PART I

Introduction and Interpretative Essays

1

On Generation and Corruption *II*

An Introduction

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1.1 Introduction

GC consists of four pieces: an account of generation and corruption, including an attempt to distinguish these natural processes from alteration and growth (*GC* I 1–5); a discussion of contact, action and passion, and mixture (*GC* I 6–10); an elemental theory with an account of how the four sublunary elements change into one another (*GC* II 1–8); a return to the study of generation and corruption, with a special focus on the moving (that is, efficient) cause, securing it so that generation and corruption in the sublunary world be continuous and uninterrupted (*GC* II 9–11). This introduction tries to overcome the impression that *GC* is a suboptimal amalgam of these four pieces by exploring the relation between the account of generation and corruption and the elemental theory. It will emerge that the discussion of contact, action and passion, and mixture is for the sake of the subsequent elemental theory, and that this theory, along with the final discussion of the moving cause of generation and corruption, fulfill a promise made at the outset of *GC*, where Aristotle announces a search for the causes of generation and corruption.[1] Far from being a suboptimal amalgam of loosely connected investigations, *GC* is a carefully crafted work. Aristotle could have rearranged the various pieces that compose this work in a different way, but this rearrangement would have been less than optimal.

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[1] *GC* I 1, 314a1–3.

Section 1.2 offers an overview of the contents of *GC* I and *GC* II, with a focus on how the account of generation and corruption and the elemental theory are connected in the broad structure of the treatise. The upshot is that the unity of *GC* is stronger than it is often thought. Section 1.3 explores how Aristotle deals with the same themes in two other works: *DC* and *Meteorology*. This brings to the fore how close the account of generation and corruption and the elemental theory are in Aristotle's mind. Finally, Section 1.4 is a detailed summary of the contents of *GC* II, showing how the broad structure outlined in Section 1.2 helps us appreciate the overall argument within *GC* II, especially the continuous treatment of the elements in *GC* II 1–8, which is prefigured in the questions raised at the outset of *GC* I 6.

1.2 Generation, Corruption, and the Elements in *GC* I and II

GC is foundational for Aristotle's science of nature. The first lines are carefully crafted to give a precise description of the topic under investigation. The topic is generation and corruption (περὶ γενέσεως καὶ φθορᾶς), and not generation and corruption of everything but of the things that come into being and perish *naturally* (τὰ φύσει γενόμενα καὶ φθειρόμενα), where these are to be treated not individually by kinds but rather in general for all natural things alike (ὁμοίως κατὰ πάντων). We are also promised a twofold task: a search for the causes of generation and corruption (τὰς αἰτίας διαιρετέον) and an account of these processes (τοὺς λόγους αὐτῶν).[2]

Contemporary readers may find the existence of generation and corruption unproblematic; as a result, they may fail to appreciate the predicament in which Aristotle finds himself at the outset of *GC*. Without a firm grasp of what generation and corruption are, including how these archetypal processes differ from other natural processes such as alteration and growth, Aristotle cannot move forward with his stated goal of providing a scientific account of them. Aristotle's predicament is not artificially created by deliberately ignoring existing accounts of these processes. What his predecessors have said on this topic makes it very difficult, if not even impossible, for him to make sense of generation and corruption. This explains why Aristotle opens his inquiry into generation and corruption

[2] Here is the opening statement in the original Greek: περὶ δὲ γενέσεως καὶ φθορᾶς τῶν φύσει γενομένων καὶ φθειρομένων, ὁμοίως κατὰ πάντων, τάς τε αἰτίας διαιρετέον καὶ τοὺς λόγους αὐτῶν (*GC* I 1, 314a1–3).

with a long, and at times convoluted, critical discussion of the views of his predecessors (*GC* I 1–2).

By the end of *GC* I 5 Aristotle is confident that he has established not only *that* generation and corruption are different from alteration and growth, but also *what* each of them is. At the outset of *GC* I 6, Aristotle negotiates the transition to the next topic on his agenda as follows:

> Since *we ought to speak first about the matter and the so-called elements* – [establishing] whether or not they exist, and whether each of them is everlasting or comes into being in some way; and if they do come into being, whether they all come into being in the same way from one another, or some one of them is primary – *we must speak beforehand about things that are currently spoken of indistinctly*. (*GC* I 6, 322b1–4)

Aristotle makes two announcements in this transitional passage. He announces that his account of generation and corruption ought to continue with a study of "the matter and the so-called elements." He adds that this study must be preceded by the treatment of a set of concepts that are relevant to any scientific account of the natural world. They are contact, action and passion, and mixture. A preliminary discussion of these concepts is needed because Aristotle's predecessors have employed them without having made the proper conceptual distinctions.[3]

Providing conceptual clarity remains a primary goal throughout the second part of *GC* I (*GC* I 6–10). Without conceptual clarity, Aristotle cannot turn to a search for the causes of generation and corruption, so he cannot fulfill the promise made in the beginning of *GC*. When we reflect on what Aristotle accomplishes in *GC* I, we see that half of the twofold task announced at the outset of *GC* is not even begun until *GC* II. We also see that Aristotle establishes a close link between the study of the elements and the account of generation and corruption and thinks of the former as a contribution to the latter – so much so that the study of the elements is presented as a natural, and indeed inevitable, development of the account of generation and corruption. This connection is confirmed by what we read at the outset of *GC* II:

> So then, with regard to mixture, contact, and acting and being acted upon, we have said how they belong to the things that change naturally. And further, with regard to simple generation and perishing, we have said how

[3] Williams 1982: 21 renders the Greek ἀδιορίστως with "in a confused way." But Aristotle's predecessors need not be confused; they only need to be unaware of the internal articulations of these concepts. Their unsystematic use of these concepts is a consequence of their not having done the required conceptual work.

> they occur, what they are of, and by what cause they occur. And similarly also with regard to alteration, we have said what being altered is and how it differs from them. *But it remains to consider the so-called elements of bodies*. (*GC* II 1, 328b26–32)

This second passage contains a precise but selective summary of the main topics discussed in *GC* I: not only a determination of what generation and corruption are, and how they differ from alteration and growth (*GC* I 1–4), but also a treatment of contact, action and passion, and mixture (*GC* I 6–10).[4] The final sentence announces the next topic on Aristotle's agenda: the so-called elements. This topic is introduced as a leftover from *GC* I – and rightly so, given that a study of "the matter and the so-called elements" was announced in *GC* I 6.

The expression "the so-called elements" is found in both transitional passages.[5] More on its significance in due course. For the time being, it is more pressing to focus on the claim (made in *GC* I 6) that the account of generation and corruption ought to continue with a study of "the matter and the so-called elements." Does Aristotle introduce two topics, matter *and* the so-called elements – or one – matter *in the sense of* the so-called elements? An answer to this question cannot be given on purely grammatical grounds. It depends on how we understand the connection between the study of the so-called elements and the study of generation and corruption. For more on this connection, we must turn to *GC* II.

As soon as we turn to *GC* II, we discover that the first and most important step in the study of the elements consists in a clarification of how we should think about matter. To this end, Aristotle singles out two main critical targets: Anaximander's *apeiron* and the Receptacle of the *Timaeus*. There are problems specific to the lines of thought leading to each of these two putative principles.[6] But both lines of thought share a common mistake: they end up positing a separable, and indeed separate, material principle, namely a self-sufficiently existing matter. Aristotle's alternative consists in adopting the explanatory strategy introduced in *Phys.* I.[7] On this strategy, matter is an existentially inseparable, but definitionally separable, potential being.

[4] The discussion of how generation differs from growth (*GC* I 5) is left out of this summary. Hence, my decision to flag it as a *selective* summary of the main topics discussed in *GC* I.
[5] It occurs one more time in *GC* II 1, at 329a26.
[6] See the essay by Timothy Clarke in this volume.
[7] The cross-reference in *GC* II 1, 329a27 is ambiguous. It can be taken to be a reference to either *DC* III or *Phys.* I. In his essay, Timothy Clarke defends the view that it is a reference to the conceptual framework introduced in *Phys.* I.

To appreciate why the study of the elements is embedded in a study of generation and corruption, we must bear in mind that "for all the naturally constituted substances, their generation and perishing are not without the perceptible bodies."[8] Aristotle's point can be restated by saying that perceptible bodies are always involved in the generation and corruption of naturally constituted substances in the sense that naturally constituted substances need to be perceptible bodies in order to be subject to the causal interactions leading to their generation and corruption. "Perceptible body" is a piece of jargon that calls for a few words of explanation. A perceptible body is not just a natural body accessible to sense perception – namely, a body that can be perceived by touch and the other senses. A perceptible body is also a natural body susceptible to entering a causal relation in which this body acts on another natural body and is acted upon by it. Such a relation, which requires two natural bodies to touch one other, is essential to our understanding of how generation and corruption are physically possible. For Aristotle, generation and corruption in all naturally constituted substances are not possible without perceptible bodies. Since the elements are the primary bodies out of which all other natural bodies are made, they are the ultimate perceptible bodies; as such, they are the ultimate source of perceptibility for the other sublunary bodies.

Emphasizing the centrality of the notion of perceptible body helps us see why Aristotle deals with contact in *GC* I 6, action and passion in *GC* I 7–9, and mixture in *GC* I 10 *before* turning to the study of the so-called elements in *GC* II. A clarification of these notions is introduced *for the subsequent discussion of the elements*. Consider the three questions that Aristotle highlights in connection with the study of the elements at the outset of *GC* I 6: (1) whether the elements exist or not; (2) whether the elements are everlasting, or rather they come into being in some way; (3) if the elements come into being, whether they all come into being from one another or rather one of them is prior to the others.[9] At the most general level, there cannot be an answer to either the second or third question on Aristotle's agenda – and so an adequate explanation of the generation and corruption of the elements – without speaking of contact, action and passion. The case of mixture is less obvious, but we should keep in mind that *GC* II 7 is concerned with elemental *mixtures*, and that these qualify as a particular case of mixture.[10]

[8] *GC* II 1, 328b32–33. See the recent discussion in Crowley 2019: 1–26. The technical meaning of perceptible bodies defended in Crowley's article is adumbrated in Buchheim 2010: 449.
[9] *GC* I 6, 322b1–4. [10] See Andreas Anagnostopoulos in this volume.

The reading that makes *GC* I 6–10 preparatory for the study of the elements offered in the first part of *GC* II is compatible with the view that a treatment of the notions of contact, action and passion, and mixture has a theoretical significance that goes beyond the narrow boundaries of Aristotle's theory of the elements.[11] In other words, there is no contradiction in holding that the results achieved in this stretch of text play a foundational role for Aristotle's study of the natural world, and holding that a preliminary clarification of these notions is required for an optimal study of the so-called elements. At the same time, placing proper emphasis on the link between contact, action and passion, and mixture, and the study of the so-called elements helps us appreciate why Aristotle deals with these notions right before engaging in a search for the principles of perceptible bodies. Aristotle could have relocated his treatment of contact, action and passion, and mixture elsewhere. If we find his discussion of these concepts embedded in his study of generation and corruption right before the study of the so-called elements, it is because Aristotle regards this treatment as especially useful for this study.

Far from being trivial or inconsequential, this conclusion sheds light on the unity of the whole *GC*. This unity is stronger than it may initially appear. *GC* I 6–10 is added to the account of generation and corruption for the sake of the subsequent discussion of the elements. Since the latter fulfils a promise made at the outset of *GC* I, where Aristotle announces a study of the causes of generation and corruption, we see that the discussion offered in the second part of *GC* I (*GC* I 6–10) is found where it belongs.

1.3 Generation, Corruption, and the Elements Beyond *GC*

Evidence that a close link exists in Aristotle's mind between the account of generation and corruption and the study of the elements can be found outside *GC*:

> Regarding the first of the elements, we have said what its nature is and that it is not subject to generation and corruption. *It remains to speak about the other two [pairs of elements].*[12] *For those who speak about them, an investigation of the topic of generation and corruption will take place at the same time*. The reason is that either generation does not exist, or it exists only in those elements and the things made out of them. (*DC* III 1, 298b6–11)

[11] For a reading that stresses the relevance of *GC* I 6–10 beyond the boundaries of the theory of the elements, see Burnyeat 2004: 7–24 and Wildberg 2004: 219–242.
[12] That is, the light pair (fire and air) and the heavy pair (earth and water).

This passage marks the transition from celestial to sublunary physics. Aristotle refers to the celestial simple body, which is also the matter of the heavenly bodies, as "the first element." A discussion of this curious expression goes beyond the scope of this introduction.[13] More interesting for us is to observe how closely the study of the sublunary elements is tied to a study of generation and corruption. Aristotle does not envision two separate studies – namely, a study of sublunary elements followed by a study of generation and corruption. He thinks that a study of the sublunary elements is *ipso facto* a study of generation and corruption. More to the point: nothing in the above passage suggests that Aristotle is restricting his claim to the study of *elemental* generation and corruption. On the contrary, he appears to be making a stronger (and more interesting) claim: the study of the sublunary elements contributes – directly and immediately – to a study of generation and corruption *in general*. What licenses this conclusion is the claim (made at the end of the passage quoted above) that "generation does not exist, or it exists only in those elements *and the things made out of them*."

The close link that exists in Aristotle's mind between the study of the elements and the study of generation and corruption finds confirmation in how the argument unfolds in *DC* III. First, Aristotle shows that a few positions are untenable. Then, he dismisses the view of those who deny generation and corruption, as well as the alternative view that everything is subject to generation and corruption. Having ruled out these extreme positions, Aristotle concentrates on which things are subject to generation and corruption and why. It is only at that point (at the beginning of *DC* III 3) that he turns to the topic of the sublunary elements, with a focus on their number and mode of generation and corruption.

GC II builds on the results achieved in *DC* III. *GC* II 3 takes for granted that there are two pairs of elements belonging to two different regions of the sublunary world.[14] *GC* II 4 assumes that these four elements change into one another.[15] Here Aristotle refers his reader to a prior discussion on this topic. *DC* III is the only plausible candidate for this reference. This result is reached by exclusion in *DC* III. Aristotle rules out that the sublunary elements are eternal and that they are generated from something else, either corporeal or incorporeal. There remains only that they are

[13] For a full discussion of the expressions "first element," "first body," and "first substance," see Falcon 2005: 113–121.
[14] *GC* II 3, 330a30–33. [15] *GC* II 4, 331a7–10.

generated from one another. The manner in which they are generated from one another is the focus of *GC* II 4.

The conceptual affinities between *DC* III and *GC* II do not extend to include *DC* IV. If we bracket the question of whether the solitary δέ in the opening sentence of *GC* refers to the solitary μέν in the last sentence of *DC* IV, and we concentrate on the conceptual resources employed in these works, we see that *DC* IV and *GC* I–II are conceptually discontinuous to the extent that the discussion of the heavy and light offered in *DC* IV does not contribute to the study offered in *GC* I–II. Although the two projects are not totally unrelated, they make use of different conceptual tools. Consider the following passage from *GC* II 2, where Aristotle tells us why the light and the heavy are not among the contraries that are relevant to his project:

> Here are the pairs of contrarieties that relate to touch: hot-cold, dry-moist, heavy-light, hard-soft, viscous-brittle, rough-smooth, coarse-fine. *Of these contrarieties, heavy and light are neither active nor passive. The reason is that things are not called heavy or light because they act on something else or they are acted upon by something else*; by contrast, the elements must act on or be acted upon by one another, since they mix and change into one another. (*GC* II 2, 329b17–23)

Aristotle could not be clearer as to the reason why *DC* IV and *GC* II are distinct projects: the heavy and the light are neither agents nor patients, so they do not contribute directly to our understanding of how elemental generation and corruption take place.

Reflecting on the relationship between *GC* II and *DC* III helps us realize that the discussion of the elements advanced in *GC* II must be placed in a larger context. It is time to elaborate further on this larger context by returning to the expression "*the so-called elements*." This phrase occurs three times in *GC* II 1. By contrast, the qualification "so-called" is dropped at the beginning of *DC* III 1. There, Aristotle is happy to speak of the elements of bodies. In fact, he is also eager to extend the use of the term "element" to the celestial simple body, which is called "the first element." More to the point: in *DC* III 3, Aristotle provides us with his own definition of element: an element is the primary constituent into which a body is divided.[16] There is no evidence that this definition is dropped in *GC* II. On the contrary, it is *prima facie* plausible that this definition is tacitly at work in *GC* II – especially if we take the view that *GC* II builds

[16] *DC* III 3, 302a14–19.