III.

DIE PHILOSOPHISCHE WIEDERGEWINNUNG DES

KONKRETEN KÖRPERS:

ARISTOTELES UND DIE ARISTOTELISCHE TRADITION

*Christian Pfeiffer*

## ARISTOTLE ON BEING IN THE SAME PLACE[1]

### I. Introduction

At several places in his works Aristotle maintains that it is impossible that there are two bodies in the same place.[2] I shall call this the principle of non-coincidence.

The aim of this paper is to clarify the nature and scope of that claim. Since this principle has been discussed both in antiquity and in present-day metaphysics, I will begin by distinguishing several versions of that claim. I will argue that Aristotle has a quite specific version of the principle in mind: It is impossible that two bodies coincide. A body is defined as a three-dimensional magnitude. For two bodies to coincide is for there to be two three-dimensional magnitudes in the same place. This claim is distinct from the question whether two *material* things or two *substances* can coincide.

It has been supposed that Aristotle's hylomorphism lends itself to the thesis that two things can be in the same place. For the matter and the thing it is the matter of are distinct. The bronze, e.g., constitutes a statue, but is not identical to it. Hence, there are two things, the bronze and the statue, in the same place. Thus, we might expect that Aristotle would be willing to acknowledge that there are exceptions to the principle of non-coincidence. But this is not the case. The reason for this is that Aristotle has a different conception of the principle of non-coincidence. For Aristotle the principle of non-coincidence is a principle about *bodies* and, as we will see, the bronze and the statue are not bodies in the strict sense of the term. Still, after having formulated and defended the principle as it is used by Aristotle, I will compare Aristotle's version of the principle of non-coincidence to other versions of this principle.

Nowhere in his works does Aristotle explicitly justify the principle of non-coincidence. On the contrary: Aristotle uses the principle of non-coincidence sometimes for *reductio ad absurdum.* That is to say, Aristotle uses the principle in proofs or discussions of rival theories in such a way that the absurd claim of the theory is the contradictory of the principle of non-coincidence. In the *De Anima,* for instance, he claims that if the soul is bodily and resides in the body, there will be two bodies in the same place, which is taken to be absurd.[3] From

[2] *An.* II 7, 418b17; I 5, 409b2–3; *Met.* III 2, 998a18–19; XIII 2, 1076a38–b1; *Phys.* IV 5, 212b25.

[3] *An.* I 5, 409b2–3.

Aristotle's perspective, a theory that denies the principle of non-coincidence is inherently flawed.[4]

Nonetheless Aristotle had reasons for accepting the principle of non-coincidence. The main reason is, as I will argue, that one cannot properly individuate coinciding bodies.[5] Once we allow for coincidence, there is no non-arbitrary answer to the question how many bodies are in a place at a given time. This argumentative strategy is, as I will argue, due to the context and aim of his arguments. Aristotle employs and defends the principle of non-coincidence primarily in arguments against the assumption of ontologically independent mathematical bodies and ontologically independent place or void. Given this context, it will become clear why Aristotle thinks the principle of non-coincidence should be a principle about bodies and why, in defending the principle, he only adduces features that belong to objects insofar as they are bodies.

## II. Several versions of the principle distinguished

In its most general form the question of coincidence is whether it is possible that there are two entities in the same place. However, stated in this form the principle is not strong. Most philosophers would not deny that Socrates' whiteness, if it has a place at all, is at the same place where Socrates is. Nor does Aristotle. Socrates has a place and his qualities have the same place because they are qualities of Socrates.[6]

What, then, is the principle of non-coincidence? I suggest that what philosophers have in mind when they discuss the principle of non-coincidence can be subsumed under one of the following questions:

(1) Can two *substances* coincide?
(2) Can two *objects of the same kind* coincide?
(3) Can two *material things* coincide?
(4) Can two *bodies* coincide?

Although the questions are distinct, they are connected. If you answer affirmatively to question (2), you are likely to affirm (1) and (3) as well. On the other hand, you might reject (2) and still endorse (3).[7] Take, e.g., the statue and the

---

[4] Cf. *Met*. III 2, 998a18–19. However, since Stoicism allowed for two bodies to be in the same place arguments of the form »The ancient didn't and couldn't imagine such a theory« do not work here.

[5] A brief note on terminology: If I say that no two bodies can be in the same place I use that as a shorthand for »no two bodies can be in the same place at the same time«. Instead of saying that no two bodies can occupy the same place, I sometimes shall say that no two bodies can coincide. Also, I use »physical substance« and »perceptible substance« interchangeably.

[6] *Phys*. IV 3, 210a26 ff.

[7] Modern day philosophy is, in the footstep of Locke's discussion in his *Essay Concerning Human Understanding*, ch. 27, mainly concerned with theses (2) and (3). Thesis (2) is rarely

bronze it is made of. One might claim that the bronze and the statue are distinct material objects that coincide. In this case one affirms (3). But one can – and most philosophers typically do – still deny (2). The statue and the bronze are not objects of the same kind. Aristotle states the problem of coincidence in terms of (4).[8]

In section III. I will provide an interpretation of Aristotle's understanding of (4). In section IV. I will reconstruct his reasons for rejecting the coincidence of bodies. Finally, in section V. I will make some suggestions how (4) relates to the other questions distinguished above.

## III. The meaning of the principle that two bodies cannot be in the same place

### A. The conception of body

Aristotle states the principle of non-coincidence in terms of bodies (σώματα). In this section, I will lay out briefly what the relevant conception of body is.

### 1. Body as three-dimensional magnitude

The claim I shall defend is that a body is essentially a three-dimensionally extended magnitude in virtue of which everything which is in a place occupies that very place. The definition of body mentions three-dimensional extension and the limit of this extension which is a surface. Thus understood, body falls in the category of quantity. Since, according to Aristotle, items in non-substantial categories do not exist separately from substances, it follows that body is a feature of substance and depends on it.

At several places within his works Aristotle characterises this notion of body (σῶμα):[9]

›Bounded by a surface‹ is the definition of body. (*Phys*. III 5, 204b5)[10]

›Body‹ is what has extension in all directions. (*Phys*. III 5, 204b20)

affirmed. An exception is Simons (1985). Most attention is given to thesis (3), which gave rise to a vast literature on material constitution. E.g. Wiggins (1968); Simons (1987); Rea (1997). A denial of thesis (3) is found in Burke (1997), (1992). For a more encompassing discussion of the principle in Ancient Philosophy see Betegh (this volume).

   [8] The only exception is *Met*. III 2, 998a19, where Aristotle speaks about two heavens being in the same place. This would fall under question (2). But as we shall see for Aristotle (4) is fundamental and the impossibility of (2) is connected with the impossibility of (4). See V.B.2.

   [9] For a book length treatment see Pfeiffer (forthcoming). For a discussion of the passage in *De Caelo* see Betegh et al. (2013).

   [10] All translations of Aristotle are from Barnes (1984); sometimes slightly revised.

> Now a continuum is that which is divisible into parts always capable of subdi-
> vision, and a body is that which is every way divisible. A magnitude if divisible
> one way is a line, if two ways a surface, and if three a body. Beyond these there
> is no other magnitude, because the three dimensions are all that there are, and
> that which is divisible in three directions is divisible in all. *(Cael.* I 1, 268a6–10)

According to these passages, body is a three-dimensionally extended magnitude
that is divisible in all three dimensions and is bounded by surfaces. Thus under-
stood, this is not simply the notion of perceptible substance. It is true that all
perceptible substances are bodies or, as I shall say, *have* bodies, but a perceptible
substance is not simply a body in this sense.[11] For although a perceptible sub-
stance like Socrates is three-dimensionally extended and bounded by a surface,
this is not what Socrates is essentially. Rather Socrates is essentially a human
being. The substance and essence of Socrates is his soul. The specification of
what Socrates essentially is is an account of his soul. Thus, even though Socrates
is three-dimensionally extended, this is not what makes him the substance he
is. It might be that it follows from the account of his soul that Socrates is three-
dimensionally extended, but this is not to say that we define Socrates as a three-
dimensionally extended body.[12] On the other hand, when we refer to the body
of Socrates, we do not speak about Socrates as such. Rather we speak about a
certain feature of Socrates, namely the three-dimensionally extended magnitude
of a certain shape which Socrates has. According to my interpretation, the body
of Socrates is a dependent particular which is essentially characterised by its
quantitative properties.[13]

It is, therefore, crucial to distinguish two uses of »body« that we find in Ar-
istotle's
works. Sometimes Aristotle uses the word »body« to refer to perceptible sub-
stances
like animals or the four elements.[14] But the use which underlies the prin-
ciple of non-coincidence is distinct from this. According to the second usage,
»body« refers to something that is *essentially* a three-dimensional magnitude
that is bounded by surfaces. A body – in this latter sense – is defined solely by its
quantitative properties. As I said, these uses are connected. It is true to say that
animals are bodies in the first sense because all animals *have* a body in the sec-
ond sense. In the same vein, when we ask what is true of the body of an animal
we ask what is true of a certain three-dimensionally extended magnitude *as such*.
This, however, is distinct from asking what is true of the animal as such. It is, e.g.,

---

[11]  I say »in this sense« because Aristotle sometimes calls perceptible substances »bodies«.
Cf. *Met.* VII 2, 1028b8–13. For more on this see below.

[12]  For an argument see Pfei er (2014).

[13]  I believe that it is this notion of body which Aristotle is concerned with in *Cat.* 6 and *Met.*
V 13, though that would require a longer argument.

[14]  Cf. *Met.* VII 2, 1028b8–14.

true of the animal *as such* that it belongs to a certain biological species, but this is not true of the body of the animal *as such*. It does not belong to the body *qua* body of the animal to belong to a certain biological species. But it is, e.g., true of the body *as such* to have a certain limit.

Moreover, this conception of body is neither exclusively mathematical nor physical.[15] Aristotle believes that mathematics does not deal with ontologically separate objects, but rather investigates ordinary physical objects insofar as they have mathematical properties. A geometer, e.g., treats natural substances »as if they were bodies only« (*Met.* XIII 3, 1077b28). A detailed interpretation of Aristotle's philosophy of mathematics is outside the scope of this paper.[16] So for the purposes of this paper I will simply state, as uncontroversially as possible, how the conception of body presented here relates to mathematics and physical science.

Stereometry studies three-dimensional bodies. Because of this, the conception of body under consideration here is rightly called a mathematical conception. The definition of body mentions the features that are studied by a mathematician and these are the only features that the mathematician is concerned with. However, since body and magnitudes are, at least for Aristotle, dependent on physical substances, the physicist also has an interest in them. To use Aristotle's own example in *Phys.* II 2, the moon is a heavenly body which is made of a certain matter, the ether, and has various other properties, such as colour etc. But the moon also has a body, i.e. it has a certain three-dimensional extension and a shape which is its topological limit. The body of the moon is an ontologically dependent feature of the moon. Considered *qua* body and as if it were separate, it is the subject matter of geometry. But considered *qua* body of the *moon* it falls under the scope of natural science. As Aristotle himself puts it:

> The next point to consider is how the mathematician di ers from the student of nature; for natural bodies contain surfaces and volumes, lines and points, and these are the subject-matter of mathematics. […][17] It seems absurd that the student of nature should be supposed to know the nature of sun or moon, but not to know any of their essential attributes, particularly as the writers on nature obviously do discuss their shape and whether the earth and the world are spherical or not. (*Phys.* II 2, 193b23–30)

---

[15] On this point see especially Betegh et al. (2013); Pfei er (2014).

[16] For an interpretation of the most relevant passages – *Phys.* II 2 and *Met.* XIII 3 – see Mueller (1970); Lear (1982); Pettigrew (2009); Hussey (2002).

[17] In the omitted sentence, Aristotle raises the question whether »astronomy [is] di erent from natural science or a department of it« (*Phys.* II 2, 193b25–26). The following remarks can be interpreted as an answer to this specific question. If this is so, the example of the moon may not be well chosen for my purposes, if it is taken to illustrate a point only about astronomy. However, I think Aristotle intended the example of the moon to be more general. In any case, the reader might simply substitute »moon« with »animal« and my argument still holds. On the status of astronomy in *Phys.* II 2 see Mueller (2006).

Natural bodies or substances have quantitative features which are also studied by the mathematician. Yet, these feature are also part of the study of natural science. In this sense, the very same features are studied both by mathematics and natural science. The distinction between the mathematician and the physicist is, therefore, not grounded in an ontological difference of their respective objects, but rather, as Aristotle continues to explain in *Phys.* II 2, in the way these features are studied by the respective sciences.[18]

If this is along the right lines, it is easy to see why Aristotle should deny that a physical body and a mathematical body can coincide. The principle of non-coincidence concerns *bodies*. Since for Aristotle it is, ontologically speaking, the same three-dimensional magnitude of a natural substance that is studied by mathematics and natural science, the question whether a physical and mathematical body can coincide reduces to the question whether two bodies can coincide. For Aristotle there is no difference.

There is, however, a difference for Platonists. Platonists believe that mathematical bodies are independent of physical substances. Thus, some Platonists are committed to the view that *in addition* to the three-dimensionally extended magnitude of a natural substance there is another three-dimensionally extended magnitude, i.e. a mathematical solid. But since for Aristotle the principle of non-coincidence concerns bodies, he argues that this Platonic view – that there are intermediate mathematical objects or Forms in the perceptible things – violates the principle of non-coincidence:

> It is not reasonable that this should be so only in the case of these intermediates, but clearly the Forms also might be in the perceptible things; for the same account applies to both. Further, it follows from this theory that there are two solids [στέρεα] in the same place, and that the intermediates are not immovable, since they are in the moving perceptible things. (*Met.* III 2, 998a11–15)

What Aristotle objects to is the view that in a given place there is not only the body that Socrates has, but in addition to this an independently existing body. This is a violation of the principle of non-coincidence because, as I said, this implies that there are two bodies in the same place. Correspondingly, I suggest, the reason why Socrates and Kallias cannot be in the same place is not that there will be two human beings – although this might be considered an impossibility, too, but for dierent reasons – but that there will be two bodies, the body of Socrates and the body of Kallias, in the same place. What unites these cases is that there are two bodies in the same place.

---

[18] As I already noted, it is a much disputed issue how the distinction between mathematics and natural science should be understood precisely. This question, however, need not detain us here. For our purposes it is enough to see that a physical body and a mathematical body are not two ontologically distinct objects, but rather ways to consider one and the same thing.

## 2. The form and matter of body

Since the notion of body is the central notion of the principle of non-coincidence, let me make some more remarks about it. A body is, as was said, a three-dimensionally extended magnitude that has a surface as its limit. Aristotle calls the limit of a magnitude its form. In keeping with this, he calls its interior or extension its matter. A body has a form which is its defining topological limit and has matter which is its extension or interior. In this sense, magnitudes can be seen as composites of form and matter.[19] We find this conception, e.g., in Aristotle's discussion of place:

> Now if place is what primarily contains each body, it would be a limit, so that the place would be the form or shape of each body by which the magnitude or the matter of the magnitude is determined [ὁρίζεται]; for this is the limit of each body. If, then, we look at the question in this way the place of a thing is its form. But, if we regard the place as the extension of the magnitude, it is the matter. For this is different from the magnitude: it is what is contained [περιεχόμενον] and determined [ὡρισμένον] by the form, as by a bounding plane. Matter or the indeterminate is of this nature; for when the boundary and attributes of a sphere are taken away, nothing but the matter is left. *(Phys.* IV 2, 209b1–11)

The matter, Aristotle says, is what is contained by the form. If we take the expression »contained« in its literal sense, as I think we should, the matter is the extension or interior of the magnitude. The interior or extension must be distinguished from its limit. The limit is what determines the extension. This means, I believe, that the limit both determines the extension insofar as it makes it a specific extension as well as defines the extension insofar as the limit defines the kind of magnitude a composite of extension and limit is. Consider the following example in two dimensional space:
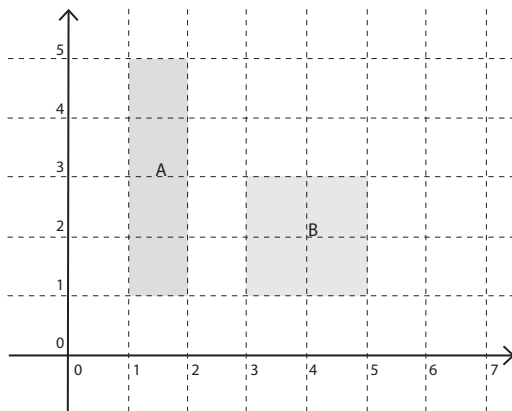
A and B are two distinct rectangles. Yet, they have the same extension.[20] Their matter, so to speak, is 4-foot extension. As such, 4-foot extension is potentially both, A and B. It can be shaped either way. A and B are distinct rectangles because what defines them is their respective shape. In this sense, their identity and the kind of rectangle they are is determined by their topological limit.[21]

*Qua* being a magnitude a bronze sphere is a composite of a boundary and extension. That is to say, insofar as the bronze sphere is considered as a magnitude its topological limit can be called its form and the extension its matter: what defines it as a sphere is its shape. And three-dimensional extension being potentially a sphere becomes actually a sphere due to the presence of a spherical shape on the matter.

## 3. How are the two bodies related?

The principle of non-coincidence, then, tells us that two or more bodies cannot be in the same place. Before explicating what is meant by »place« let us pause to ask what is meant by »two or more«? What are we counting here? I suggest that to say that there are two bodies in the same place is to say that there are two unrelated and ontologically distinct bodies in the same place. As I said above, Aristotle might pick out what is ontologically one thing under different descriptions as the body *of* a substance or as a mathematical body which is conceived of as separate from the substance it is the body of. But this is no violation of the principle. Only when one believes that there are two (or more) ontologically distinct bodies, it is correct to say that there are *two* bodies in the same place. That this is Aristotle's position is plain from his criticism in *Met.* XIII of the Platonic theory of mathematical objects that supposedly are *in* perceptible things:

> That it is impossible for mathematical objects to exist *in* perceptible things and at the same time that the doctrine in question is a fanciful one, has been said already in our discussion of difficulties – the reasons being that it is impossible for two solids to be in the same place, and that according to the same argument all the other powers and characteristics also should exist in perceptible things – none of them existing separately. (*Met.* XIII 2, 1076a38–b3)

---

[20] I am using »same« in the sense of qualitative, not numerical identity.

[21] These features – the indeterminacy of extension and the determinacy of the limit together with its role in imposing criteria of identity – also connect this specific usage of matter and form in the context of magnitudes to Aristotle's general use of matter and form. It is, however, crucial not to conflate what matter and form is in the case of a perceptible substance, e.g. Socrates, and what matter and form is in the case of a magnitude, e.g. the body of Socrates. Socrates is a composite of soul, his form, and flesh and bones, his matter. The body of Socrates, on the other hand, is a composite of limit, its form, and extension, its matter.

The Platonist theory of intermediates which Aristotle attacks maintains that mathematical objects are *in* sensible things, but still are ontologically independent of them. Aristotle believes that this theory must be rejected because none of them (i.e. mathematical and other characteristics of perceptible objects) exists separately. This criticism, however, presupposes that the criticised theory in fact assumes that mathematical objects exist ontologically independent of and yet *in* perceptible things. However, since mathematical objects are not only independent of, but also *in* the perceptible things, it follows that there are two things in the same place. Thus, when Aristotle maintains that it is impossible that there are two bodies in the same place he must mean that it is impossible that there are two *ontologically independent* bodies in the same place.

### B. The meaning of place

Before we finally turn to Aristotle's defence of the principle in section IV. we must briefly discuss another difficulty. As is well known, Aristotle has an idiosyncratic conception of what a place is. For Aristotle »the place of a thing is the innermost motionless boundary of what contains it« *(Phys.* IV 4, 212a2–21). Without going into a detailed interpretation of this claim, the basic idea is that the place of Socrates is the inner limit of that which surrounds Socrates, presumably the universe, which is in contact with Socrates.[22] Does Aristotle, when he denies coincidence, assume that the principle is true because *his* theory of place does not allow it, or is the principle true on any theory of place? I shall defend the latter.

### 1. The principle of non-coincidence is prior to Aristotle's theory of place

Let me start with a simple observation. Aristotle knows and discusses several theories of place.[23] Aristotle would weaken his case if the reason why there cannot be two bodies in the same place depended on his theory of place. Aristotle's argument would merely be that on his conception of place this is impossible. Of course, as an argument this is not impossible – especially if Aristotle had thought that his account of place is necessarily true[24] – but when Aristotle mentions the principle in the *De Anima* or the *Metaphysics* he never alludes to his theory of place specifically. Rather he seems to be making a perfectly general point.

---

[22] For an interpretation see Morison (2002).

[23] *Phys.* IV 4, 211b5–212a6.

[24] Which is probably the case since the account of place belongs to the principles of physical science. And the principles of a science are, for Aristotle, a set of necessary truths. Cf. *Apo* I 6, 74b5–11.

There is deeper reason, too, why we should not restrict the principle of non-coincidence to Aristotle's theory of place: Aristotle uses the principle that no two bodies can be in the same place to refute other theories of place. Place cannot be a body because that would imply that two bodies are in the same place.[25] Thus, the principle of non-coincidence is prior to a theory of place. It is a principle that can be used to establish an adequate theory of place. I think that it is for this reason that we find Aristotle's most extensive discussion of the principle of non-coincidence in the discussion of void. There he calls it a »common difficulty« (*Phys*. IV 7, 214b7) which seems to imply that on any theory of place it should be impossible for two bodies to be in the same place.

## 2. *Place as a three-dimensional region*

If it is not Aristotle's own notion of place that is at stake, what is? I think that Aristotle uses the concept of place in the sense of a three-dimensional region. Consider, e.g., the following passage:

> It is also evident that the cube will have this volume even if it is displaced, which is an attribute possessed by all other bodies also. Therefore if this differs in no respect from its place [τόπος], why need we assume a place for bodies over and above the volume of each, if their volume[26] be conceived of as free from attributes? It contributes nothing to the situation if there is an equal interval attached to it as well. *(Phys.* IV 8, 216b12–16)

We shall later look at the context and the argument against void more closely. At present I am interested to see how Aristotle uses the word »τόπος«. Place is here compared to the three-dimensional volume or extension of bodies. Aristotle says that the matter, thus conceived, and place do not differ in any respect. Surely, this claim would be wholly unintelligible if »place« meant »limit of the container«. Rather place seems to be simply a certain three-dimensional extension.

I believe – although a proper defence would require a longer argument – that the same notion also occurs in *Phys.* V 3:

> Things are said to be together in place when they are in one primary place and to be apart when they are in different places. *(Phys.* V 3, 226b22–24)

I take this to mean that two bodies are together if some parts of them occupy the same three-dimensional region. And two bodies are separate if none of their parts occupy the same three-dimensional region. If this is along the right lines, Aristotle describes here the relations of overlap and separation. We may picture this thus:

---

[25] Cf. *Phys*. IV 1, 209a6–7. Of course, this argument only works on the assumption that if place were a body, it would be located in itself. Aristotle does not make this premise explicit.

[26] I will comment on the translation of ὄγκος in section IV.B.2.b), footnote 36 XXX.
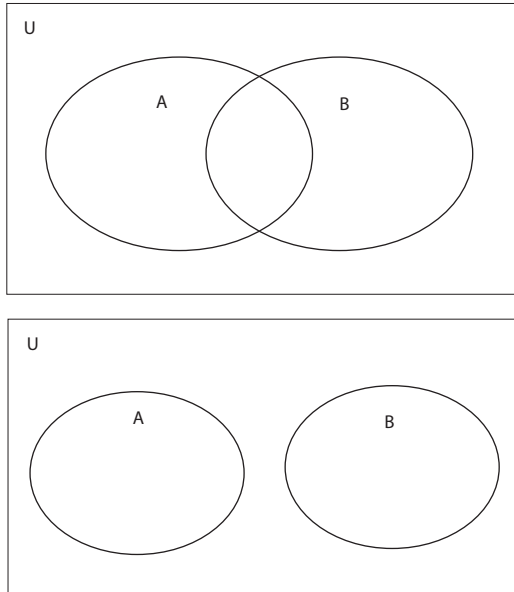
Instead of saying, »Two things (partially) coincide«, we could say in the first case, »(Part of) the extension of one object overlaps with (part of) the extension of the other object«.[27] Surely, we can speak of the places of A and B. But this does not commit us to an *independently existing* space. Speaking of spatial relations does not commit us to the view that Aristotle believed in a space that is independent from those objects. The space or place is constituted by the spatial relations of the objects.

To conclude: the principle of non-coincidence tells us that two or more ontologically independent bodies – i.e. three-dimensional magnitudes – cannot coincide – i.e. cannot have some of their parts in the same three-dimensional region.[28]

## IV. The defence of the principle of non-coincidence

So far I have explained Aristotle's conception of body and the notion of place figuring in the principle of non-coincidence. I have argued that the principle tells us, according to Aristotle, that it is impossible that two three-dimensional magni-

---

[27] It must be said that Aristotle does not consider the possibility of partial coincidence in his defence of the principle of non-coincidence.

[28] Note that the principle of non-coincidence is only true of three-dimensional magnitudes. Lower dimensional magnitudes may coincide, as Aristotle's account of place in *Phys*. IV 4, 212a6–7 and his definition of contact in *Phys*. V 3, 227a1 show. In both places Aristotle asserts that the boundaries – the boundary of an n-dimensional magnitude (n = 1, 2, 3) has n–1 dimensions – of bodies can coincide.

tudes have some of their parts in the same three-dimensional region. Now, I turn to Aristotle's defence of the principle.

### A. The strategy and scope of Aristotle's defence

The reason why two bodies cannot be in the same place is, according to my interpretation, that it is impossible to individuate coinciding bodies and, even if it were possible to individuate them, they would be individuated by theoretically and explanatorily superfluous considerations. Before I explain what I mean by this and how I think that Aristotle employs this strategy, some more general comments on this strategy are in order.

The reason is that such a defence might sound odd:[29] Aren't considerations regarding individuation and explanatory simplicity the wrong *sort* of explanation why two *physical* bodies cannot coincide?

Suppose someone asks why water and fire cannot co-locate. Since both water and fire are bodies – although they are not simply defined as being three-dimensional magnitudes – their co-location would be an instance of coincidence. According to my interpretation, this is impossible because there would arise a problem about individu- ation.[30] This answer might seem out of place. The reason why fire and water do not coincide has, one might object, nothing to do with individuation. Rather, it has to do with the fact that fire and water have opposite qualities and necessarily act upon each other once they come into contact with each other. Thus, the real reason, as one might continue, is the physical nature of water and fire.

Aristotle never considers such a physical answer to the question whether two bodies can coincide.[31] I think he does so for a good reason. The reason is *not* that such an answer did not or could not occur to him. Aristotle would have been quite capable of providing this answer. In fact, I believe that Aristotle would have given this answer if he were asked whether *fire* and *water* can coincide. The reason lies, instead, in the fact that the principle of non-coincidence concerns bodies *as such*, it concerns features that physical and mathematical bodies share. Thus, a defence of this principle should only rely on features that things have *qua* being bodies. It is true that the physical nature of fire and water explains why they cannot co-locate. But their physical nature is not something they have *qua* being bodies, i.e. insofar as they are three-dimensionally extended magnitudes.

---

[29] This challenge was raised by Christopher Noble.
[30] For the details see section IV.B.
[31] For a parallel discussion concerning Plato's theory in the *Timaeus* cf. Betegh (this volume), ¶¶¶.

Thus, the answer is not wrong, but misguided. First, it is parochial since it relies on a specifically physical explanation (an explanation, we may add, that would even fail in the case of two drops of waters).[32] More importantly, Aristotle's principle of noncoincidence should be grounded in considerations which also explain why a physical and mathematical body cannot coincide. Second and connected to this, an explanation relying on the physical nature of fire and water is not on the correct level of explanation. The principle of non-coincidence concerns a quite specific conception of body, as was argued in section III.A. Accordingly, a proper defence of this principle should draw only on resources that are directly connected to this conception of body. The question Aristotle addresses is not why two *physical substances* cannot coincide. His question is, to repeat, why two *bodies* cannot coincide. But, if this is the question, we would expect an answer that displays what it is about bodies specifically that explains why they cannot coincide.[33] The answer why fire and water cannot coincide does not satisfy that requirement. It relies on features water and fire have *qua* being perceptible substances. We, however, want an answer that is grounded in features they have *qua* being bodies.

If this is along the right lines, we can also see why Aristotle discusses the principle of non-coincidence most extensively in arguments against the assumption of independent mathematical bodies or void. For it is mainly in these cases that an argument is needed to show specifically what it is about bodies that they cannot coincide. The reason is that in these cases the only features that are germane are features that belong to objects *qua* being bodies. In other cases, such as the water and fire case, different answers are available. This, of course, does not mean that these answers are competing explanations of the principle of non-coincidence. It only means that there are additional explanations available in the physical case.

## B.  Non-Coincidence and individuation

Aristotle justifies the principle of non-coincidence in the following passage:

> What is full cannot receive anything more. [1] If it could, and there were two bodies in the same place, it would also be true that any number of bodies could be together; for it is impossible to say what is the difference which would explain why the thing stated could not be. But if this were possible, [2] it would follow also that the smallest body would contain the greatest; for the

---

[32] This was pointed our by Gábor Betegh to me.

[33] Of course, none of this is meant to suggest that Aristotle does not distinguish between mathematical bodies and physical bodies. For him a physical body qua physical is defined by being touchable and being heavy and light. Cf. *Phys.* IV 7, 214a7–9; *GC* II 1. Cf. Falcon (2005), 38. All I claim is that Aristotle's defence should not rely on facts peculiar to either physical or mathematical bodies.

large is many smalls: thus if many equal bodies can be together, so also can
many unequal bodies. (*Phys.* IV 6, 213b6–12)

The argument starts from the assumption that a full place could be occupied by
*another* body. The fact that an already occupied place is full is not the explana-
tory ground of the fact that two bodies cannot coincide. Rather the explanation
is reversed. The principle of non-coincidence explains why a full place cannot
be occupied by *another* body. And the reason for this is, as I am going to argue,
the *number.* If two bodies coincided, then [1] any number of bodies could be in
the same place. Aristotle points out that the assumption that *only two, but not
more* bodies can coincide cannot be justified. There is no principled difference
between the two cases. But if any number bodies can be in the same, this would
absurdly entail that [2] the largest body would fit in the smallest place.

   [2] surely is an absurd consequence and it provides a reason to accept the
principle of non-coincidence. However, as I will suggest in a moment, already
[1] entails an absurd consequence. For, as Aristotle continues his argument in
*Physics* IV, it becomes clear that there is something wrong with [1], too. For what
Aristotle points to is that denying the principle of non-coincidence makes it im-
possible to count and individuate the coinciding entities. The implication of [1]
is not only that there can be many bodies in the same place, but that it is impos-
sible to say exactly *how many* bodies are in the same place at any moment. The
impossibility of non-coincidence is due to the fact that if more than one body is
in a given place we lose our principle of individuation.

## 1.  [2] The coincidence of bodies of unequal size

Let us begin with the second absurd consequence. If it is true that any number
of bodies can be together (and I will explain the reasoning for this conclusion in
section IV.B.2., even objects of different size could coincide. An elephant could
coincide with a mouse, so to speak. Aristotle does not elaborate on this, but I
think his reasoning is as follows: since a large body has many parts, those parts
could be added successively to the place, where the smaller body is, in such a way
that a large body would fit onto an arbitrarily small body.[34] Take, for instance,
a glass of water. If coincidence of many bodies were possible, the whole ocean
could coincide with the water in the glass. For the ocean is, in a sense, just the
sum of parts having the size of the water in the glass. As a result the whole ocean
would fit into the glass of water.

   Why should we be worried by this result? Because it does away with many
scientific principles. One principle Aristotle holds is that,

the place and the body cannot but fit each other. (*Phys.* III 5, 205a32–33)

---

[34]  Basically the same interpretation and example is given by Ross (1936), 583.

But, if any body fits in any place, there is no point in saying that the body and the place *fit* each other. If we deny the principle of non-coincidence, we end up with a universe in which bodies do not have any determinate extension. Also, the phenomenon of growth would lose its meaning. There would be no principled way to determine whether a body has grown.

A denial of the principle of non-coincidence has, as Aristotle makes clear, all these problematic consequences. Taken together, they provide sufficient reasons for accepting the principle. There is, however, an even deeper reason why the principle of non-coincidence should not be denied.

## 2. [1] The coincidence of many bodies

Aristotle's argument centres around the following rhetorical question: if two bodies can be in the same place, why not more?[35] Once one grants that it is possible for two bodies to coincide, there is no principled reason why it should not be possible for three bodies to coincide. For, as Aristotle remarks, »it is impossible to say what is the difference which would explain why the thing stated could not be« (*Phys.* IV 6, 213b8–9). If two bodies can be in the same place, then three as well, and if that, then four and so on. What is the difference between there being two bodies and there being five bodies in the same place? Why should the first case be possible, but not the second? There is, Aristotle maintains, no sufficient reason to allow one case, but not the other. So once we allow for the coincidence of two bodies, disaster looms.

### a)  A weak and strong reading distinguished

Yet, one could question exactly this. What is wrong with such a view? We surely can imagine a world where interpenetration happens and bodies move through each other. In such a world it could happen that there are several bodies moving through each other at the same time. Suppose that four identically shaped and sized bodies which are positioned on the corners of a square start moving at the same time with the same speed towards along the diagonals. The four bodies will meet at the centre where they will move through each other. Thus, at some time after the start there will be four bodies at the same place at the same time. After they have permeated each other, each of the four bodies will continue its path till it reaches the opposite corner. A strange world, indeed, but there does not seem to be a deeper problem with it.

---

[35]  For this question see *Phys.* IV 8, 216b10–11.

At this point it might be helpful to distinguish between a weak and a strong reading of that passage. The weak reading states that if two bodies are in the same place, it is possible to add a third body that occupies the same place. This is the case in our imagined world. The strong reading states that if two bodies are in the same place, it would be possible that in the very moment, when it was supposed that there are two bodies, it should be equally true to say that there are innumerable bodies in the same place.

The difference between these readings is that the first reading assumes that the bodies are individuated and we can count the number of bodies that occupy a given place. There is a definite answer to the question, »How many bodies are there?«. The second reading, in contrast to that, maintains that there is no principled way of determining how many bodies are in that place. There is no definite answer to the question »How many bodies are there?« It is not only arbitrary how many bodies can coincide, but it is also arbitrary how many bodies in fact coincide at any given moment. Or, to put the point slightly differently, according to the weak reading there is no principled way to determine how many bodies can *come to be* in a given place. Whatever the number of bodies in a place, it seems possible that yet another body comes to occupy the place. According to the strong reading there is no principled way to determine how many bodies *are* in a given place. The problem is not that yet another body could come to occupy the place, but that we do not even know how many bodies are *already there*.

As I will argue, Aristotle endorses the strong reading. He believes that if two bodies coincide, there is no way to distinguish them. But if this is the case, then there is no way to distinguish the case where two bodies coincide from the case where more than two bodies coincide. This is to say that there is no non-arbitrary answer to the question, »How many bodies are now in this place?«, because it is impossible to individuate the coinciding bodies.

Even though I believe that this worry about individuation is Aristotle's main concern, Aristotle also thinks that there is already a problem with the weak reading. The problem is that, even if we could distinguish two coinciding bodies, we could do so *only* by relying on explanatorily superfluous considerations. Even if we could distinguish a mathematical body and a physical body (relying on what belongs to them *qua* bodies) and assume that there is a mathematical body in addition to and independent of the physical body, the mathematical body would play no role in our explanations that the physical body could not play. Mathematics can be done, as Aristotle repeatedly emphasizes, solely by considering physical bodies as bodies.

## b)  Coincidence and individuation

The reason why we lose a principle of counting coinciding bodies is due to the way bodies are individuated. Remember that the principle is stated in terms of

bodies.[36] A body is individuated by its extension and its boundaries. Thus, if two or more bodies coincide, their limits and their extension exactly match. They have the same spatial properties, same volume, same shape and the same relation to other bodies. We cannot provide any principle of individuation that distinguishes between these two bodies. Or so Aristotle seems to say:

[A] But even if we consider it on its own merits the so-called vacuum will be found to be really vacuous. For as, if one puts a cube in water, an amount of water equal to the cube will be displaced; so too in air; but the effect is imperceptible to sense. And indeed always in the case of any body that can be displaced, it must, if it is not compressed, be displaced in the direction in which it is its nature to be displaced – always either down, if its locomotion is downwards as in the case of earth, or up, if it is fire, or in both directions – whatever be the nature of the inserted body. Now in the void this is impossible; for it is not body; the void must have penetrated the cube to a distance equal to that which this portion of void formerly occupied in the void, just as if the water or air had not been displaced by the wooden cube, but had penetrated right through it.

[B] But the cube also has a magnitude [μέγεθος] equal to that occupied by the void; a magnitude which, if it is also hot or cold, or heavy or light, is none the less different in essence from all its attributes, even if it is not separable from them; I mean the volume [τὸν ὄγκον][37] of the wooden cube.

36  See section III.A.

37  Ὄγκος is usually translated as »mass«, »bulk« or »volume«. For a list of the passages and relevant meanings see Bonitz (1870). On the terminological unclarity of this section see also Hussey (1983), 134. Liddell/Scott remark that it is often used by Aristotle in the sense of »the space filled by a body«. To say that ὄγκος denotes the space filled by the body is misleading, if that is taken to imply that the space could be independent from the body. But, surely, this cannot be right as Aristotle says a few lines above that the volume of a body is not separable (*Phys*. IV 8, 216b6). Thus, whatever ὄγκος means exactly in this context here, it is a dependent feature of a substance. I think that Aristotle has the notion of a magnitude in mind which I discussed in sections III.A and III.A.2. For in this passage he indicates that the magnitude which belongs to the substance and has all various other properties is what he means by ὄγκος. But this magnitude is, as I will argue, the body of a substance as defined above. The reason why Aristotle uses the word »ὄγκος« is, I suggest, due to the context. For ὄγκος designates specifically body as opposed to void. Cf. *Phys*. III 4, 203b25–29.

Given this opposition we may wonder whether ὄγκος also has the connotation that the body of a substance is not only three-dimensional extension bounded by surfaces, but has a bulky or material nature. To avoid a misunderstanding: the perceptible substance clearly has this bulky or material nature (according to the interpretation of Bostock (2006), this is Aristotle's concept of matter). The question is whether the choice of the term ὄγκος implies that body in the sense of a three-dimensional magnitude has a bulky or material nature. For our purposes we need not decide the question. For even if we assume that ὄγκος and magnitude implies that the body has a material, space-filling nature (and thus differs from the magnitude studied by mathematics), this nature does not imply a fundamental difference between the body and the void. Otherwise Aristotle would contradict himself in the argument that follows when he concludes that body

So that even if it were separated from everything else and were neither heavy nor light, it will occupy an equal amount of void, and fill the same place, as the part of place or of the void equal to itself. How then will the body of the cube differ from the void or place that is equal to it? And if there are two such things, why will not be any number coinciding? This, then, is one absurd and impossible implication of the theory. (*Phys.* IV 8, 216a26–b12)

The context of this quotation is the discussion of the void. Aristotle wants to show that the notion of void is void. It does not have any explanatory value and leads to absurd consequences. In paragraph [A] Aristotle assumes for the sake of argument that there is void. He, then, draws our attention to a difference between physical bodies and the void. Physical objects do not interpenetrate each other, but are displaced. However, the void is not displaced, if a body occupies it, rather it interpenetrates the body. Here, Aristotle assumes the truth of the principle of non-coincidence for bodies, but grants the supposition that a body and void can coincide. Yet, as the last sentence of Paragraph [A] shows, the way of coincidence between void and body is structurally the same as the coincidence of two bodies.

In paragraph [B], then, Aristotle draws an absurd consequence from it. Aristotle points out that we lose a proper principle of individuation and cannot explain why there aren't even more things coinciding. In order to reach this conclusion Aristotle distinguishes first between the attributes of the cube and its volume (τὸν ὄγκον). A wooden cube has all sorts of properties. It is made of wood, it is (essentially) a cube, it has a certain colour and weight. But it also has a certain body. That is to say, it has a certain extension and boundary which define its topological properties.[38] It is in virtue of having this body that the wooden cube occupies a place of a certain size.

In a further step Aristotle invites us to suppose this body were separate. I think that this must mean that the body of the cube has been separated in thought. For Aristotle had said in the previous sentence that the body of the wooden cube is ontologically dependent on the cube, but its essence is different. The essence of the body is its being extended and being bounded by a surface. This is, as I argued in section III.A., what it is to be a body. In this sense, the definition of body is separable from physical substances, i.e. one can define and study body without any reference to their ontological status as bodies of substances.[39] Thus, even if it

thus understood does not differ from void. On this point see also section IV.B.2.c) where I discuss this difference with respect to Philoponus' criticism of the argument.

[38] See section III.A. and, especially, III.A.2. Note also that this passage shows why a substance has a body, rather than simply is a body.

[39] In fact, I believe that the story might be a little more complicated than that. For in some passages, most notably *Met.* VII 4–5, Aristotle suggests that the definition of all non-substantial items makes reference to substance. However, it is clear that magnitudes must be separable in thought in a substantive way since they are the subject-matter of mathematics. If magnitudes

is true that a body is always the body of a substance and has various properties, body can still be considered on its own, i.e. considered *qua* body and only insofar as it has quantitative properties, such as extension and a bounding surface.

*Vacuous Explanations:* But given that we can distinguish between the various attributes of the cube and the body of the cube which is the feature in virtue of which the cube occupies a certain place, the question arises in what respect the place or the void and the body of the cube differ. They have the same extension and the same shape. Whatever is true of the body of the wooden cube seems to be true of void and *vice versa*. How can we describe and refer to the one without describing and referring to the other? The two entities, the void and the body of the cube, do not differ in any respect. But then we may wonder why we should posit the void in the first place. The void – viewed as an extension – is explanatorily superfluous.[40] All we have is a duplication of entities – beyond necessity, as one might say.

This charge is especially obvious in a passage I already quoted on p. ¶¶¶. This passage is the direct continuation of paragraph [B]:

> [C] It is also evident that the cube will have this volume even if it is displaced, which is an attribute possessed by all other bodies also. Therefore if this differs in no respect from its place [τόπος], why need we assume a place [τόπος] for bodies over and above the volume [ὄγκος] of each, if their volume be conceived of as free from attributes? It contributes nothing to the situation if there is an equal interval attached to it as well. (*Phys.* IV 8, 216b12–16)

Since the body of the cube and the void do not differ, all explanatory work the void could do can also done by the body. There is no need to assume an additional item in our ontology to explain, e.g., location. Location can, and should be, explained by considering the body of substances.

*The impossibility of individuation:* However, as I said above, the positing of explanatorily superfluous items is not the only concern. Things are even worse: once we allow for duplication, whether two or, in fact, innumerable things coincide has no determinate answer. For, as we have seen, the body, considered on its own, and the void have exactly the same properties. I believe that Aristotle's rhetorical question addresses precisely this issue: if there are two indistinguishable entities, why shouldn't there be even more? If it is really true that the void and the body differ in no respect, there is no non-arbitrariness to the more general question of how many bodies coincide. For how can we be sure that there is not

---

were inseparable in thought, mathematics would be impossible. For, as Aristotle says, mathematics treats magnitudes »as if they were separate« (*Met.* VI 1, 1026a9–10).

40  This point is also emphasised by Hussey (1983), 134. Moreover, Hussey also sees the connection this argument has to Aristotle's critique of Platonic forms and numbers.

only the body of the cube and the void, but also yet another body indistinguish-able from them in a given place?

Thus, according to my interpretation, the difficulty Aristotle raises in [B] is not merely that if two things coincide, it should in principle be possible that a third might occupy the place as well. The difficulty rather stems from the fact that if there is no non-arbitrary way of distinguishing the objects in a place, there is no way of telling how many objects occupy a given place. Without clear criteria of identity, counting is impossible. And if there is no way of counting, there is no way of telling how many bodies are in a given place, such that every answer is equally right or wrong. But this is, as Aristotle rightly remarks, absurd.

Thus, Aristotle does not simply assume that two bodies in the same place become identical. He is not *presupposing* the principle of non-coincidence, but rather he is arguing that the two bodies could not be distinguished. Because we lose our criteria of individuation, it is impossible to count the bodies in a given place. It is because of this that we must reject the possibility of coincidence.

### c. Philoponus' counter-argument

It will help us to further sharpen Aristotle's argument if we consider Philoponus' critique of Aristotle's reasoning. Philoponus agrees with my reconstruction of the argument in *Phys.* IV 8 in its basic outline:

> Since the body is in place in no other respect than as being an extension, if we detach from it everything that has nothing to do with its being in place, such as its colour, weight, and so on, nothing will be left but its extension. So there will be no difference between the void and that extension. (Philoponus, *Corollary on Void* 687.1–3; transl. Furley)

However, Philoponus argues that there is in fact a difference between body and void. For body has a material nature – it is *bodily*. Void, on the other hand, is *bodiless:*

> For if you remove every quality from the body, even then the bodily extension is not the same as the void. For even if we take away every quality from the body, there will still remain the massed matter and the unqualified body [ἡ ὀγκωθεῖσα ὕλη καὶ τὸ ἄποιον σῶμα], which is composed of matter and form in the category of quantity; but the void is not composed of matter and form. For it is not a body at all, but bodiless and matterless – space without body. (Philoponus, *Corollary on Void* 687.30–35)

This can be seen as an answer to Aristotle's challenge to explain in what way void and the extension of body are different. Philoponus argues that they are differ-ent because their natures or essences are different. Body has matter, but void does not. Body is bulky and material, but void is not. Aristotle, of course, did not

answer this challenge, so any suggestion as to what he might say is bound to be somewhat speculative. Yet, from what has been argued so far, I believe that we can give an answer on Aristotle's behalf.

The problem with this argument is that the distinction that Philoponus draws is not well-founded. Philoponus refers to a *physical* distinction, but in the context of the argument that Aristotle presents, this is not a legitimate move.[41] For Philoponus himself concedes that the body which consists of matter and form is in the category of quantity. It is not *qua* being a body in this sense, however, that a perceptible body has bulky matter. Body, as conceived here, is simply a composite of topological limit and extension. That physical substances have matter in the sense of bulky matter is true, but this is not something in which they differ from void *qua* being bodies. For, as we have seen above, mathematical bodies also count as bodies, but surely they do not have bulky matter. For in doing mathematics we simply conceive of body without any specific type of matter. The problem with Philoponus' criticism is that he uses the term »body« ambiguously. *Qua physical* body or substance it has a bulky matter, but *qua* body alone, i.e. *qua* being a composite of topological limit and extension, this bulky matter does not differ from extension. Both the void and the body are defined by limit plus extension.

One might reply to this that I was wrong to say that the bulky nature is a physical feature of bodies. To the contrary, the bulky nature belongs to body *qua* body.[42] The matter of body is, one might argue, not extension, but material extension. Bodies *fill* the place they occupy. And, so the objection continues, Philoponus was right when he said that,

> neither will the body qua extension be in another extension: rather, qua bodily extension it will be in place-extension. So there is no necessity that the void too be in another extension, if it is not qua extension that the body is in a place-extension, but qua body. (Philoponus, *Corollary on Void* 688.29–33)

As I said above, whether bulkiness is a feature of body *qua* body or *qua* physical body is, given the evidence, hard to decide. Be that as it may, let us grant that the objection is well-founded and that body *qua* body has a material and bulky nature. Nevertheless, I think, the distinction between a place-extension and a bodily extension is a bogus one. For the distinction is based on the dubious premise that void-extension explains the location of bodies. I imagine, however, that Aristotle would challenge precisely this point: supposing it were true that every body has this bulky nature, why would we need another non-bulky extension to explain the location of the body? It seems that the relevant phenomena can be perfectly explained without this assumption. Thus, the supposition that place, or void-extension, differs from bodily extension is much like distinguishing two

[41] For the context see section IV.A.
[42] On this see also fn. 36.

bodies that are in the same place by saying that they differ insofar as one body was there *first* and the other *second*. Although the bodies are distinguished by their time of arrival, so to speak, the time of arrival has no explanatory value nor is it sufficient to tell the two bodies apart once they are in the same place.

This leads me to my second point: it is hard to say what this bulkiness *is*, if it is nothing other than a quantitative mass. Since it is not a physical matter, it has no physical properties like weight or other such properties. It simply *fills* space. But apparently there is no way to say what exactly this matter is. However, if there is no other explanation of the difference than an insistence on the difference between space-filling extension and non-space-filling extension, we should drop this distinction altogether – otherwise we are stuck with the problem of individuation again. In order to individuate the body and distinguish it from the void it occupies, we assume that body has a bulky or material nature. However, as long as there is no way to say what the bulky nature is supposed to be, this enterprise must remain unsuccessful.

The upshot of this discussion is that not any property will do to distinguish bodies from one another or from void. Aristotle does not offer us any further thoughts on what counts as a sufficient reason for distinguishing them, but our reply to Philoponus on Aristotle's behalf might show two things: first, whatever features one might cite to distinguish two coinciding bodies, these features must belong to bodies *qua* bodies and, even more importantly, must not themselves be without clear criteria of individuation.

Second, even if we assume that there is a way to circumvent this charge, part of Aristotle's argument also relies on a principle of explanatory simplicity. What it is for a body to occupy a place or to have a certain extension can, according to Aristotle, be explained without the assumption of void. Given this, the postulation of an *independent* extension or void which receives body is explanatorily superfluous.

Therefore, because the only way to differentiate body from void is either by a feature that has no criteria of individuation or by an explanatorily superfluous assumption, Aristotle's argument still holds.

### V. Aristotle's principle in context

#### A. What the conclusion tells us

Let us take stock. I have argued that Aristotle is concerned with question (4) of section II.. The principle of non-coincidence states that no two bodies can occupy the same place. A body is defined by being a three-dimensionally extended magnitude. It is a composite of a certain extension and a certain topological limit, its shape. This is what individuates bodies. In this sense, the principle concerns physical bodies and mathematical bodies equally, for the only features which are

relevant in the principle of non-coincidence are features that belong to things insofar as they are bodies.

If we allow for coincidence, we face several absurd consequences. One is that we could fill the ocean in a glass of water. This is surely an absurd consequence. However, if I am right, Aristotle has at least two further and more refined answers to the question why coincidence is impossible. Since an adequate defence of the principle of non-coincidence must rely only on features that belong to body *qua* body, coinciding bodies cannot be individuated. If we allow for coincidence, there is no objective, non-arbitrary answer to the question how many bodies are in a given place at a given moment. This is the heart of Aristotle's argument. But even if one were to assume that we could distinguish coinciding bodies, it seems that the only properties we could specify are theoretically and explanatorily superfluous properties. This is, in short, Aristotle's argument, as I understand it.

In the remainder of my paper I will put the conclusion in the wider context of the several versions of the coincidence principle that were distinguished in section II. This will bring out the philosophical significance of Aristotle's project from a slightly different perspective, too.


## B.  Aristotle's principle reviewed

We may begin with a challenge to Aristotle's principle. According to my reconstruction, the principle is concerned with a quite specific notion of body. It is a minimal conception of body insofar as the identity of a body is determined by its boundaries and its extension. However, as I also argued, there are according to Aristotle no bodies that exist independently of the substances whose bodies they are. Consider Socrates: Socrates has a certain three-dimensional extension and is bounded by surfaces. The composite of surface and extension is the body of Socrates. But this body cannot exist independently of Socrates.[43] Socrates is a substance which exists on its own, but his body does not. Thus, if all bodies belong to substances, it follows that, whenever two bodies coincide, it is also the case that two substances coincide. But if this is the case, we could use a higher-level property to distinguish the two substances and, thereby, their bodies.[44] Let us take Socrates and Plato as an example and say more specifically that they differ *qua* their souls. Why not say that Socrates and Plato do not differ *qua* their bodies, but they differ *qua* their souls?

---

[43]  According to Aristotle all physical things are ultimately composed of the four elements, so that every independently existing physical object is either one of the four elements or has these as its constituents. Cf. *Phys.* III 5, 204b29–35.

[44]  This issue was raised by Jacob Rosen.

Aristotle, as far as I am aware of, never considers an example of this type. This, one might say, is a serious oversight and Aristotle failed to yield an adequate defence of the principle of non-coincidence. This, however, would be a premature objection. It fails on two grounds. First, it misrepresents the context and aim of Aristotle's arguments. Second, it fails to appreciate the way Aristotle's argument *could* be made to work in different contexts.

In what follows I will first put Aristotle in its proper context section V.B.1. Then I will sketch how Aristotle's argument could be generalised such as to exclude the coincidence of things of the same kind section V.B.2. Lastly, I make some suggestions why, on Aristotle's theory, various situations *we* would describe as cases of coincidence, most notably the relation between matter and the composite, are on Aristotle's theory not rightly classified in this way section V.B.3.

## 1. Aristotle against the Philosophers

The reason why the challenge above misses the point can be seen if we recall the argument of section IV.A. Although it is true that for Aristotle there is no body which does not belong to a substance his opponents do not think so. Platonists assume that there are mathematical bodies independent of perceptible bodies. The Atomists believe that there is void and place independent of perceptible bodies. And it is mostly these opponents that Aristotle has in mind when he argues for the truth of the principle of non-coincidence. However, if this is the real object of dispute, considerations concerning higher-level properties are out of place.

This analysis might be corroborated further: Although it is true that Aristotle believed that all bodies are bodies of physical substances, this is a fact that can be established by the same considerations which also establish the principle of non-coincidence. Because all the explanatory work we need for mathematics, or for an account of the location of things, can be done with recourse to features of perceptible substances, there is no need to assume that body is separate from perceptible substances. Thus, similar considerations that speak in favour of the principle of non-coincidence also speak in favour of the non-separability of body, but this does not work the other way around. Aristotle cannot simply start with the assumption that there are no bodies separate from the substances whose bodies they are. This would beg the question against his opponents who believe in ontologically independent mathematical objects or ontologically independent place and void.

If this is along the right lines, we see why it is natural for Aristotle to focus in his defence on bodies as defined above. For the cases where the principle of non-coincidence is most needed are precisely the assumption of independent mathematical bodies and independent place or void. Once Aristotle has established the principle with respect to these cases, it can be used in other arguments, too –

e.g., Aristotle's arguments that soul cannot be a body or that light cannot be a body.[45]

## 2. The coincidence of two things of a kind

Viewed in its proper context, Aristotle's focus on bodies is not a shortcoming, but, given his opponents, a virtue of this view. In the remaining sections I will argue for something even stronger: although it is true that Aristotle considers in his formulation of the principle of non-coincidence only those properties that belong to things *qua* bodies, his arguments could be generalised. Higher-lever properties *as such* do not pose a problem for Aristotle.

   To avoid confusion, my claim is not that Aristotle gave such arguments as a defence of the principle of non-coincidence. In fact, as I argued in the last section and section IV.A., a defence of the principle of non-coincidence which relies on higher-level properties would be out of place. A proper defence of the principle, as Aristotle understands it, should be grounded only in what belongs to things *qua* bodies. However, once the question is not whether two *bodies* can coincide, but rather whether two *substances* or *two things of a kind* can coincide, then, but only then, can we draw on considerations that are not specifically concerned with bodies.

   The claim of the present section is merely this: *if* we draw on these other considerations, they yield an argumentative strategy which is structurally similar to the defence of the principle of non-coincidence.

*The statues of Socrates and Plato:* Let us return to the case of Socrates and Plato: they differ *qua* their soul. Surely, the argument relying on individuation is not successful against this case. However, this does not mean that from Aristotle's perspective – and for what it is worth from the perspective of most modern commentators – such a case is possible, since Aristotle has other resources to rule out this case. Aristotle would probably have reasons quite akin to Wiggins' principle S**:

   S**: A and a proper part or constituent B of a third thing C, where A ≠ C and A ≠ B, and where no part or constituent of A is any part or constituent of B or of C, cannot completely occupy exactly the same volume at exactly the same time. The basis for this truth elucidates its import. Suppose A and B were distinct and in the same place at the same time. Then they could not have been distinguished by place. But then they would have had to be distinguished by their properties. But no volume or area of space can be qualified simultaneously by distinct predicates in any range (color, shape, texture, and so forth). (Wiggins (1968), 94)

---

[45]  For the first case see *An.* I 5, 409b2–3, for the second case see *An.* II 7, 418b17.

It is impossible that there are two different souls, or two different humans, in the same place, simply because this would violate the principle of non-contradiction. Moreover, as I mentioned in section IV.A., it is plausible to assume that two substances interact with each other when they are in contact. This is another physical reason, one might mention, which explains why coincidence of perceptible substances is impossible for Aristotle.

Be that as it may, to further explore this is not our main concern. There is, however, an ancient argument which is directed against the case of two coinciding substances. This is the argument I will call »the duplicated Plato«.

*The duplicated Plato:* This argument is of special interest to us because it is structurally the same argument as Aristotle's argument against the coincidence of two bodies.

According to the Stoics, Plutarch writes,

> each of us is a pair of twins, two-natured and double – not in the way the poets think of the Molionidae [legendary Siamese twins], joined in some parts but separated in others, but two bodies sharing the same colour, the same shape, the same weight, and the same place. […] Each of us is two substrates, the one substance, the other <a peculiarly qualified individual> […] (Long/Sedley 28A).

This view of the Stoics seems to have arisen in connection to the growing argument.[46] The context and the fact that the statement of this view may be a distortion by Plutarch is for our purposes not relevant. What is relevant is only the fact that some thinkers ascribed this view to the Stoics. As stated, the view is a natural extension of Aristotle's, since in this case the two bodies in the same place are not only the same *qua* body, but they are the same in all respects. But interestingly in an anonymous Academic treatise, we find an objection which was raised against the Stoics and which went along the same lines as Aristotle's objection against void:

> since the duality which they say belongs to each body is differentiated in a way unrecognizable by sense-perception. For if a peculiarly qualified thing like Plato is a body, and Plato's substance is a body, and there is no apparent difference between these in shape, colour, size and appearance, but both have equal weight and the same outline, by what definition and mark shall we distinguish them and say that now we are apprehending Plato himself, now the substance of Plato? For if there is some difference, let it be stated and demonstrated. (Long/Sedley 28C)[47]

---

46  See Long/Sedley 173.
47  A similar criticism is raised by Plutarch. See Long/Sedley 28A.

The qualified thing which is Plato and the substance of that thing do not differ in any respect. So how shall we distinguish them? Exactly the same difficulty occurs as in our attempt to distinguish Plato's body from void. So if we extend Aristotle's reasoning to all properties, I think it is perfectly imaginable that Aristotle would have said that in the case described here it might be that there is yet another »Plato«. For if there are two indistinguishable Platos, why aren't there even more?

Although Aristotle's argument concerns only bodies, it could in principle be extended to the case of all properties. What we can learn from Aristotle is that any duplication of properties is implausible. In this way, Aristotle's argument could be extended to argue against the coincidence of things of the same kind.


## 3. The coincidence of two material things

Since Aristotle's argument could be, in principle, extended, we may wonder why he hasn't done it. This question might seem especially pressing when we consider a case that Aristotle seemed to have explicitly recognised and that *we* would describe as a case of coincidence. The case I have in mind is the case of a thing and its matter. This is typically seen as a case of constitution. The matter constitutes the object, but is not identical to it. If this is so, why did Aristotle not consider this as an exception to the principle of non-coincidence?

The main reason why Aristotle does not discuss this as a case of coincidence is, I suggest, that the context in which Aristotle employs the principle of non-coincidence is very different from the context in which modern-day metaphysics employs the principle. For Aristotle, as has been repeatedly emphasised, the principle concerns bodies and is mainly used to refute the assumption of independent mathematical objects and void. Modern-day metaphysics, on the other hand, is mostly concerned with the principle insofar as it concerns two material things.

But there is yet another reason: Aristotle, I believe, would not even count this as a case of coincidence. According to Aristotle, I suggest, it is wrong to say that both the bronze and the statue are in a place.

To see why, consider a statue of Socrates made of bronze. It is usually assumed that for Aristotle a thing and its matter are not identical. For example, in *Phys.* I 7 and *Met.* VIII 1 Aristotle seems to suggest that the matter pre-dates the thing whose matter it is. The statue of Socrates came to be from a certain lump of bronze. Thus, the bronze already existed before the production of the statue, however, if it existed beforehand, it cannot be identical to the statue.

Let us grant, then, that the bronze and the statue are distinct entities. Being distinct entities, where are they, respectively? At first glance, the place of the bronze and the place of the statue is the same. Thus, one could argue that, contrary to what I have argued above and contrary to Aristotle's own state-

ments, Aristotle denied the principle of non-coincidence after all. One might further suggest that Aristotle used only an uninteresting *version* of the principle. If someone had pointed out to him the case of the statue and its matter, he surely would have agreed that two *material* things can be in the same place.

Even though I agree that on Aristotle's account a statue and its matter are distinct, it would be, I believe, misleading for Aristotle to describe this as a case of coincidence. The reason is that this suggests that the bronze and the statue *both* have a place. But on Aristotle's view only the statue has a place. The bronze, considered on its own, has no place. It only has a place insofar as it is the matter of the statue. For according to Aristotle, the parts of an object do not have a place:

> As was explained, some things are potentially in place, others actually. So, when you have a homogeneous substance which is continuous, the parts are potentially in place: when the parts are separated, but in contact, like a heap, they are actually in place. *(Phys.* IV 5, 212b4–212b7)

The reason why parts do not have a place is that they are not ontologically independent of the thing whose parts they are. But, as Aristotle remarks, only ontologically independent things have a place. The matter, however, is a part of the composite and not ontologically independent of the composite.[48] Therefore, the matter has no place.

Thus, even though the bronze and the statue are distinct, it is for Aristotle, I suggest, quite misleading to describe this as a case of coincidence. As long as the matter constitutes the statue, there are not two things in the same place, but rather there is *one* complex thing in *one* place.

Again, I believe that this should be seen as an insight of general philosophical significance on Aristotle's part. Only ontologically independent things have a place on their own. And Aristotle is correct to assume that two bodies, that is, two indistinguishable and ontologically independent three-dimensional magnitudes, cannot be in the same place. And this is something *any* plausible principle of non-coincidence should rule out. However, this is compatible with the assumption that some things are complex and contain, *in some sense*, two things. But as long as they stand in a relation such that they are not two ontologically independent things, we should not say that they both have a place.

---

48  Cf. *Met*. V 25, 1023b19–22: »The elements into which the whole is divided, or of which it consists – ›the whole‹ meaning either the form or that which has the form; e.g. of the bronze sphere or of the bronze cube both the bronze – i.e. the matter in which the form is – and the characteristic angle are parts.«

## VI. Conclusion

In this paper, I have argued that the principle of non-coincidence in Aristotle is a principle about bodies. The principle tells us that it is impossible that two ontologically independent, three-dimensional magnitudes occupy the same region. It is, as such, neither a principle about substances nor material things. In this Aristotle differs significantly from the way the principle of non-coincidence is discussed today.

I have argued that Aristotle's defence relies on considerations about individuation and theoretical simplicity. Since the two coinciding bodies are *qua* bodies indistinguishable, there is no way to count the coinciding objects. This is how I understand Aristotle's question, »If two, why not more?«: if coincidence is in principle possible, why shouldn't there be even more coinciding objects than we might have supposed? There is no non-arbitrary way to individuate the objects. In this sense, the problem of coincidence is a question of individuation more generally.

Finally, I have argued that Aristotle's principle could be generalised in such a way that it covers the case where two things *of the same kind* are in the same place. The reason is that Aristotle's use of the principle that a duplication of indistinguishable properties in the case of bodies must be avoided could, in principle, be extended to all properties. In a further step, I have suggested that for Aristotle the case of a statue and its matter is not a case of coincidence. The reason is that the principle of noncoincidence, as Aristotle employs it, only says that two ontologically independent things cannot be in the same place. The case of constitution, however, is not such a case.

## Literature

Barnes, J. (1984), *The Complete Works of Aristotle: The Revised Oxford Translation*, Princeton.

Betegh, G./Pedriali, F./Pfeiffer, C. (2013), »The Perfection of Bodies: Aristotle's *De Caelo* I.1«, in: *Rhizomata* 1, 30–62.

Bonitz, H. (1870), »Index Aristotelicus«, in: Bekker, I. (ed.), *Aristotelis Opera*, Berlin.

Bostock, D. (2006), »Aristotle's Theory of Matter«, in: ibid., *Space, Time, Matter, and Form: Essays on Aristotle's* Physics, Oxford, 30–47.

Burke, M. B. (1992), »Copper Statues and Pieces of Copper: A Challenge to the Standard Account«, in: *Analysis* 52, 12–17.

– (1997), »Coinciding Objects: Reply to Lowe and Denkel«, in: *Analysis* 57, 11–18.

Falcon, A. (2005), *Aristotle and the Science of Nature: Unity without Uniformity*, Cambridge.

Furley, D. J./Wildberg, C. (1991), *Philoponus:* Corollaries on Place and Void *with Simplicius:* Against Philoponus on the Eternity of the World. *Translated by David Furley & Christian Wildberg*, London.

Hussey, E. (1983), *Aristotle's* Physics. *Books III and IV*, Oxford.

– (2002), »Aristotle and Mathematics«, in: Tuplin, C./Rihll, T. E. (edd.), *Science and mathematics in ancient Greek culture*, Oxford, 217–229.

Lear, J. (1982), »Aristotle's Philosophy of Mathematics«, in: *The Philosophical Review* 91, 161–192.

Locke, J. (1979), *The Clarendon Edition of the Works of John Locke: An Essay Concerning Human Understanding*, Oxford.

Long, A. A./Sedley, D. N. (1987a), *The Hellenistic Philosophers*, vol. 1: *Translations of the Principal Sources with Philosophical Commentary*, Cambridge.

– (1987b), *The Hellenistic Philosophers*, vol. 2: *Greek and Latin Texts with Notes and Bibliography*, Cambridge.

Morison, B. (2002), *On Location. Aristotle's Concept of Place*, Oxford.

Mueller, I. (1970), »Aristotle on Geometrical Objects«, in: *Archiv fur Geschichte der Philosophie* 52, 156–171.

Pettigrew, R. (2009), »Aristotle on the Subject Matter of Geometry«, in: *Phronesis* 54, 239–260.

Pfeiffer, C. (forthcoming), *Aristotle's Theory of Bodies*. Book Manuscript, under contract with OUP.

Rea, M. (ed.) (1997), *Material Constitution*, Lanham.

Ross, W. D. (1936), *Aristotle's* Physics. *A Revised Text with Introduction and Commentary*, Oxford.

Simons, P. (1985), »Coincidence of Things of a Kind«, in: *Mind* 94, 70–75.

– (1987), *Parts. A Study in Ontology*, Oxford.

Wiggins, D. (1968), »On Being in the Same Place at the Same Time«, in: *Philosophical Review* 77, 90–95.