



The Relation Between Book I and II of the *Physics*

Celestin Taylor, O.P.

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[See table of contents](#)

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The Relation Between Book I and II of the *Physics*

Books i and ii of Aristotle's *Physics* are a general introduction to the subject and method of natural science. But their relationship is a puzzling one. Having in the first book found an extensive search for the principles of *ens mobile*, we are surprised to find still another investigation of *ens mobile* in the second. What is the connexion between these two investigations? Do they form a single whole, or can we regard the second as quite independent of the first?

I. THE OPINION OF SIR DAVID ROSS

Sir David in his commentary on book ii of the *Physics*¹ offers the following solution to the problem of the twofold examination of the subject of the science of nature:

In book i Aristotle began the study of φυσική with the conception of ἀρχαί, and the main result of the book was the establishment of three distinct ἀρχαί—ὕλη, στέργησις, εἶδος. In book ii he makes a fresh start by studying the conception of φύσις itself. There is no organic connexion between the two books; they are independent approaches to the whole subject. Their independence is indicated not only by the absence of close connexion in the thought, but by the absence of a connecting particle, which is evidence, so far as it goes, that book ii was originally a separate essay (cf. Introduction, 5)².

In the 'Introduction' to which he refers in the above citation, Ross states:

The beginning of book ii presents the appearance of being the beginning of a separate work. It makes no reference to the results of book i, but starts straight off with an analysis of the notion of φύσις. In most of the MSS. and in the lemmata of Philoponus and Simplicius it begins without a connecting particle, which is an unusual feature in Aristotle's works, and one that points to relative independence. Yet we have seen that the *Metaphysics* several times refers to book i as part of τὰ φυσικά, and though it seems to have been originally a separate essay περὶ ἀρχῶν, an attempt was later made (quite possibly by Aristotle himself) to link it up with the three following books. The evidence of this patchwork is seen in the best MS., E, where at the end of book i, after the words *ὅτι μὲν οὖν... λέγωμεν*, we have *τῶν γὰρ ὄντων τὰ μὲν ἐστὶν φύσει τὰ δὲ δι' ἄλλας αἰτίας*, and then at the beginning of book ii (as in the other MSS.) *τῶν ὄντων τὰ μὲν ἐστὶν φύσει τὰ δὲ δι' ἄλλας αἰτίας*. I conjecture that here the abrupt particle-less beginning of book ii is its original beginning, and that *ὅτι μὲν οὖν... λέγωμεν* and E's *γὰρ* in *τῶν γὰρ ὄντων* represent a later attempt to produce at any rate an external connexion (for there is no organic connexion) between the two books.³

1. W. D. Ross, *Aristotle's Physics. A Revised Text with Introduction and Commentary*, Oxford, Clarendon Press, 1936.

2. *Ibid.*, p.499.

3. *Ibid.*, p.5.

Ross's solution of the problem, as is evident from the two quotations, is that books i and ii are not organically connected; that the two investigations into the subject of the science of nature are unrelated: "There is no organic connexion between the two books; they are independent approaches to the whole subject."¹ In proof of his position he notes "the absence of close connexion in the thought"² as well as "the absence of a connecting particle."³

II. THE OPINION OF CANON MANSION

Professor Auguste Mansion, too, treats the question of the relation of books i and ii, in his *Introduction à la Physique Aristotélicienne*.⁴ In the third chapter of this work, after having first noted the rather strange arrangement of the matter, namely the priority given to the discussion of the principles over that of determining the subject of the *Physics*⁵, Mansion shows the reason why Aristotle proceeded in this manner by pointing out the relation of the first book to the concept of nature.

Despite that, one must recognize that the initial book of the work is well placed; it amounts to nothing less than insuring to Natural Philosophy the completeness of its object. Such is at least the concept that Aristotle had of it: from the beginning the ancient naturalists had taken a false road in their explanations of the world, and the audacious speculations of the Eleatic School, above all, had accentuated their unfortunate tendency; be it Empedocles, Democritus, or Anaxagoras — all the subsequent theorists were affected, to a greater or less degree, by the arguments through which the Eleatics proved the unity and immobility of being; without subscribing to this thesis in its most absolute sense, they all attempted to explain cosmic becoming by reducing it to change of modalities, of positions and appearances, while the substantial substrate of things remained unchanged. But we are going to see that the presence of becoming is absolutely basic to Aristotle's conception of nature and that he wishes to defend its reality in the substantial order as well as in the accidental changes of things. It is to this that the dissertation on principles is devoted.⁶

In his résumé of this same chapter Mansion again treats of the relation of the two books. Here, however, he expressly mentions the order that book i has to book ii.

1. *Ibid.*, p.499.

2. *Ibid.*

3. *Ibid.*

4. Louvain, Éditions de l'Institut Supérieur de Philosophie, 2d ed., 1945.

5. « On peut s'étonner pourtant de le [le problème des principes] voir traiter avant l'objet même de la physique, — la nature, — car ce n'est qu'au livre II, que la définition en est établie, et qu'on apprend de quelle façon précise le physicien doit l'étudier » (*Op. cit.*, p.53).

6. *Op. cit.*, pp. 53-54: « Malgré cela on doit reconnaître que le livre initial de l'ouvrage est bien à sa place; il ne va à rien moins qu'à assurer l'intégralité de son objet à la philosophie physique. Telle est du moins la conception que s'en fait Aristote: dès l'origine les anciens physiologues avaient fait fausse route dans leurs explications du monde, mais surtout les audacieuses spéculations de l'École d'Élée avaient accentué leur fâcheuse tendance; qu'ils s'appelassent Empédocle, Démocrite ou Anaxagore, tous les théoriciens postérieurs avaient été touchés, dans une mesure plus ou moins grande, par les arguments au moyen desquels les Éléates prouvaient l'unité et l'immobilité de l'être; sans souscrire à cette thèse prise dans son sens le plus absolu, ils avaient tous essayé de rendre compte du devenir cosmique, en le réduisant à des changements de modalités, de positions et d'apparence, tandis que le fond substantiel des choses restait inchangé. Or nous allons voir que la présence du devenir est pour Aristote absolument primordiale dans sa conception de la nature, et qu'il veut en soutenir la réalité aussi bien dans l'ordre de la substance que dans les changements accidentels des choses. C'est à cela qu'est consacrée sa dissertation sur les principes ».

The first book of the *Physics* terminates with several lines, where the study of the form is postponed until later: this study will be found either in metaphysics, or, with regard to the forms of the natural things, in the subsequent exposés of the present series of lessons. This colorless conclusion does not make one suspect the general result which Aristotle had envisioned in placing this discussion on the principles at the beginning of his treatises of natural philosophy. In reality, as we have seen, he has shown the possibility of a true becoming in natural bodies: for him this thesis conditions essentially the possibility of a special philosophy of the outer phenomenal world; if one rejects it there is no longer a medium between the science of the absolute or metaphysics and the purely mechanistic explanation of phenomena; physics becomes the knowledge of the displacement of elements or minute bodies which give us the illusion of becoming. Only after he has shown that his object is not so limited and that a more profound knowledge of corporal being and its principles is attainable, does Aristotle find himself advantageously placed to successfully examine the precise nature of this object. This study begins in the second book of the *Physics*; a priori one would have expected to find it at the beginning of the entire work, but historic circumstances have forced the Stagirite to make a "new beginning" in order to approach it further on.¹

While Mansion sees in this first book a whole, whose meaning we can seek without having to refer directly to the rest of the work,² he does not look upon book ii as totally independent of book i. According to him, the extended investigation that is conducted in the first book deals with a problem of the greatest consequence — that of the principles of the subject-matter.³ The success which crowned this investigation permitted Aristotle to advance to the second one, which aims at determining in a more precise manner the subject of the science. This second investigation is contingent upon the first, and that in no merely incidental fashion.⁴ Were it not for the possibility of a true becoming in nature, which Aristotle establishes through the first inquiry, there would be no reason for the search after the principles of the science of nature, to which the second examination of the subject is immediately ordered,

1. *Op. cit.*, p.79: « Le premier livre de la *Physique* se termine par quelques lignes où l'étude de la forme est renvoyée à plus tard: cette étude trouvera sa place soit en métaphysique, soit pour les formes des êtres de la nature, dans des exposés ultérieurs de la présente série de leçons.

Cette conclusion incolore ne fait pas soupçonner le résultat général qu'a visé Aristote en mettant cette discussion sur les principes en tête de ses traités de philosophie naturelle. En réalité, on l'a vu, il a montré la possibilité d'un devenir véritable dans les corps de la nature: pour lui cette thèse conditionne essentiellement la possibilité d'une philosophie spéciale du monde phénoménal externe; dès qu'on la rejette, il n'y a plus de milieu entre la science de l'absolu ou la métaphysique et l'explication purement mécanique des phénomènes, la physique devient la connaissance des déplacements d'éléments ou de corpuscules qui nous donnent l'illusion du devenir. Ce n'est donc qu'après avoir montré que son objet ne se réduit pas uniquement à cela, mais peut comporter une explication plus profonde de l'être corporel et de ses origines, qu'Aristote se trouvera en mesure d'examiner avec fruit quel est d'une manière précise cet objet. Cette étude commence au livre II de la *Physique*; a priori on se serait attendu à la trouver en tête de tout le traité; mais les circonstances historiques ont forcé le Stagirite à faire « un nouveau début » pour l'aborder plus loin ».

2. *Ibid.*, pp.55-56: « Ce livre forme donc un tout, dont nous pouvons chercher à déterminer la signification sans avoir à nous référer nécessairement pour cela à la suite du traité ».

3. *Ibid.*, p.79: « ... Pour lui cette thèse [la possibilité d'un devenir véritable dans les corps de la nature] conditionne essentiellement la possibilité d'une philosophie spéciale du monde phénoménal externe; ... »

4. *Ibid.*, p.79: « ... Dès qu'on la rejette, il n'y a plus de milieu entre la science de l'absolu ou la métaphysique et l'explication purement mécanique des phénomènes. ... »

since there would be no such subject. Instead of the science of nature which we now possess, Physics would then be nothing more than "the knowledge of the displacement of elements or minute bodies, which give us the illusion of becoming."¹ According to Mansion, then, there does exist a very close connexion between books i and ii: so much so that book ii finds its justification in book i. Far from being independent approaches to the whole subject as Ross considers them,² in Mansion's view they constitute a unified introduction to the science of natural things.

III. AN EVALUATION OF SIR DAVID'S OPINION

We now have two solutions to the problem concerning the double examination of the subject of natural science. Ross, by holding that the two books are totally independent of each other, denies any connexion between the two inquiries. This being so, it appears that we are justified in concluding that according to Ross it is possible to study the treatise on method by beginning with the second of the two investigations of *ens mobile*. Mansion, on the contrary, maintaining as he does a close dependence of book ii on book i, seems to take the position that the problem of method involves the twofold investigation of *ens mobile*. These two positions being mutually exclusive, it will be necessary to submit them to a closer scrutiny in order to determine which of them offers the more plausible solution.

As we have indicated, Ross bases his position on two arguments. The two books are independent approaches to the whole subject, and have no organic unity. This is proved "not only by the absence of close connexion in the thought, but by the absence of a connecting particle, which is evidence, so far as it goes, that book ii was originally a separate essay."³ Let us leave aside for the moment the assertion that there is no close connexion in the thought of the two books, and examine the argument from the absence of a connecting particle.

To evaluate the argument from the lack of a verbal connexion, we must examine the argument in the light of the conclusion in proof of which it is adduced. Does the conclusion, namely that there is no organic unity between books i and ii, really flow from the premise that there is no connecting particle? It seems that Ross considers this premise as proving *directly* the separate origin of the two works⁴ and *indirectly*, through their separate origin, their mutual independence. His own words indicate that such is his thought: "Their independence is indicated not only . . . , but by the absence of a connecting particle." I believe we can grant that the books were composed at different times but, I question that this difference in time can be used to establish conclusively their independence. The fact that the two were composed at

1. *Ibid.*, p.79: «... La connaissance des déplacements d'éléments ou de corpuscules qui nous donnent l'illusion du devenir ».

2. Cf. above, section i.

3. Ross, *op. cit.*, p.499.

4. See the above citation in the text.

different times would not preclude their organic unity. It is well within the realm of possibility that, even though the treatise on the principles of natural being was originally a separate essay,¹ it could still serve as a base upon which Aristotle could build further. Such an hypothesis would guarantee the independence of the book in its origin and yet allow for an organic unity between it and that treatise for which it provides the foundation. What is involved in the question is independence versus dependence; and it is not contradictory to predicate independence of one treatise and dependence upon it of another. Should such a relation, at any rate, of unilateral dependence exist between books i and ii in the sense that book ii is dependent on book i, while this latter is an independent work, then the position maintaining their mutual independence would be false. The final and definitive judgment of this hypothesis, however, requires an investigation of the thought-content of the books in question. This we shall undertake later. At this point we may say that Ross's argument — that book i was originally a separate essay — decidedly does not destroy the above hypothesis and hence is inconclusive.

Ross resorts to a far more potent argument when he maintains that there is no close connexion in the thought-content of the books. If this opinion be substantiated, we can no longer refuse Ross's conclusion.

Seeing that we shall have another opportunity, when discussing Mansion's opinion, to test the evidence of the text itself, we will confine ourselves here to investigating this thesis of Ross in the light of Aristotle's own conception of the disputed books.

IV. ARISTOTLE'S OWN WORDS ON THIS SUBJECT

What was Aristotle's mind on books i and ii of the *Physics*? Did he consider their matter as one or as distinct? The following points, we believe, will furnish us with an answer to these questions.

Ross admits that there is evidence for the assumption that an attempt was made to compensate for the lack of a verbal connexion by the insertion of a connecting particle:

... And though it seems to have been originally a separate essay *περί ἀρχῶν*, an attempt was later made (quite possibly by Aristotle himself) to link it up with the three following books. The evidence of this patchwork is seen in the best MS., E, where at the end of book i, after the words *ὅτι μὲν οὖν... λέγωμεν*, we have *τῶν γὰρ ὄντων τὰ μὲν ἔστιν φύσει τὰ δὲ δι' ἄλλας αἰτίας*, and then at the beginning of book ii (as in the other MSS.) *τῶν ὄντων τὰ μὲν ἔστιν φύσει τὰ δὲ δι' ἄλλας αἰτίας*.²

This attempt to make up for the original deficiency by the insertion of a connecting particle, made, as Ross suggests, "quite possibly by Aristotle himself," would warrant the conclusion that the Stagirite

1. By separate we mean independent in the sense of being a totality, whose complete meaning is to be found within itself.

2. *Op. cit.*, p.5.

conceived the books as connected in their thought-content. Otherwise, the attempt to join them verbally appears inexplicable. We think that the following point will further confirm this conclusion.

In the *Metaphysics* we find many references to the first and second books of the *Physics*¹, and in regard to these it is very striking to note that Aristotle speaks of both books under a common title. Sometimes the books are referred to as τὰ φυσικά,² sometimes as τὰ περὶ φύσεως.³ This fact indicates that in his mind there was a sufficient community between the two to justify a common denominator. This is implicitly recognized by Ross, who — precisely in consideration of the common title used by Aristotle — admits that the attempt which was later made to connect the two books was made "quite possibly by Aristotle himself."⁴ The method of reference found in the *Metaphysics* considerably strengthens, then, the probability of the Aristotelian authorship of the inserted connecting particle and with it, that of our conclusion.

Again, we find in the *De Caelo*⁵ other indications of Aristotle's conception of the disputed books. In this treatise, when discussing the various ways of proving that there can be no infinite body, Aristotle makes a reference to the kind of proof he had advanced in "our discussion of principles."⁶ He refers here to *Physics*, iii, chapters 4-8, using a title more properly belonging to book i. In regard to this reference, Ross states:

If we treat book i as the treatise περὶ ἀρχῶν par excellence, we must at the same time recognize that this phrase had a wider application; for the only actual reference in Aristotle under this title (in *De Caelo* 274a21) is to *Phys.* iii. We must suppose that the treatise formed by uniting the one book περὶ ἀρχῶν with the three περὶ φύσεως could be referred to by either title, though the latter greatly predominates; Simplicius bears witness to the double nomenclature.⁷

On Ross's own admission, then, there was present in Aristotle's mind a connexion between the first four books of the *Physics*, which enabled him to designate them by a common title.

What bearing do these considerations have upon Ross's denial of a thought-connexion between books i and ii? The attempted verbal con-

1. *Phys.*, i: (*Metaph.*, 986b30; 1062b31; 1076a9; 1086a23).

Phys., ii: (*Metaph.*, 983a33; 985a12; 988a22; 993a11; 1059a34).

2. *Metaph.*, 1062b31 (*Phys.*, i, cc.7-9);

Metaph., 1076a9 (*Phys.*, i, chap.1);

Metaph., 993a11 (*Phys.*, ii, cc.3,7);

Metaph., 1059a34 (*Phys.*, ii, chap.3).

3. *Metaph.*, 986b30 (*Phys.*, i, chap.3);

Metaph., 1086a23 (*Phys.*, i, cc.4-6);

Metaph., 983a33 (*Phys.*, ii, cc.3, 7);

Metaph., 985a12 (*Phys.*, ii, cc.3, 7);

Metaph., 988a22 (*Phys.*, ii, cc.3, 7).

4. "Yet we have seen that the *Metaphysics* several times refers to book i as part of τὰ φυσικά, and though it seems to have been originally a separate essay περὶ ἀρχῶν, an attempt was later made (quite possibly by Aristotle himself) to link it up with the three following books" (*Op. cit.*, p.5).

5. *De Caelo*, 274a21.

6. "But it may also be shown universally, not only by such reasoning as we have advanced in our discussion of principles..."

7. *Op. cit.*, pp.5-6.

nexion and the method of reference used in the *Metaphysics* certainly seem to point to an opposition between Aristotle's concept of the work and the fashion Ross conceives of it. Obviously, then, there must have been in Aristotle's mind a closer connexion between the matter of the two books than is admitted by Ross. Had the two independent approaches to the same subject no other bond of unity between them than that of a common "subjectum materiale," there would be no justification for a verbal connexion or a common title, since both of these are indicative of a unity of thought. The fact, then, that Aristotle did seek, very probably, to join the two books verbally and on occasion referred to them under a common title, shows that more was involved in his concept than is consistent with Ross's opinion. Without attempting to determine definitely the opposition between the two concepts, (which would entail the examination on the text), but with the knowledge that there does exist an opposition, we may venture the following conclusion. Since Ross's opinion shows a definite opposition to Aristotle's concept, he is very probably incorrect in his contention that there is no close connexion in the thought of the books, wherefore his principal conclusion, which rests on this contention, is also very probably false. Any other conclusion would commit us to the highly improbable position that Aristotle misunderstood his own work. This is the consequence that inevitably follows from Ross's conception as opposed to Aristotle's. The place occupied by Aristotle in the history of thought does not justify the holding of that alternative without some more convincing proof.

V. AN EVALUATION OF CANON MANSION'S OPINION

Mansion's idea of book ii as essentially depending on the thought of the first book¹ has the merit of being more conformable to the Aristotelian concept, such as we have thus far indicated it, i.e. that there is a connexion between the thought-content of the two books. This connexion is conclusively established in its details by an examination of the books from the point of view of the laws governing the procedure of a scientific work as laid down by Aristotle in the *Posterior Analytics*. According to Aristotle, an indispensable preliminary for scientific knowledge is what he terms "pre-existent knowledge."² This pre-existent knowledge embraces both the things that must be known as well as the manner of knowing them. The things that must be known are three: the subject, the proper passion of the subject, and the principle.³ The manner in

1. Cf. citation in text, p.152.

2. "All instruction given or received by way of argument proceeds from pre-existent knowledge" (*Post. Anal.*, i, chap.i, 71a1).

3. The number of things to be known and the reason for their knowledge is derived from Aristotle's concept of the demonstrative syllogism, the instrument par excellence of scientific knowledge. In a syllogism what is sought is a conclusion in which the proper passion is predicated of its subject and which conclusion is inferred from certain principles. Because the knowledge of the simple is prior to that of the complex, before one can have a knowledge of the conclusion, one must first know in some way not only the subject and the passion but also the principles, for the conclusion becomes known through the principles from which it is inferred. Cf. SAINT THOMAS, *In I Post. Anal.*, lect.2, n.2.

which these three must be known is described by Aristotle in the following words. "The pre-existent knowledge required is of two kinds. In some cases admission of the fact must be assumed, in others comprehension of the meaning of the term used, and sometimes both assumptions are essential."¹ Since Aristotle's intention was to attain a scientific knowledge of nature,² it was necessary for him to have a pre-existent knowledge of the subject, the passion and the principle.

However, at the very outset he was faced with a problem which tended to destroy the subject of the science of nature. Most of his predecessors denied the fact of true becoming, as can be seen from a perusal of the first part of book i of the *Physics*, where Aristotle exposes and refutes their theories.³ Confronted with this denial of the fact of true becoming, and feeling that he could not in the face of existing opinion simply assume that fact, Aristotle took the only course that was possible. He plunged into the problem of whether there was such a thing as true becoming. Any other procedure would have amounted to a betrayal of his own doctrine on scientific procedure.

His acquaintance with the doctrines of the early naturalists made Aristotle acutely aware of where the problem lay—and also provided him with a clue to its solution. The difficulty which proved so great an obstacle to the minds of the earlier investigators had been to find the principles that would explain substantial or true becoming, and because they failed to discover such principles they denied its possibility. Aristotle, pursuing the same course, succeeded where they failed. He discovered the principles that establish the possibility of true becoming. This he achieved mainly through his concept of "prime matter": the permanent subject in every absolute becoming which in a certain sense is nonbeing. This principle enabled Aristotle to escape from the difficulty upon which his predecessors foundered: namely, that, since whatever comes to be comes to be either from being or nonbeing, and since it is impossible for it to come from either, there can be no becoming.⁴ Having solved this difficulty, and thereby established the possibility of absolute becoming, Aristotle was now, and now only, prepared to approach the problem of adapting the laws of scientific procedure to his subject, which was becoming itself. This new problem, which constitutes the matter of book ii, definitely arises from the solution of the prior problem: the reality of true becoming.

1. *Post. Anal.*, i, chap. i, 71a11-13.

2. "When the objects of an inquiry, in any department, have principles, conditions, or elements, it is through acquaintance with these that knowledge, that is to say scientific knowledge, is attained. For we do not think that we know a thing until we are acquainted with its primary conditions or first principles, and have carried our analysis as far as its simplest elements. Plainly, therefore, in the science of Nature, as in other branches of study, our first task will be to try to determine what relates to its principles" (*Physics*, i, chap. i, 184a9-15).

3. *Physics*, i, cc.ii-iv.

4. "So they say that none of the things that are either comes to be or passes out of existence, because what comes to be must do so either from what is or from what is not, both of which are impossible. For what is cannot come to be (because it is already), and from what is not nothing could come to be (because something must be present as a substratum)" (*Physics*, i, chap. viii, 191a26-32).

The foregoing analysis of book i — bringing out as it does the order that exists between books i and ii is more than sufficient to prove the correctness of Mansion's solution. His contention that the second book depends essentially on book i is in complete harmony with the conclusion reached through an examination of the thought-content of the first book. This investigation, carried on in accord with Aristotle's rules for scientific procedure, corroborates Mansion's position. For it shows that, having mastered the problem which others had failed to solve, Aristotle was able to tackle the question of method appropriate to such a subject. Had he, like those before him, failed to overcome that difficulty, the problem of a method proper to the subject of becoming would not have arisen for him at all.

This analysis also proves that Ross is wrong in maintaining the independence of books i and ii. His position is the consequence of an overemphasis of the original character of book i and of a failure to make use of the criterion furnished by the Stagirite's doctrine on the requisites for scientific knowledge. To sum up: Ross's position must be rejected, as it contradicts the evidence of the books themselves.

We now hold the answer to the problem concerning the twofold investigation of the subject of the science. The two inquiries are not independent: a very close connexion, indeed, exists between them. The first justifies the second, in that it establishes the possibility of the subject itself. The second, which looks upon the same subject under a different formality, becomes nothing more than a logical foray into the realm of phantasy if disconnected from the first investigation, since it could not then be presupposed that there was such a subject: namely, being that becomes absolutely. Saint Thomas had put it briefly: "Postquam Philosophus in primo libro determinavit de principiis rerum naturalium, hic [in secundo libro] determinat de principiis scientiæ naturalis." ¹

CELESTIN TAYLOR, O.P.

1. *In II Phys.*, lect.1, n.1.