about the respective communicative and scientific value of spoken and written language, Aristotle's is instead about the respective part-whole relations of organisms and written language.

besides being prior to what they are part of, are not themselves composed of parts. Further, the focus of the analogy is on the fact that the composition (*sunthesis*) is something that is added to the (material) parts, without itself being a (material) part.

From this it could be inferred that the model of the written name has essentially an illustrative function: just as a written name is not only its parts, but its parts plus their composition, in the same way an organism, if it were an additive system, would not only be its parts, but its parts plus their composition; therefore, if something derived from the written name in the way in which the seed derives from the parents according to the pangenetic theory, the result would not be a replica of the written name, because the composition would be missing.

The analogy, however, seems to have a heuristic function, too: the written name is used as an analogical source from which some properties of the analogical target are inferred. This is suggested by the context of the analogy, in particular by the fact that it is precisely with the written-name analogy that the level of simple elements is introduced and then transferred (through a *hoste*-clause: 722a33) to organisms, with the consequent reduction of the uniform parts to elements plus composition. This analogical inference is also favoured by the fact that the term '*stoicheion*' indicates both a letter and a physical element.³³

From this at least two conclusions can be drawn. First, the content of the analogy seems to be as follows: written name: non-uniform part = syllables: uniform parts = elements/letters: physical elements; syllables plus composition: uniform parts plus composition = elements/letters plus composition: physical elements plus composition.³⁴ If this interpretation is correct, the analogy does

³³ See n. 6.

³⁴ This hypothesis is suggested mainly by three data: 1) Aristotle introduces the analogy immediately after reducing the non-uniform parts to the uniform ones plus their composition; 2) he uses the analogy to draw the conclusion that the uniform parts derive in turn from the elements plus their composition, just like the syllables derive from the elements plus their composition; 3) the analogy between the syllables and the uniform parts is also employed in *Metaphysics* Z 17.1041b12–19. A different interpretation, however, is possible. For instance, Claire Louguet suggested to me (in private correspondence) that the written name could be the analogue of the whole organism. This, in her view, is indicated by Aristotle's use at 722a31 of the expression '*ἀπὸ παντός*' (i.e. 'from the whole name'), and by the fact that, in the entire preceding section of the chapter, '*ἀπὸ παντός*' is employed to mean 'from the whole body'. Actually, I do not think that this argument is compelling, for any compound of parts can be described as a *pan* relative to its parts, and this is exactly what Aristotle aims at stressing here (i.e. by showing that the assumption of the pangenetic theory must be applied to the parts themselves, until one arrives at parts that are not further analysable into parts). Moreover, the interpretation just mentioned does not account well for the analogical inference at 722a33, since

not include (at least, not explicitly) a linguistic analogue of the whole organism. Arguably, this would be the *logos* in the sense of *Int.* 4 and/or *Poet.* 20.1457a23–24: a (written) *logos*, *qua* composed of (written) names, is an analogue of an organism, *qua* composed of non-uniform parts;³⁵ in other words, (written) names plus composition: non-uniform parts plus composition = syllables plus composition: uniform parts plus composition = elements/letters plus composition: physical elements plus composition. Secondly, Aristotle employs the written name as an additive system, i.e. as a system whose parts are prior to what they are parts of and are such that what they are parts of is formed by adding them to each other. This is exactly the property of the written name (*qua* analogical source) that is employed in the analogical inference: in particular, Aristotle claims that the written syllables are (just) elements/letters plus composition³⁶ and from this he deduces that the uniform parts are (just) physical elements plus composition.³⁷

So, in this passage, Aristotle uses a written name as an additive system. But, can we infer from this that he is committed to the view that a written name and, more generally, written language are additive systems? Now, the conception of written language as an additive system was widespread in Aristotle's time. Aristotle himself mentions it several times in his writings. For instance, in *Metaph.* A 4.985b16–17 and *Gen. corr.* I 2.315b6–14, while tackling the atomistic

it implies that the linguistic elements are analogues of the uniform parts and hence that there is no linguistic analogue of the physical elements (despite the fact that both the physical and the linguistic elements are called '*stoicheia*'). Of course, one can object (as Claire Louquet has done) that there need not be a strict correspondence between the analogical source and the analogical target, i.e. that Aristotle employs the analogical source to provide a general pattern. Be that as it may, this point has no major relevance to the general meaning of Aristotle's argument in *Gen. an.* I 18.722a16–b3. The interpretation defended here, however, and especially its implication that the analogue of the whole organism is the *logos*, can have relevance to Aristotle's other uses of analogies between organisms and human language (on this point, see Sections 3 and 4).
35 Of course, the *logos* here should be conceived of as a written one, just like the name, the syllable, and the elements/letters. In Sections 3 and 4 I shall come back to the issue of the *logos* and of the relation between the *logos* and its parts.

36 Although Aristotle does not say it explicitly, this holds for the written name, too (i.e. the written name is just syllables plus composition), since the relation of composition is transitive and since otherwise he could not conclude that the seed (as well as its linguistic analogue) derives from the elements alone.

37 It is true that unacceptable consequences would follow from the hypothesis that something derived from a written name. The hypothesis that something derived from a written name, however, is an imaginary one. Therefore, while these unacceptable consequences undermine the pangenetic theory, they do not undermine the idea that a written name is an additive system.

and additive view on reality endorsed by Leucippus and Democritus, he analogises the atoms to the written letters (*grammata*),³⁸ and the compounds of atoms to the compounds of written letters.³⁹ Further, the idea that written language is an additive system was endorsed by Plato. In this connection, it is particularly interesting that, in the *Philebus* (18b6–d2), Plato grounds this conception on an account of the principle that governed the invention of the alphabet: the reduction of the infinity of the sounds of a language to a finite number of elements that can be combined in various ways. Plato's account of written language in the *Philebus* and elsewhere⁴⁰ implies that the 24 graphemes of the Greek alphabet are minimal units (monemes) each of which signifies a different sound (a vowel or a semivowel or a mute) of Greek spoken language, and which, if combined together in a linear sequence, allow the representation of any word or phrase in the Greek spoken language. The identity of any token graphic moneme is determined by the type to which it belongs prior to its combination with other graphic monemes, since it is the type that establishes the referent of its tokens. Further, since the rule of the system is *combine the monemes in a linear sequence in such a way that they represent the corresponding spoken items*, it is not the case that, e.g. A by itself is different from A- (or -A or -A-), i.e. from A *qua* part of a compound comprising other monemes: *qua* combinable element, A is always A- (or -A or -A-).⁴¹ Hence, any compound of graphic monemes is an additive system made out of monemes that are prior to the compounds they are part of.

38 As already noted (see n. 6), Aristotle uses the word *grammata* (letters) to refer to both the graphic and the phonic elements. However, at least in *Metaph.* A 4.985b16–17 it is evident that the letters Aristotle refers to are written ones, for they are described as endowed not only with *taxis* but also with *schema* and *thesis*.

39 Of course, by themselves these passages are compatible with several hypotheses: 1) the additive conception of written language is endorsed by the Atomists, but not by Aristotle; 2) the additive conception of written language is endorsed by Aristotle, but not by the Atomists; 3) the additive conception of written language is endorsed by both the Atomists and Aristotle.

40 See *Plt.* 277e–278d; *Tht.* 207d–208a.

41 Arguably, this also holds for those alphabets in which some graphic monemes signify more than one phonic moneme, depending on the compound of which the graphic monemes are part. This is because also in these alphabets 1) the different meanings of a graphic moneme (i.e. the different phonic monemes it refers to) are determined in advance (i.e. are a rule of the system), and 2) the different meanings of a graphic moneme can be produced without that the graphic moneme is combined with other graphic monemes (i.e. prior to, or independently of, its combination with other graphic monemes). In sum, I take it that also alphabets of this kind are additive systems (i.e. systems whose parts are prior to the compounds they are parts of, since the parts can exist and be produced prior to the compounds they are parts of).

This is a sensible and reasonable account of written language, which is still shared today.⁴² Unlike Plato, Aristotle does not provide this or any other account of written language. However, as we have just seen, he uses written language as an additive system in his writings. The fact that he uses it in this way and that, when he does so, he never shows signs of dissent suggests that he shares the view that written language is an additive system: at least, we have no reason to believe that he does not share it. Of course, we cannot rule out the hypothesis that he uses this view only because it was widespread in his time, i.e. that he plays along with it. This hypothesis, however, is weakened by the fact that it seems difficult to imagine why Aristotle would not share it and what alternative conception of written language he would have. For instance, it seems very unlikely that Aristotle conceived of written language as a non-additive system analogous to organisms, for clearly written language is not formed by the progressive articulation of a unitary matter. Alternatively, Aristotle may have conceived of written language as a non-additive system of a different type from organisms, e.g. as a system such that the single monemes, even if they pre-exist the compounds, are modified by the compounds of which they are part: their identity depends (also) on the compounds.⁴³ According to this conception, A in AB is different from A by itself, because A in AB is not A but A-. This conception, however, goes against the logic of the alphabetic system, in which the graphic monemes are defined as 'to be combined': as already noted, their nature is that of combinable elements.⁴⁴ For these and for the above-mentioned reasons, it seems difficult to attribute this conception of written language (i.e. as a non-additive system of a different type from organisms) to Aristotle.

In light of these considerations, the most plausible hypothesis seems that Aristotle shares the additive conception of written language widespread in his time. But, if we assume it, we must also explain why in *Gen. an.* I 18 (722a31) he qualifies the name as written: is this qualification relevant? If it is, does Aristotle use this qualification because, in his view, a written name is an additive system whereas a spoken one is not? Or because a written name is more or more manifestly an additive system than a spoken one? To answer these questions, I shall examine Aristotle's view on spoken language, which unlike written language he tackles at length in several of his writings (especially in *De an.*, *Hist. an.*, *Part. an.*, *Gen. an.*,

⁴² Gelb (1952), De Mauro (1982) ch. 3.

⁴³ I owe this suggestion to David Charles.

⁴⁴ Further, as argued in n. 41, there are reasons to think that also the alphabets in which some graphic monemes signify more than one phonic moneme (depending on the compound of which the graphic monemes are part) are additive systems (i.e. systems whose parts are prior to the compounds they are parts of, since the parts can exist and be produced prior to the compounds they are parts of).

Parv. nat.).⁴⁵ I shall argue that, in Aristotle's view, spoken language is a non-additive system and an analogue of organisms and their parts: in particular, just like organisms, it is formed by articulating a unitary matter into parts, not by putting pre-existing parts together; also, just like organisms, it consists of various levels of composition where the lower levels do not exist and cannot be produced prior to the higher ones. This suggests that, in *Gen. an.* I 18, Aristotle qualifies the name as written because the written name is an additive system whereas the spoken one is not. Further, this suggests that, in Aristotle's view, spoken and written language differ in their material organisation and part-whole relations.

3 Spoken Language

Aristotle defines every part of spoken language first of all as voice (*phone*),⁴⁶ and calls spoken language “*logos* produced with the voice” (*Cat.* 6.4b34–35), and “*logos* in the voice” (*Gen. an.* V 8.788b5–6). Further, he describes the voice as matter of *logos* (*Gen. an.* V 7.786b19–22). Hence, to understand what kind of system spoken language is, we need to start with Aristotle's view on the voice. In particular, I shall try to figure out what the relations between the voice, the elements, and the syllables are.

Voice (*phone*) is a particular kind of sound (*psophos*). It is produced only by certain animals – i.e. those that breath – and only with certain organs – i.e. the lungs and the windpipe.⁴⁷ In *De an.* Aristotle defines the voice as “the impact of the inbreathed air against the windpipe, caused by the soul resident in these parts of the body” (420b27–29). Further, the voice comes together with a *phantasia*, since it is aimed at communication.⁴⁸ For instance, human spoken language, the chirping of birds, the barking of dogs, the roaring of lions are all voices.⁴⁹

But human spoken language is not only voice. It is the articulation of the voice, i.e. *dialektos*.⁵⁰ A passage from *Hist. an.* IV 9 illustrates Aristotle's view on the difference between voice, mere sound (i.e. sound that is not voice), and *dialektos*.

⁴⁵ As we shall see, also the *Problemata physica* provide interesting data on spoken language, which are consistent with those of *De an.*, *Hist. an.*, *Part. an.*, *Gen. an.*, *Parv. nat.*

⁴⁶ See n. 3.

⁴⁷ *De an.* II 8.420b27–29; *Hist. an.* IV 9.535a28–29.

⁴⁸ *De an.* II 8.420b19–21, 31.

⁴⁹ Aristotle classifies animals as “having voice” (*zoa phoneenta*) and “not having voice” (*zoa aphona*): see *Hist. an.* I 1.488a32–33; IV 9.535b12–26; V 1.593b9–10; IX 28.618a5–6.

⁵⁰ Perhaps ‘speech’ is the best one-word translation of *dialektos*. However, *dialektos* means, more specifically, an articulate utterance as opposed to an inarticulate one: it concerns the phonic structure and organisation of utterances.

Voice and sound are different from one another, and *dialektos* is a third thing. The voice is produced by no other part except by the windpipe. Therefore, animals that do not have lungs do not produce voice either. Instead, *dialektos* is the articulation of the voice by the tongue. Hence, the voice and the larynx emit the things that have voice [i.e. the vowels], whereas the tongue and the lips the things that lack voice [i.e. the mutes]; and *dialektos* is composed of these (535a27–b1).

According to this passage, *dialektos* is the result of a modification of the voice. Whereas it is impossible to transform a non-vocal sound into voice (since they are produced by different parts), it is instead possible to transform the voice into *dialektos*. This is done by modifying the voice by means of other parts besides those used to produce it. Aristotle calls the modification of the voice whereby *dialektos* is produced ‘*diarthrosis*’ (articulation).

The voice is produced by the lungs and the windpipe, and its *diarthrosis* is accomplished by some organs of the oral cavity: the tongue, the lips, and the teeth.⁵¹ When the voice coming from the oesophagus arrives in the oral cavity, it is modified by the movements of these organs. These movements interrupt momentarily its flow (i.e. the vocal airflow), thereby producing the elements (*stoicheia*, *grammata*)⁵² that we call ‘consonants’ and that Aristotle calls instead ‘*aphona*’ (without voice or mutes). For instance, when the lips meet (*sumbolai*),⁵³ the vocal airflow is interrupted, and this interruption produces a labial consonant. Aristotle calls ‘*aphona*’ the elements that are produced in this way since, insofar as they are interruptions of the voice, they do not have voice by themselves: they are neither pronounceable nor audible by themselves.⁵⁴ Rather, they are pronounceable and audible together with what has by itself voice, i.e. together with vowels.⁵⁵

Vowels, in turn, are literally ‘things that have voice’ (*phoneenta*): they are produced when the vocal airflow is not or is no longer interrupted by the organs

51 *Hist. an.* IV 9.535a30–b1; *Part. an.* II 16.660a4, 17.

52 In this connection is worth noting that the adjectives ἐγγράμματος (‘articulated’) and ἀγράμματος (‘unarticulated’) derive from γράμμα.

53 *Part. an.* II 16.660a6–7.

54 The English word ‘occlusive’ comes closer to Aristotle’s view on this kind of elements. Further, it is worth noting that Aristotle uses the same term – ‘*aphona*’ – for the animals that do not produce voice and for the elements of the *dialektos* that do not have voice. Likewise, he uses ‘*phoneenta*’ both for the animals that produce voice and for the elements of the *dialektos* that have voice (*Hist. an.* I 1.488a32–33; IV 9.535b12–26; VIII 3.593b9–10; IX 28.618a5–6).

55 See *Poet.* 20.1456b28–31, where the mute (*aphonon*) – like G and D – is defined as what is produced by applying something (μετὰ προσβολῆς), e.g. the tongue to the teeth, and as what by itself has no voice, but becomes audible together with what has some voice. On this translation of *probole*, see *Part. an.* II 16.660a6.

of the oral cavity.⁵⁶ This is why, in *Hist. an.* IV 9.535a31–b1, Aristotle claims that the *phoneenta* are produced by the voice and the larynx, whereas the *aphona* are produced by the tongue and the lips. Arguably, this means that vowels are voice or – to put it more carefully – parts of voice alternating with elements that lack by themselves voice. In sum, *dialektos*, *qua* articulation of the voice, is the alternation of elements with voice and elements without voice,⁵⁷ and it is accomplished by momentary and successive interruptions of the voice, which works as the substrate of these modifications.⁵⁸

These passages and remarks show that, in Aristotle's view, spoken language – conceived of as *dialektos* – is composed of elements (*stoicheia*), but it is not an additive system of elements. Spoken language is not produced by combining elements that exist and are produced prior to the compound they are parts of. Rather, spoken language is produced by modifying a unitary material substrate (i.e. the voice): its elements are generated *together with each other* by this modification;⁵⁹ they are distinguishables (*qua* types), not detachables (*qua* tokens); abstractables (*qua* types), not extractables (*qua* tokens).⁶⁰

This is especially clear in the case of mutes. Since they are interruptions of the voice, they cannot be produced by themselves, without the voice, i.e. without being preceded or followed by a vowel. But what about vowels? It seems that, unlike mutes, vowels can be produced by themselves: it is impossible to pronounce a 'B' without a vowel, but it is possible to pronounce an 'A' by itself.

⁵⁶ See *Poet.* 20.1456b26–27, where the vowel (*phoneen*) is defined as what is produced without applying anything (ἄνευ προσβολῆς), e.g. the tongue to the teeth, and as what has audible voice. On this translation of *prosbole*, see *Part. an.* II 16.660a6. Arguably, although vowels are produced ἄνευ προσβολῆς, their differences are given by the different internal shapes that the oral cavity can take (1456b31–33).

⁵⁷ Unlike *Hist. an.* IV 8.535a27–b1, *Poet.* 20.1456b27–28 mentions also the semivowels (*hemiphona*), besides the mutes and the elements endowed with voice.

⁵⁸ See Ryle (1960) 433–435 for a similar interpretation of Plato's account of letters/elements. A modern version of this interpretation of Aristotle's account of *dialektos* is the source-filter theory of speech production (Lieberman 1975). For a different interpretation of Aristotle's account of *dialektos*, see the recent book by Noriega-Olmos (2013) 143–159. According to him, the *dialektos* includes only the consonants; likewise, the *grammata* are only the consonants. This, however, seems unlikely: if the *dialektos* is composed of *grammata*, and if the *grammata* are the same as the *stoicheia* (see n. 6), then the *dialektos* is composed of both vowels and consonants (or, better, of vowels, semivowels, and consonants: *Poet.* 20.1456b27–28); this is because, both vowels and consonants (together with semivowels) are *stoicheia* (*Poet.* 20.1456b22–26). By the way, the idea that vowels, semivowels and consonants are all *grammata* and *stoicheia* can be found also in Plato (see e.g. *Cra.* 424c–d), and there do not seem to be grounds for thinking that Aristotle endorses a different view on this point.

⁵⁹ In [*Pr.*] X 39.895a10–14, letters (*grammata*) are described as affections (*pathe*) of the voice.

⁶⁰ Borrowing these expressions from Ryle (1960) 436.

However, several passages in Aristotle's *corpus* of writings suggest that, in his view, a (part of) voice that is not a part of *dialektos* is not, properly speaking, a vowel (i.e. an element/letter) but just (a part of) voice. For instance, in *Poet.* 20.1456b23–25 and *Int.* 2.16a28–29 Aristotle claims that non-human animals (which arguably are those that produce voice) do not produce *grammata* and *stoicheia*.⁶¹ Consistently with this claim, in *Poet.* 20.1456b22–25 Aristotle describes the *stoicheion* as an indivisible voice of a particular kind, i.e. one from which a compound⁶² voice is formed *by nature*. In other words, a *stoicheion* is by its own nature a component of a larger whole, comprising several *stoicheia*: it is a part of the human *lexis* (1456b20), not a part of the vocal communication systems of non-human animals (1456b23–25). So, just like mutes, vowels – insofar as they are *stoicheia* – do not exist by themselves: there are vowels, properly speaking, only within *dialektos*, i.e. when there is an alternation of elements with voice and elements without voice.⁶³

In sum, spoken language is a non-additive system (of elements/letters) produced by the articulation of a unitary matter (the voice) into parts (i.e. the elements/letters).⁶⁴ The voice works as a substrate that, *qua* unitary, unifies the parts of spoken language.⁶⁵

Something very similar holds for the formation of organisms. As we have seen in the preceding Section, Aristotle criticises the pangenetic thesis that organisms are additive systems generated by putting pre-existing parts together. The basis of one of his criticisms – which is also the principal theoretical basis of his own view – is the idea that the parts of organisms cannot exist and be what

⁶¹ See also [*Pr.*] X 39.895a11–14. The fact that non-human animals, even those that produce voice, do not produce *grammata* and *stoicheia* suggests that they do not produce *dialektos*. On *dialektos* as unique to humans, see *Hist. an.* IV 9.536a32–b2, 536b17–13 (see also Whitaker 1996, 48–49, Laspia 1996).

⁶² Reading *συνθετή* at 1456b23. Note that reading *συνετή* at 1456b23 instead of *συνθετή* does not change much this point, since a *συνετή* voice is by itself *συνθετή* (recall that, in *Poet.* 20, *stoicheion* is conceived of a part of human *lexis*, which is both *συνετή* and *συνθετή*: 1456b20).

⁶³ The reason why, in Aristotle's view, a part of voice that is not a part of *dialektos* is not, properly speaking, a vowel is arguably the following: only *qua* part of *dialektos*, i.e. of a rhythmic and prosodic whole, a part of voice is endowed with quantity (i.e. it is long or short); so only *qua* part of *dialektos* a part of voice is a vowel properly speaking. I shall come back to this point shortly, when I tackle the status of syllables and of vowels *qua* part of syllables and *qua* elements endowed with quantity.

⁶⁴ Shortly, I shall tackle the specific status of syllables.

⁶⁵ See Plato's *Soph.* 253a4–7, where vowels are described as a bond (*desmos*) that passes through all the other letters. By claiming that 'the voice works as a substrate that, *qua* unitary, unifies the parts of spoken language' I mean that the voice is a principle of unity for spoken language, not that it is the only principle of unity.

they are if separated from the whole. This implies that organisms cannot be formed additively. Rather they are formed by the articulation (*diarthrosis*) of a unitary matter, just as with *dialektos*.⁶⁶ Blood (and menstrual blood), *qua* matter of organisms (*Part. an.* III 5.668a1–4; *Gen. an.* I 20.729a32–33), is to the parts of organisms as the voice, *qua* matter of *logos* (*Gen. an.* V 7.786b19–22), is to the parts of *dialektos*.⁶⁷

The analogy between organisms and spoken language does not end here. It also concerns, more specifically, (at least) some of their respective levels of organisation, namely (at least) some of the different kinds of parts they are composed of.⁶⁸

According to *Part. an.* II 1.646a12–24, organisms have three levels of organisation: the elements (or, better, *dunameis*), the uniform parts (like flesh or bone), and the non-uniform parts (like hand or head). Further, the formation of organisms is not an additive composition of pre-existing elements. Likewise, the formation of organisms is not an additive composition of pre-existing uniform parts or of pre-existing non-uniform parts either. In other words, organisms are not formed by first combining pre-existing uniform parts into non-uniform parts, and then by combining pre-existing non-uniform parts into the whole. Rather, in Aristotle's view, uniform and non-uniform parts are formed together with each other (*Gen. an.* II 1.734b27–28) and with the whole.⁶⁹

Something very similar holds not only for elements/letters but also for syllables. As we have just seen, *dialektos* is not an additive system of pre-existing elements. This implies that syllables are not additive systems of pre-existing elements. Further, as we are now going to see, *dialektos* is not an additive system of pre-existing syllables either: just like organic uniform parts,⁷⁰ syllables exist and are produced together with, and *qua* parts of, a larger whole.

⁶⁶ On Aristotle's account of embryogenesis as a *diarthrosis*, see n. 30.

⁶⁷ It is worth noting, however, that whereas elements/letters only exist and are produced *qua* parts of *dialektos*, physical elements are also parts of non-organic compounds.

⁶⁸ As already stressed, my inquiry here focuses on the material organisation of spoken language (i.e. on voice, elements/letters, syllables, and larger material wholes) not on its semantic organisation (i.e. on names and sentences). I address the issue of the relation between material organisation and semantic organisation and power in Section 4.

⁶⁹ See, for instance, *Gen. an.* II 6.742a37–b3, where Aristotle claims that the heart is formed for first *qua* principle of change, but together with the *telos qua* part of the *telos*.

⁷⁰ By analogising syllables to organic uniform parts, I am building on the interpretation of the written-name analogy advanced in Section 2, according to which a name : a non-uniform part = syllables : uniform parts = elements/letters : physical elements. Further, I am relying on *Metaph.* Z 17.1041b12–19, where Aristotle analogises syllables to organic uniform parts. My reasoning here, however, does not depend on this point: syllables can be analogised to any organic part that does not exist and is not produced prior to the whole it is part of.

This is shown by Aristotle's account of the syllable. First of all, just like elements/letters, syllables are parts into which the *dialektos* can be analysed. According to *Poet.* 20.1456b34–36, a syllable is a non-significant composite voice, made up of a mute and a vowel. Now, the reason why Aristotle considers the elements parts of the *dialektos* is clear: insofar as they are *indivisible* voices (*Poet.* 20.1456b22), they are the ultimate constituents of *dialektos*; besides the elements, there are no further things into which *dialektos* can be analysed. But why should *dialektos* be analysed into syllables? What is it that makes the syllables distinctive parts of the *dialektos*?

Aristotle stresses the unity of syllables in various passages, and some of them seem to provide an answer to these questions. For instance, in *Cat.* 6.4b32–35, he claims that syllables, *qua* long or short, are the units whereby *spoken* language is measured (τὸν μετὰ φωνῆς λόγον γιγνόμενον).⁷¹ Similarly, in *Metaph.* N 1.1087b36 he describes the syllable as the unit of measurement of rhythm (i.e. of the rhythm of spoken language).⁷² This suggests that a syllable is defined not only by what it is composed of (i.e. a mute and a vowel), as Aristotle characterises it in *Poet.* 20. Rather, what makes a compound of a mute and a vowel into a syllable is the rhythmic and prosodic role the compound plays within a larger whole (i.e. the *logos*): in short, a syllable is a unity insofar as it is a unit of measurement of *logos*. This implies that, even if a compound of a mute and a vowel can be produced by itself – like when someone utters just ‘BA’ – this is not, properly speaking, a syllable, for it is not produced *qua* part and *qua* unit of measurement of a rhythmic and prosodic structure.⁷³ Here too there seems to be a close analogy between organic uniform parts and syllables. In *Meteor.* IV 12 Aristotle seems to maintain that, in a sense, i.e. *qua* compound of elements, a uniform organic part can be produced by itself. However, such a compound is not, properly speaking, a uniform organic part, for it is not

71 In *Cat.* 6.4b32–35, Aristotle also stresses that, insofar as it is composed of and measured by syllables, spoken language is not a continuous but a discrete quantity (i.e. syllables are not continuous with each other). This, however, need not be in contrast with the fact that, in Aristotle's view, spoken language is a non-additive system unified by the voice *qua* unitary substrate that gets articulated into parts. The discontinuity of syllables can be seen as a result of the articulation of the voice. One starts with a unitary and continuous matter and, by articulating it, one gets a prosodic system of syllables/units. These units, *qua* units of measurement and of rhythm, are discrete. But they function as units of rhythm only insofar as they are connected to each other in a larger prosodic whole. And a factor involved in the connection of the syllables is again the voice. On this last point, see [Pr.] XI 30, where it is claimed that those who are unable to connect quickly (ταχὺ συνάψαι) the syllables to each other have a pathology called ‘weakness of voice’ (*ischnophonia*).

72 See also Plato's *Cra.* 424c–d.

73 On the rhythm of spoken language, see *Rh.* III 8.

produced *qua* part of the whole organism, and a uniform part exists and is defined by the role it plays within the whole organism.⁷⁴ This implies that *dialektos* (and, therefore, likewise a spoken name) is not an additive system of syllables.

Hence, spoken language is neither an additive system of elements nor of syllables. Similarly to organisms, it consists of various levels of organisation where the lower levels do not exist and cannot be produced prior to the higher ones. This suggests that, whereas spoken language is a non-additive system (analogous to organisms), written language is not, for what makes spoken language a non-additive system (analogous to organism) is precisely what written language lacks: a unitary material substrate underlying its modifications, and a rhythmic/prosodic larger structure of which the elements and the syllables are part. Further, if the considerations, provided in Section 2, about Aristotle's endorsement of the conception of written language as an additive system are plausible, this suggests that, in *Gen. an.* I 18.722a31, the qualification of the name as written is relevant: in particular, the name is qualified as written since a written name, unlike a spoken one, is an additive system (analogous to the pangenetic theory's faulty conception of an organism).

Unlike a spoken name, the written representation of a name is not produced by modifying a unitary material substrate: it is not a *hule-pathe* compound.⁷⁵ Rather, lacking an analogue of the voice, it comprises several distinct signs, each of which stands for a corresponding spoken element, and each of which (unlike the spoken elements) is prior to the whole it is part of: a written name is simply a sequence of independent signs and is produced in an additive way, by bringing together elements that can also be produced independently of each other and of the whole. For instance, whereas in spoken language a mute cannot be produced by itself (since it is an interruption of the voice), in written language any mute can be produced by itself, by simply writing it down, just as I do now: B.

The same holds for the written syllable. A written syllable is not by itself a unity, but a mere sequence of elements. It is a unity only if considered as a representation of a spoken syllable. This is because a written syllable lacks the two factors whereby a spoken syllable is a unity: it is not produced by modifying a unitary material substrate, and it is not the unit of measurement of a rhythmic/prosodic larger structure. Insofar as its own internal organisation is concerned, (alphabetic) written language – unlike spoken language (as well as syllabic writing systems) – is composed of elements/letters, but not of syllables.

⁷⁴ See also *Gen. an.* I 18.722b30–723a1; II 1.734b–735a4.

⁷⁵ [*Pr.*] X 39.895a10–14.

All this provides grounds for thinking that, in Aristotle's view, spoken and written language are systems of a different kind: the former is a non-additive system and an analogue of organisms and their parts, whereas the latter is an additive system and an analogue of a wrong conception of organisms and their parts (i.e. of things that would be organisms and organic parts only homonymously). Hence, written language, *qua* notation or representation of spoken language, is to spoken language as an artificial representation of a living thing (*gegrammenon zoon*) is to the living thing it represents.

Of course, since it represents the vocal signifiers of spoken language, written language is similar to spoken language. Arguably, their most relevant similarity is that both spoken and written language are ultimately analysable into elements that can occur in various combinations. Arguably, this explains why, in *Int.* 2.16a28–29, the sounds of beasts⁷⁶ are described as *agrammatoi* and are distinguished from the *onoma*. Unlike an *onoma*, the sounds of beasts are *agrammatoi* since they are not articulated into elements (i.e. they are not *dialektos*). Therefore, they cannot be represented by means of *grammata*. In sum, the sounds of beasts, *qua agrammatoi*, are not writable (by means of an alphabetic system). This, in turn, can explain why Aristotle mentions written language (*ta graphomena* and *ta grammata*) in *Int.* 1. On this interpretation, he mentions written language in *Int.* 1 not simply for the sake of completeness or to draw an analogy between the variability of *grammata* and that of the *phoniai*,⁷⁷ but also and especially because the writability of human spoken language (i.e. its being *dialektos* composed of *grammata/stoicheia*) is one of its distinguishing traits: it distinguishes human spoken language from the vocal communication systems of non-human animals.⁷⁸

The similarity between spoken and written language, however, ends here, for the part-whole relation between their respective elements and their respective higher levels of organisation (syllables and the material whole they are part of) are different: spoken language is a non-additive system, whereas written language is an additive system. This means that a system can represent another system, without that they share the same kind of organisation. In particular, unlike the vocal communication systems of non-human animals, human spoken language is writable, but its written representation is organised differently.

⁷⁶ Here I assume that, in *Int.* 2.16a29, by the 'sounds of beasts' (ψόφοι θηρίων) Aristotle means the voices of beasts, not any sound produced by beasts. This is because it would make little sense to distinguish the *onoma* from the non-vocal sounds produced by non-human animals (i.e. from sounds that are not aimed at communication).

⁷⁷ See Whitaker (1996) 9.

⁷⁸ See Dion. Thrax. *S-TG* 130: 8–10. See also Lo Piparo (2003) 94–100.

4 Looking ahead to Aristotle's Hylomorphism and to *Metaph. Z 17*

In this Section, I shall outline two possible developments of the interpretation proposed so far. The first concerns the relevance of Aristotle's conception of spoken language as a non-additive system to his account of human language's power to signify. The second is about Aristotle's use of linguistic analogies in his writings, in particular it is about the syllable analogy that he employs in *Metaphysics Z 17*.^{1041b11–33}.

4.1 Hylomorphism and the Material Organisation of Spoken Language

Starting with the first point, human language (*logos*) – as already recalled – is essentially spoken, in Aristotle's view: the voice (*phone*) is included in the definition of *logos* and of its parts (name, verb, syllable, element).⁷⁹ Written language is secondary to spoken language in that it is a representation of spoken language: put more carefully, *ta graphomena* are *sumbola* of spoken language's phonic signifiers (τὰ ἐν τῇ φωνῇ). Further, spoken language has a specific material (i.e. phonic) organisation, which is different – as I have tried to show – from the organisation of written language, and which is also different from the organisation of the vocal communication systems of non-human animals. Now, in the light of Aristotle's hylomorphism, one might wonder if the specific material organisation of spoken language has any relevance to its power to signify, i.e. if the fact that spoken language has a unique material organisation is non-accidental. Of course, it is true that, in Aristotle's view, human spoken language is significant by convention and that the meaning of, e.g. a name does not depend on the particular syllables or letters of which it is composed, but rather it is arbitrary (*Int.* 2.16a19; 4.17a1–2). The conventionality of the relation between each single phonic expression and each single meaning, however, does not exclude that spoken language's power to signify (in the way it signifies)⁸⁰ also depends on its matter and especially on the specific organisation of its matter.⁸¹ If an organism

⁷⁹ See n. 3.

⁸⁰ In Aristotle's view, human language's power to signify is different from that of the vocal communication systems of non-human animals (*Int.* 2.16a28–29; *Pol.* I 2.1253a10–18).

⁸¹ In *Int.* 2.16a26–29, Aristotle stresses a connection between an aspect of the material organisation of spoken language (i.e. its articulation) and its specific kind of signification (see also [*Pr.*] X 38–40). Further, in *Cat.* 6.4b32–35 Aristotle describes the syllable as the unit of

made of stone or wood is an organism only homonymously, and if an organism coincided of as the pangenetists do (i.e. as an additive system) is an organism only homonymously, why should this not apply to human language too?⁸² This question seems sensible especially in light of Aristotle's analogy between the material organisation of spoken language and that of organisms, and in light of the fact that the material organisation of organisms is their form or (at least) part of their form.⁸³

In this connection, what Aristotle says about the voice in *De an.* II 8 seems significant. There, he describes the voice as a particular kind of sound, one that is able to signify by its own nature. Actually, he does not claim that the voice is *semantikos phusei*, but what he says seems to come close to it. At 420b27–29 he claims that the voice is produced by the soul. Similarly, at 420b31 he says that what causes the impact whereby the voice is produced is ensouled (*empsychon*). Then he adds that the voice occurs together with a *phantasia* (420b32) and concludes by describing the voice as “a certain significant sound” (σημαντικὸς γὰρ δὴ τις ψόφος; 420b32–33).⁸⁴ This means that the voice is by

measurement of *logos*, i.e. of human language *qua phone semantike*, not simply *qua phone*. This suggests that the prosodic whole of which elements and syllables are parts is a semantic whole (i.e. *logos*), and hence that there is arguably a relation between the rhythmic and prosodic organisation of human language and its semantic organisation and power. In sum, if only human *logos* has elements and syllables, and if nature does nothing in vain, there should be a non-accidental connection between the material organisation of human *logos* (i.e. its articulation and its prosodic structure) and its power to signify.

82 See *Part. an.* I 1.640b30–641a7; *De an.* II 1.412b20–22; *Meteor.* IV 12.389b28–390a2; *Gen. an.* II 1.734b24–27. It is worth noting that, in this formulation of the homonymy principle, the homonymy stems directly from the matter: the reason why something is only homonymously an organism is that it is made out of a matter that is different from that of organisms. This is consistent with the fact that the homonymy principle, as applied to organisms, implies that their formation requires a specific kind of matter: a unitary matter that gets progressively articulated into parts (on this point, see Section 2 and n. 83).

83 I assume that the claim that “the material organisation of organisms is their form or (at least) part of their form” is endorsed by both those who defend an account of form as pure and those who defend an account of form as impure (i.e. matter-involving). On this debate, and for a defense of the view that form is impure, see Charles (2008, 2009). Note that, if it is true that – as I argued in Section 2 – the homonymy principle requires that organisms are formed from of a unitary matter that gets progressively articulated into parts, this unitary matter (*qua* principle of unity) would arguably be part of their form, and hence the form would be matter-involving.

84 According to *Gen. an.* IV 8.776b12–17, the principle (*arche*) of the voice is the heart. Further, according to *De motu an.* 700a19–20, *phantasia* and perception have the same location (*chora*) as *nous* (i.e. the heart).

itself or by its own nature significant,⁸⁵ and that, also in this respect, it is analogous to the matter of organisms (i.e. menstrual blood), which is by itself alive or potentially alive.⁸⁶ Further, this suggests that Aristotle's inclusion of the voice in the definition of *logos* and of its parts is not simply due to the fact that human language is, *de facto*, made out of voice. Rather, this inclusion seems motivated by the idea that human language is, *de iure*, made out of voice: the voice is an internal and necessary element of human language's functioning and power to signify, not an external and accidental one.⁸⁷ So, if human language were made out of a different material – e.g. if it were made out directly of the matter of written signs – it would not work and signify in the way it does *qua phone semantike*.⁸⁸ In sum, according to the proposal outlined here, Aristotle endorses the view that the form of human language (i.e. its power to signify) is matter-involving.

4.2 The Syllable Analogy in *Metaph. Z 17*

Coming to Aristotle's use of linguistic analogies in his writings, it is worth noting that, just as in *Gen. an.* I 18, also in *Metaph. Z 17* Aristotle analogises linguistic items to organic parts. In particular, in *Metaph. Z 17* he analogises a syllable (BA) to a uniform part (flesh), and the elements/letters of the syllable (B and A) to the physical elements of the uniform part (fire and earth).⁸⁹ Further, in the case of the syllable analogy employed in *Metaph. Z 17* Aristotle's commitment is evident. Now, building on the hypothesis that, in Aristotle's view, spoken language is an analogue of organisms and their parts, whereas written language is not (for it is rather an

⁸⁵ As already stressed, these claims need not be incompatible with the passages from *Int.* (2.16a19; 4.17a1–2) where Aristotle states that *onomata* and *logoi* are voices significant by convention.

⁸⁶ Menstrual blood is alive or potentially alive since: 1) it is a matter produced by organism, i.e. an organic matter (a residue); 2) it is the matter from which organisms are formed; 3) it has the parts of the offspring in potentiality (*Gen. an.* II 3.737a22–25).

⁸⁷ Of course, this would be true also for the communication systems of non-human animals, since these systems are essentially vocal, too. In the case of human language, besides the voice, also its specific organisation (i.e. articulation into elements, syllables and their prosodic wholes) would be required to accomplish the specific type of signification of *logos*.

⁸⁸ This implies that, even if the symbolic relation mentioned in *Int.* 1 were transitive (i.e. even if τὰ γραφόμενα could be σύμβολα of τὰ ἐν τῇ ψυχῇ παθήματα), and even if ταῦτα at 16a6 referred to both φωναί and γράμματα, spoken language's power to signify would anyway be different from that of written language.

⁸⁹ What is missing from the analogy employed in *Metaph. Z 17*, and which is instead present in *Gen. an.* I 18, is the relation between a non-uniform part and a name.

analogue of a wrong conception of organisms), one can reasonably wonder whether the syllable tackled in *Metaph. Z 17* is conceived of as a spoken one and, if so, what implications this would have on the meaning of the chapter.⁹⁰

The idea that, in *Metaph. Z 17*, the syllable ‘BA’ is conceived of as a spoken one is suggested first of all by the fact that its elements ‘B’ and ‘A’ are called ‘*aphonon*’ and ‘*phoneen*’, respectively (1041b17). This, however, is not sufficient evidence.⁹¹ Especially, this does not imply that the syllable, even if it is conceived of here as a spoken one, is also conceived of as a part of a non-additive system. The possibility that the syllable tackled in *Metaph. Z 17* is conceived of as a spoken one and as a part of a non-additive system depends in the first place on whether the conception of organisms as non-additive systems is employed in the analogy and on whether the analogy is a strict one (i.e. on whether the syllable is conceived of as a strict analogue of an organic uniform part rather than of any arbitrary compound item).

On the first point, it is worth noting that the idea that organisms are non-additive systems is clearly underlined in *Metaph. Z 16*.^{1040b5–16}. There, Aristotle stresses the non-additive nature of organisms, by claiming that their parts are not really substances (*ousiai*), since they do not exist without the whole of which they are parts: if separated from the whole, the parts exist only as matter and as a heap. This implies that the parts of organisms do not meet the separation-criterion of substances (and hence that organisms cannot be formed by putting pre-existing parts together). Further, Aristotle considers the case of those organisms (i.e. insects and plants) that have some parts capable of surviving when separated from the whole. He argues that this does not prove that these parts meet the separation-criterion of substances. This is because, when these parts are parts of an organism (i.e. before separation), they are ‘one and continuous by nature, not by force or *sumphusei*, for such a phenomenon is an abnormality’ (1040b14–16). This means that the status of these parts *within an organism* is not that of autonomous things. If they were autonomous things, the unity of the whole would be by force or *sumphusei*, but this is impossible.

The word ‘*sumphusis*’ is significative, for it occurs also in a passage from *Gen. an.* I 18 (722b17–30), where Aristotle tackles Empedocles’ view that organisms are formed by putting pre-existing parts together. There, Aristotle considers the hypothesis that each of these pre-existing parts is an autonomous

⁹⁰ For a defence of the hypothesis that, in *Metaph. Z 17*, the syllable is conceived of as a spoken one, see Laspia (2008).

⁹¹ A possible objection is the following: the fact that the terms ‘*aphonon*’ and ‘*phoneen*’ refer primarily to the spoken elements does not exclude that they also refer, i.e. secondarily, to the written elements.

organism, and he argues against it: it is impossible that one organism is formed by putting together several organisms by *sumphusis* (722b21, 23). So, whereas it is impossible that an organism is formed by putting together several organisms, it is possible (in the case of plants) that a part of an organism survives when it is separated from the whole. The reason why this is possible is that the separated part becomes an autonomous organism.⁹² Therefore, no part, *qua* part of an organism, meets the separation-criterion of substances; only whole organisms do.

This provides grounds for thinking that, in *Metaph. Z 17*, Aristotle is committed to the view that organisms are non-additive systems, and hence that the syllable (*qua* analogue of a uniform organic part) is conceived of as a part of a non-additive system. A further hint in this direction is given by the concluding lines of *Metaph. Z 17* (1041b28–39), where Aristotle claims that only natural things are substances. This suggests that, despite the reference to artificial compounds like a house (1041a27, b5–6), the main focus of *Metaph. Z 17* is on natural *suntheta* (i.e. “things that are one by nature, not by force”),⁹³ and hence that the syllable is, or is primarily, an analogue of organic *suntheta*, not of any *suntheton*.

If this is correct, the meaning of the analogy would arguably be different from how it is generally intended. On the standard interpretation, the unity and *ousia* of the syllable are given by the order of its elements/letters.⁹⁴ This, however, cannot be right, if the syllable and its organic analogue are conceived of as parts of non-additive systems.⁹⁵ As argued in Section 3, in Aristotle’s view a spoken syllable is a unity because: 1) *qua* part of *dialektos*, the syllable is a *hulepathe* compound (i.e. the mute ‘B’ is a modification of the voice/vowel ‘A’, not an independent element that is added to the vowel); 2) the syllable is a unit of measurement of the rhythm and prosody of *logos*. This means that the unity and essence of the spoken syllable depend on its being part of a larger whole and on the role the syllable plays in it. This larger whole is a rhythmic/prosodic structure, in which the syllable plays a role *qua* long or short (i.e. *qua* endowed with quantity). From this we can infer that the *ousia* or form of the syllable is a

⁹² See *De long. vit.* 6.467a18–30.

⁹³ On Aristotle’s distinction between things that are one by nature and things that are one by force, besides *Metaph. Z 16.1040b15*, see also *Metaph. Δ 6.1015b36–1016a1*, and *I 1.1052a22–25*.

⁹⁴ See, for instance, Burnyeat (2001) 61.

⁹⁵ Other weak points of the standard interpretation are the following: 1) Aristotle does not mention the order of the elements in *Metaphysics Z 17*; 2) he presents the elements (‘B and A’) in the same order in which they occur in the syllable: the order of ‘B and A’ is the same as that of ‘BA’ (1041b13); 3) the order does not account for the unity of a syllable but for the difference between syllables composed of the same elements, e.g. between ‘BA’ and ‘AB’.

part of the *ousia* or form of the whole of which the syllable is part, just like the *ousia* of flesh is a part of the *ousia* of the whole organism of which flesh is part (since both the syllable and the flesh do not exist and are not what they are, if separated from the whole). More specifically, the *ousia* of the syllable is given by its quantity (by its vowel *qua* endowed with quantity), and its quantity is a part of the rhythm and prosody of the whole of which the syllable is part.⁹⁶

This hypothesis explains one aspect of Aristotle's argument in *Metaph. Z* 16–17 that otherwise seems odd and problematic. As already noted, in *Metaph. Z* 16 Aristotle stresses that the parts of organisms (simple bodies included) are not really *ousiai*, suggesting thereby that only the whole they are parts of (i.e. the whole organism) is, properly speaking, an *ousia*. This point is taken up again at the end of chapter 17, where Aristotle claims that only natural things (i.e. living things)⁹⁷ are *ousiai* (1041b28–30). In the light of this, it seems strange that, in chapter 17, in order to explain what the *ousia* is, Aristotle uses the example of a *part* (an organic uniform part and a syllable *qua* analogue of it), i.e. of something that is not, properly speaking, an *ousia*. But, if Aristotle conceives of organic uniform parts (and of syllables) in the way outlined here, this choice can be explained: in the case of an organic uniform part (just as in that of a syllable), the *ousia* cannot be identical with the elements it is composed of or be a further element, for the *ousia* of an organic uniform part (just as that of a syllable) depends on the whole of which it is part. In other words, to stress and make clear the difference between elements and *ousia*, and the irreducibility of the *ousia* to the elements, the example of parts of non-additive systems is particularly effective (i.e. more effective than both the example of a whole non-additive system and the example of parts of an additive system). This is because non-additive systems are such that the existence and identity (or *ousia*) of their parts depend on the whole they are parts of. If flesh is a uniform part of an organism, and if organisms are non-additive systems, it is clear that flesh, if separated from the whole, is not what it is (and hence lacks its *ousia*). Likewise, if a spoken syllable is a unit of measurement of a larger whole (i.e. of *logos*), it is

⁹⁶ Note that the vowel *qua* endowed with quantity is not the same as the vowel *qua* element into which the syllable is broken down, for only within the whole a vowel is endowed with quantity, i.e. is a vowel properly speaking. Further, note that, if the form of the syllable is its vowel *qua* endowed with quantity, the form of the syllable is matter-involving. This is because a vowel, *qua* endowed with quantity, is a part of the voice *qua* unitary substrate; and this unitary substrate is in turn a cause of the unity of the whole of which the syllable (with its vowel) is part (just like blood, *qua* unitary matter of organisms, is a cause of the unity of organisms and of their being organisms non-homonymously; on this point, see nn. 82, 83).

⁹⁷ I take it that the natural things referred to in *Metaph. Z* 17.1041b29–30 are living things, since in *Metaph. Z* 16.1040b8–10 Aristotle claims that the simple bodies are not *ousiai*.

clear that a syllable like ‘BA’, if separated from the whole, is not what it is (and hence lacks its *ousia*).⁹⁸

If this hypothesis is correct, Aristotle’s employment of the syllable analogy in his metaphysical inquiry turns out to be particularly significant also from a dialectical point of view. To the Atomists’ employment of *written* language as a heuristic tool in their inquiry into nature⁹⁹ and, more generally, to the additive conception of reality endorsed by some reductionists,¹⁰⁰ Aristotle replies by using *spoken* language as an analogue of the only things that, in his view, are substances properly speaking: i.e. living things. And the reason why Aristotle uses spoken language as an analogue of organisms is that, just like organisms, it is a non-additive system.

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98 Arguably, this account of the *ousia* of the syllable would be true also of the written syllable, if also the written syllable were part of a non-additive system. As I argued in Section 2, however, on the basis of the textual evidence available to us, the most plausible hypothesis is that Aristotle conceives of written language as an additive system.

99 See Hallyn (2000).

100 See, for instance, the dream theory discussed in Plato’s *Theaetetus* (201d–206b).

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