Biology and Teleology in Aristotle's Account of the City*

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INTRODUCTION

A famous problem in the scholarship on Aristotle's *Politica* pertains to the nature of the city: is the highest form of political community a product of nature or of art? The evidence is notoriously ambiguous.[1] In chapter two of the first book of the *Politica*, Aristotle explains how the city develops naturally out of more scattered and agricultural ways of living, and compares the city to an organic whole, suggesting that the city is a natural entity. However, Aristotle also praises the person 'who first established' the city (*Pol* 1.2.1253a30-31) and later compares this lawgiver to a craftsman,[2] giving evidence for the artificialness of the city and the importance of human practical reason in its construction.

My aim in this paper is to present an interpretation of Aristotle's account of the city that accommodates both perspectives. I argue that the city is a product of natural generation *and* of the artificial process of lawgiving, but that the two processes pertain to different levels of organization of the city: the first pertains to what I call the 'natural city' and the second pertains to the 'ethical city'.

The argument proceeds in two parts. First, I argue that Aristotle's use in his *Politica* of teleological principles – which belong properly to the science of nature – indicates that it is a hybrid treatise, being part natural science and part political science (just as his *De Anima* is part natural science and part metaphysics).[3] Natural science pertains to the human beings who possess a natural drive towards forming ever more complex communities for the sake of *living*, that is, for the sake of satisfying the biological needs of all humans involved. The outcome of this natural

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[1] For instance, Keyt 1991: 118 refers to this problem as 'a blunder at the very root of Aristotle's political philosophy.' See also Kraut 2002: 240-6, Mayhew 1997: 325-6 and Reeve 2009: 513-8.

[2] See *Pol* 2.8.1268b34-8; 2.12.1273b30-3, 1274b18-19; and 7.4.1325b39-1326a5.

[3] On the hybrid nature of the *Politica,* cf. Kullmann 1991: 104 and 114, who differentiates between 'political' statements and 'biological' statements that are being 'adopted in the scientific treatment of politics,' but concludes that 'biology serves merely as an 'analogical model' … for the polis, and the comparisons have a purely heuristic function.' On the hybrid nature of *De Anima*, cf. Lennox 1999: 2-4; 13 and 2006: 310; Van der Eijk 1997: 233-235.

teleological process is the natural city. I take it that this natural city is then *used* by the lawgiver as his material for the sake of producing a city that enables free male citizens to *live well* – that is, to live virtuous and happy lives. This is the ethical city, and it constitutes the proper object of political science.

Next, I show that the different goals served by the biological and ethical city, and the different causal mechanisms by which they come to be or exist resemble the patterns of teleological explanation in Aristotle's biological works. The natural city is similar to other biological features that are *necessary for living* and which are always a realization of a pre-existing potential for form – a process that I refer to as 'primary teleology'. The ethical city, however, is similar to those biological features that are not strictly speaking necessary for living, but are rather *'for the better'* and are said to be for the sake of *living well*. Such features are the result of goal-directed agents making use of what is already available for something good – a process that I refer to as 'secondary teleology'.[4]

Under this interpretation, Aristotle's use of nature and natural teleology in the *Politica* is thus not a category mistake as has been suggested:[5] there are aspects of the city that belong genuinely to the science of nature.

SCIENCE OF NATURE IN ARISTOTLE'S *POLITICA*

Aristotle explicitly characterizes his investigations in the *Ethica Nicomachea* and the *Politica* as part of one and the same science, namely political science (see, e.g., *EN* 1.2.1094a26-b7 and 10.9). This political science is defined as the study of how to make citizens 'good and capable of fine deeds' (see, e.g., *EN* 1.9.1099b29-32 and *Pol* 7.13.1332a7-38). Whereas the *Ethica Nicomachea* focuses on virtue, i.e., on what constitutes a good state of character, and works predominantly at the level of individual human beings, the *Politica* operates at the level of the highest form of human community, and offers an investigation of the city and of particular constitutions as the means by which politicians make citizens good. Both provide political knowledge, which is the 'most authoritative and most architectonic' form of knowledge (*EN* 1.2.1094a26-b7) and belong – according to Aristotle's categorization of the sciences in the *Metaphysica* (*Meta* 6.1 and 11.7) – to the branch of *practical* sciences.

Although political science is thus clearly separated off from natural science, which is a *theoretical* science, Aristotle's *Politica* nevertheless contains at least three biological features that appear to belong more properly to a treatise engaged in natural science. The first and most problematic of these features is Aristotle's quasi-etiological account (in *Pol* 1.2) of the natural development of cities, characterizing

[4] My characterization of 'primary teleology' builds on Gotthelf's 1987 interpretation of teleology. The characterization of 'secondary teleology' in this paper builds on materials I have developed elsewhere (Leunissen, 2010a & 2010b).

[5] See, e.g., Lloyd 1996: 185; 202-4.

them as a nature and end of human communal relations. According to this account, the first stage of the development consists in the formation of couples between male and female for the sake of sexual reproduction, and between ruler and ruled for the sake of preservation (*Pol* 1.2.1252a26-30). From these two communities then arises the household, which is put together for the supply of daily needs (*Pol* 1.2.1252b9-15). Next, when several households are united, a village comes to be for the sake of non-daily needs (*Pol* 1.2.1252b15-16). And finally, the city comes into being (*Pol* 1.2.1252b27-1253a4):

> The complete community from multiple villages is the city, which has already reached the limit of total self-sufficiency so to say, and which comes to be for the sake of living, but exists for the sake of living well. Therefore each city is by nature, if indeed also the first communities are. For it is their end, and nature is an end: for what each thing is when its generation is completed that is what we call its nature, just as of a man, a horse, a house. In addition, that for the sake of which and the end are the best. And self-sufficiency is both an end and best. From these [arguments] it is clear then that the city is among the things that are by nature (ὅτι τῶν φύσει ἡ πόλις ἐστί), and that man is by nature a political animal, and that he who is without a city by nature and not by luck is either bad or more than human.

Aristotle thus presents the city as something that grows organically out of lower-level communities for the sake of living – thus satisfying the tendencies and needs humans have by nature: humans instinctively (and not by choice: *Pol* 1.2.1252a28-30) strive towards self-preservation and reproduction, and tend to live together and co-operate in securing these goals, even when they are not in need of anything (this is what it means to be political: *HA* 1.1.487b33-488a13, *EN* 9.9.1169b16-19 and *Pol* 3.6.1278b15-21). In addition, the smallest elements of the city (*Pol* 1.1.1252a18-23) turn out to be its conditionally necessary parts (cf. *Pol* 1.2.1252a24-26): even if one finds Aristotle's historical account of the *genesis* of cities not to be terribly compelling, the biological overtones are undeniably present.

The city's developmental account is followed by two other arguments, exemplifying the second and third biological feature. The second occurs in Aristotle's argument that human beings are *more* political than any other political animal, on the grounds that we alone have the faculty of speech and thus possess the unique capability to communicate moral concepts (*Pol* 1.2.1253a8-18). This argument builds on the principle that nature does nothing in vain (the thought being that if it hadn't been for our political nature, our ability to speak would have been in vain), which – as Aristotle indicates elsewhere – is an empirical hypothesis that belongs properly to the science of nature and *not* to the science of politics (*IA* 2.704b12-705a2):

> The starting point of our investigation is achieved by positing [principles] that we are accustomed constantly to use for our *science of nature* (πρὸς τὴν μέθοδον τὴν φυσικήν), assuming that this is the way in which things are in all the works of nature. One of these is that nature does nothing in vain, but always, given the possibilities, does what is best for the substantial being of each kind of animal; therefore, if it is better in a certain way, that is also how it is by nature. (…). (Cf. *GA* 5.8.788b20-5.)

The use of the principle that nature does nothing in vain in the *Politica* is surprising, given that Aristotle typically prohibits the transfer (or *metabasis*) of scientific principles from one (unrelated) science to another (*APo* 1.7.75a38-b6). However, its occurrence here does not seem to be an accidental slip, as Aristotle applies it two more times in the *Politica*: first, in the establishment of war as a natural art of acquisition (in *Pol* 1.8.1256b15-22) and later, in the characterization of 'love of the self' as a feeling in human beings that is implanted by nature, which explains why humans value private property (in *Pol* 2.5.1263a38-b3). In fact, there are several more passages in the *Politica* in which Aristotle applies principles or methods that belong properly to the natural sciences to his analysis of (aspects of) the city.[6] The use of teleological principles and natural methods in the *Politica* is thus quite pervasive.

The third biological feature occurs in Aristotle's next argument, which establishes the city's natural priority to the family and the individual on the ground that a whole is necessarily prior to its part (*Pol* I 2, 1253a18-20). Aristotle supports this claim by drawing an analogy with natural bodies and their parts (destroy the body, and a hand will be a hand in name only, since it is no longer able to perform its function), thus conceptualizing the city as an organism, and citizens as its instruments (*Pol* 1.2.1253a20-6):

> For once the whole is destroyed there will be no foot or hand, except homonymously, in the same way one would speak about [a foot or hand] made of stone (for when destroyed it is just like that), and everything is defined by its function and capacity, such that one must no longer say that such things are the same except by homonymy. So it is clear that the city is both by nature and prior to each of us.

[6] For instance, in *Pol* 1.2.1252b1-5, Aristotle refers to the principle that 'nature prefers to make one thing for one purpose' in explaining why human beings are sexually differentiated, which is a fairly common principle in his biological works (see, e.g., *PA* 2.16.659a20-2 and 5.6.683a19-25; *GA* 1.1.716a24-7). In *Pol* 4.4.1290b23-1291b1, Aristotle claims that the method of determining how many species of animals there are by analyzing their necessary parts and the possible combinations thereof is the *same* as the one needed to determine how many species of cities there are (cf. *Pol* 3.4.1277a5-10). In *Pol* 5.3.1302b33-1303a2, 5.9.1309b18-35 and 7.4.1326a35-b2 Aristotle implies that the same laws of proportion apply to both animals (and their parts) and cities.

The analogy raises a number of interpretational problems, the most pressing of which is the question whether Aristotle believes that cities, not just are by nature, but also *have* a nature. That is, for something to qualify as a true natural entity for Aristotle, it not only needs to be a nature in the sense of being a final cause (for even non-natural entities can be a nature in that sense: see the example of a house in *Pol* 1.2.1252b34), but it also needs to have a nature in the sense of having an internal principle of motion and rest (i.e., have an internal efficient cause) through which its pre-existing potential for form is realized. If cities turn out to have their own internal efficient cause and their own form that transcends the forms of the individual human beings of which they are composed (in other words, if Aristotle's analogy between cities and organisms is *too biological*), that would imply that Aristotle ultimately does away with the ontological independence of 'ordinary' substantial beings such as individual humans. It would also extend the scope of natural teleology to an inter-species or perhaps even cosmic level.[7] And finally, it would contradict Aristotle's immediately following appraisal of 'the person who first put it [i.e. the city] together (ὁ δὲ πρῶτος συστήσας)' as responsible for one of the greatest goods (*Pol* 1.2.1253a29-31), which suggests that politicians are like craftsmen, and that cities are products of art. This artificial model of the city is also endorsed in the later books (cf. note 2 above). There the politician is characterized as operating as the external efficient cause who crafts laws and constitutions (the external formal causes of the city; cf. *Pol* 3.1.1274b38 and 3.3.1276b1-13), imposes these laws and constitutions on a body of citizens (the city's material cause; cf. *Pol* 7.4.1325b37-1326a8), and thereby *creates* the city. Given these problems, scholars have sometimes suggested that Aristotle's characterization of the city as natural must be false, or that it is only meant to be read metaphorically,[8] but the biological language is too strong to be just explained away.

Before offering an alternative solution to these problems, let me explain why we should take the biological features seriously as belonging to Aristotle's study of nature, here carried out in the context of the *Politica*, which would thus be a hybrid treatise.

The clearest indication that Aristotle is conducting natural science in the *Politica* lies in his use of the teleological principle that nature does nothing in vain. As indicated above, all teleological principles belong properly and exclusively to the science of nature (see *IA* 2.704b12-705a2, quoted above).[9] The principles are empirical hypotheses about the goal-directed actions of formal natures in the production of animals (cf. *GA* 5.8.788b20-25 and *Resp* 10.476a13): seeing that nature *for the most part* produces functional parts we may posit this to be a general rule

[7] Sedley 1991; Wardy 1993: 24-26.

[8] See respectively Keyt 1991 and Kullmann 1991: 96-101.

[9] On the scientific status of teleological principles, see Lennox 2001: 205-23. For my interpretation of teleological principles as heuristic tools, see chapter four of Leunissen (2010a).

applying to all the works of nature, that is, we posit that nature *never* produces parts in vain. Aristotle frequently appeals to these 'general rules' or principles in his biological treatises in cases where the causes of a given explanandum are not immediately discernible, for instance, because the explanandum pertains to the absence of a part or to the presence of two parts that are both associated with the performance of the same function. By thinking of such explananda as being a case of nature 'not doing anything in vain' or of nature 'always doing something because it is either necessary or better' (and thus by engaging in a kind of thought experiment where we picture nature as a goal-directed designer of the animal in question), we might be able to discover for what reason nature acted this way in this particular case.[10] I contend that Aristotle's use of teleological principles in the context of the *Politica* suggests at least a similar *search* for the discovery of natural causes.[11]

In addition, to the extent that the use of teleological principles in the *Politica* actually exhibits the natural causes of certain phenomena (that is, to the extent that the use of these principles is *successful* in generating natural explanations), those phenomena must be assumed to belong properly to the science of nature. Since teleological principles cannot prompt the discovery of natural causes of things that are not the result of the goal-directed actions of formal natures, they indirectly also function as markers of the boundaries of the science of nature.

Aristotle's use of teleological principles in the *De Caelo* provides an illuminating parallel for their double function in helping to generate natural explanations and thereby laying bear the boundaries of the science of nature.[12] In this treatise, Aristotle tries to establish the study of the heavenly bodies as a genuine part of the science of nature, thereby opposing some of his predecessors, who tended to treat *astrologia* as a mathematical science. However, he is hindered in this attempt by the fact that the heavenly domain is empirically underdetermined, which makes it very difficult to provide causal explanations of the heavenly motions and attributes. In fact, the whole treatise – even though it is explicitly introduced as being part of

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[10] For instance, in order to discover why snakes have no feet (which Aristotle considers to be a paradoxical absence of parts, given that snakes are blooded land-dwellers and all other animals of this wider kind do have feet), Aristotle posits the principle that nature does nothing in vain and engages in a thought experiment in which the now absent parts are imagined to be present (*IA* 8.708a9-20; cf. *PA* 4.13.696a10-15). This mental picture of the snake immediately reveals for what reason nature did not produce four feet in the animal: *given the disproportionate dimensions of the snake's body*, having only two pairs of feet set a distance from each other (nature cannot give the snake more than four feet, because that would violate its substantial being as a blooded animal) would not allow the snake to be able to move swiftly at all. Since nature does nothing in vain, it removed the parts from the snake (cf. *PA* 4.11.691a27-b4 and *Cael* 2.8.290a29-35).

[11] A crude search in the TLG shows fifteen occurrences of the principle that nature does nothing in vain in the biological works (I found five in *PA*; six in *GA*; three in *IA*; and one in *Resp.*); one in the *Physics*; four in *De Caelo*; and two in *De Anima*. The principle is never used outside the natural treatises, except for the three occurrences in the *Politica*.

[12] On Aristotle's use of teleological principles in *De Caelo*, see Leunissen 2009 and chapter five of my 2010a.

the science of nature (*Cael* 1.1.268a1: Ἡ περὶ φύσεως ἐπιστήμη; cf. *Cael* 3.1.298b2-3 and *Meteor* 1.1.338a20-5) – contains only seven full-fledged physical explanations of heavenly phenomena, all of which are generated through the application of teleological principles.[13] The principle that nature does nothing in vain is used four times in this treatise, each time for the discovery of the causes of absences of heavenly phenomena. Aristotle points out that the teleological explanations he ultimately provides are not as necessary as the ones provided in the biological works, but he insists that they are at least 'plausible' or 'reasonable'.[14] Given the lack of empirical evidence about heavenly phenomena, these explanations are the best *physical* explanations he can possibly provide, and by providing them, Aristotle is able to incorporate the study of the heavens into the science of nature.

Aristotle's use of the teleological principle that nature does nothing in vain in the *Politica* has a similar double function: if their use is successful, they help identify the natural causes of a given explanandum *and* thereby exhibit that explanandum to be a proper object of the science of nature. In all three applications of the principle in the *Politica*, this can be seen to be the case. In the first example, in *Pol* 1.2.1253a7-18, the principle is used to find the explanation of why human beings are *more* political than other political animals. The cause for this differentiation turns out to be a feature that belongs to the substantial being of (and is thus natural to) human beings, but that is absent in the other political animals: whereas other political animals only have the capacity for voice, human beings have the unique capacity for speech.[15] Aristotle reasons that, since nature does nothing in vain, this capacity for speech must be for the sake of something *and* enable humans beings to live a kind of political life that is different from those who merely possess voice (imagine the presence of speech in non-political humans, or imagine political animals with voice living the same kind of communal life as humans do: in both cases, the presence of speech in humans would be in vain). The purpose of speech in this context is identified as the communication of moral concepts, and it is this ability that makes us *more* political than any other political species.[16] Granted, the teleological principle is not used here as it is in the biological works in order to find the cause of the *absence* of a part (its use for finding the cause of the presence of something is however attested in the *De Anima*: see, e.g., *DA* 3.12.434a30-b8), but the explanation it yields picks out a natural cause pertaining to the nature of human beings. The two other

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[13] See *Cael.* 1.4.271a22-33, 2.3.286a7-9, 2.5.288a2-12, 2.8.290a29-35, 2.9.291a23-25, 2.11.291b10-15 and 2.12.292a15-b25.

[14] See Aristotle's methodological statements preceding his teleological explanations in *Cael* 2.3.286a3-7, 2.5.287b29-288a2, 2.12.291b24-8 and 2.12.292a14-18; cf. *Meteor* 1.7.344a5-7.

[15] On the spectrum of the more and the less political lives among animals, see Depew 1995: 161ff and Cooper 1990: 360n6.

[16] Cf. Depew 1995: 179: 'In the matter of making a living, reason and articulate speech (*logos*) bestow a flexibility, creativity, and diversity on human *bioi* that is absent from the lives of other animals.' *Pace* Keyt 1991: 123 who clams that 'man is a political animal to a greater degree than any other animal since man is the only animal to form a polis.'

applications of the principle in the *Politica* equally identify natural features of humans as the causes to be picked out in the explanation: in *Pol* 1.8.1256b15-22 the principle points to a human's need food after birth, which explains why nature supplies in this need by providing animals for consumption and, by extension, why certain forms of war are natural and just. In *Pol* 2.5.1263a38-b3, the principle points to the natural love of self humans have, which explains why they enjoy private possessions, and thus why citizens of the perfect state should not have all their possessions in common as Plato envisaged in the *Republica*.

It is significant *both* that the objects of natural science that are exhibited through the application of teleological principles in the *Politica* are human beings and the attributes they have by nature, *and* that these attributes subsequently inform what kind of actions Aristotle believes the lawgiver ought or ought not to perform (certain forms of war are good, and so is allowing citizens to have a certain amount of private possessions). In this way, political science builds on results of natural science, at least in so far as the latter reveals attributes of humans that a lawgiver needs to take into account if he is to produce a successful, well-functioning city. Aristotle hints at this relationship of dependence between political and natural science in the following passage (*Pol* 1.10.1258a21-4):

> For just as political science does not make humans, but receives them from nature and uses them (ὥσπερ γὰρ καὶ ἀνθρώπους οὐ ποιεῖ ἡ πολιτικὴ, ἀλλὰ λαβοῦσα παρὰ τῆς φύσεως χρῆται αὐτοῖς), so too is it necessary that nature provides earth and sea and whatever else for food.

Political science *makes use* of the humans it receives from nature and in that sense supervenes on natural science. It is not the task of political scientists to make humans, but to make them good, and in order to do this he needs to make use of and perfect their natural propensities (*Pol* 7.4.1325b39-1326a5):

> I am talking, for instance, about a quantity of citizens and land. For just as for other craftsmen, such as the weaver or shipbuilder, it is necessary that some material is available that is fitting for the function (for to the extent that it turns out to be better prepared, the thing that comes to be by art will necessarily also be better), in the same way also is it necessary for the politician and the lawgiver that material is available that is suitable, being fittingly disposed (οὕτω καὶ τῷ πολιτικῷ καὶ τῷ νομοθέτῃ δεῖ τὴν οἰκείαν ὕλην ὑπάρχειν ἐπιτηδείως ἔχουσαν).

To the extent that politicians make use of human beings as their material, they thus need to know some natural science. It is only by knowing enough of the biology of human beings (and some of their psychology: see, for instance, *EN* 1.13.1102a18-26;

10.9.1181b12-15; and *Pol* 7.13.1333a16-b5, esp. 1333a37) that the lawgiver will be able to choose the most suitable 'materials' and make the best use of them.[17]

For the *Politica* as a treatise, this means that we should distinguish between two layers: a 'biological' layer pertaining to the natural, constitutive material of cities (i.e., the human beings and the communities they form by nature, without interference of a lawgiver) and to which principles of the science of nature can properly be applied, and an 'ethical' or 'political' layer pertaining the constitutions and the lawgivers who use human beings and their natural communities to create the kind of city that makes its inhabitants good, which is the proper domain of the science of politics.

TWO CITIES – AND TWO TYPES OF TELEOLOGY

The two sciences at play in the *Politica* account for Aristotle's ambivalent treatment of the city: there are two stages in the development of cities, the first being entirely natural, but the second being a result of the art of lawgiving. I believe that Aristotle says as much in his teleological explanation of the city in *Pol* 1.2.1252b27-30:

> The complete community from multiple villages is the city ... which comes to be for the sake of living, but exists for the sake of living well (γινομένη μὲν τοῦ ζῆν ἕνεκεν, οὖσα δὲ τοῦ εὖ ζῆν.).

In this passage, Aristotle distinguishes between (a) two types of goals that are served by the city and between (b) a genetic and a static explanation of the city. Apparently, what drives the *coming into being* of the city is the realization of the function of *living*, presumably for all its inhabitants, including the women and slaves. This biological goal is the primary function of the development of this 'natural' city,[18] and it explains why all humans are invested in its realization. However, what accounts for its continued and stable *existence* is the fact that the city (once organized properly by a lawgiver) makes possible the realization of the function of *living well* – if only to its free male citizens. This ethical goal is the most important and most defining function of the city (see *Pol* 3.6.1278b15-31; 1287b23: μάλιστα μὲν οὖν τοῦτ' ἐστὶ τέλος;

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[17] See also *Pol* 7.7.1327b18-1328a20, where Aristotle indicates that the lawgiver needs to have knowledge of the character of the citizens he chooses for his city, since those who are both intelligent and courageous in their nature will be "most easily led to virtue" (1327b36-38: εὐαγώγους ἔσεσθαι … πρὸς τὴν ἀρετήν). Cf. the following passage from (ps-?)Aristotle's *Protrepticus* (Iamblichus, *Protrepticus* X.54.12-55.3): 'For just as all the sophisticated doctors and most sophisticated athletic trainers pretty much agree that those who are to be good doctors or trainers must be experienced about nature – and indeed much more than the former … in the same way, the statesman must have certain norms taken from nature itself, i.e., from the truth, by reference to which to judge what is just and what is good and what is advantageous.' (I borrowed this translation from Hutchinson & Johnson 2005: 263.) I thank Monte Johnson for bringing this passage to my attention.

[18] Cf. Kullmann 1991: 102-103.

3.9.1280b29-1281a4), and is what the lawgiver has in view when he organizes the city. As I shall explain in more detail below, the two goals – and the two stages of the city – form a hierarchical continuum, in which the ethical realm builds, as it were, on the biological one.

Let me first specify the causal mechanisms through which the two stages of the city are realized: even though Aristotle is never terribly explicit about this, I believe that the *language* he uses in the passage quoted above characterizes the natural city as a product of natural teleology, but the ethical city as a product of art *imitating nature*. For in the biological works, Aristotle draws similar contrasts between features that are for the sake of living versus those that are for the sake of living well, and differentiates between the causes of the coming to be and the existence of features only in a special type of case – distinctions an aspiring politician might well be assumed to be familiar with. In the *De Partibus Animalium*, for instance, Aristotle characterizes the liver as a necessary condition for the living of an animal (*PA* 4.2.677a36-b5):

> For it is reasonable that, since the nature of the liver is vital (ἐπίκαιρον) and necessary to all the blooded animals, its being of a certain character is a cause of living a shorter or longer time (τοῦ ζῆν ἐλάττω ἢ πλείω χρόνον). …and none of the other viscera [with the exception of the heart, of course] is necessary to these animals, but only the liver.

The liver is among the parts that Aristotle considers to be the necessary prerequisites for the realization of either vital or essential functions: without those parts the animal could not live, or would not be able to be the kind of animal it is. Such parts all come to be and exist due to a process I call 'primary teleology': they are the necessary realizations of a pre-existing, internal potential for form, as specified by the definition of the substantial being of the animal. Because of their vital or essential importance to the animal, these parts come to be first during the process of embryogenesis and are generated by that form, or formal nature, through conditional necessity: if there is to be an animal of that form, it *must* have these very parts. Thus, if the substantial being of an animal specifies that it is blooded (see *PA* 4.5.678a31-5, 4.12.693b2-13 and 4.13.695b17-26), it must have a liver.

Other parts, however, such as kidneys (*PA* 3.7.670b23-7) and horns (*PA* 3.1.661b28-662a2) are not 'among the necessities for living' (see Aristotle's description of limbs in *PA* 3.4.665b21-7; 25-6: οὐκ ἔστι τῶν πρὸς τὸ ζῆν ἀναγκαίων; cf. *GA* 1.4.717a12-31 on testes), but are rather present for the sake of 'the well and the good' or 'for the better'. These parts are of a subsidiary or 'luxury' nature: they contribute to the performance of functions already performed by other, necessary parts (e.g., kidneys help the bladder collect residue, testes slow down the ejaculation of semen through the ducts), or perform functions that contribute to the well-being of the animal without being absolutely necessary for its survival or reproduction (e.g.,

horns provide protection – a function not mentioned in Aristotle's list of soul-functions in his *De Anima*). Hypothetically speaking, the formal nature of the animal could have realized all the vital and essential functions without producing such parts (which Aristotle believes is evidenced by the fact that there are indeed related animals that perform those functions without the presence of the relevant subsidiary parts), but with these parts, the animal is not only able to live, but also to live well. The causal mechanism through which these parts are produced is that of 'secondary teleology': the materials constitutive of these parts come to be as materially necessary by-products of the primary teleological processes and are then *used* by the animal's formal nature for ('*pros'* or '*charin'* – Aristotle often uses 'weaker' teleological language in these cases) the production of parts that serve the animal's well-being. This is also why Aristotle distinguishes between the causes of the *coming to be* of these parts, which is usually material necessity, and the causes of their *existence* or *presence*, which is a final cause of the subsidiary or luxury kind. The process is teleological (it are the goal-directed actions of the formal nature in using these materials that account for the part's functional presence), but the function is imposed on the extra materials only secondarily to their independent production and is restricted by the potentials those materials of necessity have.

Aristotle lays the foundation for this distinction between features that are necessary for living and those that are subsidiary to living well in the 'biological chapters' at the end of *De Anima* (chapters 3.11-13). There, Aristotle investigates the question why living beings possess the precise sequence of nested capacities (for the performance of which animal parts form the necessary prerequisites) they have. He does this by determining for each capacity whether it is necessary for a specific way of *living* or *being* itself, or is rather for the sake of *living well* or *the good* (see especially *DA* 3.12.434a22-6, b10-18 and b22-27; 3.13.435b19-21). In the first case, Aristotle believes that the realization of a certain capacity is of *immediate* vital or essential importance for all the subspecies within the same widest form of life as considered in *De Anima*, i.e., plants, non-human animals, and human beings. Without the possession of and the means to realize that capacity, the living being could not at all have existed or have been the specific kind of being it is. For instance, having the capacity of touch is both a necessary and sufficient condition for being an animal, and *all* animals therefore will have touch; without it, no animal can exist or could have been an animal in the first place (*DA* 3.12.434b10-14; b22-24). In the second case, which pertains only to non-human and human animals, Aristotle believes that the possession of and means to realize the capacity in question are not of immediate vital or essential importance for all animals (and therefore not necessary in the strict sense). However, their realization does serve the well-being of *some* of them: the capacity seems to be present for the sake of *optimizing* their performance of the essential and vital life functions, rather than for the sake of their basic performance. For instance, having the capacity of voice is not necessary for all animals (i.e., nature *could* have 'designed' those animals to function without the ability to produce sounds;

and, as it turns out, there are in fact animals that lack this capacity), but it is present only in those which take in air (*DA* 2.8.420b13-22). Since in these animals breath is already present for the sake of cooling, nature can use it for a subsidiary function, which is to express pain and pleasure (see *Pol* 1.2.1253a8-18). Whereas cooling is a necessary function, being able to communicate pain and pleasure contributes to the well-being of these animals.

In biology, the distinction between the two goals of living versus living well thus operates at the level of soul-capacities as well as at the level of animal parts. In both cases, the goal of living is realized widely, whereas the goal of living well is only realized in the more complex organisms; and in both cases, the features that enable the animal to live well presuppose the existence of the features that enable it to live. In this way, the distinction gives rise to a *scala naturae* (*PA* 2.10.656a3-13; 656a3-7):

> The animals that have perception in addition to life are more polymorphic in their appearance, and some of them more than others, and there is still more variability among those whose nature partakes not only of living but, in addition, of living well (ὅσων μὴ μόνον τοῦ ζῆν ἀλλὰ καὶ τοῦ εὖ ζῆν ἡ φύσις μετείληφεν). And such is the species of humans.

At the bottom of the scale are those living beings, such as plants, that only possess capacities for basic survival and reproduction; at the top are the living beings that display a greater organic and functional complexity (in addition to having all the basic capacities) and that thus partake in a form of living well.[19] Human beings, as a species, are at the top of this gradual scale: they are the most complex animals and possess the highest soul-capacity, which is thought. All humans, therefore, are capable of living as well as of living well in a biological sense, and – as Aristotle points out in a later reference back to book one of the *Politica* – both of these are something even a natural city can provide to all its inhabitants (*Pol.* 3.6.1278b17-30):

> As was said in the first chapters … man is by nature a political animal. And therefore, human beings, even when they do not require help from each other, no less desire to live together … But they also come together and *hold together the political community for the sake of life itself* (τοῦ ζῆν ἕνεκεν αὐτοῦ): for perhaps there is some part of the good present also in what is in accordance *only with living itself* (ἴσως γὰρ ἔνεστί τι τοῦ καλοῦ μόριον καὶ κατὰ τὸ ζῆν αὐτὸ μόνον), as long as the difficulties pertaining to life do not overbalance it too much. For it is clear that many people steadfastly cling to life, even though it brings many bad experiences, because [they believe] there is some fineness in it and a natural sweetness.

[19] See also *HA* 8.1.588b4-22 and *PA* 4.5.681a10-15. Cf. Lennox 1999: 6-7.

However, the *highest* form of living well, which Aristotle defines as living a happy and virtuous life in accordance to reason (see, e.g., *NE* 1.4.1095a17-20, 1.8.1098b20-22 and 6.5.1140a24-28), is restricted to a select group of human beings, namely to those who possess an 'authoritative' faculty of deliberation and, in addition, are educated and habituated in the right way. In other words, in order to live well *in an ethical sense*, one has to meet specific natural and cultural requirements: one has to be a free, male human being by birth (cf. *Pol* 7.13.1332a40-1) and be brought up within the confines of a city that has the right kind of constitution, organization and educational system (*EN* 2.1.1103a30-b5 and 10.9.1179b29-1180a5; *Pol* 7.13.1332a41-b11). Although many forms of living together will suffice for the preservation of life of all humans, free males need an 'ethical city' if they want to live well. The ethical city thus performs a subsidiary function in helping this group of people realizing the highest form of human happiness and is strictly speaking, only for them (*Pol* 3.9.1280a31-4; 1280b39-81a4):

> If the city is not only for the sake of life, but more for the sake of living well (εἰ δὲ μήτε τοῦ ζῆν μόνον ἕνεκεν ἀλλὰ μᾶλλον τοῦ εὖ ζῆν) – for if it did [exist only for the sake of life] then slaves and other animals could have a city; but in fact they cannot, because they do not participate in happiness or in the life in accordance with choice ... The end of the city is living well, and these things are for its end. And the city is the community of families and villages in a complete and self-sufficing life, and this is – as we call it – the life of happiness and goodness. It must thus be posited that the political community exists for noble actions, but not for living together.

Schematically, the language Aristotle uses in his characterization of the two ends of the city suggests the following *analogies*:

	BASIC LEVEL (final cause is living/existing)		**COMPLEX LEVEL (final cause is living well/the good)**	
Type of feature	Necessary	Beneficiary	Subsidiary	Beneficiary
Biological part	Liver, bladder	All blooded animals	Kidneys, horns	Some animals
Soul-capacity	Touch	All animals	Voice	Some animals
Level of city	Natural city	All humans (incl. women and slaves)	Ethical city	Some humans (i.e., all citizens)

The causal mechanisms responsible for the two cities can be summed up as follows. Just like all other biological features that are necessary for living, Aristotle explains the coming to be of the natural city 'bottom up' – as the result of the formal natures of human beings realizing their own internal, pre-existing potential for form, which includes their political nature. The political community arises as an emergent property from the combined individual impulses of all human beings towards

survival and reproduction (cf. *Pol* 1.2.1253a29-30). It can reach considerable levels of complexity[20] and provide a comfortable level of living to all or many.

However, in order to make this community serviceable to the living well of its free male citizens in a non-accidental and reliable way, it needs to be organized in an appropriate way. This happens 'top down', through a deliberate application of the art of lawgiving: just as the internal formal natures of biological organisms make use of the materials that are naturally available for something good, so too do lawgivers – as external goal-directed agents – make use of the naturally available city and inform it with a constitution (cf. *Pol* 1.10.1258a21-4, quoted above). And, just as the subsidiary and luxury parts made from extra materials help the animal to which they belong to live well, so too does the ethical city – or more precisely: the extra time (*scholê*) opened up for the pursuit of politics and philosophy[21] – make a good life possible to those for whom this is possible. The ethical city is thus a product of art, but of the kind of art that imitates the natural process of secondary teleology and that is therefore 'in accordance to nature' (cf. Ps.-Arist. *Econ* 1.2.1343a24-b1).[22]

The question of whether the city is a product of art or of nature thus presents a false dichotomy. The teleological explanations Aristotle gives in his account of the city indicate that it is both: the city first comes into being as a product of natural teleology, but its existence for the sake of living well is a product of the art of lawgiving in its imitation of the process of secondary teleology. The resulting ethical city, which is the proper object of political science, is not a realization of a pre-existing, natural potential for a city-form (the forms of constitutions differ and are imposed through the external goal-directed actions of a lawgiver). The city does not have a form that transcends the individual forms of its inhabitants, nor does it have a nature, even if it is 'by nature' because its constitutive material has come to be naturally.[23]

When Aristotle compares the city to an organism in order to show its natural priority to its individual inhabitants (in *Pol* 1.2.1253a18-22), he does not claim that the city *is* an organism: in fact, as Aristotle points out, if the plurality of parts of which the city is composed would reach the same degree of unity as the parts of a natural body possess, the city would be destroyed (*Pol* 2.2, 1261a15-22).[24] Instead, he claims that both are *functionally organized wholes* consisting of parts that cannot function

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[20] Think, for instance, of Athens before Solon, or of the way most barbarians live according to Aristotle, or even of the hierarchical social structures and divisions of labour that can be found in bee hives and ant colonies.

[21] I thank Jim Hankinson for pointing out this analogy. For the importance of leisure, see *Pol* 2.9.1269a34-36; 2.12, 1273a31-b7; and 7.9.1329a1-2.

[22] The role of the lawgiver is in that sense not that much different from that of the farmer: although most crops grow and reproduce by nature (and can reach some level of excellence by nature or chance), a perfect and regular yield can only be attained through the art of agriculture as applied by a farmer who knows his materials and is able to make use of the availability of rain during the winter.

[23] Cf. Wardy 1993: 25.

[24] Cf. Ferguson 1985: 263.

properly independently of that whole (cf. *MA* 10.703a29-36). Parts of animals, when separated from the animal, are no longer able to perform their biological function – a function which is defined in terms of the contribution the part makes to the whole. When this whole is destroyed, however, parts of animals do not evaporate out of existence, but exist merely 'as matter' and 'as a heap' (*Meta* 7.16.1040b5-10)[25] and remain stripped of their original identity. An eye is no longer an eye, but merely a heap of fluids and solids, referred to as an 'eye' only homonymously. Similarly, human beings, when separated from what must be the ethical city (this is revealed by Aristotle's reference to self-sufficiency in *Pol* 1.2.1253a26, which is the purpose of the ethical city; cf. *Pol* 3.9.1280b29-35), are no longer able to perform their civil function – they loose their self-sufficiency, which is necessary, not for living,[26] but for *living well*. The natural priority Aristotle refers to thus entails the *functional dependency* of the parts to the whole of which they are part: without the city, human beings exist merely as 'unorganized' matter and can no longer to be identified as citizens (for the identification of the citizens as parts of the city, see *Pol* 3.1.1274b38-40) – they have lost the external conditions necessary for living a happy life (note that they can still be called 'humans' in a non-homonymous way).[27] Humans are not like wild animals or gods (*Pol* 1.2.1253a27-9): unlike wild animals, humans are capable of living in communities and need to do so for the sake of living, and unlike gods, humans need to be parts of such communities for the sake of self-sufficiency and living well.

In sum, for Aristotle, existing (successful) cities are a joint product of human nature and political art. Humans form political communities by nature, but the application of political art is necessary to take this biological way of life in support of self-preservation and reproduction to a level of complexity that allows the free citizens to achieve happiness.

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[25] Mayhew 1997: 327.

[26] Aristotle's genetic account of the city and his description of the moral downfall of a person who is separated from the laws of the city in *Pol* 1.2, 1253a31-7 make it clear enough that human beings can survive without cities. See Kraut 2002: 256-257, especially n.20, and Reeve 2009: 515.

[27] For humans (but not for parts of a body) it makes a huge difference whether or not they are separated from the ethical city as a group or by themselves. Any human separated as an individual from the ethical city will end up loosing at least part of what makes him human if he is also no longer part of a natural city: a political animal needs to be with others – however few – to realize his particular way of life. If separated from the ethical city as a group, on the other hand, humans can still form a natural community (and attain a natural level of organization) that allows them to live and realize their political way of life. For this group of humans, the citizens among them suffer the greatest loss: they become 'mere' humans and loose their capacity to live a happy life, whereas for the women and slaves among them nothing much may change (if separated from their husbands and masters, they will loose the benefit of being ruled, but since they could never become truly happy in the first place, this may be considered to be a minor loss). I thank Larry Jost for pressing me to draw out the analogy in a more precise and nuanced way.

CONCLUDING REMARKS

Building on Aristotle's use of teleology in the *Politics*, I have argued that his concept of the city as well as the treatise in which he presents this concept are hybrid entities. The city that comes to be for the sake of living, and that does so under the influence of the natural inclinations and tendencies all human beings have, is the object of natural science. The city that exists for the sake of living well and that is established by the lawgiver who uses the natural city as his material is the object of political science. The *Politica* is mostly concerned with the latter, i.e., the ethical city, and therefore forms, together with the ethical treatises, mostly a study in political science. However, where the 'matter' of the ethical city is at stake, Aristotle (as should the lawgiver) approaches the inhabitants of the city as biological entities, and uses principles that belong properly to the science of nature: the *Politica* also involves discussions that are at home in the study of nature. This in turn provides an interesting perspective on the relation between the natural and the ethical realm: although the ethical city is ontologically dependent on the prior coming into being of the natural city, it also provides the only means for a select group of human beings to perfect their nature, and to live a happy life. Natural teleology and political art come together in producing successful cities in which all can live, and some can live well.

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