A R I S T O T L E
ON COMING-TO-BE & PASSING-AWAY
(DE GENERATIONE ET CORRUPTIONE)

A REVISED TEXT
WITH INTRODUCTION AND COMMENTARY

BY

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TO

THE MEMORY

OF

INGRAM BYWATER
PREFACE

In dedicating this book to the memory of the late Professor Ingram Bywater, I am trying to express, however inadequately, my sense of an overwhelming obligation. Bywater was the founder and first president of the Oxford Aristotelian Society, and when, about thirty years ago, it was my good fortune to be elected a member, the subject of our study was Aristotle's περὶ γενέσεως καὶ φθορᾶς. We discussed it line by line, every Monday evening during many successive terms, in our founder's rooms and under the inspiring guidance of his wonderful scholarship.

Beyond doubt I have incorporated in this edition many interpretations and suggestions which I owe either to Bywater himself or to my fellow-members of the Aristotelian Society, though I cannot now recall my borrowings in detail. But I am profoundly sensible of a far deeper and more general indebtedness. For Bywater's genius—his quiet but unmistakable mastery of the subject, his contempt for everything careless and unscholarly, his shrewd criticism and dry humour, his ready encouragement of every genuine endeavour—made of those weekly discussions an experience unique and unforgettable. The study of Aristotle (we could not but feel) demanded our utmost efforts: no labour could be spared, no detail neglected, no difficulty slurred. We were engaged upon an enterprise arduous indeed and infinitely laborious, but emphatically and supremely worth while. It was as if we were privileged to spend those Monday evenings in close and intimate communion with the very spirit of original work.

Amongst the many distinguished scholars who were at that time members of the Aristotelian Society, three have laid me under special obligations in connexion with this book—the late Mr. Charles Cannan, Professor John Burnet, and Professor John Alexander Smith. On its completion
in 1915 my manuscript was entrusted to Mr. Cannan for submission to the Delegates of the Clarendon Press, and the lively personal interest he took in it was a source of constant encouragement to me in the long years of uncertainty that followed—when it was difficult to believe that anybody would ever care to publish a book on Aristotle or that I myself should ever be free to return to philosophy from propaganda. I owe to Mr. Cannan, in addition, a number of most valuable suggestions and criticisms—chiefly on my Introduction and Text—which he contributed a few months before his death. Frequent references in my Commentary bear witness to the help which, in common with all students of Greek philosophy, I have derived from the works of my friend, Professor Burnet. It is more difficult to define, even approximately, the extent of my debt to Professor J. A. Smith. Almost every week, during a friendship of nearly thirty years, we have discussed philosophy in general and Greek philosophy in particular. He was the originator, I believe, of most of our problems: I am certain that he contributed whatever of value emerged in our discussions. It is quite beyond my power to determine how much in this book is his, or mine, or the joint result of the efforts of us both.

When I returned to the study of Aristotle's \textit{peri γενέσεως καὶ φθορᾶς} in the summer of 1910, my object was to prepare a translation for the series now being published by the Clarendon Press under the editorship of Mr. W. D. Ross. It was no part of my intention to write a commentary; and it would have seemed to me grotesque, had I been told that I should venture upon a revision of the text. But it soon became evident that a mere translation would be of little or no value, since the intrinsic philosophical interest of the original depends, to a large extent, upon what it implies and presupposes. In short, Aristotle’s fascinating and masterly little treatise calls for a commentary in almost every sentence. It is full of allusions to the speculations of his predecessors and contemporaries, and inextricably
interwoven with the theories elaborated in his other works—particularly in the *Physics, de Caelo*, and *Meteorologica*, of which no modern English editions exist. It is, moreover, often difficult to interpret, and the obscurity (as I soon discovered) is due, in no small measure, to various defects in the traditional text.

Thus I was led on, step by step, first to write a detailed commentary and then to undertake the revision of the text. I collated photographs of six manuscripts, EFHJL and Db, and took into consideration the commentary of Philoponos and also the Latin translation published by Andreas Asulanus in 1483 (see below, p. ix).1 A few notes on these sources, and on the use I have made of them, may here be added.

(1) J = Vindobonensis, phil. Graec. 100.

This manuscript is described by Mr. F. H. Fobes in the *Classical Review*, Dec. 1913 (‘A preliminary study of certain manuscripts of Aristotle’s *Meteorology*’). According to Mr. T. W. Allen, it is earlier than E and belongs to the first half of the tenth century. There are a great many corrections, written above the line, most of which agree with L. I have noted (under the sign J2) only those which differ from L. It has not proved possible to follow J in all passages, but I have treated it as, on the whole, equal in authority to E. In the following passages I have adopted J’s

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1 I am greatly indebted to many friends for assistance in preparing the text. The late Professor Bywater gave me much valuable advice and presented me with his collation of a chapter (Book II, ch. 1) in a fifteenth-century manuscript in his possession; he also sent me notes on the readings in the first three chapters of Book II which he had inferred from the Latin translation in an old edition of the commentary of Aquinas. Mr. T. W. Allen (Fellow of Queen’s College, and at that time University Reader in Greek) gave me his expert opinion on the dates of EFHJL and Db. Mr. W. D. Ross, Fellow of Oriel, first drew my attention to J and also to Π (see below, p. ix). Mr. J. L. Stocks (Fellow of St. John’s College, Oxford) lent me his photograph and collation of J. Finally, I have to thank Dr. A. E. Cowley (Fellow of Magdalen and Bodley’s Librarian), Mr. W. Ashburner (Honorary Fellow of Merton), Mr. A. B. Poynton (Fellow of University College), and Signor Ratti (Librarian of the Biblioteca Ambrosiana) for helping me to obtain photographs of some of the manuscripts in question.
reading against EFHL:—15b 2, 22b 28, 23a 30, 24a 15 (J$: cf. ΦcT), 28b 28 (J1: cf. Db), 33b 10 (cf. however EHLΦc), 36a 12 (cf. however E3H), 37a 11. In 17a 11 and 33b 15 I have adopted conjectures based on J's reading. Further J has an interesting addition (which is reproduced in Π and in the translation by Vatablus) at 22b 29: and it adds a diagram in the text at 32b 17. Finally, at 38b 4, J reads οὐτὸς for οὐτῶς, thus confirming the conjecture of Bonitz (οὐτὸς οὐτῶς).

(2) E = Parisiensis Regius 1853.
This manuscript, which belongs to the tenth century, has been very much doctored, and the corrections are at least as late as the fifteenth century. (There would seem to be more than one corrector at work. I have marked the corrections with the sign E2.) It is also somewhat carelessly written. Nevertheless it is of great importance. In the following passages I have followed it against FHJL:—16a 12, 16b 16, 22a 29 (E1: corr. E2), 24a 35, 25a 27, 26a 7, 26b 16, 29a 24, 32a 31 32b 25 (cf. F), 34a 28, 35a 15 (cf. J), 36a 18, 37b 20.

(3) F = Laurentianus 87. 7.
A twelfth-century manuscript, of considerable value. I have followed it against EHJL in 16b 2, 25b 5 (cf. Π), 26a 12 (cf. ΦeΠ), 27b 30, 32b 18, 35b 24.
I have used the sign F2 in a few places where the corrections in this manuscript seemed worth quoting.

(4) H = Vaticanus 1027.
This is certainly a twelfth-century manuscript, if not of earlier date: it is probably older than F and is of considerable value. I have adopted its readings against EFJL at 22a 10 (cf. Φe), 26a 19 (cf. however ΠΓ), 27a 20 (cf. however E2FJ), 32b 2 (cf. Φe Π), 33b 24.

(5) L = Vaticanus 253.
An inferior manuscript, of far less value than EFH or J, belonging to the fourteenth or fifteenth century. I have followed it against EFHJ in three passages: but in all of them its reading appears to be a mere conjecture of the

1 In all references to the text I omit the first figure. Thus, e.g., 315b 2 becomes 15b 2.
scribe and not an original variant. The passages are 23\textsuperscript{b} 22, 37\textsuperscript{b} 33 (cf. Φ\textsuperscript{g}), 38\textsuperscript{a} 6 (an obvious combination of the reading of H with that of FJ).

(6) D\textsuperscript{b} = Ambrosianus F. 113 sup.

This manuscript belongs to the fifteenth century and contains the commentary of Philoponos (cf. Vitelli's preface to his edition of Philoponos, p. vi). Bekker used it to some extent for his text of the Metaphysics. It is of very little value, and I have quoted it in five passages only (15\textsuperscript{a} 27, 22\textsuperscript{a} 19, 28\textsuperscript{a} 4, 28\textsuperscript{b} 28, 34\textsuperscript{b} 7), where its readings seemed of some interest.

(7) The commentary of Philoponos (Ἰωάννου γραμματικοῦ Ἀλέξανδρέως σχολικά ἀποσημειώσεις ἐκ τῶν συνουσιῶν Ἀμμωνίου τοῦ Ἐρμείου μετὰ τινῶν ἰδίων ἐπιστάσεων κτλ.) is very valuable as an aid to the interpretation of Aristotle's treatise, and I have used it freely in my notes. Its value for the constitution of the text is perhaps not so great, but I have quoted those readings which might conceivably prove important. My references are to Vitelli's edition (Berlin, 1897). Φ\textsuperscript{1} = readings in the lemmata. Φ\textsuperscript{o} = readings given in, or inferred from, the paraphrase. Φ = readings supported both by the lemmata and the paraphrase. Where the manuscripts of Philoponos differ, I have added the signs of those to which my quotation refers.

(8) Γ = readings (either in Latin or, by inference, in Greek) from the 'nova translatio' which Andreas Asulanus prints in his edition (3 vols., 1483) of Averroes' commentary on Aristotle. The treatise περὶ γενέσεως καὶ φθορᾶς ends with the following note: — 'Nove translationi librorum de generatione et corruptione ab Averoii Cordubensi commentate: Summi philosophi Aristotelis ex Stragyra grecie oppido Nicomachi Medicine artis professoris filii: deo optimo maximoque favente finis impositus est: Impensa atque diligentia Andree de asula Venetiis impressae: Anno salutis christianae. MCCCCLXXXIII septimo calendas octobris'.

This translation, in spite of certain minor differences, is substantially the same as the old Graeco-Latin version to
which Jourdain refers—so far, at least, as I am able to judge from the specimen page given in his *Recherches sur les anciennes traductions latines d'Aristote* (new edition, Paris, 1843, Specimen XIII, pp. 412–13). I have quoted its readings only where they seemed of interest or of possible value.

Two other Latin translations which I have compared seem to be based on Jourdain’s version. They differ from one another and from the translation I quote: but the differences are in the main superficial. The first is contained in an old copy (Paris, 1514) of the commentary of Paulus Venetus which the Librarian of Wadham College kindly placed at my disposal. The second was brought to my notice by the late Mr. E. W. Webster, Fellow of Wadham College. It is a fragmentary translation of Book I, which originally formed part of a translation of Aristotle’s physical works printed at Venice and said to belong to the year 1482. The copy I examined consists of leaves taken from the bindings of old books and is preserved in the Library of Corpus Christi College, Oxford. I have also consulted the translation by Franciscus Vatablus (cf. 22* 28, 29, 30) which is printed in the Berlin Aristotle.

Bekker’s text is based on EFHL, but his *apparatus criticus* is not very reliable. I have corrected—usually without remark—about two erroneous statements concerning the reading of each manuscript on every page of the Berlin edition. Many of these errors are doubtless unimportant, but some at least are serious. The Teubner text by C. Prantl (Leipzig, 1881) professes to follow the authority of E wherever possible. This promise, however, is not fulfilled: and I regret that I have been unable to form a high opinion of Prantl’s work.

It remains for me to express my hearty thanks to the Delegates of the Clarendon Press for their generosity in publishing a book which is most unlikely to prove remunerative.

H. H. J.
IN citing my own notes, I write (e.g.) 'cf. *14a 3-6' for 'cf. note on 314a 3-6'.


Apelt = Beiträge zur Geschichte der griechischen Philosophie by Otto Apelt (Leipzig, 1891).

Bäumker = Das Problem der Materie in der griechischen Philosophie by Clemens Bäumker (Münster, 1890).


Bonitz = Aristotelische Studien by Hermann Bonitz (Vienna, 1862, 1863, and 1866).

Bonitz, Ind. = Index Aristotelicus by Hermann Bonitz (vol. v of the Berlin Aristotle).


Burnet, Ethics = the same author's edition of Aristotle's Nicomachean Ethics (Methuen & Co., 1900).


Diels, Elementum = the same author's Elementum, eine Vorarbeit, &c. (Leipzig, 1899).

Gilbert = Die meteorologischen Theorien des griechischen Altertums by Otto Gilbert (Leipzig, 1907).


Jaeger = Studien zur Entstehungsgeschichte der Metaphysik des Aristoteles by Dr. Werner Wilhelm Jaeger (Berlin, 1912).
instances

xii  ABBREVIATIONS, ETC.

Martin = Études sur le Timée de Platon by Th. Henri Martin (Paris, 1841).
Pacius = Aristotelis De Coelo lib. III. De Ortu et Interitu II, &c. by Iulius Pacius (Francofurti, Typis Wechelianis... MDCL).
Zabarella = Iacobi Zabarellae Patavini Commentarii in magni Aristotelis libros Physicorum; Item: in libros de Generatione et Corruptione. Item: in Meteor... Anno MDCLII Francofurti, Typis Wolfgangi Richteri, Sumptibus Ioannis Theobaldi Schönwetteri.¹

¹ My friend, Mr. R. P. Hardie, lent me his copy of this rare work. There is a copy, as I have recently discovered, in the Library at New College.
INTRODUCTION

Aristotle's conception of a 'science', and the place of the treatise περὶ γενέσεως καὶ φθορᾶς in his writings on natural philosophy.

§ 1. The intelligence, which, according to Aristotle, distinguishes man from the other living things, displays itself in all the spheres of his activity and characterizes his action and production as well as his speculation. Thus man is an 'agent' (the responsible subject of praise and blame), and his behaviour is 'conduct' (morally good and bad), in so far as what he does is the effect of deliberate decision (προαίρεσις), i. e. issues from intelligent desire and not from unreflective impulse, appetite, or passion. And he is a craftsman and an artist, a 'maker' of things useful and beautiful, in so far as he works under the guidance of clearly conceived ideals and with

1 Cf. e. g. Μεταφ. 1025b 25 ὅστ' εἰ πᾶσα διάνοια ἡ πρακτικὴ ἡ ποιητικὴ ἡ θεωρητικὴ . . . . I use the term 'intelligence' in a wide sense, so as to include what Aristotle calls (in different connexions) νοῦς, διάνοια, λογισμός, τὸ νοητικὸν, τὸ λόγον ἔχον, κτλ. I cannot here discuss the precise significance of these different terms, nor whether any of the psychical functions, which they denote, are attributed by Aristotle to animals other than man. It is enough for our present purpose to recognize that man, according to the broad outlines of Aristotle's doctrine, is distinguished from the two lower grades of ἔμψυχα (from the animals and plants), because the human ἔμψυχος is essentially intelligent, thoughtful, reasoning. Man is ζωὸν λογικὸν: and his 'intelligence' permeates and characterizes all the activities of which the human soul is the origina
tive source, even those which he seems to share with the other ἔμψυχα. Like the plants and animals, we assimilate food, grow, and reproduce our kind; and, like the animals, we feel, sensate, desire, and move. But in us these processes and activities are profoundly affected by the dominant character of the soul from which they issue—by its 'intelligence' (cf. e. g. De Anima B. 1-3).

2 Cf. e. g. Μεταφ. 1025b 22-25. On προαίρεσις, see especially Eth. Nic. I. 1-5.
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a technique developed into skill by intelligent practice. His buildings, for instance, unlike the spider's web or the swallow's nest, result from the deliberate execution of a purpose. This purpose is not immersed in the blind striving of instinct. There is nothing latent or metaphorical about it, nor is it only our misnomer for the unthinking play of natural forces. It is the architect's ideal, the object of his explicit thought. It lies open to his reflective analysis and becomes the plan by which he consciously works.¹

But the intelligence which is displayed in the activities of the craftsman and the artist, or of the statesman and the moral agent, is subordinated to an 'end' not its own. For the proper 'end' or work of intelligence is truth: and though the thought embodied in good action and production must be true, the object of the agent and the maker is not simply the attainment of truth. They wish to think truly in order that they may act or make well, and they pursue their investigation of the truth only so far as is required to make their conduct good, or their works useful or beautiful. The 'end' of the maker is the good product or work; and the 'end' of the agent is the good conduct itself, i.e. the particular piece of 'good living' in question.

It is only in his speculative activities that man pursues an 'end' which is the proper 'end' of intelligence. In the pursuit of knowledge simply for the sake of understanding—in what Aristotle calls θεωρητικὴ επιστήμη or φιλοσοφία—the intelligence moves freely towards the attainment, and in the vision and enjoyment, of the truth.²

§ 2. Aristotle distinguishes, within the whole of speculation, three 'philosophies' or 'bodies of speculative knowledge'. The whole system of what we should call 'knowledge' or 'science' is thus articulated into 'first philosophy' or 'philosophy of God' (θεολογική), 'second philosophy' or 'philosophy of nature' (φυσική), and 'mathematical philosophy' (μαθηματική).³

¹ Cf. e.g. Metaph. 1032a 32 ff., Phys. 199a 17 ff.
² Cf. e.g. Eth. Nic. 1095a 5, 1139a 21—b 4, 1179a 35 ff.; Metaph. 980a 21 ff., 993b 20—23; de Caelo 306a 16—17.
³ Cf. e.g. Metaph. 1026a 18 ὥστε τρεῖς ἄν εἶν φιλοσοφίαι θεωρητικά,
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It is true that Aristotle speaks of πρακτική ἐπιστήμη and ποιητική ἐπιστήμη, and co-ordinates them with 'speculative knowledge' (θεωρητική ἐπιστήμη): but it is clear that neither πρακτική nor ποιητική ἐπιστήμη is a 'science' in any sense in which we should naturally use that term. The first is not a theory of 'action', nor is the second a theory of 'production'. The man who embodies πρακτική ἐπιστήμη is the φρόνιμος—the statesman or wise agent whose conduct is alive with his own intelligent insight. His ἐπιστήμη is φρόνησις, the thought which informs and spiritualizes emotion and impulse, passion and appetite. It is the thought at work in good conduct, the living reasonableness in 'action', not a reflective theory about 'action'. And the man who embodies ποιητική ἐπιστήμη is τέχνη, a confirmed thoughtful mastery of his materials—a thought inseparably incarnated in the 'making' which it illumines and controls.

This is not the place to discuss Aristotle's conception of πρακτική and ποιητική ἐπιστήμη, nor to criticize his articulation of speculative philosophy. It will, however, be noticed that, if we take his statements strictly, neither aesthetics, nor moral philosophy, nor even logic, exists as a 'science' or purely speculative investigation. Aristotle's own Poetics, his Ethics and Politics, and his Organon—however paradoxical it may seem—are not, in his own view, results of the free movement of the intelligence in its endeavour to attain to truth. They are not, or at least they are not primarily, contributions to 'science'.

§ 3. 'First philosophy' or metaphysics is the 'science

μαθηματική, φυσική, θεολογική. The treatise περὶ γενέσεως καὶ φθορᾶς belongs, as we shall see, to φυσική, i.e. it investigates a part of the subject-matter of the philosophy of nature.

1 'Metaphysics', though a post-Aristotelian term, is a convenient title for the science which Aristotle himself calls 'first philosophy' or 'theology'. Aristotle's writings on 'first philosophy' appear to have been collected after his death—either by Andronikos (as is commonly supposed) or by some earlier editor (cf. Jaeger, pp. 178–80)—under the title of τὰ μετὰ τὰ φυσικά, 'the problems subsequent to those of natural philosophy'.
which investigates what is, in so far as it is, and the properties which essentially attach thereto.¹ The metaphysician, therefore, studies reality as a whole, and the various kinds and forms of the 'real', with a view to determine what is implied in the 'being' of anything which in any sense 'is', and to distinguish the kinds and degrees of reality possessed by the various departments and forms of the 'real'. He is thus led to distinguish between 'substantial' and 'adjectival' being: between that which 'is' in its own right and self-dependently, and that whose 'being' is inherence in something else or is in various senses derivative and dependent. Even within 'substantial being' there are degrees of reality. For there is substance which is through and through 'simple'; and there is substance which is 'composite', a union of different elements. The former is sheer actuality, without any unrealized basis of being, without any latent background, as it were, from which new activities may emerge or into which the present activities may subside. The latter is concrete of form and matter; it contains a duality of elements; it is in part actual and active, but in part always potential—a basis capable of emerging into activity, but as yet unrealized.

The substance which is sheer actuality is alone absolutely real. It is the primary 'real', the standard and measure of reality. All other things, which in any sense 'are', derive their 'being' in the end from it; they are ranked, in respect to their degree and kind of reality, according to their dependence upon, and their approximation to, this primary 'real'.²

§ 4. Hence it is the metaphysician who has e.g. to discuss the Laws of Contradiction and Excluded Middle.³ He has to establish their unquestionable validity, by showing that they are presupposed in all knowledge and in all 'being'. They are in fact the most fundamental laws of 'being'. They define in the most general terms 'what is, in so far as it is', expressing the conditions to which anything whatever must

¹ Cf. e.g. Metaph. 1003a 21 ff.
² Cf. e.g. below, * 36a 14–18 with the passages there cited.
³ Cf. e.g. Metaph. 1005a 19 ff.
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conform, if it is to 'be' in any sense and at all, and thus delimiting 'what is' from 'what is not'. For if anything, \( A \), is to 'be', at least it cannot also be \( \text{not}A \); and at least it must accept as its predicate either \( x \) or \( \text{not}-x \).

Again, it is the metaphysician who examines and develops the conception of the primary 'real', the absolutely substantial or self-subsistent. This, as he shows, is a substance which is through and through actual—a substance which is actuality or life, not a substance which has life or manifests activity. In it there is no distinction between 'nature' and 'expression'; its nature is single and is wholly actual or self-fulfilling. It is timeless or eternal life, a life which is activity without change and rest without stagnation. And this eternal life Aristotle identifies with God. For God is mind, and mind which is wholly and singly expressed in self-contained and self-determining spiritual activity, in thinking turned upon itself, or thinking with thinking for its object. God—the eternal life of mind, the pure spiritual actuality in which mind is self-expressed—is thus the primary 'real', and the central object of the metaphysician's speculation.

And metaphysics, since it is concentrated on the primary 'real', is itself the first of speculative sciences; and since that 'real' is God, metaphysics is the 'philosophy of God' or 'theology'. God is for the metaphysician the absolutely 'real', and the standard and clue by which he explains the reality of everything else. And in his investigation of the less perfect and more derivative forms of being, he is completing his knowledge of God. For the eternal life, which God is,

1 Cf. e.g. *Eth. Nic.* 1154b 24–28.
2 Cf. e.g. *Metaph.* 1074b 33 άυτον άρα νοεί, εἰπέρ ἐστι τὸ κράτιστον, καὶ ἐστὶν ἡ νόησις νοθεὼς νόησις. It is clear from Aristotle's statements (e.g. in the *Metaph.* A. 6, 7, and 9) that he conceives God as 'subject' rather than as 'substance', if I may use Hegel's distinction. He speaks of God as οὐσία, but an οὐσία which is ἐνέργεια ἄνευ δυνάμεως or ἐνόοι ἄνευ υλης. God is 'substance' *qua* self-subsistent and self-determining.
3 It is πρώτη φιλοσοφία on the principle that the rank of a science depends upon the rank—the degree of reality—of its subject-matter. Cf. e.g. *Metaph.* 1026a 18–32.
radiates through the whole of ‘being’, communicating itself (immediately or mediatelv, and in intenser or weaker degrees) to all that is. Or, God is the ἀρχή, from which originates, and on which depends, the entire universe in all its parts; and the Ideal which inspires and animates all things.¹

Hence, finally, the metaphysician traces out the divinity in things, i.e. exhibits the degree and kind of reality which belongs to the various departments of ‘being’. It is, therefore, a part of his task to determine in what precise sense the ‘composite substances’—the perceptible bodies, animate and inanimate, which constitute the world of ‘nature’—are real;² and, again, to show what kind of ‘being’ is to be attributed to the mathematical things, e.g. to the solids and plane figures of the geometer, and to the numbers of the arithmetician.³ Thus the metaphysician discusses and explains what the natural philosopher and the mathematician take for granted,⁴ viz. the ‘being’ or reality of their subject-matters.

§ 5. Whereas metaphysics investigates reality as a whole, or ‘what is, simply in respect to its being’, natural and mathematical philosophy select, each of them, a determinate ‘part’ or ‘kind’ of the real.⁵ The φυσικός selects perceptible and changeable substance, and studies it in respect to the movement, or to the other forms of change, to which it is liable. And the μαθηματικός studies the perceptible substances neither qua real, nor qua changeable, but only qua quanta (discrete and continuous), i.e. qua numerable and measurable.

Natural philosophy is thus doubly contrasted with metaphysics. For the φυσικός studies a part only of the real, and

¹ Cf. below, *36b* 14–18, *36b* 30–32. Aristotle’s God is a self-subsisting and self-fulfilling spiritual activity, ‘apart from’ or transcending the perceptible world: and yet God is also the divine life, pervading all the parts of ‘being’ as the perfect Order which gives to them their unity and intelligibility. Cf. e.g. *Metaph.* 1075a 12–19. Plato’s ἰδέα τοῦ ἀρχήν is, in the same way, both transcendent and immanent: cf. *Republic* 508 e ff., and 526 d, e.

² Cf. e.g. *Metaph.* Z and H.

³ Cf. e.g. *Metaph.* M and N.

⁴ Cf. e.g. *Metaph.* 1023b 10–18, *Post. Anal.* 76a 31 ff., and often.

⁵ Cf. e.g. *Metaph.* 1003a 22–26, 1025b 3–13.
investigates that part not *qua* real, but *qua* changeable. The metaphysician, on the other hand, investigates all forms of the real in respect to their reality. And natural philosophy is subordinate to metaphysics, being the 'second' of the speculative philosophies on the same principle on which metaphysics is the 'first'.

For the central object of the metaphysician's study is the primary 'real'—the timeless, imperceptible and changeless substance, which is 'simple' (ἀπλή), i.e. through and through one sheer actuality. But the part of the real which the φυσικός studies is 'composite substance' (σύνθετος υδότα), i.e. a union of two elements, concrete of form and matter, and thus secondary and derivative in its being.

Mathematics, alone of the speculative philosophies, has for its subject-matter not substance at all, but adjectival characters abstracted from the substance which they qualify. The perceptible substances are *quantia*, i.e. quantified things. They have shape and size; they have unity, and multiplicity of parts. And certain further properties attach to the perceptible things in virtue of, or mediately through, their quantitative characters. These quantitative characters are thus the logical subjects of certain πάθη, which in fact inhere not in them, but (mediately through them) in the perceptible things. It is

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1 See above, p. xvii, note 3; and cf. e.g. *Metaph.* 1026a 27 ff., 1037a 13-17.

2 The scope of the province of φυσική is explained below, § 10. The 'composite substance' which it studies is perceptible, and subject at least to movement, if not also to the other forms of change. Cf. e.g. *Metaph.* 1069a 30 ff.

3 In this sense, the mathematical sciences are said to be πεπληθῶν (cf. e.g. *Post. Anal.* 79a 7-10). Aristotle in one passage excepts astronomy. He says that it investigates perceptible (but eternal) substance, and is thus, of all the mathematical sciences, most akin to first philosophy' (*Metaph.* 1073b 3-8). But this view of astronomy seems to be due to the fact that Aristotle substantiated (i.e. materialized) the spheres of Eudoxos and Kallippos, thus transforming an abstract mathematical system into a mechanical system of homocentric spherical shells (see below, *36a 14—b 10*, with the passage there quoted from Sir Thomas Heath's *Aristarchus of Samos*). Astronomy, as we shall see in § 6, like optics and acoustics, is both a mathematical science and a part of φυσική. Cf. also below, § 10.

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b 2
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these quantitative characters, these 'adjectivals', which the mathematician severs by definition from their substances. In his science they become the subjects, of which he demonstrates πάθη; i.e. they are treated as if they were substances, really subsistent things, the owners of the properties which they mediate. The mathematical things, therefore, of which the mathematician demonstrates certain properties, are mere adjectives abstracted from the perceptible substances. The solids, planes, lines, points, and units, whose 'being' the geometer and the arithmetician take for granted, are in fact so many specific determinations of the quantitative character of the perceptible things. Their 'being' is adjectival, not substantial.¹

§ 6. Although Aristotle speaks of mathematics as a single 'speculative philosophy', he also speaks of 'the mathematical sciences';² and attributes to each of them a distinct 'kind', or sphere, of 'being' as its subject-matter. Geometry and arithmetic e.g. have reciprocally-exclusive γένη ὑποκειμένα. Continuous magnitude on the one hand, and number on the other, are self-contained wholes or 'kinds' of 'being', so that it is illegitimate to attempt to prove an arithmetical conclusion through a geometrical middle term, or vice versa. In every demonstration in the science of arithmetic, all three terms (major, minor, and middle) must belong to the sphere of number: and in every demonstration in the science of geometry, all three terms must belong to the sphere of continuous magnitude.³

Aristotle's conception of the unity of a science is puzzling and perhaps not altogether consistent. A science is one, when its subject-matter is a single 'kind'.⁴ But what constitutes a single 'kind' is far from clear. Thus, although

¹ Cf. e.g. Phys. 193b 22 ff., Metaph. K. 1061a 28 — b 33, A. 1073b 3–8, M. 1077b 12—1078a 31. The passages cited from K and M undoubtedly express Aristotle's doctrine, even if these books were not written by Aristotle himself.
² Cf. e.g. Metaph. 1003a 25 (αἱ μαθηματικαὶ τῶν ἑπιστημῶν), 1026a 25—27.
⁴ Cf. e.g. Metaph. 1003b 19, Post. Anal. 87a 38 — b 4.
quanta fall apart into at least two reciprocally-exclusive ‘kinds’ (into number, the system developed out of an indefinite plurality of ‘units’, and into spatial magnitude, the system developed out of ‘points and lines’), nature is a single ‘kind’ of ‘being’.\footnote{Cf. Metaph. 1005a 34 (ἐν γὰρ τι γένος τοῦ ὄντος ἡ φύσις), 1025b 18–21.} Hence φύσική is a single science, although it includes in its survey a great variety of perceptible substances, some of which are eternal, whilst others come-to-be and pass-away. Mathematical philosophy, on the other hand, is rather a series of connected sciences than a single science. There are ‘parts’ of μαθηματική, and it includes within itself a ‘first’ and a ‘second’ science, and others continuing the series.\footnote{Metaph. 1004a 6–9, and cf. 1026a 23–27.} The order of these successive mathematical sciences appears to be determined by the increasing complexity of the mathematical things whose ‘being’ is taken for granted. Arithmetic e.g. is prior to geometry in the series, because the arithmetician assumes the ‘being’ of the ‘unit’ (οὐσία άθετος) only, whereas the geometer assumes the ‘being’ of the ‘point’, i.e. unit plus position (οὐσία θετός).\footnote{Cf. Post. Anal. 87a 31–37.}

The mathematical sciences come into close connexion with certain provinces of φύσική. Thus e.g. acoustical, optical, and astronomical phenomena are investigated, in different ways, both by the philosophy of nature and by mathematics. The φυσικός establishes empirical generalizations as to what combinations of notes, or what musical intervals, produce consonances and dissonances. But the scientific explanation of these (and other) acoustical phenomena is arithmetical, derived from the theory of ratios. Again, the φυσικός observes the phenomena of light and establishes empirical generalizations with regard e.g. to the deflexion of the visible line (the ray) in various media and its reflection from various surfaces. But the scientific explanation is geometrical, a corollary of the abstract theory of lines and angles. Lastly, the φυσικός studies the ‘heavenly bodies’. He observes the apparent sizes, shapes, and distances of the stars and planets, and formulates empirical generalizations with regard e.g. to eclipses, risings, and
settings, and so forth. But here again the scientific explanation is mathematical, a corollary of the geometry of solids, and presumably also of an abstract theory of motion, i.e. of dynamics.\(^1\)

\(\S\) 7. Each of these sciences—the mathematical sciences and the philosophy of nature—has a determinate ‘part’ or ‘kind’ of ‘being’ as its province. And the character of such a ‘kind’ determines the procedure of the science in its endeavour after truth. The procedure is what Aristotle calls ‘demonstration’ (\(\alpha\pi\delta\epsilon\epsilon\iota\varsigma, \alpha\pi\delta\epsilon\epsilon\iota\kappa\iota\varsigma\ \sigma\upsilon\lambda\lambda\omicron\upsilon\iota\sigma\omicron\mu\delta\)), and each of these sciences is a ‘demonstrative science’ (\(\alpha\pi\delta\epsilon\epsilon\iota\kappa\iota\varsigma\ \epsilon\pi\iota\sigma\tau\eta\mu\eta\)).\(^2\) The aim of a ‘demonstrative science’ is (we may say shortly) so to analyse and resynthesize its ‘kind’, that the mediated necessary judgements, which are the conclusions of the science, precisely reflect the mediated necessary connexions between substances and properties which are the inner articulation of the ‘kind’. The ‘truth’ here to be attained is a \textit{replica} of the ‘real’.

Each ‘kind’ is a relatively self-contained whole, a world of ‘substances’\(^3\) with their essential properties. The substances, however, which are the inhabitants of this world, though individual, are nevertheless universal or typical. They are the \textit{infima species} (the \(\alpha\tau\omicron\mu\alpha\ \epsilon\iota\delta\eta\)) of the ‘kind’ (the \(\gamma\epsilon\nu\nu\sigma\)) in question. ‘Man’ e.g. is an individual, or unique, species of ‘animal’, which itself is a specification of \(\sigma\omega\mu\alpha\ \varphi\nu\iota\kappa\iota\kappa\omicron\), the ‘kind’ studied by \(\varphi\nu\iota\kappa\iota\kappa\). Similarly ‘the circle’ is an individual, or unique, type of plane figure.

\(^1\) Cf. e.g. \textit{Post. Anal.} 78\(^b\) 34—79\(^a\) 16, \textit{Physics} 193\(^b\) 22—194\(^a\) 12. Unfortunately Aristotle’s theory of the relation of astronomy, acoustics, and optics as parts of \(\varphi\nu\iota\kappa\iota\kappa\) (the ‘subalternate’ sciences) to the mathematical sciences (the ‘subalternant’ sciences) is nowhere fully worked out. I have tried to interpret his slight indications correctly: but—particularly with regard to astronomy (cf. above, p. xix, note 3, and below, \(\S\) 10)—the whole subject is very obscure.

\(^2\) The doctrine of the \textit{Post. Anal.} as to the aim, nature, and method of \(\alpha\pi\delta\epsilon\epsilon\iota\kappa\iota\varsigma\ \epsilon\pi\iota\sigma\tau\eta\mu\eta\) undoubtedly applies to the mathematical sciences and to \(\varphi\nu\iota\kappa\iota\kappa\). It is doubtful whether—and, if so, under what qualifications—it applies to metaphysics.

\(^3\) For the purposes of the \textit{Post. Anal.}, the mathematical things, \textit{qua} logical subjects, are treated as if they were substances: cf. above, \(\S\) 5.
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And both 'man' and 'the circle' are universal; a 'such-everywhere-and-always', not a 'this-here-and-now'.

Each of these 'substances'—each ἄτομον ἔδος—can be analysed, though not divided. The analysis, that is to say, is into 'constitutive moments' of its individual being, not into separable parts. And these constitutive moments reduce to two—viz. 'the proximate generic nature', of which the substance is a specification, and 'the last differentia', i.e. the differentia which converts that generic nature into the substance, or species, in question. The constitutive moments are 'essential' predicates of the substance. For they are necessary to its being, elements in its essential nature (τὰ ἐν τῷ τί ἐστι κατηγορούμενα), and the formula which enumerates them is its definition. Thus the definition of 'man' (ζῴου-δίπτων λογικόν), or of 'the circle' (ἐπίπεδον τὸ ἐκ τοῦ μέσου ἵσον), resynthesizes the individual substance out of its

1 'Sokrates' and 'Kallias', or 'this circle' and 'that circle', are distinguishable only for ἀλλοθρεῖς, not for ἐπιστήμη. They do not differ in their knowable or definable being, in their 'form'. Hence their difference is irrelevant for science; it is an affair merely of the coincident and variable properties, or merely of 'the matter' in which 'the form' is embodied. For further explanations, and some qualification, of this doctrine, see below, § 8. Aristotle, it may be thought, comes perilously near to the theory which he imputes to Plato and condemns: for the ἄτομον ἔδος ('man-as-such', 'the circle', &c.) shows unmistakable affinity to the Platonic Ἰδέα as Aristotle interprets the latter. Yet at times he is fully conscious of the difficulty: and perhaps the distinction between ἐπιστήμη as a ξίγ, and ἐπιστήμη in its fulfilment as θεορία, is in part an attempt to meet it (cf. e.g. Metaph. Λ. 1071a 24–29, M. 1087a 10–25, de Anima 417a 22–29).

2 Any remoter genus, and any differentia specifying such remoter genus, may be stated in the 'set of terms' or formula (the λόγος) defining the substance. But in principle, and for ultimate analysis, the constitutive moments reduce to the proximate genus and the last differentia (ἐδοξοῦς or τελευταία διαφορὰ), the latter being related to the former as ἐνέργεια to δύναμι: cf. Metaph. 1037b 8—1038a 35.

3 Cf. e.g. Post. Anal. 73a 34–37 καθ' αὐτὰ δ' ἄνα υπάρχει τε ἐν τῷ τί ἐστιν, οἷον τριγώνον γραμμῆ καὶ γραμμῆ στιγμῆ (ἡ γὰρ οὐσία αὐτῶν ἐκ τούτων ἐστί, καὶ ἐν τῷ λόγῳ τοῦ λέγοντι τί ἐστιν ἐνναρχεῖ) . . .

4 This is given as the definition of 'circle' in Rhet. 1407b 27: cf. also Post. Anal. 92b 20.
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proximate genus and its ultimate differentia, i.e. out of 'moments' resulting from its analysis.

Now every science takes for granted the being and the meaning of its 'kind', and of the 'substances' into which it is articulated, or which are its ἄτομα εἴδη. Plane geometry e.g. assumes that there is such a thing as plane figure, and that plane figure is so-and-so, or must be thus defined. It also assumes that the ἄτομα εἴδη of the γένος—viz. points and lines, and the more complex plane figures (triangle, square, circle) which develop out of them—in some sense 'are real', and mean so-and-so, i.e. must be thus defined. Natural philosophy similarly takes for granted the meaning and the being of φυσικόν σώμα as a γένος, and the meaning and being of the subordinate genera and of the 'substances' or ἄτομα εἴδη into which it is articulated. This assumption of the 'being' of the kind and of its articulations is the ὑπόθεσις of the science. And either the 'kind' itself, or its subordinate genera, or (in the majority of cases) its ἄτομα εἴδη figure as the minor terms of the demonstrative syllogisms which constitute the science; they are the subjects, of which the science demonstrates certain properties.

§ 8. But the articulated 'kind' which is the world of a science—a world, whose inhabitants are individual, and yet universal, substances—exists in fact and actually in, and as, an indefinite multiplicity of singular perceptible embodiments, each of which is a 'this-here-now', not a 'such-everywhere-and-always'. From this point of view, the province of the 'real', upon which a science reflects and which it has to explain, is a world of singular substances—a world of αἰσθητά, rich with an inexhaustible detail of perceptible properties. It is a world manifest to concrete experience, i.e. to sense combined with intelligence; not a world manifest

1 Cf. e.g. Post. Anal. 76a 31-36, b 3-6, 11-13: and for the meaning of ὑπόθεσις, ἵπποιθεσθα in this connexion, cf. e.g. 72a 18-24, 76b 16-19, 35-39, 93b 24-25, &c. The 'kind', as that which the science ἵππο-θετα, is called the γένος ἵπποείκενων.

2 'Substances', in the sense in which Kallias and Sokrates are 'substances': cf. Categ. 2a 11-14.
in toto to thought. And out of this far richer (but only partly intelligible) world, science has to select the terms of its demonstrations—isolating by definition its substances, its properties, and its connecting causes.

Some amongst the characters, which are predicable of the singular representatives of an ἀτομον εἴδος, are essential to their being, as the 'constitutive moments' of their essential nature. These, as we have seen, are formulated by the man of science as the definition of the ἀτομον εἴδος—of that individual, but yet universal, 'substance' (the minor term of the scientific demonstration) whose 'being' and 'meaning' he takes for granted. The remaining characters may be grouped

1 Under 'sense' I here include νόησις, so far as concerns the mathematical things: cf. Metaph. 1036a 2–12.

2 Science starts from a province of the 'real' presented to perception. The 'world of science' in this sense (viz. as that upon which the science reflects, which it endeavours to explain) is a world of singular substances, of αἰσθητά. But the 'real' which is made manifest by science (the 'world of science' as the adequate correlate of scientific explanation) is an intelligible articulated 'kind', an ordered sphere of commensurate connexions between universal substances (types) and universal properties. The difficulty in Aristotle's position is that (i) he sometimes insists that the singulars (this man, this horse, &c.) alone are 'substances' in the proper and primary sense of the term (cf. e.g. Categ. and Metaph. II. cc.): and yet (ii) he emphasizes the substantiality of the objects of φυσική in contrast to the adjectival character of the mathematical things (cf. above, § 5). We should have expected him either (i) to deny the self-subsistence of the perceptible singulars, i.e. to show that the αἰσθητά are only imperfectly 'real'—as indeed he sometimes does: or (ii) to insist that the intelligible world of φυσική, like the intelligible worlds of the mathematical sciences, is a world of adjectivals isolated by definition from the perceptible singular substances which they qualify; and that, therefore, the ἀτομα εἴδη of φυσική (e.g. 'man') are no more 'substantial' than the circle, or 'the number two'. Cf. Metaph. 1035b 27–31; and above, p. xxiii, note 1.

3 Cf. above, § 7, and Post. Anal. 96a 22—b 14. In some of the demonstrations of a science the minor term may be the 'kind' itself, or some subaltern genus, i.e. some specification of the 'kind' short of (wider than) an ἀτομον εἴδος. This, however, does not affect the general principle of the doctrine. For the 'kind', or any subordinate specification of it, is predicable as a 'constitutive moment' in the
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together as πάθη or συμβεβηκότα; and from amongst them the science selects its major terms, i.e. the properties whose 'meaning' it assumes, but whose 'being' it has to demonstrate.¹

In the ideally-perfect scientific demonstration ² the πάθος, which is the major term, must be 'commensurate' with the minor term. In other words, if e.g. the minor term is an ἀτομον εἴδος, the major term must be a property which (a) belongs to every singular representative of the εἴδος, and (b) belongs to the singulars as the necessary consequence of their 'essential nature'. Such a property is called a καθ' αὐτὸ συμβεβηκός (a proprium) of its subject. It attaches to that subject (viz., in the case supposed, to the ἀτομον εἴδος) as a whole, and can neither 'be' nor 'be defined' without the latter. It is found qualifying every singular representative of the εἴδος, and it qualifies (strictly-speaking) ³ no other singular substance. The judgement which affirms the inheritance of a proprium in its subject asserts a precise, reciprocal, nexus between universals. Such a nexus is 'universal' (καθόλου) or 'commensurate': and it is the object of every ideally-perfect scientific demonstration to establish a mediated universal nexus of this kind.⁴

essential nature of all the singular representatives of an ἀτομον εἴδος: cf. above, p. xxiii, note 2.

¹ Cf. e.g. Post. Anal. 76ª 32—36, ²6—16, &c. The 'meaning', which the man of science assumes, is (when explicitly formulated by him) a 'nominal definition' of the πάθος, a λόγος τοῦ τί σημαίνει τὸ ὄνομα (cf. e.g. Post. Anal. 93ª 29—32). The 'being' of a πάθος is its inheritance in its proper subject.

² i.e. in the συνλογισμός τοῦ διψτι (in demonstratio potissima). The proofs actually occurring in any science may fall short of this ideal in various ways and degrees. Cf. e.g. Post. Anal. 74ª 32—b4, 78ª 22—79ª 16.

³ 'White-black-or-coloured' is a proprium of surface (ἐπιφάνεια). Hence, though Sokrates e.g. is white, 'white' really attaches not to Sokrates, but to the surface limiting the solid (σώμα) which is isolable by definition as a quantitative character of Sokrates (cf. above, § 5). In relation to Sokrates 'white' is a mere coincident πάθος, a mere συμβεβηκός. It has no direct essential or necessary connexion with him ᾧα δίον λογικόν.

⁴ Thus e.g. geometry demonstrates that 'the triangle' (i.e. any triad of internal angles resulting from the enclosure of a surface by
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It is true that Aristotle sometimes speaks as if, in certain regions of the province of \( \psi u o k h \), strict 'universal' connexions did not obtain; and as if, therefore, the 'ideal' of scientific demonstration must at times be set lower. Thus in astronomy the \( \psi u o k h s \) demonstrates 'deprivation of light' of the moon; in meteorology he proves the occurrence of 'thunder' in the clouds; and, in what we should call 'physiology', he demonstrates becoming 'grey-haired' of man. But neither moon, nor clouds, nor man exhibit these \( \pi \acute{a} \theta \eta \) invariably or commensurately. Man grows grey only as a general rule; the moon is frequently, but not always, eclipsed; and thunder occurs only occasionally in the clouds. Hence (Aristotle seems at times to maintain) the aim of the \( \psi u o k h s \) is sometimes to establish connexions which are not timeless and not commensurate, but hold only as a general rule or for the most part.

But such apparent exceptions disappear on closer inspection. For the cause, which links such \( \pi \acute{a} \theta \eta \) to their subjects, further determines and purifies either the \( \pi \acute{a} \theta \eta \) or the subjects in such a way that the connexion when demonstrated (i.e. the mediated nexus which is the 'conclusion' of the \( \dot{a} \pi \acute{d} \delta e i \acute{g} i s \)) is commensurate and reciprocal. Thus (not moon in general, but) moon in such a position that the earth screens it from the sun is deprived of light. And this deprivation of light—viz. one caused by the \( \dot{a} \nu r i \phi r a \acute{g} i s \ \gamma \acute{h} s \)—

three straight lines) 'is equal to two right angles'. The application to the isosceles is a mere corollary, and forms no part of the essential logical structure of the science (cf. e.g. Post. Anal. 73\(^{b}\) 26—74\(^{a}\) 3). \textit{Propria} are 'essential' predicates (\( k a \theta \ a i r \acute{a} \)) of their subjects in the second sense of \( k a \theta \ a i r \acute{a} \) recognized by Aristotle (\textit{ib.} 73\(^{a}\) 37 — \(^{b}\) 3). For a predicate is \textit{essential} (i) if it is a 'constitutive moment' in the being of its subject (cf. above, p. xxiii, note 3), or (ii) if it is a necessary consequence of its subject's being. In this second case, the \( \lambda \acute{g} o s \) which defines the predicate must contain the name (or the definition) of the subject as an element. Thus 'straight-or-curved' is a \textit{proprium} of line and 'odd-or-even' of number. Every line must be either straight or curved, every number either odd or even, and nothing else can as such possess these properties. Moreover, it is impossible to define oddness or evenness (or straightness or curvedness) without specifying number (or line) in the definitory formula.
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is lunar eclipse, a *proprium* of moon. Moon-qua-screened-by-the-earth is deprived of light commensurately and timelessly. And the noise, which is thunder, occurs inevitably and invariably in the clouds in so far as fire is quenched in them: *that* noise—viz. the noise caused by the quenching of fire—is a *proprium* of clouds.¹ Finally, growing grey is one amongst the alternatives of a 'disjunctive' *proprium* of man. For man, in so far as increasing age destroys the hair-sacs or follicles, must either grow grey or grow bald, as inevitably as number must be either odd or even, and line straight or curved.²

§ 9. In the ideally-perfect demonstration the *middle term* expresses the proximate (i.e. the precisely-adequate) cause of the inherence of the *proprium* in its commensurate subject.³ Thus, given extinction of fire in the clouds, the noise which is thunder precisely and inevitably results: and, given the interposition of the earth screening the moon from the sun, that deprivation of light, which is a lunar eclipse, is the immediate and inevitable effect.⁴ Aristotle identifies this cause, which appears as the middle term, with a definition of the major term.⁵ And in fact, as we saw,⁶ the *middle*

¹ This definition of thunder (ψόφος ἀποσβεβουμένου πυρὸς ἐν νέφεσιν), which Aristotle constantly quotes in illustration, appears to be derived from the views of Anaxagoras. Aristotle's own theory of thunder is different: cf. Meteor. 369a 10—370a 33.

² I have no doubt that this is the true doctrine, and the only one which is consistent with Aristotle's general conception of ἀποδεικτική ἐπιστήμη: cf. e.g. Post. Anal. 75b 33–36, 98a 35—b 38. Aristotle, however, hesitates: and the reason of his hesitation is his anxiety to maintain man's freedom as an agent, which appeared to him to demand a real indeterminateness in certain parts of nature (cf. de Interpr. 18a 28—19a 22, Pr. Anal. 32b 13–22, Post. Anal. 87b 19–27). Hence he sometimes treats imperfect stages in the development of a scientific demonstration as if they were distinct, though inferior, types of ἀπόδειξις.

³ τὸ πρῶτον ὁπίσω (cf. e.g. Post. Anal. 78a 24–26).

⁴ Another example is the demonstration that 'broad-leaved shrubs must lose their leaves' through the *middle* πῆξις τοῦ ἄγρου, or διὰ τὸ πήγυνον τοῦ ἐν τῇ συνάψει τοῦ σπέρματος ὑπὸν: cf. Post. Anal. 98a 35 ff., b 32–38, 99a 21–29.


⁶ Above, p. xxvii.
helps to define the major (and sometimes also the minor) and thus purifies the connexion, rendering it ‘commensurate’.

In so far, therefore, as a man of science achieves the knowledge which is his aim, and succeeds in expressing it in the ideally appropriate form, his science will appear as an ordered system of apodeictic syllogisms. In these syllogisms every term will be universal; and in the basal syllogisms, on which the system depends, every premiss will be an immediate ‘commensurate’ judgement, reflecting an immediate reciprocally-necessary nexus between substance and proprium, or substance and ‘constitutive moment’, or proximate cause and proximate effect. The conclusion of every syllogism will include the middle term and will be a mediate ‘commensurate’ judgement, reflecting a reciprocally-necessary nexus between substance and proprium mediated through the proximate cause of the inherence of the latter in the former. The three terms of every such apodeictic syllogism can be rearranged and concentrated so as to constitute the adequate scientific definition of the proprium in question. Thus Anaxagoras’s definition of ‘thunder’ is the concentration of the three terms of a scientific demonstration, and includes (a) the clouds as the subject in which, (b) owing to the extinction of fire, (c) that determinate noise, which ‘thunder’ means, must occur. And the adequate definition of ‘lunar eclipse’ is a λόγος including all three terms of a συλλογισμός του διότι. For it states (a) the moon (the minor term) in which, (b) owing to γῆς ἀντίφαξ (the middle term), (c) that deprivation of light (the major term), which ‘eclipse’ means, must occur.²

¹ Cf. above, p. xxviii, note 1.
² Cf. e.g. Post. Anal. 71b 19-25, 84b 19—85a 1, 94a 1—14. The scientific definition of μικρός (see below, *28b 22) is a good example of a concentrated apodeictic syllogism.

None of Aristotle’s examples completely fulfils the conditions of a perfect apodeictic syllogism, adapted to form the basis of a system of scientific demonstrations. The instances quoted above (‘thunder’, ‘eclipse’, ‘shedding of leaves’) are derivative syllogisms: their minor premisses are not immediate, and their middle terms are neither ‘constitutive moments’ nor propria of their minor terms. Yet the
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It is to be observed that, if we take the major and minor terms of an apodeictic syllogism without the middle, we get a formula (λόγος) which is the ‘nominal definition’\(^1\) of a πάθος. Thus ‘noise in the clouds’, ‘deprivation of light in the moon’, ‘unification of the combinable bodies’ (τῶν μικτῶν ἐνωσις) are the nominal definitions of βροντή, ἐκλειψις, and μίγς respectively. And if we expand these formulae into judgements (‘In the clouds there is noise’, ‘In the moon there is deprivation of light’, ‘The combinable bodies exhibit unification’), we get in each instance that unmediated suggestion of a demonstrable connexion which Aristotle calls a πρόβλημα.\(^2\) The man of science starts with a suggested connexion of this kind—with a proposed conclusion. His aim is to mediate it, to find a middle or middles which will convert it into a demonstrated truth. Hence Aristotle sometimes represents him as filling up the interval between subject and predicate of the πρόβλημα, by interpolating the middle or middles which are required to ‘pack’ the whole interval with ‘elementary’, immediate, or self-evident connexions.\(^3\)

schema of the ideally-perfect basal demonstrative syllogism, according e.g. to Post. Anal. 71\(^b\) 19–25, is:—

B precisely and reciprocally carries with it A, for B is A’s proximate cause; C immediately and inevitably involves B (either because B is a ‘constitutive moment’ of C’s being, or because B is a proprium immediately flowing from C’s essential nature);
Therefore C is commensurately linked with A through B.
The favourite example of the old commentators is:—
Rationality (i.e. reason embodied in an animal organism) carries with it, precisely and reciprocally, the power to laugh (i.e. the power to express the intelligent appreciation of the ludicrous by a determinate modification of breathing);
Man immediately and inevitably involves rationality, as the specific differentia constituting his being;
Therefore Man ὑπαλαστικός—and only Man—must be γελαστικόν.

\(^1\) Cf. above, p. xxvi, note 1.
\(^2\) Cf. e.g. Post. Anal. 98\(^b\) 32.
\(^3\) Cf. e.g. Post. Anal. 84\(^b\) 19–85\(^a\) 1. Aristotle’s conception of ἀπόδειξις, looked at from this point of view, is in principle identical with Descartes’ conception of ‘deductio’: see my Essay on the Nature of Truth, pp. 69–72.
§ 10. The composite perceptible substance, which the φυσικός studies in so far as it is changeable, is displayed in our experience as a multiplicity of ‘natural bodies’ (φυσικά σώματα). A ‘natural’ body is one which contains, innately inherent in it, ‘an originaire source of motion and rest’ (άρχη κινήσεως καὶ στάσεως) or ‘an impulse to change’ (δρμὴ μεταβολῆς ἐμφυτος). This αρχὴ is the φύσις of the body, as the ‘form’ which constitutes it, distinguishing a natural from a mathematical body (a ‘solid’) and from a product of τέχνη. The ‘kind’, which is the world of natural philosophy, may be most simply and adequately called σῶμα φυσικόν. It is the business of the φυσικός to demonstrate of the ‘kind’ itself, and of the subordinate genera and ἄτομα ἔιθη into which it is articulated, the propriα which commensurately attach to them.

The ‘kind’ itself—φυσικὸν σῶμα in general—is the subject of Aristotle’s Physics, the first in the series of his works on natural philosophy. In it he discusses (i) πρῶτη ὕλη and ‘the contraries’ (εἴδος, στέρνησι), as the fundamental ‘constitutive moments’ of all φυσικά σώματα which are γεννητὰ καὶ φθαρτὰ: (ii) φύσις, i.e. the originaire source of motion and rest which constitutes all φυσικὰ σώματα, whether eternal or perishable: (iii) motion, the proprium of all φυσικὰ σώματα: (iv) place, time, and continuity, which are predicable of natural body and are necessarily implied in motion: (v) the infinite and the void, which are erroneously supposed to be implied by moving bodies: and so forth.

Next in the systematic order is the de Caelo, in which Aristotle studies the ‘simple’ or elementary natural bodies, in so far as they form so many strata composing the physical

1 Cf. above, p. xviii.  
2 Cf. e.g. Phys. B. i.  
3 In what follows I have drawn freely upon Zabarella’s De naturalis scientiae constitutione (pp. 2-134 in his De rebus naturalibus, Francofurti, MDCXVII). In that admirable work the reader will find an excellent account of the subject-matter of φυσική and a most thorough discussion of the systematic connexion of Aristotle’s ‘physical’ writings.  
4 First in the systematic or logical order, not necessarily first in the order of writing.  
INTRODUCTION

universe. For the natural bodies comprised within the physical universe are either (i) 'simple',¹ or (ii) complex, resulting from the combination or composition of pieces of the simple bodies. Now the 'nature' of a 'simple' natural body is expressed in a 'simple' motion. A simple motion is either rectilinear ('up' or 'down'), i.e. from the centre towards the periphery of the universe, or vice versa) or circular. And Aristotle recognizes five simple natural bodies as composing the physical universe; viz. the Aether, whose 'nature' it is to move eternally in a circle, and Earth, Air, Fire, and Water whose 'natures' are expressed in rectilinear motion.² Earth, Air, Fire, and Water are concrete of form and matter (for they are informations of πρώτη ὑλή), and they together compose the 'Lower Cosmos' or the 'sublunary sphere'—i.e. that part of the physical universe which extends from the earth to the region immediately below the moon. Earth inherently gravitates towards the centre of the universe, and at the centre it is 'by nature' at rest. It is thus the nature of Earth to 'underlie' all other bodies; and it is therefore absolutely heavy, and forms the lowest stratum. Water inherently moves towards a region (or constitutes a stratum) immediately encircling the Earth; and is therefore light relatively to Earth, and heavy relatively to Air and Fire. Air 'by nature' moves up towards a region (or constitutes a stratum) immediately encircling the Water; and is therefore heavy relatively to Fire, but light relatively to Water and Earth. And Fire is absolutely light: for it is its 'nature' to rise above the other three, to 'float on their surface', and thus to constitute the uppermost stratum of the Lower Cosmos.³

¹ They are ἀπλά σώματα, though they are σύνθετοι υἱοί, i.e. concrete of form and matter: cf. e.g. below, * 22b 1–2.
² Cf. de Caelo 268b 14—269a 9. Since there are three 'simple' motions (from the centre, to the centre, and round the centre), Aristotle sometimes speaks of three simple bodies:—viz. (i) the Aether, which is eternally revolving and constitutes the outermost shell of the physical universe, (ii) Earth, which gravitates towards, and rests at, the centre, and (iii) the 'intermediate body', which moves from the centre towards the periphery and includes the three strata, Water, Air, and Fire. Cf. de Caelo 270b 26–31, 277b 12–17, 298b 6–8.
³ Cf. de Caelo 269b 20–29, 308a 14–33, 311a 15ff. This rough
The remainder of the physical universe consists of the fifth simple body, the Aether. It constitutes the whole of the Upper Cosmos—i.e. the outermost shell of the heavens (the πρώτος οὐρανός) and the stars which are set in it, and the planetary spheres together with the planets which they carry. Since its motion is circular, and neither 'up' nor 'down', it is neither light nor heavy. It is unchangeable, ungenerated and imperishable, and in general contrasted in all its properties with the other four simple bodies. 1 Many passages in the de Caelo are devoted to the study of this elusive substance, which is in its own way as full of contradictions as the 'Ether' of modern physical science. We are, in fact, confronted here with one of the most obscure features in Aristotle's natural philosophy. 2 The Aether, the stars, and the planets, although 'divine' or 'heavenly' bodies, are yet included in the province of φυσική: and Aristotle undoubtedly regards them as in some sense φυσικὰ σώματα. The stars and planets are perceptible substances, and 'all perceptible substances have matter'. 3 They must, indeed, qua perceptible be concrete of form and matter: for perception is the presence, in the soul of the percipient, of the form abstracted from the matter of the perceptible thing. 4 Are we then to regard the Aether as the 'matter' of the stars and planets, and the Intelligences, which initiate and control the motions of the spheres, 5 as the souls informing their aetherial bodies? But the Aether itself is a 'simple' natural body: hence it must be concrete of form and matter, and ought to be perceptible. And if it is the 'matter' of the stars and planets, it is their proximate matter, itself the information of a more primary matter; just as Earth, Air, Fire, and Water, though the proximate materials of the compound bodies, are themselves informations of πρώτη ὃλη.

1 Cf. e.g. de Caelo 260b 29—270a 35.
2 Cf. also above, p. xix, note 3, and p. xxii, note 1.
3 Metaph. 1042a 25.
4 Cf. de Anima 424a 17—24, 431b 20—432a 3.
5 Cf. e.g. Metaph. 1073a 14—b 3, de Caelo 292a 18 ff.
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It is equally clear, from another consideration, that the Aether, the stars, and the planets must all involve "matter" of some kind. For though they are eternal and unchangeable, they all are in ceaseless motion: and motion involves matter in the moving thing. For the moving thing occupies successively, and not simultaneously, the different points on its path. It is now actually here and only potentially there: and now actually there, no longer actually here, and only potentially at a third point. Accordingly Aristotle ascribes to the heavenly bodies—and his argument applies to the Aether as well as to the stars and planets1—a ἀλη πόθεν ποῖ (or a ἀλη τνική), though he denies of them ἀλη in any other sense. Clearly they cannot contain the matter which is involved in the perishable and changing things, the ἀλη γεννητή και φθαρτή or the matter of αὐξησις or of ἀλλοϊοσις: for, if they did, they would themselves be subject to γένεσις and φθορά, to αὐξησις and φθίσις, and to ἀλλοϊοσις.2

It is tempting to connect the ἀλη πόθεν ποῖ with the ἀλη νοητή which is the 'matter' of the mathematical planes and solids, i.e. with the empty extensity which may be informed e.g. by circularity to constitute this or that geometrical circle.3

If so, then the Aether is a σύνθετος οὐσία (and thus a proper object of φυσική) qua concrete of νοητή ἀλη and mathematical form: and it is 'perceptible' only in the sense in which this or that geometrical circle or sphere is 'perceptible', viz. intuitable, imaginable, 'perceptible' to the mind's eye, an object of νόησις and not of ἀιδθησις.4

The stars and planets, it would seem, are analogous to the

1 It is primarily the aetherial spheres which 'move', carrying the stars and planets round in their revolutions: cf. e.g. de Caelo 289b 30ff.
3 We cannot identify ἀλη πόθεν ποῖ with the ἀλη of the geometrical planes and solids. For the latter are devoid of motion, whilst the ἀλη πόθεν ποῖ is primarily intended to account for the motion which characterizes the Aether and the heavenly bodies. Still we may perhaps suppose that the 'stuff', which is informed as these moving spheres, is (if we disregard its potentiality for motion) the same as the νοητή ἀλη involved in this or that circle or sphere.
4 Cf. e.g. Metaph. 1036a 2—12, 1036b 32—1037a 5.
living things of the sublunary sphere. They are pieces of aetherial stuff besouled by an Intelligence which initiates and controls the motions of their spheres. The Aether is thus their 'matter' in a sense remotely analogous to that in which pieces of Earth, Air, Fire, and Water are the 'matter' of the perishable living things. The Aether itself is an information of ὀργὴ πῶθεν ποίη, a substance concrete of form and matter, and thus a φύσικόν σώμα. Its φύσις is an inherent tendency to revolve; and, in obeying the initiation of the Intelligence, its revolution is both divinely inspired and 'natural'. We do not 'see' the Aether, except in the sense in which we 'see'—i.e. imaginatively visualize—the geometrical planes and solids. We suppose ourselves to see the stars and planets; but we do not see them as they really are, i.e. we do not see aetherial stuff alive with besouling Intelligence. We see moving solids, solids with such and such shapes and orbits; and we also see (and ascribe to the moving solids) the flames, which the revolving aetherial spheres cause by friction in the immediately subjacent stratum.¹

If this is Aristotle's doctrine, it is difficult to see why the aetherial spheres, and the bodies they contain, should fall within the province of φύσική at all. For—apart from the Intelligences besouling them—they are 'concrete of form and matter' and 'perceptible' only in the sense in which the mathematical things are so. Yet Aristotle insists that the aetherial spheres, the stars, and the planets are not 'adjectivals', but substances,² and substances in a very special sense. For each of them is the unique singular representative of a species, i.e. is both an ἀτομον εἶδος and an actually-existent singular. Hence they are 'eternal substances' and yet 'perceptible', timeless-actually species, sole individuals in which the type is precisely and completely fulfilled. Here—and here alone—the subjects of demonstrative science are 'substances' both

¹ Cf. de Caelo 289a 19–35, where Aristotle ascribes the apparent light and heat of the stars and planets to this cause. There is a more exact statement of this curious theory in Meteor. A. 3, where, however, Aristotle is referring only to the heat, and primarily to the heat of the sun. Cf. also * 22b 2–3.
² Cf. also above, p. xix, note 3.
universal and sheerly singular. The subject, e.g., of which ‘eclipse’ is demonstrated, is the moon: and the moon is identically also this moon.\(^1\)

§ 11. Next to the *de Caelo* in the systematic order, if not also in the order of writing,\(^2\) comes the present treatise. The πάθη here primarily in question are γένεσις and φθορά. Aristotle distinguishes them from the other forms of change (αλλοίωσις, αύξησις and φθίσις) which occur in the natural bodies of the Lower Cosmos, and demonstrates their ‘inheritance’ in their ‘proper subject’. But what is this proper subject? What is the minor term of which γένεσις and φθορά are demonstrated?

All the natural bodies of the Lower Cosmos are γεννητὰ καὶ φθαρτά, and γένεσις and φθορά are therefore propria (or a proprium) of them all. The proper or commensurate subject, of which these πάθη are demonstrated, must accordingly be taken to include all the natural bodies in the sublunary sphere. And Aristotle does in fact treat in full of the γένεσις and φθορά of the ‘simple’ natural bodies (Earth, Air, Fire, and Water), and refers, though only incidentally, to the γένεσις and φθορά of the most complex of the natural bodies, i.e. to the birth and death of the living things.\(^3\)

Nevertheless, if we look more closely at the contents of the treatise, we shall find that Aristotle is primarily concerned with the γένεσις and φθορά of the ὁμοιομερὴν. These are the first, or most rudimentary, compound natural bodies, resultants of the combination (μίγσις) of pieces of Earth, Air, Fire, and Water.\(^4\) And Aristotle explains the γένεσις and φθορά of the ‘simple’ bodies because they are the proximate material constituents of the ὁμοιομερὴν, and because their combination (which produces the ὁμοιομερὴν) necessarily implies their γένεσις and φθορά. Aristotle’s references to the

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\(^1\) Cf. *Post. Anal.* 74\(^a\) 7–8, 16–17, 33–34. Aristotle’s illustrations are fictitious ones, drawn from plane geometry; but his doctrine applies, without any fiction, to astronomical demonstrations, if my account of his astronomical views is correct.

There is an interesting discussion of the Aether in Zabarella’s *De Natura Caeli*.

\(^2\) Cf. below, *14\(^a\) 1.

\(^3\) Cf. below, e.g. *28\(^b\) 32–33.

\(^4\) Cf. below, e.g. *14\(^a\) 19.
γένεσις and φθορά of the living things are quite general and vague. There is no discussion of these πάθη quia distinctive of the ἐμψυχα, no treatment of the birth and death which are the ‘coming-to-be’ and the ‘passing-away’ of an organic-body-vitalized-by-soul. The living things, however, in their birth and death share in the γένεσις and φθορά of the δόμοιομερῆ: for the σῶμα ἐμψυχοῦν is a σῶμα ὄργανικόν, and every ὄργανον is a σύνθεσις of δόμοιομερῆ. Hence, to this limited extent, Aristotle’s treatment, though primarily directed to elucidate the γένεσις and φθορά of the δόμοιομερῆ, applies also to the coming-to-be and passing-away of the ἐμψυχα.

§ 12. The following brief outline may be of service to the reader:

(i) A. 1–5 (314a 1—322a 33). The πάθη which are to be demonstrated—viz. coming-to-be and passing-away, growth and diminution, alteration—are distinguished from one another by precise definitions of the meaning of the terms. Incidentally (a) the discussion establishes (against the views of some of the early Greek philosophers) the occurrence of coming-to-be and passing-away as changes distinct from alteration and again from the composition and dissolution of an aggregative whole: and (b) πρῶτη ὑλή is shown to be presupposed as the ground of γένεσις and φθορά, and of their never-failing alternation in the Lower Cosmos.

Growth and diminution are fully discussed in chapter 5. Aristotle restricts the meaning of the terms to growth and diminution proper, i.e. in the ἐμψυχα.

(ii) A. 6–10 (322b 1—328b 22). The second part of Aristotle’s task is to discover and define the causes of coming-to-be and passing-away, in order that we may be in a position to demonstrate the ‘inherence’ of these πάθη in their proper subject

1 Cf. below, e.g. * 21b 17–19, * b 19–22.
2 Cf. Zabarella, De nat. sc. constitutione, pp. 56–61. His view is summarized thus (p. 61 c, d): ‘In libris ... de generatione dicimus agi et de caduco corpore generaliter, et de misto generaliter, quia nullus est alius liber naturalis, in quo vel de hoc vel de illo agatur; sed hoc eo modo, quem declaravimus, intelligendum est, ut generatio ita in rebus inesse cognoscatur, ut revera inest, misto ut subjecto praecipuo, elementis ut principiis, corpori autem caduco ut subjecto adaequato,’ etc.
and thus to formulate their adequate scientific definitions. Now Earth, Air, Fire, and Water are the proximate matter (the material constituents) of the ὁμοιομερή, and thus medially the matter of all the complex natural bodies which come-to-be: and they constitute the ὁμοιομερή by combination (μίξις). Combination implies Action and Passion (ποιεῖν καὶ πάσχειν), and Action and Passion imply Contact (αφή). Hence Aristotle discusses, explains, and defines ἀφή (A. 6), ποιεῖν—πάσχειν (A. 7–9), and μίξις (A. 10).

(iii) B. 1–8 (328b 26—335a 23). These chapters contain a thorough and exhaustive investigation of the so-called 'elements' (Earth, Air, Fire, and Water) as the material constituents of the compound natural bodies, and of those reciprocal transformations of the 'elements' which are necessarily implied in their combination to form the ὁμοιομερή.

(iv) B. 9–11 (335a 24—338b 19). These chapters contain (a) a brief discussion of the material and formal causes of coming-to-be (B. 9); (b) a short account of the final cause, and an elaborate account of the efficient cause, together with an explanation of the 'continuity' of coming-to-be (B. 10); (c) a proof that any continuous coming-to-be which is cyclical (i.e. any sequence of events which is unbroken and returns upon itself) exhibits genuine, as well as conditional, necessity.

1 Cf. above, § 9.
ΑΡΙΣΤΟΤΕΛΟΥΣ

ΠΕΡΙ ΓΕΝΕΣΕΩΣ ΚΑΙ ΦΘΟΡΑΣ
SIGLA

E = cod. Parisiensis Regius 1853
E² = quae in eodem codice, manu tamen recentiore addita vel correcta, leguntur

J = cod. Vindobonensis, phil. Graec. 100
J² = quae in eodem codice manu recentiore addita a lectionibus libri L differunt (vide praefationem)

F = cod. Laurentianus 87. 7
F² = quae in eodem codice manu recentiore addita vel correcta commemoratione digna videbantur

H = cod. Vaticanus 1027
L = cod. Vaticanus 253

Quinque tantum locis citatur etiam

Dᵇ = cod. Ambrosianus F. 113 sup.

Γ = versio Latina commentariis ab Averroe in Aristotelis opera conscriptis inclusa et impressa Venetiis anno 1483 ab Andrea Asulano

Φ₁, Φ₁, Φ₀ Philoponi commentaria, Hieronymi Vitelli studio Berolini anno 1897 edita, respiciunt. Scilicet Φ = lectio quae eadem et in lemmate exhibetur et in commentario tractatur: Φ₁ = lectio quae non nisi in lemmate continetur: Φ₀ = lectio quae, quamvis in lemmate non reperiatur, in commentario tamen citatur vel e commentario colligenda videtur. Denique dissidentia librorum, quibus Vitelli in constituendo Philoponi textu usus est, siglis post Φ, Φ₁, et Φ₀ adiectis interdum notatur. Itaque, exempli gratia, lectionem Philoponi codicum R et Z auctoritate, invitis ceteris, in lemmate receptam siglo Φ₁ (codd. RZ) significavi.
ΑΡΙΣΤΟΤΕΛΟΣ
ΠΕΡΙ ΓΕΝΕΣΕΩΣ ΚΑΙ ΦΘΟΡΑΣ Α

Περὶ δὲ γενέσεως καὶ φθορᾶς τῶν φύσει γνωμένων καὶ 314α
φθειρομένων, ὁμοίως κατὰ πάντων, τὰς τε αλλὰ διαιρε-
tέων καὶ τῶν λόγων αὐτῶν, ἔτι δὲ περὶ αὐξήσεως καὶ ἀλ-
λοισεως, τί ἐκάτερον, καὶ πότερον τὴν αὐτήν ὑπολήπτεον
eίναι φύσιν ἀλλοισέως καὶ γενέσεως, ἥ χωρὶ, ὀσπερ 5
διώρισται καὶ τοῖς ὀνόμασιν. τῶν μὲν οὖν ἀρχαῖοι οἱ μὲν τὴν
cαλουμένην ἀπλήν γένεσιν ἀλλοιωσιν εἶναι φασιν, οἱ δὲ ἐτέ-
ρον ἀλλοιώσων καὶ γένεσιν. ὅσοι μὲν γὰρ ἐν τῷ τῶν εἶναι
λέγουσι καὶ πάντα ἐξ ἐνὸς γεννώσι, τούτων μὲν ἀνάγκη
tὴν γένεσιν ἀλλοιωσιν φάναι καὶ τὸ κυρίος γεγομένον ἀλ-
λοισθαν. ὅσοι δὲ πλέον τὴν ὑλὴν ἐνὸς τιθέοσιν, οὐν Ἐμ-
πεδοκῆς καὶ Ἀναξαγόρας καὶ Λεύκιππος, τούτως δὲ ἐτέ-
ρον. καίτοι Ἀναξαγόρας γε τὴν οἰκείαν φωνὴν ἡγηνύθεν—λέ-
geι γοῦν ὅσ τὸ γέγονεθαι καὶ ἀπόλλυσθαι ταύτων καθέστηκε
τῷ ἀλλοιωσθαί, πολλὰ δὲ λέγει τὰ στοιχεῖα, καθάπερ καὶ 15
ἐτεροι. Ἐμπεδοκῆς μὲν γὰρ τὰ μὲν σωματικὰ τέταρα,
tὰ δὲ πάντα μετὰ τῶν κινοῦντων ἐξ τῶν ἀριθμῶν, Ἀνα-
ξαγόρας δὲ ἀπειρα καὶ Λεύκιππο καὶ Δημόκριτος (ὅ μὲν
γὰρ τὰ ὁμοομερῆ στοιχεῖα τίθησιν, οὐν ὡστὸν σάρκα
μυελοῦ καὶ τῶν ἄλλων δὲν ἐκάστῳ συνώνυμον τὸ μέρος ἐστὶν, 20
Δημόκριτος δὲ καὶ Λεύκιππος ἐκ σωμάτων ὁδιαθέτων ταλ-

α 1 δὲ om. E 3 αὐτῶν διαιρετέον ἐτὶ F 5 φύσιν εἰςai L:
einoi φύσιν εἰναι E¹ 6 διϊώρισται καὶ ἀρισταὶ E¹ μὲν τὴν] μὲν
οὖν τὴν E 8-9 λέγουσιν εἴναι EL 9 γεννῶσιν] γεγονέται H, et
fecit E μὲν om. H: μὲν δὴ F 10 ἀλλοιωσιν τὴν γένεσιν H
gεγομένου καὶ ἀλλοιωθαί F 12 δὲ om. F¹HL
FH 14 οὖν . . . ἀπολύσθαι in litura add. J, prima tamen
manus καὶ τὸ F tauto FJL 16 μὲν prius om. HL 19 οὖν
om. H καὶ post ὀστοῦν add. HL καὶ post σάρκα add. FHL
20 μυελοῦ καὶ ἄλοιπο καὶ H καὶ τῶν] τῶν δὲ E ἐκάστου
FHLδζ συνώνυμος FL: συνώνυμον post μέρος H ἐστίν]
cataphoroitai L 21 τάλλα] ταύτα EF: haec et alia Γ

2234 B
ΠΕΡΙ ΓΕΝΕΣΕΩΣ ΚΑΙ ΦΘΟΡΑΣ Α

λα συγκείσθαι φασί, ταῦτα δ’ ἀπειρα καὶ τὸ πλήθος εἶναι καὶ τὰς μορφὰς, αὐτὰ δὲ πρὸς αὐτὰ διαφέρει τοῦτοι ἐξ ἃν εἰσι καὶ θέσει καὶ τὰξει τοῦτοι: ἐναντίως γὰρ φαίνων· 25 ταῖς λέγοντες οἱ περὶ Ἀναζαγόραν τοῖς περὶ Ἐμπεδοκλέα. ὁ μὲν γὰρ φησὶν πῦρ καὶ ὕδωρ καὶ ἀέρα καὶ γῆν στοιχεία τέταρτα καὶ ἀπλὰ εἶναι μᾶλλον ἡ σάρκα καὶ ὀστοῖν καὶ τὰ τουαῦτα τῶν ὁμοιομερῶν· οἱ δὲ ταῦτα μὲν ἄπλα καὶ στοιχεία, γῆν δὲ καὶ πῦρ καὶ ἦδωρ καὶ ἀέρα σύνθετα—παν· 314 οπερμάλα γὰρ εἶναι τούτων. τοῖς μὲν οὖν ἐξ ἑνὸς πάντα κατα- σκευάζοντων ἀναγκαίον λέγει τὴν γένεσιν καὶ τὴν φθόραν ἀλλοίωσιν, ἀεὶ γὰρ μένειν τὸ ὑποκείμενον ταῦτῳ καὶ ἐν (τὸ δὲ τοιοῦτον ἀλλοιωθεῖν φαμεν)· τοῖς δὲ τὰ γένε πλείω ποιο- 5 σι διαφέρεις τὴν ἀλλοίωσιν τῆς γένεσεως—συνώνυμων γὰρ καὶ διαλομένου ἡ γένεσις συμβαΐνει καὶ ἡ φθόρα. διὸ λέγει τοῦτον τὸν τρόπον καὶ Ἐμπεδοκλῆς, ὅτι "φύσις οὐδενὸς ἐστιν . . . ἀλλὰ μόνον μέξις τε διάλαξις τε μιγέων". οὗτος μὲν οὖν οἶκείος ὁ λόγος αὐτῶν τῇ ὑποθέσει οὐκ ὁμοίως, δὴλον, 10 καὶ οὗτος λέγοντας τὸν τρόπον τοῦτον· ἀναγκαῖον δὲ καὶ τούτου τῆς ἀλλοίωσιν εἶναι μὲν τι φάναι παρὰ τὴν γένεσιν, ἀδύ- νατον μὲν τινα κατὰ τὰ ὑπ’ ἐκείνων λεγόμενα. τοῦτο δὲ οὗτος λέγομεν ὁρθῶς, βάδιον συνιδεῖν. ὁσπερ γὰρ ὅρωμεν ἡρμούη- σις τῆς οὕσιας ἐν αὐτῇ μεταβολὴν κατὰ μέγεθος, τὴν κα- 15 λομένην αὐξήσιν καὶ φθόνος, οὐτώ καὶ ἀλλοίωσιν οὐ μὴν ἀλλ’ ἐξ ὧν λέγουσιν οἱ πλεῖοι αρχαῖοι ποιοῦσι μιᾶς ἀδύ- νατον ἀλλοιωθεῖν. τὰ γὰρ πάθη, καθ’ ὃ φαμεν τοῦτο συμ- βαίνειν, διαφορᾶ τῶν στοιχείων εἰς τό, λέγω δ’ οἶνον θερμῶν ψυχρῶν, λευκῶν μέλαιν, ἅλως, γαρν, ἐκεῖνοι ἵπποι, μαλακῶν σκληρῶν καὶ 20 τῶν ἀλλῶν ἔκαστον, ὁσπερ καὶ φησὶν Ἐμπεδοκλῆς "ἡλιοὺς μὲν λευκῶν ὁρᾶν καὶ θερμῶν ἀπάντητη, ὁμβρῶν δ’ ἐν πᾶσιν

a 22 φησι Λ. εἶπαι post μορφᾶς F 23 πρὸς αὐτὰ FH
dιαφέρει F 24 γὰρ] δὲ FHLφ1 25 περὶ τῶν Ἀναζαγόραν F
26] δὲ ΦΓ φησὶ Γ στοιχεία εἶναι F 27 τέταρτα om. sed
-date supra lin. add. J μᾶλλον εἶναι F 28 ὁμοιομερῶν μερῶν F:
similium partium Γ 29 γῆν . . . ὕδωρ] πῦρ δὲ καὶ ὕδωρ E1 καὶ
post πῦρ om. F b 3 μένει J (sed post μένει erasum aliquid) et φ1,
Bonitz 4 δὲ prius om. E 5 τὴν γένεσιν τῆς ἀλλοίωσεως fecit E
7 λέγει καὶ τοῦτον L 8 τε καὶ διάλαξις τε L 9 et 11 φάνει J
10 καὶ δει] δει καὶ E 11 τι] τι F 12 ὑπ’ ἐκείνων fecit E
16 ποιοῦται L 19 λευκῶν] καὶ H σκληρῶν μαλακῶν EL 20 καὶ
φησίν] φησί καὶ F 21 ὁρᾶν] ὁρὰ EL
δυναμέντα τε ἡ μεγάλειν τε” (ὁμοίως δὲ διωρίζει καὶ ἐπὶ τῶν λοιπῶν) ὅστ' ἐλ ἡ δυνατόν ἐκ πυρὸς γίνεσθαι ὕδωρ μηδ' ἐξ ὕδατος γίνεται, οὐδ' ἐκ λευκοῦ μέλαν ἔσται οὐδέν οὐδ' ἐκ μαλακοῦ σκληρῶν (δ' αὐτὸς λόγος καὶ περὶ τῶν ἄλλων), τούτῳ δ' ἦν 25 ἀλλόωσις. ἦ δ' καὶ φανερὸν ὅτι μιᾶν ἀεὶ τοῖς ἐναντίωσι ὑποθετέοιν ὑλὴν, ἃν τε μεταβάλλῃ κατὰ τόπου, ἃν τε κατ' αὐξήσιν καὶ φθώσιν, ἃν τε κατ' ἀλλόωσιν. ἦτι δ' ὁμοίως ἀναγκαῖον εἶναι τούτῳ καὶ ἀλλόωσιν· ἐτέ γὰρ ἀλλόωσις ἦτι, καὶ τὸ ὑποκείμενον ἐν στοιχείοι καὶ μία πάντων ὑλὴ 315θ ὑπὸ τῶν ἐχόμεν ἐλ ἡ ἀλληλα ὑπερβάλλην, καὶ εἶ τὸ ὑποκείμενον ἐν, ἔστι ἀλλόωσις. Ἐμπεδοκλῆς μὲν οὗτ έἰκεν ἐναντία λέγει καὶ πρὸς τὰ φαινόμενα καὶ πρὸς αὐτὸν αὐτός. ἅμα μὲν γὰρ ὁ φήσιν ἐτέρου εἶ ἐτέρου γίνεσθαι τῶν στοιχείων οὐδέν, 5 ἀλλὰ πάλιν πάντα ἐκ τούτων, ἅμα δ' ὅταν έλ ἐν συναγάγῃ τὴν ἀπασάν φύσιν πλῆν του νείκους, ἐκ τοῦ ἐνδ' γινεσθαι πάλιν ἑκαστών· ὅστ' εἰ ἐνδ' τινω δήλων ὅτι διαφοράς τοις χωριζομένοις καὶ πάθεσιν ἐγένετο τὸ μὲ ν ὕδωρ τὸ δὲ πῦρ, καθάπερ λέγει τοῦ μὲν ἡλίου λευκὸν καὶ θερμόν, τῆς 10 δὲ γῆ ὁμοίω καὶ σκληρῶν. ἀφαιρομένων οὖν τούτων τῶν διαφόρων (εἰς γὰρ ἀφαίρεται γενόμεναι γε) δήλων ὡς ἀνάγκη γινεσθαι καὶ γῆς εἰ ἐνδ' ὕδατος καὶ ὕδωρ ἐκ γῆς, ὁμοίως δὲ καὶ τῶν ἄλλων ἑκαστῶν, οὐ τότε μόνον ἀλλὰ καὶ νῦν, μεταβαλλότα γα τοῖς πάθεσιν. ἐστι δ' εἰ δ' ὃν εἰρήκε δυνάμενα 15 προσγίνεσθαι καὶ χωρίζομαι πάλιν, ἄλλως τε καὶ μαχομένων ἀλληλοις ἐτί τοῦ νείκους καὶ τῆς φιλίας, διότι καὶ τότε εἰ ἐνδ' ἐγεννηθησαν—οὐ γὰρ δὴ πῦρ γε καὶ γῆ καὶ ὕδωρ οὔτα ἐν ἤν τοῦ πάνω. ἀδήλων δὲ καὶ πάτερον ἀρχὴν αὐτῷ βεβείν τὸ ἐν ἣ τὰ πολλά, λέγω δὲ πῦρ καὶ γῆν 20 καὶ τὰ σύστοιχα τούτων. ἦ μὲν γὰρ ὃς ὅλη ὑπόκειται, εἰ δ' οὐ μεταβαλλότα διὰ τὴν κίνησιν γίνονται γῆ καὶ πῦρ, τὸ

b 22 δυναμέντα Γ' ἦτι, καὶ ὑπερβάλλην, Ε' οὐδὴν Η' οὐδὲν Ε' 26 ἄλλοιϊς Ε' σερ κορετίς ἦ ἤ Ε' Ε' Η' Η' δεῖ ... ὑποθετέον] ὑποθετέοιν ἐνάντια τοῖς ἐναιτίως Η' δεῖ ἄντιοι ὑποθετέοι εἰ 27-28 ἀν τε κατ' ἀναϊσι καὶ φθώνισιν οὖν Ε' α 1 μία τοῦ Φ' 4 ἐκατὸν Φ' αἰτὸς οὖν Ε' 12 γενόμενα Ε' ὁ ὁμείς Ε' ἀναγκαῖος Η' 16 προσγίνεσθαι] 18 γε οὖν Φ' 19 ύδωρ ἐτι ἀνα Bekker: ἦτι οὖν ομ. codd. omnes, Φ' καὶ Γ'. Infra lin. (sub ύδωρ) incerta quedam habet H' 20 αἰτῶν Η': αἰτὰ ς Φ' τοῖς πολλα τὸ ἐν Φ' καὶ οὖν Φ' 22 γίνεται Φ' πῦρ καὶ γῆ Φ' γῆ καὶ τὸ ύδωρ Φ' : ignis et terra et aqua Γ'
ἐν στοιχείον: ἦ δὲ τούτο μὲν ἐκ συνθέσεως γίγνεται συνώντων ἐκείνων, ἐκείνα δ’ ἐκ διαλύσεως, στοιχειωδέστερα ἐκείνα καὶ 25 πρότερα τῷ φύσιν.

"Ολος τε ὁ περὶ γενέσεως καὶ φθοράς τῆς ἀπλῆς 2 λεκτέων, πότερον ἑστιν ἡ οὐκ ἔστι καὶ πᾶς ἔστιν, καὶ † περὶ τὰς ἀλλὰς κινήσεις, ὃν περὶ αὐξήσεως καὶ ἀλλοώσεως. Πλάτων μὲν οὖν μόνον περὶ γενέσεως ἐσκέψατο καὶ 30 φθοράς, ὡποὶ ὑπάρχει τοῖς πράγμασι, καὶ περὶ γενέσεως οὐ πάσης ἀλλὰ τῆς τῶν στοιχείων, πῶς δὲ σάρκες ἢ ὡτὰ ἢ τῶν ἄλλων τι τῶν τοιούτων, οὐδέν. Εἶτε οὖν περὶ ἀλλοώσεως οὖν ἐπεί περὶ αὐξήσεως, τίνα τρόπον ὑπάρχουσι τοῖς πράγμασιν. ὅλως δὲ παρὰ τὰ ἐπιπολῆς περὶ οὐδενὸς οὐδεὶς ἐπέστησεν ἐξω
35 Δημοκρίτου οὖν τὸ ἐοίκε μὲν περὶ ἀπάντων φροντίσα, ἢδη 315 ὁ ἐν τῷ πώς διαφέρειν. όστε γὰρ περὶ αὐξήσεως οὐδεὶς οὖν διώρισεν, ὡσπερ λέγομεν, ὃ τι μὴ κἂν ὁ τυχῶν εἶπεν, ὅτι προσονίων αὐξᾶναιτι τῷ ὑπάρξει (πῶς δὲ τῷ, οὐκέτι), οὐδὲ περὶ μίξεως, οὐδὲ περὶ τῶν ἄλλων ὡς εἰπεῖν οὐδενός, οὐν 5 τοῦ ποιεῖ ἢ τοῦ πάσχει, τίνα τρόπον τὸ μὲν ποιεῖ τὸ δὲ πάσχει τῶν φυσικῶν ποιήσεως. Δημοκρίτου δὲ καὶ Δεύκτης 315 ποιήσεαι τὰ σχήματα τῆς ἀλλοώσεως καὶ τῆς γένεσιν ἐκ τούτων ποιοῦν, διακρίσεις μὲν καὶ συγκρίσείς γένεσιν καὶ φθοράν, τάξει δὲ καὶ θέσει ἀλλοώσεως. ἔπει δ’ ὁ θυντο 10 ληθὲς ἐν τῷ φαινεῖται, ἐναῦτα δὲ καὶ ἀπειρά τὰ φαινόμενα, τὰ σχήματα ἀπειρὰ ἐποίησαν, ὡστε ταῖς μεταβολαῖς τοῦ συγκειμένου τὸ αὐτὸ ἐναυτὸν δοκεῖν ἄλλῳ καὶ ἄλλῳ, καὶ μετακωμείθησαν μικρῶθεν ἐμμεγαλυμενύον καὶ ὦλος ἐτερον φαίνεσαι ἐνός μετακωμιθέντος—ἐκ τῶν αὐτῶν γὰρ τραγῳδίαν 15 καὶ κωμῳδία γίνεται γραμμάτων. ἔπει δὲ δοκεὶ σχεδὸν

216 gēnesis kai ἀλλοίοσις K kai γίνεσθαι μὲν kai ἀνθρακότων ἐναι καὶ ἄλλοιοσις, kai γίνεσθαι μὲν kai φθείρεσθαι συγκρινομένα kai διακρινομένα, ἄλλοιοσιαὶ δὲ μεταβάλλοντων τῶν παθημάτων, περὶ τούτων ἐπιστήμασίς θεωρητέον. ἀπορίαι γὰρ ἔχει ταῦτα kai πολλαὶ kai εὐλόγια. ἐι μὲν γὰρ ἐστὶ σύγκρισις ἡ γένεσις, πολλὰ ἀδύνατα 20 συμβαίνει. εἰς δὲ αὐτὸν ἔτερον ἀναγκαστικοὶ kai ὅπως εὑ- ποροι διαλύουσι ὡς οὐκ ἐπιθύμησι ἀλλὰς ἔχειν καὶ ἐστὶ σύγκρισις ἡ γένεσις, ἢ ὅλως οὐκ ἔστι γένεσις ἡ ἀλλοίοσις, ἢ καὶ τοῦτο διαλύσει χαλεπὸν ὑπὲρ τερατέων. ἀρχή δὲ τούτων πάντων, πότερον οὕτω γίνεσθαι kai ἄλλοιοσιαὶ kai αὖ- 25 ἔσται ἡ ὑπὸ kai τάναντι τούτοις πάντῃ, τῶν πρῶτων ὑπαρχόντων μεγεθῶν ἀδιαμέτρων, ἡ οὕτων ἐστὶ μεγέθος ἀδιαμέτρων διαφέρει γὰρ τούτῳ πλείστον. kai πάλιν εἰ μεγέθη, πότερον, ὡς Δημόκριτος kai Λέκικππος, σῶμα ταῦτ' ἐστὶν, ἢ ὅσπερ εἰς τῷ Τιμαιῷ ἐπίσειδα; τοῦτο μὲν οὖν αὐτό, 30 καθάπερ kai καὶ ἐν ἀλλοις εἰρήκαμεν, ἄλογον μέχρι ἐπιπέδων διαλύεσθαι; διὸ μᾶλλον ἐξερχόμενο σῶμα εἶναι ἀδιαμέτρητο, ἀλλὰ kai ταῦτα πολλὰν ἔχει ἄλογίαν. ὅμως δὲ τούτοις ἀλλοίωσι kai γένεσις ἐνδιέχεσθαι ποιεῖται, καθάπερ ἐφέρτα, τροπὴ kai διαθεμῆτι μετακινοῦσι τὸ αὐτὸ kai ταῖς τῶν σχη- 35 μάτων διαφοράς, ὑπὲρ ποιεῖ Δημόκριτος (οὗ διὸ kai χροίναν ἀντὶ φησιν εἶναι—τροπὴ γὰρ χρωματίζεσθαι), τοῖς δὲ εἰς ἐπί- πεδα διαμείναντα οὐκέτι οὕτων ἐστὶν γὰρ γίνεσθαι πλὴν στερεά συντεθημένων, τάθεον γὰρ οὐδ' ἐγχειρήσῃ γεννάν οὐδὲν ἔξ αὐτῶν. αὐτῶν δὲ τοῦ ἐπὶ ἔλαττον δύνασθαι τὰ ὁμολογομένα συνορῶν 5 ἡ ἀπερία· διὸ οὐκ εὐφρόνησαι μᾶλλον ἐν τοῖς φυσικοῖς, μᾶλλον δύνασαι ὑποτίθεσθαι τοιαύτας ἀρχὰς αἱ ἐπὶ πολλ' δύνασαι συνεργεῖ, οἱ δ' ἐκ τῶν πολλῶν λόγων ἀδειφρῶτοι

τῶν ὑπαρχόντων ὄντες, πρὸς ὅληγα βλέποντες, ἀποφαίωνον·
ται μέν. ήδον δ' ἂν τις καὶ ἐκ τούτων δόσον διαφέρουσιν οἱ
φυσικῶς καὶ λογικῶς σκοποῦντες· περὶ γὰρ τὸν ἄτομα εἶναι
μεγέθη οἱ μέν φασίν ὦτι αὐτὸ τὸ τρέχων πολλὰ ἐσται,
Δημόκριτος δ' ἂν φανεὶ ὀλίκειοι καὶ φυσικοῖς λόγοις πε-
πείσθαι. δῆλον δ' ἐστι δ' ἱέγομεν προίοντων. ἔχει γὰρ ἀπο-
15 πλαί, εἰ τις θείη σῶμα τι εἶναι καὶ μέγεθος πάντη διαμε-
τῶν, καὶ τοῦτο δυνατόν. τί γὰρ ἐσται ὅπερ τὴν διαίρεσιν δια-
φεύγει; εἰ γὰρ πάντη διαμετῶν, καὶ τοῦτο δυνατόν, κἂν
ἀμα εἶν τοῦτο διηρημένον, καὶ εἰ μὴ ἀμα διηρηταῖ καὶ
καὶ τοῦτο γένοιτο, οὐδὲν ἂν εἶν αὐτῶνον. οὕκοι καὶ κατὰ
20 τὸ μέσον ὁσαυτῶς, καὶ ὅλως δὲ, εἰ πάντη πέφυκε διαμετῶν,
ἀν διαμεθῆ, οὐδὲν ἐσται ἀδύνατον γεγονός, ἐπεὶ οὐδ' ἂν εἰς
μυρία μυριάκις διηρημένα (διαμεθῆ)η', οὐδὲν ἀδύνατον καὶ τοῦτο
δοῦνοι ἂν δίελοι. ἐπεὶ τοῦτο πάντη τοιούτων ἐστὶ τὸ σῶμα,
διηρήσθω. τὶ οὖν ἐσται λοιπῶν; μέγεθος; οὐ γὰρ οὖν τε ἐσται
25 γὰρ τι ὅποι διηρημένον, ἥν δὲ πάντη διαμετῶν. ἀλλὰ μὴν εἰ
μηδὲν ἐσται σῶμα μηδὲ μέγεθος, διαίρεσις δ' ἐσται, ἢ ἐκ
στιγμῶν ἐσται, καὶ ἀμεγέθη ἢς ἂν σύγκεισαι, ἢ οὐδὲν παν-
τάπασιν, ὥστε κἂν γίνοιτε ἀν μηδενὸς κἂν εἶν συγκείμενον,
καὶ τὸ πᾶν δὴ οὐδὲν ἀλλ' ἡ φαινόμενον. ὁμοίως δὲ κἂν
30 ἐκ στιγμῶν, οὐκ ἐσται ποσῶν. ὅποτε γὰρ ἡπτούτο καὶ εἰν
μέγεθος καὶ ἀμα ἵσταν, οὐδὲν ἐπολοῦν μεῖζὸν τὸ πᾶν διαμε-
θέντος ὑπὸ εἰς ὅλως καὶ πλείως, οὐδὲν ἐλαττὸν οὐδὲ μεῖζὸν
tὸ πᾶν τὸ πρότερον ὥστε κἂν πᾶσα συντεθῶσιν, οὐδὲν ποιήσουσι
μέγεθος. ἀλλὰ μὴν καὶ εἰ τὶ διαμετημένον οὖν ἐκπέμψα
316 γίνεται τοῦ σώματος, καὶ οὕτως ἐκ τὸς μεγέθους σῶμα τι

a 9 ἀποφαίωνων] ἀπεκρίματο L 10 δοσῶν Е: ὅσω L 11 εἶναι
tὸ τρ.] τὸ αὐτὸ τρ. ]: τὸ αὐτοτρίγωνον FHLΦ 13 οἰκεῖοι Ε: ἔκλεος vel
τοῦτο δυνατὸν ομ. Е] ὅπερ] παρὰ Е διαφέρειν Е 17 κάν
καὶ Е 18 τοῦτο ομ. Φ] τοῦτο πάντη διηρημένον Φ ἀμα τοῦτο
dιηρήται F 19 εἰ om. H: γένεται FH 20 το om. Е, et Φ
(exceptis codd. GT) 21 ἂν prius] εἰν Φ: κἂν FL διαιρεθεὶν F
ei om. ЕF] εἰ J 22 μιρία om. ЕJ, et erasit F3 suprascr. εἰ
dιηρημένα (δ' αἱρεθ)'scripsi: διηρημένα Φ ЕΗ] Φ: εὶν διηρημένα εἰν F
(priore tamen εἰν eras, et secundo εἰν τc. manu addito) 29 η
om. HJ Φ] εἰ HL 30 ἐστι Λ ἦν ἂν μέγεθος J: ἐν μέγεθει
(omission ἤν) H 32 η καὶ Φ] πλείους ЕF 33 προτέρου F
πνεύματι F  b 1 τοῦ post εκ om. Φ
άπερχεται, ὁ αὐτὸς λόγος· ἐκεῖνο γὰρ πῶς διαιρετῶν; εἰ δὲ μὴ σῶμα ἀλλ’ εἶδος τὰ χωριστῶν ἢ πάθος ἀπῆλθεν, καὶ ἐστὶ τὸ μέγεθος στιγμαὶ ὃ ἀφ’ αὐτὸν παθότατα, ἄτοπον ἐκ μὴ μεγεθῶν μέγεθος εἶναι. ἔτι δὲ ποῦ ἔσονται, καὶ ἀκάλυπτος ὃ 5 κυνοὺμεναι αἱ στιγμαί; ἀφ’ αὐτὶ μὲν μία δύον τινῶν, ὡς ὥστοι τῶν παρὰ τὸν ἄφην καὶ τὴν διαίρεσιν καὶ τὴν στιγ- μήν. εἰ δὴ τις θῆσεται ὃ τινοῦ ὁ ὄρθικοισθεὶ σῶμα εἶναι πάντη διαιρετῶν, ταῦτα συμβαίνει. ἔτι ἐὰν διελθῶν συνθῶ τὸ ἔντον η ἢ τῇ ἀλλῳ, πάλιν ἔσον τε καὶ ἐν. ὑστόρων ὀυτῶς ἔχει 10 ὁμολογῇ κἀν τέμω τὸ ἔντον καθ’ ὁτινῶν σημείων· πάντη ἀρὰ διήρηται δυνάμει. τὶ όν περὶ παρὰ τὴν διαίρεσιν; εἴ γὰρ καὶ ἐστὶ τὶ πάθος, ἀλλὰ πῶς εἰς ταῦτα διαλύεται καὶ γίνεται ἐκ τούτων; ἡ πῶς χωρίζεται ταῦτα; ὡςτ’ εἰπερ ἀδύνατον εὖ ἂφ’ ἢ στιγμῶν εἶναι τὰ μεγέθη, ἀνάγκη εἶναι σῶματα 15 ἀδαιρετὰ καὶ μεγέθη. ὦ μὴν ἀλλ’ καὶ ταῦτα θεμένοις ὦν ἢ τὸν συμβαίνει ἀδύνατα· ἐσκεπταὶ δὲ περὶ αὐτῶν εἰ ἐτέρους. ἀλλὰ ταῦτα πειρατέων λύειν, διὸ πάλιν εὖ ἂρχῆς τὴν ἀπορίαν λεκτέων. τὸ μὲν ὄν ποὺ αἰσθητὸν εἶναι διαιρετοῦν καθ’ ὁτινῶν σημείων καὶ ἀδαιρετῶν οὐδὲν ἄτο- 20 πον’ τὸ μὲν γὰρ δυνάμει, τὸ δ’ ἐνεπελεξάται ὑπάρξῃ. τὸ δ’ εἶναι ἀμα πάντη διαιρετῶν δυνάμει ἀδύνατον δοξεῖν ἐν εἶναι. εἰ γὰρ δυνατῶν, καὶ γένειτο (οὐχ ὡστε ἄμα εἴναι ἄμφω ἐνεπελεξάται, ἀδαιρετῶν καὶ διηρημένουν, ἀλλὰ διηρη- μένου καθ’ ὁτινῶν σημείων) οὐδέν ἀρὰ ἔσται λοιπόν, καὶ εἰς 25 ἀνάματον ἐφθαρμένον τὸ σῶμα, καὶ γέγονεν δ’ ἀν πάλιν ἢ τοι ἐκ στιγμῶν ἢ ὑλῶς εὖ οὐδενός. καὶ τούτο πῶς δυνατῶν; ἀλλὰ μὴν ὅτι γε διαιρεῖται εἰς χωριστὰ καὶ δεῖ εἰς ἐλάττω μεγέθη καὶ εἰς ἀπέχουσα καὶ κεχωρισμένα, φαινονέν. οὔτε δὴ κατὰ μέρος διαιροῦντι εἰς ἀν αἰτερίος ἢ θρυσίς, οὔτε ἀμα 30

οἶνον τε διαπρεπήναι κατὰ πᾶν σημεῖον (οὐ γὰρ δυνατόν), ἀλλὰ μέχρι τοῦ ἀνάγκη ἄρα ἀτομα ἐνυπάρχειν μεγάθη ἀόρατα, ἄλλως τε καὶ ἐπερ ἔσται γένεσις καὶ φθορά ἡ μὲν διακρίσει ἡ δὲ συγκρίσει. ὁ μὲν οὖν ἀναγκάζειν δοκῶν
317οὶ λόγος εἶναι μεγάθη ἀτομα οὐτός ἔστιν· ὅτι δὲ λαυνάνει παρά
λογιζόμενος, καὶ ἡ λαυνάνει, λέγομεν. ἐπεὶ γὰρ οὐκ ἔστι στιγμὴ στιγμῆς ἐχομένη, τὸ πάντη εἶναι διαιρέτων ἔστι μὲν ὡς ὑπάρχει τοῖς μεγέθεσι, ἔστι οὕς οὖν. δοκεῖ δ', ὅταν τούτῳ 5 τεθῇ, καὶ ὅπως καὶ πάντῃ στιγμῆν εἶναι. ὅστ' ἀναγκαῖον ἐσται διαιρέτην τὸ μέγεθος εἰς μιθὲν—πάντῃ γὰρ εἶναι στιγμῆν, ὅστε ἡ ἐξ ἀφών ἡ ἐκ στιγμῶν εἶναι. τὸ δ' ἔστιν ὡς ὑπάρχει πάντῃ, ὅτι μία ὅπηρον ἔστι καὶ πάσαι ὡς ἐκάστην πλεονεύς δὲ μᾶς οὐκ εἰσίν (ἐφεξῆς γὰρ οὐκ εἰσίν), ὅστ' οὐ πάντῃ.
10 εἰ γὰρ κατὰ μέσον διαιρέτων, καὶ κατ' ἐχομένην στιγμὴν ἐσται διαιρέτων' (οὐκ ἔστι δὲ), οὐ γὰρ ἐστὶν ἐχομένου σημείου σημεῖον ἡ στιγμὴ στιγμῆς, τοῦτο δ' ἔστι διαιρέσεις ἡ σύνθεσις. ὅστ' ἔστι καὶ σύγκρισις καὶ διακρίσις, ἀλλ' οὖν εἰς ἄτομα καὶ εἰς ἀτόμων (πολλὰ γὰρ τὰ ἀδύνατα) οὔτε οὕτως ὅστε πάντῃ 15 διαιρέσως γενέσθαι (εἰ γὰρ ἦν ἐχομένη στιγμῆ στιγμῆς, τοῦτ' ἢν ἦν), ἀλλ' εἰς μικρὰ καὶ ἠλάττω ἐστι, καὶ σύγκρισις εἰς ἐλαττών. ἀλλ' οὕς ἡ ἀπλὴ καὶ τελεία γένεσις συγκρίσει καὶ διακρίσει ὃρισται, ὡς τινὲς φασίν, τὴν δ' ἐν τῷ συνεχεὶ μεταβολήν ἀλλοίωσιν, ἀλλὰ τούτ' ἔστιν ἐν ὃι 20 ὁ σφάλλεται πάντα· ἔστι γὰρ γένεσις ἀπλῆ καὶ φθορά οὐ συγκρίσει καὶ διακρίσει, ἀλλ' ὅταν μεταβάλλῃ ἐκ τούτῳ εἰς τὸ τὸ ὅλον. οὐ δὲ οἰόνται ἀλλοίωσιν εἶναι πάσαν τὴν τοιαύτῃ μεταβολήν· τὸ δ' διαφέρει. ἐν γὰρ τῷ ὑποκείμενῳ τὸ μὲν ἔστι κατὰ τὸν λόγον, τὸ δὲ κατὰ τὴν ἐπιθυμίαν.

3 Διωρισμέναν τῶν τούτων, πρώτων θεωρητέον πότερον ἔσται τι γινόμενον ἅπλῶς καὶ φθειρόμενον, ἡ κυρίως μὲν οὖν ἄει, ἀεὶ δ' ἐκ τισος καὶ τί, λέγω δ' οὖν ἐκ κάμποστον ὑγιανοῦν καὶ κάμφον ἐξ ὑγιανοῦτος, ἡ μικρὸν ἐκ μεγάλου καὶ 35 μέγα ἐκ μικροῦ, καὶ τάλλα πάντα τούτον τῶν τρόπων. EL 317β γὰρ ἁπλῶς ἔσται γένεσις, ἅπλῶς ἂν τι γίνοιτο ἐκ μὴ οὖντος, ὅστ' ἀληθὲς ἂν εἰπ' λέγειν ὅτι ὑπάρχει τοις τῷ μὴ οὖν· τις μὲν γὰρ γένεσις ἐκ μὴ οὖντος τιμώς, οὖν ἐκ μὴ λευκοῦ· μὴ καλοῦ, δ' ἰδ' ἀπλῆ ἐξ ἅπλῶς μὴ οὖντος. τὸ δ' ἁπλῶς 5 ἤτοι τὸ πρῶτον σημαίνει καθ' ἕκαστὴν κατηγοριαν τοῦ οὖντος, τὸ τὸ κάθολου καὶ τὸ πάντα περιέχον. εἰ μὲν οὖν τὸ πρῶτον, οὐσίας ἔσται γένεσις ἐκ μὴ οὐσίας. δ' ἐκ μὴ ὑπάρχει οὐσία μιθὲ τὸ τόδε, δὴ λογος ὁς οὐδὲ τῶν ἀλλων οὔδεμα κατηγοριῶν, οὖν οὔτε ποιεῖ οὔτε ποιήσει οὔτε τὸ ποι. (χωριστά γὰρ ἐν εἰς τὰ πάθη τῶν οὐσιῶν). εἰ δ' τὸ μὴ οὖν ἄλος, ἀπόφασις ἔσται καθολου πάντων, οὐσία οὕτως ἐκ μηδενὸς ἀνάγκη γίνεσθαι τὸ γινόμενον. περὶ μὲν οὖν τούτων ἐν ἄλλως τε διηπόρηται καὶ διωρισται τοὺς λόγους επὶ πλεύνοις, συντόμως δὲ καὶ νῦν λεκτέων, ὅτι τρόπων μὲν τινα ἐκ μὴ οὖντος ἁπλῶς 15 γίνεται, τρόπον δὲ ἄλλον ἐξ ὦτου ἄει· τὸ γὰρ δυνάμει ὁ ἐνεπελεχεῖα· δὴ μὴ ὃν ἀνάγκη προοπάρχειν λεγόμενον ἄμφοτέρως. δ' ὅτι καὶ τούτων διωρισμένων ἔξει θαυμαστὴν ἀπο-

plau, pāliiē ἐπαναποδιστέων, πῶς ἔστων ἀπλῇ γένεσις, εἰτ'
20 ἐκ δυνάμεις ὄντος ὄντα εἶτε καὶ πῶς ἄλλος. ἀπορρήσει γὰρ
αὖ τις ἀρ' ἐστιν οὐσίας γένεσις καὶ τοῦ τοῦδε, ἀλλὰ μὴ τοῦ
touμβδε καὶ τοσοῦδε καὶ ποῦ (τῶν αὐτῶν δὲ τρόπον καὶ περὶ
φθορᾶς). εἰ γὰρ τι γίνεται, ὑδην ὡς ἔσται δυνάμεις τις
οὐσία, ἑντελεχεῖα δ' οὐ, ἢς ἡ γένεσις ἔσται καὶ εἰς ἐν
25 ἀνάγκη μεταβάλλειν τὸ φθειρόμενον· πότερον οὖν ὑπάρξει τι
τούτῳ τῶν ἄλλων ἑντελεχείᾳ; λέγω δ' οὗτον ἃρ' ἔσται ποσὸν
ἡ ποιῶν ἢ ποῦ τὸ δυνάμει μόνον τὸ δέ καὶ οὐ, ἀπλῶς δὲ μὴ
tὸ δέ μηρ' οὖν; εἰ γὰρ μηδὲν ἀλλὰ πάντα δυνάμει, χρωμο-
στὸν τε συμβαίνει τὸ μὴ οὐσῖν ὑν καὶ ἐτί, ὃ μάλιστα φο-
30 βούλευοι διετέλεσαν οἱ πρῶτοι φιλοσοφήσαντες, τὸ ἐκ μη-
δείνὸς γίνεσθαι προοπάρχοντος: εἰ δὲ τὸ μὲν εἶναι τὸδε τι
ἡ οὐσίαν οὐχ ὑπάρξει, τῶν δ' ἄλλων τι τῶν εἰρημένων,
ἔσται, καθάπερ εἴπομεν, χρωστῶν τὰ πάθη τῶν οὐσιών. περὶ
tε τούτων οὖν ὅσον ἐνδέχεται πραγματευτέον, καὶ τίς αἰτία
35 τοῦ γένεσιν ἂεi εἶναι, καὶ τὴν ἀπλὴν καὶ τὴν κατὰ μέρος.

318οὐσιας δ’ αἰτίας μᾶς μὲν ὅθεν τὴν ἀρχήν εἶναι φαιμὲν τῆς
κινήσεως, μᾶς δὲ τὴν ὅλης, τὴν τοιαύτην αἰτίαν λεκτέον.
περὶ μὲν γάρ ἐκείνης εἰρηται πρότερον εν τοῖς περὶ κινήσεως
λόγοις, ὅτι ἐστὶ τὸ μὲν ἀκίνητον τῶν ἀπαντά χρόνον, τὸ δὲ
5 κινοῦμενον ἂεί· τούτων δὲ περὶ μὲν τῆς ἀκίνητον ἀρχής τῆς
ἐτέρας καὶ προτέρας διελεῖν ἐστι φιλοσοφίας ἐργον, περὶ δὲ
tοῦ διὰ τὸ συνεχῶς κυνωθαι τάλλα κυνωθος ὑστερον ἀπο-
δοτεον, τι τοιοῦτον τῶν καθ’ ἕκαστα λεγομένων αἰτίων ἔστιν.
νῦν δὲ τὴν ὅσον ἔν ὅλης εἴδει τιμεμένη αἰτίαν εἴπομεν, δι’ ἑν
10 ἂεὶ φθορὰ καὶ γένεσις οὐχ ὑπολείπει τὴν φύσιν—ἀμα γὰρ

ὅ20οὐσα] οὐσία Η· οὐσίας Λ· 21 τοῦ post μη om. Λ· 22 τοιού-
δε] τοιουτοῦδε Ε· καὶ τού τοσοῦδε Φ· καὶ τοῦ ποῦ Φ] δὲ] δὴ
FHL 23 ei om. Ε τι] fort. legendum τοδὲ τι 24 οὐσία]
οῦσα Ε· εἰ . . . ἔσται om. E· ἔσται om. J· ἔσται om. J· ἔσται τοῦ Φ
tοῦ F 26 τοῦτῳ τοῦτο Φ· λέγω om. Ε· οἶνον om. Η· ποιῶν
ἡ ποιῶν J· 27 τὸ] τῷ Η· μόνον] ἃ FL δὲ] το το Φ· 29 το đ
το E· μὴ οὖσα om. EL.δο: οὔτως μη Η· οὔτως μη Φ]· quod sit (l. sic)
non ens G· ἔτι om. Ε· 31 γίνεσθαι om. Ε· τι ἢ] τὴν J· 32 οὐσία
ΕΦ· sed οὐσία feclt Ε· ὑπάρξει FL· 33 χρυσάτα J· 34 πραγ-
ματέον Λ· 35 εἶναι post ἀπλὴν EL· Α· τῆς κινησῖς εἶναι
φαιμὲν F· 4 ὅτι δὲ ἔστιν E· πάντα Ε· δὲ om. Ε· add. supra
lin. J· 5 τῆς ἀκίνητον om. (ut videtur), et ἀρχής post ἑτέρας ponit
E· τῆς ἀντε ἑτέρας om. F· 6 ἑτέρας καὶ om. Λ· 8 τοιοῦτων Λ
τῶν om. Ι
14 tiv] de[ tiv Ph1 15 mev] o[vde[ me[ : od[ de[ L 17 anwtrai HJ
palai in marg. add. F 18 he[ E] ginwstai tov om. E.
ymbolem E 22 mivn] e[ ] 26 om] de[ peri F 27 olgion
ikwv[pwv] aitiv F 28 legemtai [vne]tai F kai] ta de kai E:
ta de Pl 29 apilom E esto om. L 30 phorad gwevsi
ta tov om. L 32 vov] vov mev Pl 35 od. kathap] o[ gar
cathapr E diorotme[ pollakis FHL b 3 om. E 4 esto
om. L Pl 5 tis phorad tis gwevsi de phorad E1 tis gwevsi
phorad L: gwevsi tis, phorad Pl
άπλως, οὖν πυρός—ὡσπερ Παρμενίδης λέγει δύο, τὸ ἄν καὶ τὸ μή ὁν λεν ψάκωνιν Γίρμ καὶ γῆν. τὸ δὴ ταύτα ἢ τοιοῦτο ἐτέρα ὑποτίθεσθαι διαφέρει οὐδὲν τῶν γὰρ τρόπων ζητοῦμεν, ἀλλ' οὖν τὸ ὑποκείμενον. ἢ μὲν οὖν εἰς τὸ μὴ ὑν ἀπλῶς ὡδὸς φθορὰ ἀπλὴ, ἢ δ' εἰς τὸ ἀπλῶς ὑν γένεσις ἀπλῆ. οὖς οὖν διάρισται, εἴτε πυρὶ καὶ γῆ εἴτε ἄλλους ταύτα, τούτων ἐσται τὸ μὲν ὅν τὸ δὲ μὴ ὑν. ἐνα μὲν οὖν τρόπον τούτῳ διοίσει τὸ ἀπλῶς γίνεσθαι καὶ φθείρεσθαι τοῦ μὴ ἀπλῶς, ἄλλον δὲ τῇ ὕλῃ ὑπόλα τις ἢ ἢ μὲν γὰρ μᾶλλον οἱ διαφοραὶ τὸ οἱ σημαίνονσι, μᾶλλον οὐσία, ἢς δὲ στέρσῃ, μὴ οὖν εἰς τὸ μὲν θερμὸν κατηγορία τις καὶ εἰδὸς, ἢ δὲ ψυχρότης στέρησις, διαφέρουσι δὲ γῆ καὶ πῦρ ταύτας ταῖς διαφοραῖς. δοκεῖ δὲ μᾶλλον τοὺς πολλοὺς τῷ αἰσθητῷ καὶ μὴ αἰσθητῷ διαφέρειν ὅταν μὲν γὰρ εἰς αἰσθητήν μεταβάλλῃ ὑλὴν, γίνεσθαι φασών, ὅταν δ' εἰς ἄφαντι, φθείρεσθαι. τὸ γὰρ ὅν καὶ τὸ μὴ ὁν τῷ αἰσθάνεσθαι καὶ τῷ μὴ αἰσθάνεσθαι διορίζοντω, ὡσπερ τὸ μὲν ἐπιτητήν ὅν, τὸ δ' ἁγνωστόν μὴ ὅν (ἢ γὰρ αἰσθησις ἐπιστήμης ἔχει δύναμιν) καθάπερ οὖν αὐτοὶ τῷ αἰσθάνεσθαι ἢ τῷ δύνασθαι καὶ ζην καὶ εἰσὶ νομιζοῦντοι, οὕτω καὶ τὰ πράγματα, τρόπον των διάκουστε τάλανθες, αὐτὸ δὲ λείγοντες οὐκ ἄληθες. συμβαλεῖ δὴ κατὰ δόξαι καὶ κατ' ἀλήθειαν ἄλλως τὸ γίνεσθαι τε ἀπλῶς καὶ τὸ φθείρεσθαι πνεύμα γὰρ καὶ ἄθροι κατὰ μὲν τὴν αἰσθησιν ἑττῶν ἑπτῶν (διὸ καὶ τὰ φθειρόμενα ἀπλῶς τῇ εἰς ταύτα μεταβολῆ φθείρεσθαι λέγουσιν, γίνεσθαι δ' ὅταν εἰς ἄπτον καὶ εἰς γήν μεταβάλλῃ), κατὰ δ' ἀλήθειαν μᾶλλον τὸδε τι καὶ εἰδὸς ταύτα τῆς γῆς. τοῦ μὲν οὖν εἰσὶ τὴν μὲν ἀπλῆν γένεσιν φθορὰν οὐ-

12 ΠΕΡΙ ΓΕΝΕΣΕΩΣ ΚΑΙ ΘΟΡΑΣ Α

σάν τινος, τήν δὲ φθοράν τήν ἀπλήν γένεσιν οὐδὲν τινος, εἰ-ρηται τὸ αἰτίου (διὰ γὰρ τὸ τήν ὅλην διαφέρειν ἢ τῷ οὐσίαν 35 εἶναι ἢ τῷ μὴ, ἢ τῷ τῆν μὲν μᾶλλον τὴν δὲ μή, ἢ τῷ την 319a μὲν μᾶλλον αἰσθητὴν εἶναι τὴν ὅλην εἰς ἢ καὶ εἰς ἢν, τὴν δὲ ἂττων εἶναι): τοῦ δὲ τὰ μὲν ἀπλῶς γίνεσθαι λέγεσθαι, τὰ δὲ τι μῶνον, μὴ τῇ ἢ ἀλλήλων γενέτει καθ’ ὑπέμονεν νῦν τρόπον (νῦν μὲν γὰρ τοσοῦτον διώριστα, τί δ’ ποτε πα- 5 σης γενέσεως οὐσῆς φθορὰς ἄλλου, καὶ τάς φθορὰς οὐσῆς ἐτέρου τινὸς γενέσεως, οὐχ ὁμοίως ἀποδίδομεν τὸ γίνεσθαι καὶ τὸ φεβερεσθαι τοῖς εἰς ἀλλήλα μεταβάλλουσιν: τὸ δ’ ὅστερον εἰρήμενον οὐ τούτο διαπορεῖ, ἀλλὰ τί ποτε τὸ μανθάνων μὲν οὗ λέγεται ἀπλῶς γίνεσθαι ἀλλὰ γίνεσθαι ἐπιστήμων, τὸ δ’ το φυόμενον γίνεσθαι), ταῦτα δὲ διώρισται ταῖς κατηγορίαις. τὰ μὲν γὰρ τὸε τι σημαίνει, τὰ δὲ τοιώθε, τὰ δὲ ποσοῦν ὡσα οὖν μὴ οὐσίαν σημαίνει, οὐ λέγεται ἀπλῶς, ἀλλὰ τι γί-νεσθαι. οὐ μὴν ἀλλ’ ὁμοίως εἰς πάσιν γένεσιν μὲν κατὰ τὰ ἐν τῇ ἐτέρᾳ συστοιχίᾳ λέγεται, οἷον ἐν μὲν οὐσία ἐὰν πῦρ ἄλλ’ 15 οὐκ ἔαν γῆ, ἐν δὲ τῷ ποῦ ἐὰν ἐπιστήμων ἀλλ’ οὖκ ὅταν ἀνεπιστήμων. περὶ μὲν οὖν τοῦ τὰ μὲν ἀπλῶς γίνεσθαι τὰ δὲ μή, καὶ ὅλως καὶ ἐν ταῖς οὐσίαις αὐταῖς, ἔρηται, καὶ διότι τοῦ γένεσιν εἶναι συνεχῶς αὐτία ὡς ὅλη τὸ ὑποκείμενον, ὃτι μεταβλητικὸν εἰς τάναυτα καὶ ἐστὶν ἡ βατέρου γένεσις ἀεὶ 20 ἐπὶ τῶν οὐσίων ἄλλου φθορᾶ καὶ ἡ ἄλλου φθορᾶ ἄλλου γένε-σις. ἀλλὰ μὴν οὐδ’ ἀπορήσαι δεῖ διὰ τί γίνεται ἀεὶ ἀπολ-λυμένον· ὥσπερ γὰρ καὶ τὸ φεβερεσθαι ἀπλῶς φασιν, ὅταν εἰς ἀναίσθητον ἔλθῃ καὶ τὸ μὴ οὐ, ὁμοίως καὶ τὸ γίνεσθαι ἐκ μὴ οὕτως φασιν, ὅταν εἰς ἀναίσθητον. εἰτ’ οὖν οὕτως τινὸς τοῦ 25
τὸ πότερον τῶν ἐναυτῶν ἐστὶ, οἷον γῆ καὶ τὸ βαρύν μὴ ὄν, τὸ δὲ καὶ τὸ κοῦφον ὄν, ἡ οὔ, ἀλλ' ἐστι καὶ γῆ τὸ ὄν, τὸ δὲ μὴ ὄν ὥλη ἡ τῆς γῆς καὶ πυρὸς ὑστάτως; καὶ ἄρα γε ἑτέρα ἐκατέρω ἡ ὥλη, ἡ οὔκ ἂν γι-κατέρων, ἀλλ' ἂν ἐστιν (τούτου γὰρ ὑπάρχει τάνασσα, πυρί, γῆ, υδάτι, ἀέρει); ἡ ἔστι μὲν ἡ, ἡ αὐτή, ἐστι δ' ὡς ἑτέρα; ὃ μὲν γὰρ ποτε ὄν ὑπόκειται, τὸ αὐτό, τὸ δ' ἐναι οὐ τὸ αὐτό. περὶ μὲν οὕν τούτων ἐπὶ τοσοῦτον 5 εἰρήσων.

περὶ δὲ γενέσεως καὶ ἀλλοιώσεως λέγομεν τι διαφέ- 4
ροντι—φαμέν γὰρ ἑτέρας ἐστίν τάς μεταβολὰς ἀλ-
λήλοις. ἐπειδὴ οὖν ἔστι τι τὸ ὑποκείμενον καὶ ἑτέρον τὸ πάθος ὃ κατὰ τὸ ὑποκείμενον λέγεσθαι τέφυκεν, καὶ ἔστι μεταβολὴ 10 ἐκατέρων τοῦτων, ἀλλοιώσεις μὲν ἔστιν, ὅταν ὑπομένειτο τὸ ὑποκείμενον, αἰσθητοῦ ὄντος, μεταβάλλει ἐν τοῖς ἐαυτοῦ πά-
θεσιν, ἡ ἐναυτῖνος οὕσων ἡ μεταξύ (οἷον τὸ σώμα υγιαίνει καὶ πάλιν κάμει υπομένου γε ταῦτα, καὶ ὁ χάλκος στρογ-
γύλος ὅτε δὲ γανοειδής ὁ αὐτός· γε ὄν)· ὅταν δ' οἶλον μετα-

15 βάλλῃ μὴ ὑπομένειτο αἰσθητοῦ τινος ὡς ὑποκείμενον τοῦ αὐτοῦ, ἀλλ' οἶνον ἐκ τῆς γονής αἴμα πάσης ἡ ἦ ἡ υδάτος ἅρ ἡ ἦ ἡ ἀερὸς παντοῦ τῷριφω, γένεσις ὡθή τὸ τοσοῦτον, τὸ δὲ φθόρα, μάλιστα δὲ, ἀν ἡ μεταβολὴ γίνεται ἢ ἀναισθήτου ἐλς αἰσθητοῦ ἡ ἄφη ἡ πάσας ταῖς αἰσθησεσι· οἷον ὅταν

ūdor gēntai ἡ φθαρῆ εἰς ἀέρα, ὃ γὰρ ἄηρ ἐπιεικὸς ἀναι- 20 σῆτον. ἐν δὲ τοῦτοι ἀν τι ὑπομένῃ πάθος τὸ αὐτὸ ἐναντιώ- 
σεως ἐν τῷ γενομένῳ καὶ τῷ φθαρέντι (οὗν ὅταν εἰς ἀέρος ὑδώρ, εἰ ἄμφω διαφανῆ ἡ ψυχρᾶ), οὐ δει τούτον θάτερου πάθος εἶναι εἰς δ ἐμπαθήλλει: εἰ δὲ μή, ἔσται ἄλλοσις. οὗν ὁ μουσικὸς ἀνθρωπὸς ἐφθάρη, ἀνθρωπὸς δ' ἄμους ἐγέ- 25 ντο, ὃ δ' ἀνθρώπους ὑπομενεῖ τὸ αὐτό. εἰ μὲν οὖν τούτον μή 
πάθος ἴν καθ' αὐτό ἡ μουσική καὶ ἡ ᾿αμοῦσια, τού μὲν γένε- 
σις ἵν τι, τοῦ δὲ φθορά: νῦν δὲ πάθος τοῦ τοῦ ὑπομενόντος, 
διὸ ἀνθρώπου μὲν ταῦτα πάθη, ἀνθρώπου δὲ μουσικοῦ καὶ 
ἀνθρώπου ἄμουσον γένεσις καὶ φθορά—διὸ ἀλλοωσις τὰ 30 
tοιαῦτα. οὗν μὲν οὖν κατὰ τὸ ποσὸν ἦ ἡ μεταβολή τῆς ἐναντιώσεως, 
ἀξίη καὶ φθορίς, ὅταν δὲ κατὰ τόπον, φορά, ὅταν 
δὲ κατὰ τὸ τοῖον καὶ τὸ ποιόν, ἀλλοώσις, ὅταν δὲ μη- 
δὲν ὑπομενή οὐ βάτερον πάθος ἡ συμβεβηκὸς ὀλος, γένεσις, 320a 
tὸ δὲ φθορά. ἔστι δὲ ἡ ὑλή μάλιστα μὲν κυρίως τὸ ὑπο- 
κείμενον γενέσεως καὶ φθορᾶς δεκτικῶν, τρόπον δὲ των καὶ 
τὸ ταῖς ἄλλαις μεταβολῶς, ὅτι πάντα δεκτικὰ τὰ ὑπο- 
κείμενα ἐναντιώσεων των. περὶ μὲν οὖν γενέσεως, εἰτε 5 
ἔστω εἰτε μή, καὶ πῶς ἔστι, καὶ περὶ ἄλλοωσεως διωρίσθω 
tοῦτον τοῦ τρόπον.

5 περὶ δὲ ἀνδιχθέως λοιπὸν εἰπέν, τὶ τε διαφέρει γενε- 
σεως καὶ ἄλλοωσεως, καὶ πῶς αὐξάνεται τῶν αὐξανομέ- 

νων ἔκαστον καὶ βθύνει ὅτι οὐ τῶν φθινοντῶν. σκεπτέον δὴ 10 
πρῶτον πότερον μόνος ἐν τῷ περὶ δὲ ἐστιν αὐτῶν ἡ πρὸς ἀλ- 

tηλα διαφόρα (οὗν ὅτι ἡ μὲν ἐκ τοῦτον εἰς τὸ ἔε μεταβολή

5. 320a 13 — 320b 34

δ' οἶνοι εἰς γίγνεται ἄληρ εξ ὑδάτως, οὐ τοῦ ὑδάτος ἐστι μεταβάλλοντος, ἀλλὰ διὰ τὸ ὡσπερ ἐν ἀγγείῳ τῷ ὑδατί ἐπιεῖναι τὴν ὠλην αὐτοῦ. ἀπείρους γὰρ οὐδὲν κωλύει ὡλὰς εἶναι, τὸ ὡστε καὶ γίγνεσθαι ἐντελεχεία. εἰτ' δ' οὐ' οὖθω φαίνεται γεγυμένος ἄληρ εξ ὑδάτως, οὐον ἔξιδων ὑπομένοντος. βέλτιον τοῖσιν ποιεῖν πᾶσιν ἀχώριστοι τὴν ὠλην ὡς οὖσαν τὴν αὐτὴν καὶ μαίν τῷ ἀριθμῷ, τῷ λόγῳ δὲ μὴ μίαν. ἀλλὰ μὴν οὐδὲ στιγμὰς θετέον οὐδὲ γραμμὰς τὴν τοῦ σώματος ὠλην διὰ 15 τὰς αὐτὰς αἰτίας· ἐκεῖνο δὲ ὅταν ταῦτα ἐσχάτα ἡ ὠλη, ἢν οὐδέποτ' ἀνεί πάθους οἶνον τε εἶναι οὐδ' ἀνεί μορφῆς. γίγνεται μὲν οὖν ἀπλως ἐτερον εξ ἐτερον, ὡσπερ καὶ ἐν ἄλλοις διώριστα, καὶ ὑπὸ των δὲ ἐντελεχεῖα ὅπτος ἡ ὁμογενοὶ ἡ ὁμοειδοὶ (οἶνον πῦρ πῦρ πῦρ ἡ ἀνθρωπος ὑπ' ἀνθρωποτ) 20 ἡ ὑπ' ἐντελεχείας [σκληρὸν γὰρ οἰχ ὑπὸ σκληροῦ γίνεται]. ἐπεὶ δ' ἐστὶ καὶ οὐσίας ὠλη σωματικῆς, σώματος δ' ἤ' ὁμή τοιούτι (σώμα γὰρ κοινον οὖδέν), ἡ αὐτή καὶ μεγέθους καὶ πάθους ἐστὶ, τῷ μὲν λόγῳ χωριστῆ, τότῳ δ' ὀν χωριστῆ, εἰ μὴ καὶ τὰ πάθη χωριστά. φανερὸν δὲ ἐκ τῶν διηπτοριμένων ὅτι 25 οὐκ ἐστὶν αὐξησίας μεταβολῆ ἐκ δυνάμει μεγέθους, ἐντελεχεία δὲ μηδὲν ἔχοντος μέγεθος χωριστὸν γὰρ ἂν εἴη τὸ κενόν, τοῦτο δ' ὅτι ἀδύνατον, εἰρήνη τό ἐτεροι πρότερον. ἐτὶ δ' ἡ γε τοιαύτη μεταβολῆ οὐκ αὐξηθείτων οἴοις ἀλλὰ γενέσεως ὁλος. ἡ γάρ αὐξηθεί αὕτη τοῦ ὑπάρχουσα μεγέθους ἐπὶ 30 δοσις, ἡ δ' φθῖσις μελασις (διὰ δὴ ἔξεχον τι δελ μέγεθος τὸ αὐξανόμενον), ὡστ' οὖν εξ ἀμεγέθους ὠλης δελ εἶναι τὴν αὐξησιν εἰς ἐντελεχείαν μεγέθους γένεσις γὰρ ἂν εἴη σώματος μᾶλλον, οὐκ αὐξηθεί. λιπτεύον δὴ μᾶλλον οἴον ἀποτέμουσι.
δ' ἀν τις καὶ τι ἐστὶ τὸ ἀυξανόμενον, πότερον ἡ προστίθεται 30 τι, οἷον ἐπὶ τὴν κνῆμιν ἀυξάνει, αὐτὴ μείωσι, ὥ δὲ ἀυξά-
νει, ἡ τροφή, οὐ. διὰ τὸ δὴ ὧν ὦν ἀκμὸς ἦλθεται; μείωσι
γὰρ καὶ ὃ καὶ ὁ, ὡσπερ ὅταν μέξην ὦν ἦν ὁμοίως
γὰρ πλεῖον ἐκάτερον. ῥ οίτι τοῦ μὲν μένει ἡ οὐσία, τοῦ δ' οὐ,
οἷον τῆς τροφῆς; ἐπεὶ καὶ ἐνταῦθα τὸ ἐπικρατοῦν λέγεται εἰν 35
τῇ μίξῃ, οἷον ὧν ὦνος: ποιεῖ γὰρ τὸ τοῦ οὖν ἔργον ἀλλ' οὖ 321b
τὸ τοῦ ὑδατος τὸ σύνολον μῆγα. ὁμοίως δὲ καὶ ἐπ' ἀλ-
λοώσεως, εἰ μένει σάρξ οὕσα καὶ τὸ τί ἐστι, πάθος δὲ τι
ὑπάρχει τῶν καθ' αὐτό, δ' πρότερον οὐκ ὑπήρχει, ἡλλο-
ται τούτῳ. δ' ἡ ἠλλοῦται, ὅτε μὲν οὐδὲν πέποιθεν, ὅτε δὲ 5
κάκεινο. ἀλλὰ τὸ ἀλλοωδὸς καὶ ἡ ἀρχὴ τῆς κωψεως εἰν τῷ
αὐξανομένῳ καὶ τῷ ἀλλοομένῳ (ἔν τούτοις γὰρ τὸ κινοῦν;)
ἐπεὶ καὶ τὸ ἐκτιθέον γένοιτ' ἂν ποτε μείωσι καὶ τὸ ἀπο-
λαύσαν αὐτὸν σώμα, οἷον εἰ εἰσελθῶν γένοιτο πνεύμα—ἀλλ' ἐφ' ἠφαρται γε τούτῳ πάθος, καὶ τὸ κινοῦν οὐκ ἐν τούτῳ. ἐπεὶ δὲ 10
διηπόρηται περὶ αὐτῶν ἰκανώς, δει καὶ τῆς ἀπορίας περα-
σάθαι λύσιν εὑρεῖν, σώζοντας τὸ ὑπομενοῦντος τοῦ τοῦ ἀυξα-
νομένου καὶ προσιτότοις τῶν αὐξάνεσθαι, ἀπιόντος δὲ φθίνειν,
ἐτι δὲ τὸ οὖν θεμεῖν αἰσθητῶν ἡ μείωσι ἡ ἔλαττον γεγο-
νέναι, καὶ μήτε κενῶν εἶναι τὸ σώμα μήτε δύο ἐν τῷ αὐ-
15 τῷ τόπῳ μεγέθη μήτε ἀσωμάτῳ αὐξάνεσθαι. ἀπηπτέον δὲ
τὸ αἵτων διορισμένοις πρῶτον ἐν μὲν ὦτ τὰ ἀνωμομερὴ
αὐξάνεται τῷ τὰ ὁμοιομερὴ αὐξάνεσθαι (σύγκειται γὰρ ἐκ
tούτων ἔκαστον), ἐπεἰδ' ὅτι σάρξ καὶ ὄστοι καὶ ἔκαστον τῶν
τοιούτων μορίων ἐστὶ διπτών, ὡσπερ καὶ τῶν ἄλλων τῶν ἐν 20
ἀλή ἐκδόσ ἐχόντων· καὶ γάρ ἡ ἀλή λέγεται καὶ τὸ εἶδος
σάρξ καὶ ὄστοιν. τὸ οὖν ὦτοιν μέρος αὐξάνεσθαι καὶ προσιτότοις
τῶν καθ' μὲν τὸ εἶδος ἐστιν ἐνδεξόμενον, κατά δὲ τὴν ἄλη
οὐκ ἐστὶ. δει γὰρ νοήσαι ὡσπερ εἰ τις μετροῦ ὁ τούτῳ μέ-

F1 οὐκ om. Bekker errore typogr. 33 καὶ prius om. F δ καὶ
ω om. E ὡσπερ καὶ ὅταν F2 b 5 τοῦτο om. E: τότε H φδ'
ηλλοιώτατι om. E post pêpounth add, οὐδ' ἡλλοιώτατ' ἡ οὖσα ΦΓ
ὅτε δὲ] οὐδ' ὦτε F 9 ει om. EF 10 γε] τε E. πάθον J
ἐπεὶ δὲ] ἐπειδὴ δὲ FL: ἐπειδὴ vel ἐπειδὴ δὲ φδ' 13 αὐξέσθαι FL
17 τι αἵτων om. H ἀπορισμένοις J εν om. L ὁμομομερὴ E
19 ἐκαστὸν prius om. E ἐκαστὸν τῶν τοιοῦτων] τοῖτών ἐκαστ.ν τῶν L
20 διπτῶν E 22 καὶ prius] η FL

C 2
25 τρυφ. ὑδώρι ἀει γὰρ ἄλλο καὶ ἄλλο τὸ γνώμενον. ὀυτὼ δ', αὐξάνεται ἡ ὅλῃ τῆς σαρκός, καὶ οὐχ ὑποῖων παντὶ προσγίνεται, ἀλλὰ τὸ μὲν ὑπερεῖ τὸ δὲ προσέρχεται, τοῦ δὲ σχήματος καὶ τοῦ εἶδους ὑποῖον μορίαν. ἐπὶ τῶν ἀνομοιωμέρων δὲ τοῦτο μᾶλλον δήλον, οἷον χειρός, ὥστε ἀνάλογον ἡπίζηται—ἡ 30 γὰρ ὅλῃ ἐτέρα ὡσα δήλῃ μᾶλλον τοῦ εἶδους ἐνταῦθα ἡ ἐπὶ σαρκός καὶ τῶν ὁμοιωμέρων, διὸ καὶ τεθεῖστος μᾶλλον ἂν δόξειν εἴη ἐτὶ σάρξ καὶ ὡστὸν ἡ χεὶρ καὶ βραχίων. ὡστε ἐστὶ μὲν ὡς ὅτιον τῆς σαρκός ἡπίζηται, ἐστὶ δ' ὡς οὖν κατὰ μὲν γὰρ τὸ εἶδος ὑποῖον προσελήφθη, κατὰ δὲ τὴν ὅλην οὖν.

35 μείζον μέντοι τὸ ὅλον γέγονε προσεληθόντος μὲν τώος, δ' κα-

322' λείτα τροφὴ καὶ ἐναιτίων, μεταβάλλοντος δὲ εἰς τὸ αὐτὸ εἶδος, οἷον εἰ ἔφηρ προσίον ύγρόν, προσελθὼν δὲ μεταβάλλοι καὶ γένοιτο ἔξωρν' ἐστὶ μὲν γὰρ ὃς τὸ ὁμοιὸν ὁμοίῳ αὐξάνεται, ἐστὶ δ' ὡς ἀνομίαν. ἀπορήσει δ' ἂν τοῖς ποίοις τι δέ εἴη τὸ 5 ὧν αὐξάνεται. φανερὸν δ' ὃ ὅτι δύναμεί ἐκεῖνο, οἷον εἰ σάρξ δύναμει σάρκα' ἐντελεχεία ἄρα ἄλλο. φθαρέν δ' ὡς τοῦτο σάρξ γέγονεν· οὐκοῦν οὐ τοῦτο αὐτὸ καθ' αὐτὸ (γένεσις γὰρ ἂν ἢ, οὐκ αὐξησις) ἀλλὰ τὸ αὐξανομένου τούτῳ, τι ὅν παθὼν ἐν τοῦτον [ἡπίζηθι]. ἡ μικρὴν, ὡσπερ οὐφω εἰ τις ἐπιχείον ὑδώρ, δ' 10 δὲ δύνατο οὐνον ποιεῖν τὸ μικρὲν· καὶ ὡσπερ τὸ πῦρ ἀφάλλον τοῦ καυστοῦ, οὕτως εὖ τὸ αὐξανομένῳ καὶ διϊτε ἐντελεχεία σαρκὶ τὸ ἐνδον αὐξητικὸν προσελθόντος δύναμει σαρκός ἐποίησεν ἐντελεχεία σάρκα. οὐκοῦν διὰ ὡμοὶς· εἰ γὰρ χωρίς, γένεσις. ἐστὶ μὲν γὰρ ὀυτῶ πῦρ ποιησάτω ἐπὶ τὸ ὑπήρχο- 15 ἁπρόχων ἐπιθέστα ἐξαίτω· ἀλλ' ὀυτῶ μὲν ἄφιξησις, ὅταν δὲ αὐτὰ τὸ ἠπίλα ἀφή, γένεσις. ποιοῦν δὲ τὸ μὲν καθόλου ὑν γίνεται, ὡσπερ οὐδὲ ζωον δ' ὑπ' ἀνθρωπος μήτε τῶν

καθ’ ἐκαστα (ἄλλ’ ὡς ἐνταῦθα τὸ καθόλου, κάκει τὸ ποσοῖν), σάρξ δὲ ἡ ὀστοῦν ἡ χείρ (ἡ βραχίων) καὶ τούτων τὰ ὀμοιομερή· προσελθόντος μὲν δὴ τισο ποσοῦ, ἀλλ’ οὐ σάρκως ποσής. ὃ 20 μὲν οὖν δυνάμει τὸ συμμαφρέτερον, οὖν ποσῆ σάρξ, ταύτη μὲν αὐξεί (καὶ γὰρ ποσήν δεῖ γίνεσθαι καὶ σάρκα), ἢ δὲ μόνον σάρξ, τρέφεις ταύτη γὰρ διαφέρει τροφῆ καὶ αὐξησιος τῷ λόγῳ. δό τρέφεται μὲν ἐώς ἄν σώζηται καὶ φθίνων, αὔξε- ται δὲ οὐκ ἂν, καὶ ἢ τροφῆ τῇ αὐξήσει τὸ αὐτὸ μὲν, τὸ 25 δ’ εἰναι ἄλλον. ὃ μὲν γάρ ἐστι τὸ πρὸσωπο τον ποσῆ σάρξ, ταύτη μὲν αὐξητικῶν σαρκὸς, ἢ δὲ μόνον δυνάμει σάρξ, τροφῆ. τοῦτο δὲ τὸ εἰδός [ἀυνέ ὦλης], οὖν αὐλός, δύ- ναμίς τις ἐν ὦλῃ ἐστὶν. ἡν δὴ τις προσῳ ὦλη, οὕσα δυνάμει αὐλός, ἐχοῦντα καὶ τὸ ποσὸν δυνάμει, οὕτω ἔστων μείζους 30 αὐλοί. ἐὰν δὲ μηκέτι ποιεῖν δύνηται, ἀλλ’ οὖν ὕδωρ οὕσιν αὐ- εὶ πλεον μεγαλυμένον τέλος ὑδάρη ποιεῖ καὶ ὕδωρ, τότε φθίσων ποιήσει τοῦ ποσοῦ· τὸ δ’ εἰδός μείει.

6 'Επεὶ δὲ πρῶτον δεὶ περί τῆς ὦλης καὶ τῶν καλουμένων 322 στοιχείων εἰπεῖν, εἰτ’ ἐστὶν εἰτε μή, καὶ πότερον αἰτίων ἐκα- στον ἡ γίγνεται πως, καὶ εἰ γίνεται, πότερον εἰς ἄλληλων γίνεται πάντα τῶν αὐτῶν τρόπων ἢ τι πρῶτον ἐν αὐτῶν ἐστιν— ἀνάγκη δὴ πρῶτον εἰπεῖν περὶ δὲ ἀδιδροστώς λέγεται νῦν. 5 πάντες γὰρ οὐ τέ τα στοιχεῖα γενεώντες καὶ οἴ ἃ τά ἐκ τῶν

στοιχείων διακρίσει χρώνται καὶ συγκρίσει καὶ τὸ ποιεῖν καὶ πάσχειν. ἐστι δ' ἡ σύγκρισις μέξις; πῶς δὲ μήγιν συναίνει λέγομεν, οὐ διάφοροι σαφῶς. ἀλλὰ μήν οὐδ' ἀλλοιούσθαι ὑπατόν, οὐδὲ διακρίνεσθαι καὶ συγκρίνεσθαι, μηδενὸς ποιῶν· τῶν μηδὲ πάσχοντος καὶ γὰρ οἱ πλεία τὰ στοιχεῖα ποιοῦν· τες γεννώτα τῷ ποιεῖν καὶ πάσχειν ὑπ' ἀλλήλων, καὶ τοῖς ἐξ ἐνὸς ἀνάγχη λέγει τῷ πολέμῳ· καὶ τοῦτ' ὄρθως λέγει Διο- γένης, ὅτι εἰ μὴ ἢν εἰς ἔνας ἀπαντά, οὐκ ἂν ἦν τὸ ποιεῖν καὶ τὸ πάσχειν ὑπ' ἀλλήλων, οἰον τὸ θερμὸν ψύχοσθαι καὶ τοῦτο θερμαίνεσθαι πάλιν—οὐ γὰρ ἡ θερμότης μεταβάλλει καὶ ἡ ψυχρότης εἰς ἀλλήλα, ἀλλὰ δῆλον ὅτι τὸ ὑποκεί- μενον, ὥστε ἐν οἷς τὸ ποιεῖν ἐστὶ καὶ τὸ πάσχειν, ἀνάγχη τούτων μιᾶν εἶναι τῷ ὑποκειμένῳ φόσω. τὸ μὲν οὐν πάντα τουαίτα εἰναι φάσκειν οὐκ ἄλλης, ἀλλ' ἐν οἷοι τὸ ὑπ' ἀλ- λήλων ἐστίν. ἀλλὰ μήν εἰ περὶ τοῦ ποιεῖν καὶ πάσχειν καὶ περὶ μίξεως θεωρητέον, ἀνάγχη καὶ περὶ ἀφής: οὔτε γὰρ ποιεῖν ταύτα καὶ πάσχειν δύναται κυρίως ἡ μή οἷον τε ἄφασθαι ἀλλήλων, οὔτε μὴν ἀφάμενα πως ἐνδέχεται μιχθή- ναι πρῶτον· ὥστε περὶ τριῶν τούτων διοριστέον, τί ἀφή καὶ τί μίξεις καὶ τί ποιήσεις. ἀρχὴν δὲ λάβωμεν τήνδε. ἀνάγχη γὰρ τῶν ὑπότων οἷοι ἐστὶ μίξεις, εἰναι ταῦτ' ἀλλήλων ἀπτι- κά, κἂν εἰ τι ποιεῖ, τὸ δὲ πάσχει κυρίως, καὶ τοῦτοι ὡσάντως· διὸ πρῶτον λεκτέον περὶ ἀφής. σχεδοῦ μὲν οὖν ὥσπερ καὶ τῶν ἄλλων ὑπομάτων ἐκαστὸν λέγεται πολλα- χώς, καὶ τὰ μὲν ὑμοῦνας τὰ δὲ βάτερα ἀπὸ τῶν ἐτέρων καὶ τῶν προτέρων, οὔτως ἔχει καὶ περὶ ἀφής. ὁμώς δὲ τὸ κυρίως λεγόμενον ὑπάρχει τοῖς ἄχουσι βέσιν, θεσίς δ' οὖσπερ καὶ τόπος· καὶ γὰρ τοῖς μαθηματικοῖς ὁμοίως ἀπὸστεῖν ἀφήν καὶ τόπου, εἴτ' ἐστὶ κεχωρισμένων ἐκαστὸν αὐτῶν εἴτ' ἄλλον τρόπον. εἰ οὖν ἐστίν, ὥσπερ διώρισθη πρὸτερον, τὸ ἀπτε-
a 4 apuntov F 5 δειρημένα scripsi, cf. 323b 11: διωρισμένα
codd. et Φο  ἐχειν ] ἐχειν L 7 πρώτη post κάτω ponit F τὸ
ante κάτω om. EL 8 τὰ om. E ἐχειν ] ἐχει F 12 κινήτων
και κινητικῶν FHL ἐπει] ἐπὶ E 14 οὐ add. supra lin. J
15 κινοῦν] κινεῖν L 16 ποιεῖν v] ποιεῖν L διαφεύει καὶ δεῖ E, sed
ei καὶ δεῖ fecit in loco plurium capace 17 τὸ κινών πάν FΗJ
ποιεῖν] ποιεῖν FΗJ 19 τὸ utrumque om. J τὸ θερμόν καὶ τὸ
λευκὸν F 20 κινεῖν F κινοῦν E πλεῖον H 21 κινητικάς
ἀκίνητας F: incertum E1: κινοῦτα ΛΦ, et fecit E2: motiva immobilia
tangunt Π κινητικῶν κινοῦμενον Φ 22 ὡς om. E δ post μὲν
om. Φ (codd. RΖ) 24 δὲ om. E κινητοῦ καὶ κινητικοῦ ΕΦ
ὑπάρχειν E 25 τὸ post καὶ om. L τὸ post ἐπὶ om. E 27 δοσις
οῖς Φ καὶ om. J 28 ἐστὶ . . . 29 ἀποτόμου om. F 29 μόνον
μόνον F 30 ὀμοιογενὴς ΕΗJ2 δοκεῖ ] δοκεῖν EFΗL
εἶναι ἀποτελοῦσθαι, ὡστε εἰ τι κυνεῖ ἄκωντον ὅν, ἐκείνῳ μὲν ἄν ἀποτεῦ τοῦ κυνητοῦ, ἐκείνου δὲ οὐδὲν—φαμέν γὰρ ἐνίοτε τὸν λυτώντα ἀπεσταθεὶ ἡμῶν, ἀλλ᾽ οὐκ αὐτοὶ ἐκεῖνοι. περὶ μὲν οὖν ἀφῆς τῆς εἰν τοῖς φυσικοῖς διωρίσθω τοῦτον τοῦ τρόπου.

περὶ δὲ τοῦ ποιεῖν καὶ πάσχειν λέκτεον ἐφεξῆς. παρε-7 λῆφθαι δὲ παρὰ τῶν πρότερον ὑπεναντίους ἄλληλοις λόγοις.

οἱ μὲν γὰρ πλεῖστον τοῦτο γέ ὑμωνοητικός λέγουσιν, ὡς τὸ μὲν ὦμοιον ὑπὸ τοῦ ὦμοιον πᾶν ἀπαθὲς ἐστὶ διὰ τὸ μηδὲν 5 μᾶλλον ποιητικῶν ἡ παθητικῶν εἶναι βάτερον βατέρου (πάντα γὰρ ὦμοιος ὑπάρχει ταύτα τοῖς ὦμοιοις), τὰ δ᾽ ἀνώμως καὶ τὰ διάφορα ποιεῖν καὶ πάσχειν ἄλληλα πέφυκεν καὶ γὰρ ὅταν τὸ ἐλαττὸν πύρ ὑπὸ τοῦ πλεόνον φθείρθαι,

diā τῆς ἐναντίωσιν τοῦτο φασὶ πάσχειν, ἐναντίον γὰρ εἶναι 10 τὸ πολὺ τῷ ὀλίγῳ. Ἡμῶν προσφέρει δὲ παρὰ τοὺς ἄλλους ἰδίας ἔλεγξε μόνος: φθορὶ γὰρ τὸ αὐτὸ καὶ ὦμοιον εἶναι τὸ τοιοῦτον καὶ τὸ πάσχον—οὐ γὰρ ἐγχωρεῖ τὰ ἔτερα καὶ διαφέροντα πάσχειν ὑπ᾽ ἄλληλων, ἀλλὰ κἂν ἔτερα ὑπῆρchu τι ἄλληλα, οὐχ ἄτροπον τὶ ὑπάρχει, ταύτη 15 τούτῳ συμβαίνειν αὐτοῖς. τὰ μὲν οὖν λεγόμενα ταῦτ᾽ ἐστὶν, ἐοίκαις δὲ οἱ τούτων τοῦ τρόπου λέγουσε ὑπεναντία φαινεσθαι λέγειν· αὐτών δὲ τῆς ἐναντιολογίας ὁτὶ δεόν ὄλον τι θεωρῆσαι μέρος τι τυχχάνουσι λέγεσθαι ἑκάτεροι. τὸ τε γὰρ ὦμοιον καὶ τὸ πάντῃ πάντως ἀδιάφορον εὐλογοῦμεν μή πά-20 σχεῖν ὑπὸ τοῦ ὦμοιον μηδένα (τὶ γὰρ μᾶλλον ἐσται βάτερον ποιητικῶν ἡ βατέρου; εἰ τ᾽ ὑπὸ τοῦ ὦμοιον πάσχει τι δυνατόν, καὶ αὐτὸ ψφ᾽ ἑαυτοῦ—καίτοι τοῦτον οὕτως ἔχωντων υποδέν ἄν εἰήν οὔτε ἄφθαρτον οὔτε ἄκώντων, εἴπερ τὸ ὦμοιον ἰδίως ποιητικῶν, αὐτὸ γὰρ ἑαυτὸ κινήσει πάν), τὸ τε παντελῶς ἑτερον

καὶ τὸ μηθαμή ταῦτον ὡσαύτως. οὐδὲν γὰρ ἄν πάθοι λεγεῖ· 25 κότις ὑπὸ γραμμῆς ἡ γραμμὴ ὑπὸ λευκότητος, πλὴν εἰ μὴ ποιν κατὰ συμβεβηκός, οἶνον εἰ συμβεβηκε λευκὴ ἡ μελανὰν εἶναι τὴν γραμμὴν· οὐκ ἐξάστησι γὰρ ἐαυτὰ τῆς φύσεως ὡσα μὴτ' ἐναντία μὴτ' ἐξ ἐναντίων ἑστὶν. ἀλλ' ἐπεὶ οὐ τὸ πυχῶν πέφυκε πᾶσχεω καὶ ποιεῖσαν, ἀλλ' ὥσαν ἡ ἑναντίον 30 τίων ἐγείρει ἡ ἐναντία ἑστὶν, ἀνάγκη καὶ τὸ ποιεῖαι καὶ τὸ πάσχοι τῷ γένει μὲν ὁμοιοὶ εἶναι καὶ ταῦτα, τῷ δ' εἰδεῖ ἀνόμοιοι καὶ ἐναντίον (πέφυκε γὰρ σώμα μὲν ὑπὸ σώματος, χυμὸς δ' ὑπὸ χυμοῦ, χρώμα δ' ὑπὸ χρώματος πᾶσχεω, ὅλως δὲ τὸ ὁμογένει ὑπὸ τοῦ ὁμογενοῦς· τούτου δ' 324 οὕτων ὡσαμὲν τῇ ἑναντίᾳ εἰς τῷ αὐτῷ γένει πάντα, ποιεῖ καὶ πάσχει τᾶναντία ὑπ' ἀλλήλων, ὡστ' ἀνάγκη πώς μὲν εἶναι ταῦτα τὸ τε ποιεῖν καὶ τὸ πάσχον, τῶν δ' ἐτερα καὶ ἀνόμως ἀλλήλως. ἐτεῖ δὲ τὸ πάσχον καὶ τὸ ποιεῖν τῷ 5 μὲν γένει ταῦτα καὶ ὁμοια τῷ δ' εἰδεῖ ἀνόμως, τοιαῦτα δὲ τᾶναντία, φαινέροι ὡς παθητικά καὶ ποιητικὰ ἀλλήλων ἐστὶ τὰ τ' ἑναντία καὶ τὰ μεταξύ—καὶ γὰρ ὅλως φθορὰ καὶ γένεσις ἐν τούτωι. διὸ καὶ εὐλογοῦν ἡδή τὸ τε πρὸ θερ- μαίνει καὶ τὸ ψυχρόν ψάχνεω, καὶ ὅλως τὸ ποιητικὸν ὁμοῖον 10 ὅπως ἑαυτῷ τὸ πάσχον. τὸ τε γὰρ ποιεῖν καὶ τὸ πάσχον ἑναν- τία ἑστὶ, καὶ ἡ γένεσις εἰς τοῦναντίων ὡστ' ἀνάγκη τὸ πάσχον εἰς τὸ ποιεῖν μεταβάλλειν, οὕτω γὰρ ἑστὶν εἰς τοῦναντίων ἡ γένεσις. καὶ κατὰ λόγου δὴ τῷ μὴ ταύτα λέγονται ἀμφοτέρους ὁμοῖος ἀπτεσθαί τῆς φύσεως. λέγομεν γὰρ πάσχειν 15 ὅτε μὲν τὸ ὑποκείμενον (οἷον ψύγαζεθαι τὸν ἄρθρωλπ καὶ θερμαίνεσθαι καὶ ψύχεσθαι καὶ τὰλλα τῶν αὐτῶν τρόπων), ὅτε δὲ θερμαίνεσθαι μὲν τὸ ψυχρόν, ψύγαζεθαι δὲ τὸ κά-
μνων. ἀμφότερα δ’ ἔστιν ἀληθῆ (τὸν αὐτὸν δὲ τρόπον καὶ
20 ἐπὶ τοῦ ποιοῦντος, ὅτε μὲν γὰρ τοῦ ἀνθρωπῶν φαμεν θερμα-
νευ, ὅτε δὲ τὸ θερμοῦ), ἔστι μὲν γὰρ ὡς ἢ ἰδιπόσχει, ἐστι
δ’ ὡς τὸ ἐναντίον. οἱ μὲν οὖν εἰς εἰκόνα βλέψαντες ταύτων τι
δεὶν φῇησαν τὸ ποιοῦν ἕχει καὶ τὸ πάσχου, οἱ δ’ εἰς θά-
τερα τοῦναυτίν. τὸν αὐτὸν δὲ λόγον ὑποληπτέον εἶναι περὶ
25 τοῦ ποιεῖν καὶ πάσχειν ὄπιστε καὶ περὶ τοῦ κινεῖται καὶ
κινεῖν. διόχως γὰρ λέγεται καὶ τὸ κινοῦν: ἐν φ’ τε γὰρ ἡ
ἀρχὴ τῆς κινῆσεως, δοκεῖ τούτῳ κινεῖν (ἡ γὰρ ἁρχὴ πρώτῃ
tῶν αἰτίων) καὶ πάλιν τὸ ἐσχατον πρῶς τὸ κινοῦμενον καὶ
tὴν γένεσιν. ὅμως δὲ καὶ περὶ τοῦ ποιοῦντος· καὶ γὰρ τὸν
30 λατρὸν φαμεν ὑγίαζειν καὶ τὸν οὕνων. τὸ μὲν οὖν πρῶτον κινοῦν
οὐδέν κωλύει ἕν μὲν κινήσει ἄκυντον εἶναι (ἐπ’ ἑνῶν δὲ καὶ
ἀναγκαῖον), τὸ δ’ ἐσχατον αὐτὶ κινεῖν κινοῦμενον· ἐπὶ δὲ ποιή-
σεως τὸ μὲν πρῶτον ἀπαθὲς, τὸ δ’ ἐσχατον καὶ αὐτὸ πά-
σχον. ὅσα γὰρ μὴ ἔχει τὴν αὐτὴν ὑλὴν, ποιεῖ ἀπαθῆ
35 οὐτα (οἶον ἡ λατρική, αὐτὴ γὰρ ποιοῦσα ὑγίειαν οὐδέν πά-
324 ἐπὶ τοῦ ὑγιαζομένου), τὸ δὲ σιτίον ποιοῦν καὶ αὐτὸ
pάσχει τι—ἡ γὰρ θερμαίνεται η ψύχεται η ἀλλο τι πάσχει
ἀμα ποιοῦν. ἔστι δὲ ἡ μὲν ιατρική ὡς ἁρχὴ, τὸ δὲ σιτίον τὸ
ὡς ἐσχατον καὶ ἀπτόμενον. ὅσα μὲν οὖν μὴ ἐν ὑλὴ ἔχει τὴν
5 μορφήν, ταῦτα μὲν ἀπαθῆ τῶν ποιητικῶν, ὅσα δ’ ἐν ὑλῆ,
pαθητικά—τὴν μὲν γὰρ ὑλὴν λέγομεν ὁμοίως ὡς εἰπεῖν τὴν
αὐτὴν εἶναι τῶν αὐτικειμένων ὑποτεροῦν, ὄσπερ γένος ὑπὲρ,
tὸ δὲ δυνάμενον θερμὸν εἶναι παρόντος τοῦ θερμαντικοῦ καὶ πλη-
σιάζουσον ἀνάγκη θερμαίνεσθαι. διό, καθάπερ εἴρηται, τὰ
10 μὲν τῶν ποιητικῶν ἀπαθῆ τὰ δὲ παθητικά, καὶ ὄσπερ ἐπὶ
kινήσεως τῶν αὐτὸν ἔχει τρόπον καὶ ἐπὶ τῶν ποιητικῶν

a 20 τῶν om. F 21 ἡ om. E 22 τούναυτίν F ti om. 
FHJ² 23 θετερα] θετερον F 24 δὲ λόγον] τρόπον F 25-26 κινεῖν 
καὶ κινεῖσθαι EL. 26 ὁ om. E 27 ὡς om. E 28 τὸ 
ἐσχατον . . . 29 γένεσιν] ultimum aliquid id quod movetur ad genera-
tionem Γ 30 κινοῦν om. E 31 μὲν] μὲν οὖν : μὲν τῇ F 
32 τῷ] τῷ E¹, τῷ Φ ἐπὶ] ἐπι E 34 ἔχει τὰ πάσχει ΦJ 
35 αὐτῷ] αὐτὴ FΗJL b 1 τὸ ποιοῦν ΦΗJ. 2 οἱ prius om. F 
ti . . . θερμαίνεται in litura η ψύχεται om. E 3 σιτίον τὸ ὡς 
ἐσχατον] ἐσχατον τὸ σιτίον F (sed post σιτίον erasum habet ὡς ἐσχατον): 
αὐτίον τὸ ἐσχατον E 5 μὲν οὖν ἄπαθή E 6 ὁμοίως delendum 
notat J τῶν αὐτῶν ὡς ἐπιέατ F 7 ὀπόστεροιον ΦJ : ὀπόστεροιον 
H]² δὲ delendum notat J 8 θερμαντικοῦ] θερμοῦ H 11 τρόπον 
ἔχει F
8. πῶς δὲ ἐνδέχεται τοῦτο συμβαίνειν, πάλιν λέγωμεν. τοῖς 25 μὲν ὁδεὶ πᾶσχειν ἐκαστὸν διὰ τῶν πόρων εἰσιόντος τοῦ ποιοῦντος ἑσχάτου καὶ κυριωτάτου, καὶ τοῦτον τὸν τρόπον καὶ ὅραν καὶ ἀκούειν ἡμᾶς φασὶ καὶ τὰς ἄλλας αἰσθήσεις ἀισθάνεσθαι πᾶσας· ἔτι δὲ ὀρᾶσθαι διὰ τε ἀέρος καὶ ὦδας καὶ τῶν διαφανῶν, διὰ τὸ πόρον ἤχειν ἀοράτους μὲν 30 ὅσα μικρότητα, πυκνοῦς δὲ καὶ κατὰ στοιχέων, καὶ μᾶλλον ἤχειν τὰ διαφανῆ μᾶλλον. οἱ μὲν οὖν ἔπὶ τῶν οὕτω διώρισαν, ὁσπέρ καὶ Ἐμπεδοκλῆς, οὐ μόνον ἔπὶ τῶν ποιοῦντων καὶ πασχόντων, ἄλλα καὶ μίγνυσθαι φασίν ὅσον οἱ πόροι σύμμετροι πρὸς ἀλλήλους εἰσόην. δοῦ δὲ μᾶλλον καὶ περὶ 35 πάντων ἐνὶ λόγῳ διωρίσασθαι. Λευκίππος καὶ Δημόκριτος, ἀρ-325α χίν ποιητάμενοι κατὰ φύσιν ἦπερ ἐστίν. ἐνίοις γὰρ τῶν ἀρχαίων ἔδοξε νὸν ἐξ ἀνάγκης ἐν ἐνίαι καὶ ἀκίνητοντ' τὸ

b 12 πρώτωs FL 13 τὸ ... ἀπαθὲς delenda notat J πρῶτωs FL τὸ μὲν ποιητικόν L 15 ἡ om. F 16 ὅταν γὰρ ὑπάρχη E tī delendum notat J 17 ἡδη] εἰδή EF1 18 τὰ om. F ἡ

μὲν γὰρ κενῶν οὐκ ὄν, κινηθῆραί δ’ οὐκ ἂν ὄνωσθαι μὴ ὄντος 5 κενοῦ κεχωρισμένου, οὖν ἂν πολλὰ εἶναι μὴ ὄντος τοῦ διεξ- γυντος—τοῦτο δ’ οὐδὲν διαφέρειν, εἰ τις οἴεται μὴ συνεχές εἶ- ναι τὸ πᾶν ἀλλ’ ἀπεσταθαί διηρημένον, τὸν φάραξ πολλὰ καὶ μὴ ἐν εἶναι καὶ κενῶν. εἰ μὲν γὰρ πάντη διαφερότων, οὐδὲν εἶναι ἐν, ὡστε οὐδὲ πολλά, ἀλλὰ κενὸν τὸ ὄλων εἰ δὲ τῇ 10 μὲν τῇ δὲ μὴ, πεπλασμένῳ τῷ τούτῳ ἐνοίκεσαν. μέχρι πόσου γὰρ, καὶ διὰ τί τὸ μὲν οὔτως ἔχει τὸ ὄλων καὶ πληρές ἐστι, τὸ δὲ διηρημένον; ἐτί δ’ ὁ ὁμοιὸς ἀναγκαῖοι μὴ εἶναι κινητών. ἐκ μὲν οὖν τούτων τῶν λόγων ὑπερβάντες τὴν αἰσθήσεως καὶ παριθνέστες αὐτὴν ὡς τῷ λόγῳ δέν ἄκολουθείν εἴναι καὶ 15 ἀκώντων τὸ πᾶν ἐναὶ φασι καὶ ἀπειροὶ ἐνιοῦν τὸ γάρ πέρας περαινεῖν ἢν πρὸς τὸ κενῶν. οἱ μὲν οὖν οὐτως καὶ διὰ ταύτας τὰς αἰτίας ἀπεφήναντο περὶ τῆς ἀλήθειας. ἐτί δ’ ἐπὶ μὲν τῶν λόγων δοκεῖ ταῦτα συμβαίνειν, ἐπὶ δὲ τῶν πραγμάτων μανία παραπλησίων εἶναι τὸ δοξάζειν οὔτως. οὐδένα γὰρ τῶν 20 ομονομενῶν ἔξεστάναι τοσοῦτον ὡστε τὸ πῦρ ἐν εἶναι δοκεῖν καὶ τῶν κρυσταλλῶν, ἀλλὰ μόνω τὰ καλά καὶ τὰ φαινό- μενα διὰ συνήθειαν, ταῦτ’ ἐνιοῦν διὰ τὴν μανίαν οὐθὲν δοκεῖ διαφέρειν. Λεύκηντος δ’ ἔχειν φήμη λόγους, οὕτως πρὸς τὴν αἰσθήσεως ὁμολογούμενα λέγοντες οὐκ ἀναφησόσωσιν ὡστε γε- 25 νειν ὡστε φθορὰν ὑπὸ τοὺς κίνησι καὶ τὸ πλῆθος τῶν οὕτως. ὁμο- λογήσασα δὲ ταῦτα μὲν τοῖς φαινομένοις, τοῖς δὲ τὸ ἐν κατα- σκευάζουσιν ὡς οὐκ ἂν κίνησιν οὖσαν ἄνευ κενοῦ, τὸ τε κενῶν μὴ ὃν καὶ τοῦ οὕτως οὐθέν μὴ ὃν φήσιν εἶναι τὸ γὰρ κυ- ρίως ὁ παμπλῆρες οὖν. ἀλλ’ εἶναι τὸ τοιοῦτον οὖν ἐν, ἀλλ’ 30 ἀπειρα τοῦ πλῆθος καὶ ἀόρατα διὰ συμπρότειν τῶν ὅγκων. ταῦτα δ’ ἐν τῷ κενῷ φέρεσθαι (κενοῦ γὰρ εἶναι), καὶ συν- επτάμενα μὲν γένεσιν ποιεῖν, διαλυόμενα δὲ φθορὰν. ποιεῖν

a 6 δ’ οὐδέν] δὲ μηδὲν EL ei] ei F.L: ut si G 8 εἰ om. E
8. 325a 4 — 325b 25

dē καὶ πάσχειν ἢ τυγχάνουσιν ἀπότομα (ταύτη γὰρ οὐχ ἐν εἶναι), καὶ συντιθέμενα δὲ καὶ περιπλεκόμενα γενναία. Εἴ δὲ τοῦ κατ' ἀλήθειαν ἐνὸς οὐκ ἀν γενέσθαι πλῆθος οὐδ' ἐκ 35 τῶν ἀληθῶς πολλῶν ἐν, ἀλλ' εἶναι τούτ' ἀδύνατον. ἀλλ', ὁσπερ Ἐμπεδοκλῆς καὶ τῶν ἄλλων τινές φασι πάσχειν 325b
dιὰ τῶν πόρων, οὐτὸ πάνταν ἀλλοίωσαν καὶ πάν τὸ πάσχεϊ τοῦτον γίνεσθαι τὸν τρόπον, διὰ τοῦ κενοῦ γνωμονῆς τῆς δια-
lύσεως καὶ τῆς φθοράς, ὡμοίως δὲ καὶ τῆς αὐξήσεως, ὑπ᾽
eισυνομένων στερεών. σχέδου δὲ καὶ Ἐμπεδοκλῆι ἀναγκαίοις 5
λέγειν ὁσπερ καὶ Λεύκιππός φησιν εἶναι γὰρ ἀττα στε-
rεα, ἀδιαίρετα δὲ, εἰ μὴ πάντη πόροι συνεχεῖς εἰσιν. τούτο
δὲ ἀδύνατον, οὐδὲν γὰρ ἐστὶ ἐτερον στερεῶν παρὰ τῶν πόρων,
ἀλλὰ πάν κενοῦ. ἀνάγκη ἃρα τὰ μὲν ἀπότομα εἶναι ἀδι-
αίρετα, τὰ δὲ μεταξὺ αὐτῶν κενά, οὐς ἐκείνοις λέγει πόρους. 10
οὐτὸς δὲ καὶ Λεύκιππος λέγει περὶ τοῦ ποιεῖν καὶ πάσχει
οὶ μὲν οὐν τρόποι καθ' οὐς τὰ μὲν ποιεῖ τὰ δὲ πάσχει σχε-
δῶν οὐτοί λέγονται. καὶ περὶ μὲν τούτων, καὶ πῶς λέγουσι,
δήλου, καὶ πρὸς τὰς αὐτῶν θέσεις αἰς ἄρθροι εἰς 
σχέδου ὁμο-
λογομενόν φαίνεται συμβαίνον τοῖς δὲ ἄλλοις ἢπτοιν, οἷον 15
Ἐμπεδοκλεὶ τίνα τρόπον ἔσται φθορά καὶ ἀλλούσιοι
οὐ δήλου. τοῖς μὲν γὰρ ἐστὶν ἀδιαίρετα τὰ πρῶτα
τῶν σωμάτων, συχματί διαφέροντα μόνον, ἐξ ὃν πρῶτων
σύγκειται καὶ εἰς ἑκοὐτα διαλύεται: Ἐμπεδοκλεὶ δὲ
tὰ μὲν ἄλλα φανερὸν ὅτι μέχρι τῶν στοιχείων ἔχει τίν 
20 γένεσιν καὶ τὴν φθοράν, αὐτῶν δὲ τούτων πᾶς γίνεται καὶ
φθείρεται τὸ σωρεύομενον μέγεθος, οὕτε δήλου οὔτε ἐνδέχεται
λέγειν αὐτῷ μὴ λέγοντι καὶ τοῦ πυρὸς εἶναι στοιχείων,
ὁμοίως δὲ καὶ τῶν ἄλλων ἀπάντων, ὁσπερ ἐν τῷ 
Τιμαῖῳ
gέγραφε Πλάτων. τοσοῦτον γὰρ διαφέρει τοῦ μή τῶν αὐτῶν 25

a 33 τυγχάνει F 34 καὶ prius om. L b 2 τῶν om. E,L
4 φθοράς|φθορᾶς J εἰσδομομέων Ε,J : ὑποδομομέων F 5 στερεῶν
Fr: ἐπέρως ΕΗJKLM 6 φῶς F ἀττα] αὐτὰ J 7 καὶ post
στερεὰ add. E πόρους L 8 ἐσται om. F ἐτερον om. EL
15 οἷον ... 17 γὰρ om. F, sed in margine addit οἷον Ἐμπεδοκλεὶ τίνα
τρόπον ἔσται φθορά καὶ γένεσις οὐ δήλου. τοῖς μὲν γὰρ, et inter plura
incerta habere videtur etiam ἀλλοίωσις 16 τίνα] ἢ el τίνα H ἔσται φθορὰ ΕΗJKLM: ἔσται γένεσις καὶ φθορὰ Bekker, qui haec verba
libris FH perperam attribuit 17 ἐστὶν] ἐστι J3 τὰ om. E
περὶ τὸν Λεύκον, ὅτε ἦν ἐπὶ τῆς στέρετος ἐδίπερ 
καὶ ἐκεῖνῃ οὐκ ἦν ἐνεργὸς ἡ νόσος ὁπλίτης.
auctō eō té pāthē, óstē kai eān páșχη ἂνερ ψύχεται, ταύτη ti kai āllo pousίσεi ἢ peiσεται. tōn auctōn de 20 τρόπον kai ἐπὶ tōn āllon páthmātōn tōuto gār kai tōis stērēa kai tōis ἐπίπεδα λέγουσιν ἀδιαίρετα συμβαίνει τῶν auctōn trōpōn, ήστε ἕαρ μανότερα οὔτε πικνοτέρα οἵαν tē nevσθαι κενοῦ μὴ ὄντος εν tοis ādiasrētοs. ēti δ' ātopon kai tō mikrā mēn ādiasrēta εἶναι, μεγάλα δὲ μῆ. νῦν mēn 25 γάρ eιλογός tā meiζον θραύσεται μᾶλλον tōn miκrōn: tā mēn ὅαρ διαλύεται ῥαδίως, οὖν tā meγάλα, προσκόπτει ἕαρ πολλοῖς, tō δὲ ādiasrētōn ὅλως διὰ τī μᾶλλον ὑπάρχει tōn μεγάλων tōis miκrōis: ēti δὲ πότερον mīa pántωn ἢ φύσις ἐκείνων tōn stēreων, ἡ διαιρέσει θάτερα tōn ēτέρων, 30 ὁσπερ ἄν eὶ tā mēn εἶ gήνων, tā δὲ γήνων tōn ὅγκων; eὶ mēn ὅαρ μᾶν φύσει ἐστίν ἀπάντων, τί tō χωρίσαν; ἡ διὰ τι οὐ γίγνεται ἀφάμενα εἶν, ὁσπερ ὅωρ ὅδατος όταν θήγη; οὖν ἕαρ διαιρέσει tō ὑστέρων tōν πρωτέρων. eὶ δ' ēτερα, ποίαι ταῦτα; καὶ δὴλον ὡς ταῦτα θετέου ἀρχάς καὶ αἰτίας tōn 35 συμβαίνοντων μᾶλλον ἡ tā schῆmatā. ēti δὲ διαιρέοντα 326 tīn φύσιν κἂν ποιοῦ κἂν πάσχοι θηγάνουτα ἀλλήλουν. ēti δὲ tī tō kwnōν; eὶ mēn ὅαρ ēτερον, παθητικά· eὶ δ' auctō auctō ἐκαστον, ἡ διαιρέσων ἔσται, κατ' ἄλλο mēn κωμῶν κατ' ἄλλο δὲ κωμόμενον, ἡ κατὰ ταυτό ταυτατίa υπάρξει, καὶ 5 ἡ ὕλη οὗ μόνον ἀριθμῷ ἔσται μία ἄλλα καὶ δυνάμει. ὄσοι mēn οὗν διὰ τῆς ὅτων πόρων κινήτεος φασὶ tā páthη συμβαίνειν, eὶ mēn καὶ πεπληρωμένων τῶν πόρων, περιέρχον tōν πόρου: eὶ γάρ ταύτη πάσχει tī tō πῶν, κἂν μῆ πόρους ἔχου ἀλλ' auctō συνεχές ὃν pάσχοι tōn auctōn trōpōn. ēti 10

δὲ πῶς ἐνδέχεται περὶ τοῦ διοραίν ἑμβαίνειν ὡς λέγον-σιν; οὔτε γὰρ κατὰ τὰς ἀφὰς ἐνδεχεται διείναι διὰ τῶν διαφανῶν, οὔτε διὰ τῶν πόρων, εἰ πλήρης ἐκαστος τί γὰρ διοίσει τοῦ μὴ πόρους ἐχει, πάν γὰρ ὁμοίως ἐσται πλήρες.

15 ἀλλὰ μὴν εἰ καὶ κενά μὲν ταῦτα, ἀνάγκη δὲ σώματα ἐν αὐτοῖς ἔχει, ταῦτα συμβῆσται πάλιν. εἰ δὲ τηλικαῦτα τὸ μέγεθος ὡστε μὴ δέχεσθαι σῶμα μηδέν, γελοιοῦ τὸ μικρὸν μὲν οἰςθα χενον εἶναι, μέγα δὲ μὴ μηδ' ὑπηλικοῦν, ἥ τὸ κενὸν ἀλλο τι οἰςθαί λέγειν πλὴν χώραν σώματος, ἀντι ὡστε δήλου ὅτι παντὶ σώματι τῶν ὦγκων ἣςων ἐσται κενον.

ὅςωσ δὲ πόρους ποιεῖν περιέργον. εἰ μὲν γὰρ μηδὲν ποιεὶ κατὰ τὴν ἀφήν, οὔτε διὰ τῶν πόρων ποιήσει διων' εἰ δὲ τῷ ἀπτεσθαί, καὶ μὴ πόρους ὄντων τὰ μὲν πείσεται τὰ δὲ ποιῆσε τῶν πρὸς ἀλληλα τούτον τοῦ τρόπων πεφυκότων. ὅτι 25 μὲν οὖν όστως λέγειν τοὺς πόρους ὡς τινὲς ὑπολαμβάνουσιν, ἢ ψεῦδος ἢ μάταιον, φανερὸν ἐκ τούτων ἐστὶν. διαμετέων ὃν ὄντων πάντη τῶν σωμάτων πόρους ποιεῖν γελοιοῦ—ἡ γὰρ διαμετέω, δύναται χωρίζεσθαι.

Τύνα δὲ τρόπων ύπάρχει τοίς οὖσι γεννάν καὶ ποιεῖν καὶ 9 30 πάσχει, λέγωμεν λαβώντες ἄρχην τὴν πολλάκις εἰρημένην. εἰ γάρ ἐστι τὸ μὲν δυναμεί το δ' ἐντελεχεία τοιοῦτον, πέφυκεν οὔ τῇ μὲν τῇ δ' οὔ πάσχει, ἀλλὰ πάντη καθ' ὅσον ἐστὶ τοιοῦτον, ἤτοι δὲ καὶ μᾶλλον ἢ τοιοῦτον μᾶλλον ἐστὶ καὶ ἤτοι καὶ ταύτῃ πόρους ἢ τις λέγον μᾶλλον, καθάπερ 35 ἐν τοῖς μεταλευομένοις διατείνουσι τοῦ παθητικοῦ φλέβες 327α συνεχείς. συμφυές μὲν οὖν ἐκαστον καὶ ἐν ὃν ἀπάθεις ὁμοίως δὲ καὶ μὴ θυγανύντα μήτε αὐτῶν μήτ' ἄλλους, ἃ ποιεῖν πέφυκε καὶ πάσχειν (λέγω δ' οἴον οὐ μόνον ἀπτεσμοὺς θερμαίνει τὸ πῦρ, ἀλλὰ κἂν ἀποθεν ἃ—τῶν μὲν γὰρ ἄρα 5 ἐν τὸ πῦρ, ὦ δ' ἄρθρο τὸ σῶμα θερμαίνει, πέφυκος καὶ ποιεῖν καὶ

b 11 περὶ... 12 ἐνδέχεται in marg. add. F 12 διώναν Ε. 14 ἔχειν πόρους ΕL πῶς ἐχειν J ἐσται] ἐστιν Ε. 15 καὶ om. ΕF Φ1 16 αὐτοὶ FHJLΦ1 18 μέγας ΚΑΝ τὸ κενὸν ponit F 20 ἐσται κενὸν ἤςων Η 21 ποιεῖ... 22 πόρους om. Ε1 22 δὲ καὶ τὸ Ε 26 ἐστι καὶ τὸν φανερὸν ponit F 27 δ' οὖσιν post σωμάτων ponit F 29 τοῖς οὖσιν υπάρχει J γενναίος τοῖς οὖσι F καὶ ante ποιεῖν delendum notat J 30 εἰρημένην πολλάκις F 31 τοιοῦτον] τούτο J πέφυκεν in marg. add. F 32 πάντων Η 34 ἀν] εἰ Ε λέγοι] λέγη Λ: om. Ε Μᾶλλον ἢ καθάπερ ΕF1 a 2 αὐτῶν Φ1 4 θερμαίνειν ΕJ2 ἀπαθεθέν EJ 5 ἄρθρο καὶ τὸ Ε πέφυκος J καὶ ante ποιεῖν om. ΕL
10. λοιπὸν δὲ θεωρήσας περὶ μίξεως κατὰ τὸν αὐτὸν τρόπον τῆς μεθόδου, τοῦτο γὰρ ἦν τρόπον τῶν προδιδομένων εἰς ἀρχής. σκεπτέον δὲ τί τ’ ἐστὶν ἡ μίξεις καὶ τί τὸ μικτὸν,

a 6 post ἡ excidisse quaedam suspicor 7 τὸ ἐν ἀρχῆ (ut videtur) ἐν ἀρχῆ (ut videtur) τοῦτο λαμβάνεται 8 σῶμα μὲν ἀδιαίρετον Η 9 οὐδὲν ἐντὸς ἀπὸ τὸν ἀρχηγόν. εἰς τοῦτο λάμβανε τὸν ἑαυτὸν. εἰς τοῦτο λάμβανε τὸν ἑαυτὸν. 10 καὶ τὸ ποιεῖν καὶ τὸ γίγνεσθαι τέ οὐκ ἐστὶν.}
καὶ τίσιν ὑπάρχει τῶν ὄντων καὶ πῶς, ἐτὶ δὲ πότερον ἔστι μέξις ἢ τούτο ἴσως. ἀδύνατον γάρ ἔστι μιχθῆναι τι ἐτε-35 ρον ἐτέρω, καθάπερ λέγουσιν τινες· ὄντων μὲν γὰρ ἔτι τῶν 327 μιχθέντων καὶ μὴ ἥλιοσωμένων οὐδὲν μᾶλλον μειώθαι φασὶν νῦν ἢ πρότερον, ἀλλὰ ὁμοίως ἔχειν· μικρον μὲν δὲ μέξιν ὁμοίως ἔχοντων εἶναι τῶν αὐτῶν δὲ τρόπων καὶ 5 εἰ ἄρμοστέρων συνελθόντων ἐφθαρται τῶν μιχθήμενων ἕκα-τερον, οὐ γὰρ εἶναι μεμιγμένα γε. ὥστε τούτων ὑπορεῖ διαπορθήσει λύνοντ' ἄν. ἀλλὰ μὴν οὖν τὴν ὑλὴν τῶν πυρὸς μειώθαι φαμεν οὖν μέγιστον καΙο-μένην, οὔτ' αὐτήν αὐτῆς τοῖς μορφῶσ οὔτε τῷ πυρὶ, ἀλλὰ τὸ μὲν πῦρ γίνεσθαι τὴν δὲ φθοράς, καὶ τὶ τὸ μικτὸν τοῦ γεννητοῦ καὶ φθορα-τού· ὁδὸν γὰρ ὡς δὲι διαφέρειν, εἴπερ ἔστιν· ὥστε τούτων 10 ὑπορεῖ διαπορθήσει λύνοντ' ἄν. ἀλλὰ μὴν οὖν τὴν ὑλὴν τῶν πυρὸς μειώθαι φαμεν οὖν μέγιστον καὶ ἄρμοστέρως συνελθόντως ἐφθαρται τῶν μιχθήμενων ἕκα-τερον, ἀλλὰ μὴν οὖν τὸ λόγον εὐκεῖν διορίας τὶ διαφέρει μεξίς— γε— νέστειος καὶ φθοράς, καὶ τὶ τὸ μικτὸν τοῦ γεννητοῦ καὶ φθορα-τοῦ· ὁδὸν γὰρ ὡς δὲι διαφέρειν, εἴπερ ἔστιν· ὥστε τούτων 15 μιγνύμενον σχηματίζειν τῶν ὄγκων· οὖν τὸ σῶμα καὶ τὸ λευκῶν οὖν ὀδὸς τὰ πάθη καὶ τὰς ἐξείς οὖν τε μειώθαι τοῖς πράγμασιν—σωζόμενα γὰρ ὀραταί. ἀλλὰ μὴν οὖν τὸ λευκὸν γε καὶ τὴν ἐπιστήμην ἐνδέχεται μιχθῆναι, οὔτ' ἄλλα τῶν μὴ χωριστῶν οὖν. ἀλλὰ τούτῳ λέγουσιν οὐ καλῶς 20 οἰ πάντα ποτὲ ὁμοίοι πάσκοντες εἶναι καὶ μεμιγμένοι οὐ γὰρ ἀπαν ἀπαντι μικτον, ἀλλ' ὑπάρχει τει καὶ χωριστῶν ἐκατέρων τῶν μιχθέντων, τῶν δὲ παθῶν οὖν χωριστῶν. ἐπεὶ δὲ ἐστὶ τὰ μὲν δυνάμει τὰ δὲ ἐνεργεία τῶν ὄντων, ἐνδέχε-ται τὰ μιχθέντα εἶναι πως καὶ μὴ εἶναι, ἐνεργεία μὲν 25 ἐτέρου ὄντος τοῦ γεγονότος εἰς αὐτῶν, δυνάμει τοῖς ἐς ἐκατέ-ρου ἀπερ ἴσαι πρὶν μιχθῆναι, καὶ οὐκ ἀπολολοῦτο—τοῦτο γὰρ ὁ λόγος διηπότει πρότερον, φαίμεται δὲ τὰ μιγνύμενα

πρότερον τε ἐκ κεχωρισμένων συνιόντα καὶ δυνάμενα χωρίζονται πάλιν. οὔτε διαμένουσιν οὐν ἀνεργειά ὀστήρ τοῦ σώμα καὶ τὸ λευκόν, οὔτε φθείρουται, οὔτε θάτερον οὔτ' ἄμφω, σῶ- 30 ζεται γὰρ ἡ ὄνωμας αὐτῶν. διὸ ταῦτα μὲν ἀφελέσθων τὸ ἐς συνεχεῖ τοῦτοι ἀπόρρημα διαιρετέον, πότερον ἡ μῖξις πρὸς τὴν αἰσθήσεως ἐστίν. ὅταν γὰρ οὗτος εἶς μικρὰ διαιρεθῇ τὰ μαγνύμενα καὶ τεθῇ παρ' ἀλλήλα τούτων τῶν τρά- πουν ὅστε μὴ δὴλον ἔκαστον εἶναι τῇ αἰσθήσει, τότε μέμκαιται; 35 ἢ οὔ, ἀλλ' ὅτε έστιν ὀστὶν οὗτοι παρ' ὅτι οὐκ εἶναι μόριον τῶν 328a μιχθέντων; λέγεται μὲν ὁ ἐκεῖνος, ὁ οὗν κράτος μεμιχθαί πυροί, ὅταν ἦττοσιν παρ' ὄντων τεθῇ· εἰ δ' ἐστι πᾶν σῶμα διαιρετόν, εἴπερ ἐστὶ σῶμα σώματι μικτὸν ὁμοιουμέρες, ὅτι οὐν ἀν δέου μέρος γίνεσθαι παρ' ὅτιον. ἐπεὶ δ' οὐκ ἔστι εἰς 5 τὰ ἐλάχιστα διαιρεθήναι, οὔδε σύνθεσις ταῦτο καὶ μῖξις ἀλλ' έστερον, ἤδην ὡς οὔτε κατὰ μικρὰ σωζόμενα δεῖ τὰ μαγνύμενα φάναι μεμιχθαί (σύνθεσις γὰρ ἐσται καὶ οὐ κρά- σις οὔδε μίξις, οὔδ' ἔξει τοῦ αὐτὸν λόγον τῷ ὀλῳ τὸ μό- ριον. φαιμέν δε δειν, εἴπερ μέμκαιται, τὸ μιχθὲν ὁμοιο- 10 μερὲς εἶναι, καὶ ὅσπερ τοῦ ύδατος τὸ μέρος ὕδωρ, οὕτω καὶ τοῦ κραδέντος· ἀν δ' ἡ κατὰ μικρὰ σώμας ἡ μῖξις, οοδέν συμβίζεσθαι τούτων, ἀλλὰ μόνον μεμιγμένα πρὸς τὴν αἰσθήσιον, καὶ τὸ αὐτὸ τῷ μὲν μεμιγμένον, ἕαν μὴ βλέπῃ ὅξο, τῷ Λυγκεί δ' οὔθεν μεμιγμένον) οὔτε τῇ διαιρέσει 15 ὅστε οὕτως πάρ' ὅτιον μέρος, ἀδύνατον γὰρ οὕτω διαιρε- θῆναι. ἢ οὖν οὖν ἐστὶ μίξις, ἢ λεκτέων τούτο πῶς ἐνδέχεται γίνεσθαι πάλιν. ἐστὶ δή, ὡς φαίμεν, τῶν ὅστων τὰ μὲν ποιητικὰ τὰ δ' ὑπὸ τούτων παθητικά. τὰ μὲν οὖν ἀντιστρέφει,
30 δισων ἡ αὐτὴ ἤλθε ἐστὶ, καὶ ποιητικὰ ἄλληλών καὶ παθητικὰ ὑπ’ ἄλληλών· τά δὲ ποιεῖ ἀπαθῆ ὄντα, ὅσων μὴ ἡ αὐτὴ ἤλθ. τοῦτον μὲν οὖν οὐκ ἔστι μίξις· διὸ οὐδ’ ἡ λατρικὴ ποιεῖ ὤγειαν οὐδ’ ἡ ὤγεια μυγμημένη τοῖς σάμασισι. τῶν δὲ ποιητικῶν καὶ παθητικῶν ὡστε εὐδαιμετα, πολλὰ μὲν ὀλίγοις καὶ με-25 γάλα μικρὸι συντιθέμενα οὐ ποιεῖ μίξιν, ἀλλ’ ἀνθρίσσων τοῦ κρατοῦντος· μεταβάλλει γὰρ θάτερον εἰς τὸ κρατοῦν (διὸ σταλαγμίῳ οἷον μλυῶσ τοιοῦτος οὐ μύγνυται) λάτεται γὰρ τὸ εἴδος καὶ μεταβάλλει εἰς τὸ πᾶν ὤδωρ; ὅταν δὲ ταῖς δυνάμεσιν ισάζῃ ποιεῖ, τότε μεταβάλλει μὲν ἐκάτερον
30 εἰς τὸ κρατοῦν ἐκ τῆς αὐτοῦ φύσεως, οὐ γίνεται δὲ θάτερον ἀλλὰ μεταξὺ καὶ κοινών. φανερῶν οὖν ὃν ἐστὶ ταῦτα μικτά ὡστε ἐναντίωσιν ἔχει τῶν ποιουτῶν (ταῦτα γὰρ ἔστιν ὑπ’ ἄλληλων παθητικῶν)· καὶ μικρὰ δὲ μικρὸι παρατιθέμενα μύγνυται μάλλον, μᾶλλον γὰρ καὶ θάττων ἄλληλα μεθιστάσι, 35 τὸ δὲ πολὺ καὶ ὑπὸ πολλοῦ χρώματος τούτῳ ὑδρᾷ. διὸ τὰ εὐδ. 328b ῥίστα τῶν διαρετῶν καὶ παθητικῶν μικτὰ—διαφερεῖται· γὰρ εἰς μικρὰ ταῦτα ῥίσδιος, τούτῳ γὰρ ἕν τὸ εὐρύστω εἶναι—οἷον τὰ υγρὰ μικτὰ μάλιστα τῶν σωμάτων· εὔρυστὸν γὰρ μάλιστα τὸ υγρὸν τῶν διαρετῶν, εὰν μὴ γλύσχων ἄρ (ταῦτα γὰρ ἐς τὰ πλεῖός καὶ μεῖζον μικρὸν ποιεῖ τοῖς ὄγκοις). ὅταν δ’ ἡ θάτερον μικρὸν παθητικὸν, ἡ σφόδρα τὸ δὲ πάμ-παν ἡρέμα, ἡ οὔθεν πλεῖός τοῦ μικθένες εξ ἀμφότεροι· μικρὸς ἐπερ συμβαίνει περὶ τῶν καττίτερον καὶ τῶν χαλκῶν. ἑπι γὰρ ψελλίζεται πρὸς ἄλληλα τῶν ὑπότων καὶ ἑπαμφοτερί. 10 ζεύ—φαινεται γὰρ πως καὶ μικτὰ ἡρέμα καὶ ὡς θάτερον μὲν δεκτικὸν θάτερον δ’ εἴδος· ὅτερ καὶ ἐπὶ τούτων συμβαίνει· ὁ γὰρ καττίτερος ως πάθος τι ὅν ἀνευ ἀληθῆ τοῦ χαλκοῦ

Io. 328a 20 — B. I. 329a 6

σχέδον ἀφανίζεται καὶ μιχθεὶς ἀπεισί χρωματίσας μόνον.
taūτὸ δὲ τούτῳ συμβαίνει καὶ ἕφ’ ἑτέρων. 

φανερὸν τούν ἐκ τῶν εἰρημένων καὶ ὅτι ἐστὶ μίξεις καὶ τὶ ἐστὶ καὶ διὰ τὶ, καὶ 15
ποιὰ μικτὰ τῶν ὀντῶν, ἐπείπερ ἐστὶν ἐνιὰ τοιαῦτα οἰα πα-
θητικά τε ὑπ’ ἀλλήλων καὶ εὐόριστα καὶ εὐδαιμετα. 

ταῦτα γὰρ οὗτ’ ἐφθάρθαι ἀνάγκη μεμψομένα οὔτ’ ἐτὶ ταῦτα ἀπλῶς
ἐιναι, οὔτε σύνθεσιν εἰναι τὴν μίξιν αὐτῶν, οὔτε πρὸς τὸν
αἰσθησιν’ ἀλλ’ ἐστὶ μικτὸν μὲν ὃ ἀν εὐόριστον ὃν παθητικὰν ὃ 20
καὶ ποιητικόν, καὶ τοιοῦτῳ μικτὸν (πρὸς ὁμώιμον γὰρ τὸ
μικτὸν), ἦ δὲ μίξις τῶν μικτῶν ἀλλουωθέντων ἐνοσις.

B

Περὶ μὲν οὖν μίξεως καὶ ἀφῆς καὶ τοῦ ποιεῖν καὶ πά- 30
σχεω εἰρήτα πῶς ὑπάρχει τοῖς μεταβάλλουσι κατὰ φύσιν,

ἐτὶ δὲ περὶ γενέσεως καὶ φθορᾶς τῆς ἀπλῆς, πῶς καὶ τῖνος
ἐστὶ καὶ διὰ τῶν αὐτῶν ὀμοῖος δὲ καὶ περὶ ἀλλοιω-
σεως εἰρήτα, τι τὸ ἀλλοιωθόθαυ καὶ τῶν ἐχει διαφοράν αὖ-
των λοιπῶν δὲ θεωρῆσαι περὶ τὰ καλούμενα στοιχεῖα τῶν
σωμάτων. γένεσις μὲν γὰρ καὶ φθορὰ πάσας ταῖς φύσεις
συνεστώτας οὐτίαις οὐκ ἀνέω τῶν αἰσθητῶν σωμάτων.

τούτων δὲ τῆν ὑποκειμένην ὑλὴν οἱ μὲν φασὶν εἰναι μίαν, οἱν ἄρα
τιθέντες ἡ πύρ ἡ τι μεταξὺ τούτων, σῶμα τε ὑν καὶ χωρι-
35
τον ὡς πλειόν τοῦ ἀρθμοῦ ἐνός—οἱ μὲν πῦρ καὶ γῆν, οἱ 329 a

dε ταῦτα τε καὶ ἀέρα τρίτου, οἱ δὲ καὶ ὑδάρ τούτω τέταρ-
του, ὀστερ ’Εμφεδοκλῆς—ἐξ ὁν συγκρυνομένων καὶ διακρι-
μένων ἡ ἀλλοιωμένων συμβαίνει τὴν γένεσιν καὶ τὴν φθο-
ραν τοῖς πράγμασιν. 

ὅτι μὲν οὖν τὰ πρῶτα ἀρχὰς καὶ στοι- 5
χεία καλὸς ἐχεί λέγειν, ἐστὼ συνομολογούμενον, ἐξ ὁν

πας J καὶ χρωματίσας L  14 τοινυν καὶ εκ F  16 οια τα
παθητικα H  17 ταύτα] τα E  18 ταύτα] τα E : τα αὐτα
FJ  20 δ ἀρ] σταν L : σταν μέν E  21 ante οι οι ποιητικων
lituram habet J 22 ενοσις. περὶ μὲν οὖν μίξεως καὶ ἀφῆς καὶ περὶ του
ποιεῖν καὶ πάσχων εἰρήται H], et (omissio meiv) F1 26 καὶ περὶ του F
28 ἐτι δὲ] ἐτι καὶ E, δὲ in marg. addito τῆς ἀπλῆς, πῶς καὶ
τίνος J’D : τῆς ἀπλῆς, τίνος καὶ πῶς EJ : τῆς ἀπλῆς καὶ τίνος καὶ
πῶς H : τῆς τῖνος καὶ ἀπλῆς καὶ πῶς (καὶ anto πῶς supra linea
addito) FF : τῆς τε ἀπλῆς καὶ τῆς τινώς, πῶς coni. Bonitz 30 αὐτῶν
om. F  35 τιθέντες om. L  τι μεταξύ τι (secundo tamen τι
eraso) F  a 3 καὶ J  ἘFHJ  4 ἦ] καὶ J, et fecit E
...
μεταβάλλει εἰς ἄλληλα, καὶ οὐχ ὁ 'Εμπεδοκλῆς καὶ Ἱπποκράτης ἐπερει \ετεροι λέγουσιν (οὐ γὰρ ἂν ἦν ἄλλοιςωσί), αἱ δ' ἐναντιώσεις οὐ μεταβάλλουσιν. ἄλλῃ οὐδὲν ἦττον καὶ ὅσι, σώματος ποιάς καὶ τόσας λεκτέων ἁρχάς; οἱ μὲν γὰρ ἄλλοι ὑποθέμενοι χρώνται, καὶ οὐδὲν λέγονσι διὰ τὸ αὕτη ἡ το-5 σαῦται.

2 Ἑπεὶ οὖν ἄπτομεν αἰσθητοὶ σώματος ἁρχὰς, τούτῳ δ' ἔστιν ἀπτοῦ, ἀπτόν δ' οὐ ἢ αἰσθησις ἁφή, φαινομένῳ ὃι οὐ πᾶσαι αἱ ἐναντιώσεις σώματος ἐίδη καὶ ἁρχὰς ποιοῦσι, ἄλλα μόνον αἱ κατὰ τὴν ἁφήν κατ' ἐναντιώσεις τε γὰρ το διαφέρουσι, καὶ κατὰ ἀπτὴν ἐναντίωσιν. διὸ οὔτε λευκότης καὶ μελανία οὔτε γλυκύτης καὶ πικρότης, ὁμοίως δ' οὔδε τῶν ἄλλων τῶν αἰσθητῶν ἐναντιώσεων οὐδὲν ποιεῖ στοιχεῖον. καίτοι πρότερον οὖν ἁφής, οὔστε καὶ τὸ ὑποκείμενον πρότερον· ἄλλ' οὖν ἐστὶ σώματος ἀπτοῦ πάθος ᾧ ἀπτόν, ἄλλα 15 καθ' ἔτερον καὶ εἰ ἐνυχε τῇ φύσει πρότερον. αὐτών δὴ τῶν ἀπτῶν διαμετέον ποιᾶ πρῶται διαφορὰ καὶ ἐναντιώσεις. εἰσί δ' ἐναντιώσεις κατὰ τὴν ἁφήν αὐδῇ, θερ-μοὺς ψυχρῶν, ἔχρων ὕγρων, βαρῶ κούφων, σκληρῶν μαλακῶν, γλάσχρων κραδής, τραχύ λείου, παχὺ λεπτῶν. τοῦτων δὲ 2ο βαρύ μεν καὶ κούφων οὐ ποιητικὰ οὔδε παθητικά· οὐ γὰρ τῷ ποιεῖ τῷ ἔτερον ἐπὶ πᾶσχειν ύφ' ἔτερον λέγονται, δεὶ δὲ ποιη-τικὰ καὶ παθητικά εἶναι ἄλληλων τὰ στοιχεῖα, μέγισται γὰρ καὶ μεταβάλλει εἰς ἄλληλα. θερμῶν δὲ καὶ ψυχρῶν καὶ ἔχρων καὶ ὕγρων τὰ μὲν τῷ ποιητικὰ εἶναι τὰ δὲ τῷ 25 παθητικὰ λέγεται· θερμῶν γὰρ ἐστὶ τὸ συγκρίνου τὰ ὁμo-γενῆ (τὸ γὰρ ἀκριβεῖς, ὅπερ φαίνει ποιεῖ τὸ πῦρ, συγκρίνων ἐστὶ τὰ ῥόμοφυλα—ἱσυμβαίνει γὰρ ἐξαιρέω τὰ ἄλ-λότρια), ψυχρῶν δὲ τὸ συνάγω καὶ συγκρίνων ὁμοίως τά

etiam tamen

fieppry-

33 a άπτομένω, τὸ δὲ λεπτὸν ἀναπληστικὸν (λεπτομερέσι γάρ, καὶ τὸ μικρομερὲς ἀναπληστικόν· διὸν γὰρ διὸν ἀπτεται, τὸ δὲ λεπτὸν μάλιστα τουωτὸν), φανερὸν ὅτι τὸ μὲν λεπτὸν ἐσται τοῦ ύγροῦ τὸ δὲ παχῦ τοῦ ξηροῦ. πάλιν δὲ τὸ μὲν γλυ-

35 διὰ τὸ μὴ ὑφισθαὶ μὲν εὐφριστὸν δὲ εἶναι καὶ ἀκολουθείν τῷ

33 a άπτομένω, τὸ δὲ λεπτὸν ἀναπληστικὸν (λεπτομερέσι γάρ, καὶ τὸ μικρομερὲς ἀναπληστικόν· διὸν γὰρ διὸν ἀπτεται, τὸ δὲ λεπτὸν μάλιστα τουωτὸν), φανερὸν ὅτι τὸ μὲν λεπτὸν ἐσται τοῦ ύγροῦ τὸ δὲ παχῦ τοῦ ξηροῦ. πάλιν δὲ τὸ μὲν γλυ-

5 σχροῦ τοῦ ύγροῦ (τὸ γὰρ γλυσχρὸν ύγρὸν πεπουθὸς τί ἔστω, οὐν τὸ ἐλαίον) τὸ δὲ κραύρου τοῦ ξηροῦ· κραύρου γὰρ τὸ τελέως ξηρόν, ὡστε καὶ πεπηγέναι δι’ ἐλλειψιν ύγρότητος. ἐτὶ τὸ μὲν μαλακῶν τοῦ ύγροῦ (μαλακῶν γὰρ τὸ ύπείκον εἰς ἑαυτὸ καὶ μῆ μεθιστάμενον, ὅπερ ποιεῖ τὸ ύγρὸν—διὸ

10 καὶ οὐκ ἔστι τὸ ύγρὸν μαλακῶν, ἀλλὰ τὸ μαλακῶν τοῦ ύγροῦ) τὸ δὲ σκληροῦ τοῦ ξηροῦ· σκληροῦ γάρ ἐστὶ τὸ πεπηγός, τὸ δὲ πεπηγὸς ξηρόν. λέγεται δὲ ξηρὸν καὶ ύγρὸν πλεοναξῶς· ἀντίκειται γὰρ τῷ ξηρῷ καὶ τῷ ύγρῷ καὶ τῷ διερῷ, καὶ πάλιν τῷ ύγρῷ καὶ τῷ ξηρῷ καὶ τῷ πεπηγῷ, ἀπαντά δὲ

15 ταῦτ’ ἐστὶ τοῦ ξηροῦ καὶ τοῦ ύγροῦ τῶν πρῶτων λεχθέντων. ἐτεὶ γὰρ ἀντίκειται τῷ διερῷ τῷ ξηρῷ, καὶ διερῷ μὲν ἐστὶ τὸ ἔχον ἀλλοτριὰν ὑγρότητα ἐπιστολῆς, βεβρεγμένου δὲ τὸ εἰς βάθος, ξηρόν δὲ τὸ ἐστερμένου ταύτης, φανερὸν ὅτι τὸ μὲν διερόν ἐσται τοῦ ύγροῦ, τὸ δ’ ἀντικειμένου ξηροῦ τοῦ πρῶ-

20 τος ξηροῦ. πάλιν δὲ τὸ ύγρὸ καὶ τὸ πεπηγὸς ὀσώστως· ύγρὸν μὲν γὰρ ἐστὶ τὸ ἔχον οἰκείαν ὑγρότητα ἐν τῷ βάθει (βεβρεγμένου δὲ τὸ ἔχον ἀλλοτριαίῳ ὑγρότητᾳ), πεπηγὸς δὲ

31 β ι διέ ἀλλοτρίως H τοῦ εὐφριστοῦ τοῦ αὐριστοῦ Ε 32 παχύ

παχύτερον E 33 καὶ σκληρόν om. J: καὶ τὸ σκληρὸν L ἀλλα

αι E a I λεπτομερέις μικρομερέις L, et (ut videtur) δέ ι ἐστι

7 ξηρῶν J1, supra lineam tamen scripsit σκληρῶν J3

οἰκείας ὑγρότητος G 8 τοῦ ύγροῦ μαλακῶν om. E post ύγροῦ

add. τὸ δὲ σκληροῦ τοῦ ξηροῦ F 9 μὴ om. EJ διὸ... 10 ύγροῦ om. E 10 οὐκ ἔστιν L 11 σκληρὸν γὰρ] ξηρὸν γὰρ E 14 δὲ δὴ δὴ EF 17 ἀλλοτριαῖν χοιν J 19 πρῶτος] πρῶτον

FHL 20 δὲ δὴ F 21 γὰρ om. F] ἔχον τὴν οἰκείαν F

ἐν τῷ βάθει om. F 22 βεβρεγμένον... ὑγρότητα om. HLF: βεβρεγ-

μένον δὲ τὸ ἔχον ἀλλοτριαίῳ ὑγρότητα ἐν τῷ βάθει in marg. (prima
tamen manu) ponit J 22 post ύγρότητα add. ἐν τῷ βάθει EF (cf. etiam J)
3. 329 30 — 3. 330 16

to ἑστερμέμον ταύτης, ὡστε καὶ τούτων ἦστι τὸ μὲν ἔχρον
tο δὲ ὑγρόν. ὅδηγον τοιῶν ὃτι πάσαι αἱ ἀλλαὶ διαφοραί
ἀνάγονται εἰς τὰς πρώτας τέτταρας, αὐταὶ δὲ οὐκέτι εἰς 25
ἐλάττους: οὔτε γὰρ τὸ θερμὸν ὑπὲρ ὑγροῦ ἢ ὑπὲρ ἔχρον, οὔτε
tὸ ὕγρον ὑπὲρ θερμοῦ ἢ ὑπὲρ ψυχροῦ, οὔτε τὸ ψυχρὸν καὶ
tὸ ἔχρον οὔθ' ὧν' ἄλληλ' οὐθ' ὑπὸ τὸ θερμὸν καὶ τὸ ὕγρον
eisw' ὡστ' ἀνάγκη τέτταρας εἶναι ταύταις.

3' Επεὶ δὲ τέτταρα τὰ στοιχεῖα, τῶν δὲ τεττάρων ἔξας αἱ
συζεύξεις, τὰ δ' ἐναυτία οὐ πέφυκε συνδυάζεσθαι (θερ-
μὸν γὰρ καὶ ψυχρὸν εἶναι τὸ αὐτὸ καὶ πάλιν ὑγρόν καὶ
ἔχρον ἀδύνατον), φανερῶν ὃτι τέτταρες ἔσονται αἱ τῶν στοι-
χείων συζεύξεις, θερμοῦ καὶ ἔχρου, καὶ ὑγροῦ καὶ θερμοῦ, καὶ
πάλιν ψυχροῦ καὶ θερμοῦ, καὶ ψυχροῦ καὶ ὑγροῦ. καὶ ἥκο-330b
λοθῆκε κατὰ λόγον τοῖς ἀπλοῖς φαινομένοις σῶμασι, πυρὶ
cαὶ ἁέρι καὶ ὅθατι καὶ γῆ. τὸ μὲν γὰρ πῦρ θερμὸν καὶ
ἔχρον, ὃ δ' ἀθρ θερμὸν καὶ ὕγρον (οἷον ἀτμίς γὰρ ὁ ἀθρ' ),
tὸ δ' ὕδωρ ψυχρὸν καὶ ὑγρὸν, ἢ δὲ γῆ ψυχροῦ καὶ ἔχρον, 5
ὡστ' εὐλόγως διανέμεσθαι τὰς διαφοράς τοῖς πρῶτοις σώ-
μαι, καὶ τὸ πλῆθος αὐτῶν εἶναι κατὰ λόγον. ἄπαντες
γὰρ οἱ τὰ ἀπλὰ σώματα στοιχεία ποιοῦστε οἱ μὲν ἐν, οἱ
dὲ δύο, οἱ δὲ τρία, οἱ δὲ τέτταρα ποιοῦσιν. ὅσοι μὲν ὅν
ἐν μόνον λέγουσιν, εἶτα πυκνόσει καὶ μικρόσει τάλλα γεν-10
νόσι, τοῦτοι συμβαίνει δύο ποιεῖν τὰς ἀρχὰς, τὸ τε μαρν...
καὶ τὸ πυκνὸν ἢ τὸ θερμὸν καὶ τὸ ψυχρὸν—ταῦτα γὰρ τὰ
δημιουργοῦντα, τὸ δ' ἐν υπόκειται καθάπερ ὤλη. οἱ δ' εὗθος
dύο ποιοῦντες, ὡστε Παρμενίδης πῦρ καὶ γῆν, τὰ μεταξὶ
μέγατα ποιοῦσιν τούτων, οἷον ἁέρα καὶ ὕδωρ, ὡσαύτως ἐδὲ 15
καὶ οἱ τρία λέγονται (καθάπερ Πλάτων ἐν ταῖς διαρέσεσιν,

tας] αὐτὰ εἶναι H 30 ἐπείδη δὲ FHL τὰ om. L 32 ὑγρὸν καὶ έχρον] ἕχρον καὶ ψυχρὸν EL 34 καὶ ἔχρον ... θερμοῦ om. F, qui
tamen καὶ ἔχρον θερμοῦ καὶ ψυχροῦ in marg. add. καὶ ψυχροῦ καὶ θερμοῦ] καὶ θερμοῦ καὶ ψυχροῦ E; ψυχροῦ καὶ ὑγροῦ L b 1 πάλιν om. L, supra
τὸ γὰρ μέσου μέγιμα ποιεῖ· καὶ σχεδὸν ταῦτα λέγουσιν οἷς τε δύο καὶ οἱ τρία ποιοῦντες, πλὴν οἱ μὲν τέμπους εἰς δύο τὸ μέσον, οἱ δὲ ἐν μόνον ποιοῦσιν. ἔνιοι δ᾽ εὐθὺς τέσσαρα λέ- 
20 γουςιν, οἶον Ἐμπεδοκλῆς συνάγει δὲ καὶ οὕτως εἰς τα ὄντα, 
τῷ γὰρ πυρὶ τάλλα πάντα ἀντιτίθεναι. οὐκ ἦστε δὲ τὸ πῦρ 
καὶ ὁ ἄρπ καὶ ἐκαστὸν τῶν εἰρημένων ἄπλοιον, ἄλλα μικτά, 
τὰ δὲ ἀπλὰ τοιαῦτα μὲν ἔστω, οὐ μέντοι ταῦτα, οἶον τὸ 
τῷ πυρὶ ὑμοίοι πυροειδὲς, οὐ πῦρ, καὶ τὸ τῷ ἄρπ ἀεροει- 
25 δὲς· ὁμοίοις δὲ κατὶ πάντων ἄλλων. τὸ δὲ πῦρ ἐστὶν ὑπερβολὴ 
θερμότητος, ὁσπερ καὶ κρύσταλλος ψυχρότητος· ἡ γὰρ 
πῦξις καὶ η ἐξίς ὑπερβολαὶ των ἐστὶν, ἡ μὲν ψυχρότη- 
τος, ἡ δὲ θερμότητος· τι εἶ οὖν ο κρύσταλλος ἐστὶ πῦξις ψυροῦ καὶ 
ψυχροῦ, καὶ τὸ πῦρ ἦσται ἐξίς ἐξροῦ καὶ θερμοῦ (ὅδι καὶ οὗτοι 
30 οὔτ' ἐκ κρύσταλλος γίγνεται οὔτ' ἐκ πυρός). ἄυτως δὲ τετάρτων 
tῶν ἄπλον σωμάτων, ἐκάτερα τοῖς ὄνοις ἐκατέρω τῶν τό- 
pων ἔστω. (πῦρ μὲν γὰρ καὶ ἄρπ τοῦ πρὸς τῶν Ὄρων φερομένου, 
γῆ δὲ καὶ ὕδωρ τοῦ πρὸς τὸ μέσον), καὶ ἀκρα μὲν καὶ εὐλ- 
κρανέστατα πῦρ καὶ γῆ, μέσα δὲ καὶ μεμεγέμενα μᾶλλον· 
331η ὕδωρ καὶ ἄρπ· καὶ ἐκάτερα δὲ ἐκατέρως ἐναντία—πυρὶ μὲν 
γὰρ ἐναντίον ὕδωρ, ἄρπ· δὲ γῆ, ταῦτα γὰρ ἐκ τῶν ἐναντίων 
pαθημάτων συνεστήκεν. οὐ μὴν ἀλλ' ἀπλῶς γε τετάρτα ὄντα 
ἐνὸς ἐκαστὸν ἔστι, γῆ μὲν ἐξροῦ μᾶλλον ἡ ψυχροῦ, ὕδωρ δὲ 
5 ψυχρὸς μᾶλλον ἡ ψυροῦ· ἅρη δ' ψυροῦ μᾶλλον ἡ θερμοῦ, πῦρ 
dὲ ἐκρημοῦ μᾶλλον ἡ ἐξροῦ.

Ἐπει δὲ διώρισται πρὸτερον ὅτι τοῖς ἀπλοῖς σάμασιν 4 
ἐξ ἀλλήλων η γένεσις, ἀμα δὲ καὶ κατὰ τὴν οἰκίσθην 
φαίνεται γνώμενα (οὐ γὰρ ἄν ἢν ἀλλοίωσίς· κατὰ γὰρ τὰ 
10 τῶν ἀπτῶν πάθη ἡ ἀλλοίωσις ἔστιν), λεκτέων τίς ὁ τρόπος 
τῆς εἰς ἀλληλα μεταβολῆς, καὶ πότερον ἄπαν ἄξιον ἄπαντος

γίγνεσθαι δυνατὸν ἢ τὰ μὲν δυνατὸν τὰ δ’ ἀδύνατον. ὅτι μὲν οὖν ἀπανταί πέφυκεν εἰς ἀλληλαὶ μεταβάλλειν, φανερόν. ἢ γὰρ γένεσις εἰς ἐναντία καὶ εἰς ἐναντίων, τὰ δὲ στοιχεῖα πάντα ἔχει ἐναντίωσιν πρὸς ἄλλα ἅμα τὸ τάς διάφορες ἐναντίας εἶναι. τοὺς μὲν γὰρ ἄμφοτεραι ἐναντιά, οἶνον πρὶν καὶ ὑδατί (τὸ μὲν γὰρ ἔηρον καὶ θερμόν, τὸ δ’ ὕγρον καὶ ψυχρόν). ὅστε καθόλου μὲν φανερὸν ὅτι πᾶν ἐκ παντὸς γίγνεσθαι πέφυκεν, ἢδη δὲ καθ’ ἐκαστον οὐ χαλεπὸν ἑδεῖν πως— ἀπαντα οἷς γὰρ εἰς ἀπάντων ἔσται, διούσε δὲ τῷ βάττοις καὶ βραδύτεροι καὶ τῷ βασιν καὶ χαλεπώτεροι. ὡσα μὲν γὰρ ἔχει σύμβολα πρὸς ἄλληλα, ταχεία τούτων ἡ μετάβασις, ὡσα δὲ μὴ ἔχει, βραδεία, διὰ τὸ βασιν εἶναι τὸ ἐν 25 ἢ τὰ πολλά μεταβάλλειν—οἶνον ἐκ πυρῶς μὲν ἔσται ἄληθερον μεταβάλλοντος (τὸ μὲν γὰρ ἤνι θερμόν καὶ ἔηρον, τὸ δὲ θερμόν καὶ υγρόν, ὡστε ἀν κατηγορῆτο ἐκ ἔηρον ὑπὸ τοῦ ὕγρου ἀλήθεται), πάλιν δὲ εἰς ἀέρος ὑδατά, εἶναι κατηγορῆτο τῷ θερμῷ ὑπὸ τοῦ ψυχροῦ (τὸ μὲν γὰρ ἤνι θερμόν 30 καὶ υγρόν, τὸ δὲ ψυχρόν καὶ υγρόν, ὡστε μεταβάλλοντος τοῦ θερμοῦ ὑδατά ἔσται). τοῦ αὐτοῦ δὲ τρόπου καὶ εἰς ὑδατας γῆ καὶ εἰς γῆς πῦρ. ἔχει γὰρ ἄμφω πρὸς ἄμφος σύμβολα: τὸ μὲν γὰρ ὑδαταὶ ψυχροῦ καὶ ψυχρῶν, ὡστε κατηγορηθέντος τοῦ ὕγρου γῆς 35 ἔσται, καὶ πάλιν ἔπει τὸ μὲν πῦρ ἔηρον καὶ θερμόν, ὡστε ἀν κατηγορηθέντος τοῦ ψυχροῦ γῆς ἔσται, καὶ πάλιν ἔπει τὸ μὲν πῦρ ἔηρον καὶ θερμόν, ὡστε ἀν κατηγορηθέντος τοῦ θερμοῦ ὑδατά τοῦ ὑγροῦ γῆς πῦρ ἔσται ἐκ 331 b γῆς. ὅστε φανερὸν ὅτι κύκλῳ τε ἔσται ἡ γένεσις τοῖς ἀπάλοις σώμασι, καὶ βάστας ωτοὺς δ’ ὑπὸ τῆς μεταβολῆς διὰ τὸ σύμβολον ἐνυπάρχειν τοῖς ἐφεξῆς. ἐκ πυρῶς δὲ ὑδατα καὶ ἀέρος ἔγερ καὶ πάλιν ἐξ ὑδατα καὶ γῆς ἀέρα καὶ πῦρ 5 ἐνδέχεται μὲν γίγνεσθαι, χαλεπῶτερον δὲ διὰ τὸ πλεῖόν ἐστιν τῆς μεταβολῆς. ἀνάγκη γὰρ, εἰ ἔσται εἰς ὑδατας πῦρ,
φθαρναί καὶ τὸ ψυχρὸν καὶ τὸ ὑγρὸν, καὶ πάλιν εἶ ἐκ γῆς ἀήρ, φθαρναί καὶ τὸ ψυχρὸν καὶ τὸ ἥρπων ὡσαύτως

δὲ καὶ εἶ ἐκ πυρὸς καὶ ἀέρος ὕδωρ καὶ γῆ, ἀνάγκη γὰρ ἀμφότερα μεταβάλλει. αὐτὴ μὲν οὖν χρονιωτέρα ἡ γένεσις· ἐὰν δ' ἐκατέρω βάτερον φθαρῆ, βάφων μὲν, οὐκ εἶς ἀλλήλα δὲ ἡ μεταβάσις, ἀλλὰ ἐκ πυρὸς μὲν καὶ ὕδατος ἑσται γῆ καὶ ἀήρ, εἶ ἀέρος δὲ καὶ γῆς πῦρ καὶ ὕδωρ. ὅταν μὲν γὰρ τοῦ ὕδατος φθαρῆ τὸ ψυχρὸν τοῦ δὲ πυρὸς τὸ ἥρπων, ἀήρ ἑσται (λειπέται γὰρ τοῦ μὲν τὸ θερμὸν τοῦ δὲ τὸ ὑγρὸν), ὅταν δὲ τοῦ μὲν πυρὸς τὸ θερμὸν τοῦ δὲ ὕδατος τὸ ὑγρὸν, γῆ διὰ τὸ λειπέσαι τοῦ μὲν τὸ ἥρπων τοῦ δὲ τὸ ψυχρὸν. ὡσαύτως δὲ καὶ εἶ ἀέρος καὶ γῆς πῦρ καὶ ὕδωρ· ὅταν μὲν γὰρ τοῦ ἀέρος φθαρῆ τὸ θερμὸν τῆς δὲ γῆς τὸ ἥρπων, ὕδωρ ἑσται (λειπέται γὰρ τοῦ μὲν τὸ ὑγρὸν τῆς δὲ τὸ ψυχρὸν), ὅταν δὲ τοῦ μὲν ἀέρος τὸ ὑγρὸν τῆς δὲ γῆς τὸ ψυχρὸν, πῦρ διὰ τὸ λειπέσαι τοῦ μὲν τὸ θερμὸν τῆς δὲ τὸ ἥρπων, ἀπερ ἢν πυρὸς. ὀμολογουμένη δὲ καὶ τῇ αἰσθήσει ἡ τοῦ πυρὸς γένεσις.

σι' μάλιστα μὲν γὰρ πῦρ ἡ φλοξ, αὐτὴ δ' ἐστὶ κατόπος καιόμενος, ὁ δὲ κατόπος εἶ ἀέρος καὶ γῆς. ἐν δὲ τοῖς ἐφεξῆς οὖν ἐνδέχεσθαι φθαρέστως ἐν ἐκατέρω βάτερον τῶν στοιχείων γενέσθαι μεταβάσιν εἰς οὕδην τῶν σωμάτων διὰ τὸ λειπέσαι εἰς ἀμφὸς η ἑκατέρω. ἡ ταναυτία—εἰς οὐδετέρων δὲ ἐγχωρεῖ γίγνεσθαι σῶμα—οὖν εἰ μὲν τοῦ πυρὸς φθαρεῖ τὸ ἥρπων, τοῦ δ' ἀέρος τὸ ὕγρον (λειπέται γὰρ εἰς ἀμφὸὶ τὸ θερμὸν), ἐὰν δ' εἶ ἐκατέρω τὸ θερμὸν, λειπέται ταναυτία, ἥρπων καὶ ὕγρον. ὧμοιος δὲ καὶ εἰν τοῖς ἀλλοίς· ἐν ἀπαισί γὰρ τοῖς ἐφεξῆς ἐνπάρχει τὸ μὲν ταύτῳ τὸ δ' ἑναύτῳ, ὅτι

332 mὲν οὖν ἄπαντα ἐκ παντὸς γίγνεται, καὶ τίνα τρόπον εἰς ἄλληλα μεταβάσις γίγνεται, ἐξηρταία.
ΕΠΙ ΓΕΝΕΣΕΩΣ ΚΑΙ ΦΘΟΡΑΣ Β

30 των ἐγγαρευ. ὅτι μὲν τοῖνυν μεταβάλλεις ἀνάγκη εἰς ἄλληλα δεδεικταῖ πρότερον, καὶ ὅτι ὦν όμοιος ταχέως ἄλλο ἐξ ἄλλου [ἐλήτησ πρότερον], ὅτι τὰ μὲν ἔχουσα σύμβολον βάπτων γίνεται ἐξ ἄλληλων, τὰ δ’ οὐκ ἔχουσα βαριότερον. εἰ μὲν τοῖνυν ἡ ἑναντίοτης μία ἐστὶ καθ’ ἂν μεταβάλλοντων,

35 ἀνάγκη δύο ἐισ’ ἡ γὰρ ὅλη τὸ μέσον ἀνασθήσως οὐσα 332 καὶ ἀχώριστος. ἐπεὶ δὲ πλεῖον ὡρᾶται οὔτα, δύο ἂν εἴης αἱ ἐλάχισται. δύο δ’ οὐσῶν οὐχ οἶδον τε τρία εἶναι, ἀλλὰ τέταρτα, ὥσπερ φαίνεται τοσάττα γὰρ αἱ συνήγαγ, εἴ γὰρ οὐσῶν τὰς δύο ἀδύνατον γενέσθαι διὰ τὸ ἑναντίας εἰς

5 να ἄλληλαις. περὶ μὲν οὖν τούτων ἐλήτησα πρότερον ὃτι δ’, ἐπειδὴ μεταβάλλουσιν εἰς ἄλληλα, ἀδύνατον ἀρχήν τω μὲν εἰναι αὐτῶν ἡ ἐπὶ τῷ ἄκρω ἡ μέσφο, ἐκ τῶν δῆλον. ἐπὶ μὲν οὖν τοὺς ἄκρους οὐκ ἔσται, ὅτι πῦρ ἔσται ἡ γῇ πάντα, καὶ οἱ αἵτινς λόγος τῷ φαύναν ἐκ πῦρς ἡ γῆς ἐισ’ πάντα ὁτι δ’ οὐδὲ μέσον—ὁσπερ δοκεῖ τοιοῦ ἄγρ μὲν καὶ εἰς πῦρ μεταβάλλεις καὶ εἰς οὐδορ, οὐδορ ∆ καὶ εἰς ἀέρα καὶ εἰς γῆν, τὰ δ’ ἑσχατα οὐκέτι εἰς ἄλληλα—***. δέ μὲν γὰρ στῖγμα καὶ μη εἰς ἄπειρον τοῦτο λέναι ἐπ’ εὐθείας ἐφ’ ἐκάτερα, ἄπειρον γὰρ ἑναντίοτητες ἐπὶ τοῦ ἑνὸς ἔστοιται. γῇ ἐφ’ Ἐ

15 Γ’, οὐδορ ἐφ’ ὦ Τ, ἀηρ ἐφ’ ὦ Α, πῦρ ἐφ’ ὦ Π. εἰ δὴ τὸ Α μεταβάλλει εἰς τὸ Π καὶ Τ, ἑναντίοτης ἔσται τῶν Α Π. ἐστω ταῦτα λευκότης καὶ μελανία. πάλιν εἰς εἰς τὸ Τ καὶ Α, ἐσται ἄλλη’ οὐ γὰρ ταῦτα τὸ Τ καὶ Π. ἐστω δὴ ἐπρό-

της καὶ υγρότης, τὸ μὲν Ξ ἐπρότης, τὸ δ’ υγρότης.

α 30 et 35 ἀνάγκη] ἀναγκαίον Η 30 ἀνάγκη post τοῖνυν ponit Φ, post ἄλληλα F 31 δεδεικτα]ἐλήτησα Φ καὶ om. FHJL 32 ἐλή-


ψ τ α ν Γ

ψ τ α ν Γ


Φ Κ ΗΗΡ


εἰ] ἐπεὶ FHJ 18 καὶ] τῷ fecit E δὴ] δὴ EHJL
οὐκοῦν εἰ μὲν μένει τὸ λευκὸν, ὑπάρξει τὸ ὅδωρ ὑγρὸν καὶ ὅ λευκόν, εἰ δὲ μη, μέλαν ἔσται τὸ ὅδωρ· εἰς τᾶναυτία γὰρ ἡ μεταβολή· ἀνάγκη ἁρὰ ἡ λευκὸν ἡ μέλαν εἶναι τὸ ὅδωρ.

ἐκτὸς δὴ τοῦ πρῶτον ὁμολογοῦν καὶ τῷ Π ξ ὑπάρ-

ξεί ἡ ἥξυρτής. ἔσται ἁρὰ καὶ τῷ Π τῷ πυρι μεταβολή
eis τὸ ὅδωρ· ἐναυτία γὰρ ὑπάρχει, τὸ μὲν γὰρ πῦρ τὸ 25

πρῶτον μέλαν ἢν, ἐπειτα δὲ ἥξυρτ, τὸ δ' ὅδωρ ὑγρὸν,

ἐπειτά δὲ λευκόν. φανερὸν δὴ ὅτι πᾶσιν εἰς ἀλληλῶν ἔσται

ἡ μεταβολή, καὶ ἐπὶ γε τούτων ὅτι καὶ ἐν τῷ Γ τῇ γῇ

ὑπάρξει τὰ λουπά καὶ δύο σύμβολα, τὸ μέλαν καὶ τὸ

ὑγρόν· ταῦτα γὰρ οὐ συνεδνύσαι πω. οὕτως εἰς ἄπειρον 30

οὐχ ὄντων τ' ἕναι, διὸ μελλῆσαντες δεῖξεν επὶ τοῦτο ἐμ-

προσθεν ἡλάθως, ὁδὴν εἰκὼν τῷ ὑπάρχει τῶν εἰρημένων

οὐδεὶς γὰρ τὸ αὐτὸ ὑπόκειται τῶν η γ Α Π 35

to Ψ. ἔστω δὴ τῷ μὲν Π τῷ Κ, τῷ δὲ Ψ τῷ Φ. τῷ δὴ Κ 333a

πᾶσιν ὑπάρξει τοῖς Γ Θ Α Π, μεταβάλλουσι γὰρ εἰς ἀλ-

ληλα—ἀλλὰ γὰρ τούτο μὲν ἐστώ μήτω δεδειγμένων, ἀλλ' ἐκεῖνο ὁδὴν, ὅτι εἰ πάλιν τῷ Ψ εἰς ἄλλο, ἀλλή ἐναυτίτης

καὶ τῷ Ψ ὑπάρξει καὶ τῷ πυρὶ τῷ Π. ὁμολογὸς δ' ἀεὶ μετα 5

tοι προστιθεμένον ἐναυτίτης τοὺς ὑπάρξει οὕτως ἐμπροσθεν, ὡστ' εἰ ἄπειρα, καὶ ἐναυτίτητες ἄπειροι τῷ εἰνὶ ὑπάρξουσιν. εἰ δὲ τοῦτο, οὐκ ἔσται οὔτε ὅρισασθαι οὔτε οὔτε γενέσθαι· δείησα γάρ, εἰ ἔσται ἄλλο εἰς ἄλλου, τοσαῦτα διεξελθεῖν ἐναυτίτητας, καὶ εἰτὶ πλεῖονς, ὡστ' εἰς ἐνα μὲν οὐδέποτέ' ἔσται μεταβολή, ἵ 10

οἶνον εἰ ἄπειρα τὰ μεταξύ (ἀνάγκη δ', εἰπὲ ἄπειρα τὰ στοιχεῖα), ἐτί δ' οὐδ' εἰς ἀνερος εἰς πῦρ, εἰ ἄπειροι αἱ ἐνα-

ναυτίτητες. γίνεται δὲ καὶ πάντα ἐν· ἀνάγκη γάρ πάσας

υπάρχειν τοῖς μὲν κατώ τοῦ Π τὰς τῶν ἀνωθεν, τούτους δὲ τὰς τῶν κάτωθεν, ὡστε πάντα ἐν ἑσταί.

Θεωμάσσει δ' ἂν τις τῶν λεγόντων πλείω ἐνός τὰ 6 στοιχεῖα τῶν σωμάτων ὡστε μὴ μεταβάλλει εἰς ἀλλήλα, καθάπερ Ἐμπεδοκλῆς φησι, πῶς ἐνδέχεται λέγειν αὐτοῖς εἶναι συμβλητα τὰ στοιχεῖα—καίτοι λέγει οὕτω, "ταῦτα γὰρ 20 ἰδα τε πάντα". εἰ μὲν οὖν κατὰ τὸ ποσὸν, ἀνάγκη ταύτῳ τι ἐναι ὑπάρχον ἀπασί τοῖς συμβλητοῖς δ' μετροῦνται, οἶον εἰ ἔξ ὑδατος κοτύλης εἰνὲν άέρος δέκα τούτῳ τι ἐν ἀρα. ἄμφω, εἰ μετρεῖται τῷ αὐτῷ. εἰ δὲ ηὐ οὕτω κατὰ τὸ ποσόν συμβλητα ὡς ποσὸν ἐκ ποσοῦ, ἀλλ' ὦσον ὁμοῖον, οἶον εἰ 25 ἔτι κοτύλη ὑδατος ἅγιον δύναται ψύχειν καὶ δέκα άέρος, καὶ οὕτως κατὰ τὸ ποσὸν οὐχ ἢ ποσὸν συμβλητα, ἀλλ' ἢ δύναται τι. εἰ δ' ἂν καὶ ηὖ τῷ τοῦ ποσοῦ μέτρῳ συμβάλλεσθαι τὰς δυνάμεις, ἀλλὰ κατ' ἀναλογίαν, οἶον ὡς τὸ δε θερμόν τὸτε λευκών τὸ δ' ὡς τὸτε σημαίνει ἐν μὲν ποιῷ τὸ 30 ὡμοίου, ἐν δὲ τῷ ποσῷ ἑν οὕτω. ἄτοπον δ' ἐναίηται, εἰ τὰ σώματα ἀμετάβλητα οὕτω μὴ ἀναλογία συμβλητα ἑσταί, ἀλλὰ μέτρῳ τῶν δυνάμεων καὶ τῷ εἴναι ἃγιον θερμὸν ἢ ὡμοίου πυρὸς τοσοῦτο καὶ άέρος πολλαπλάσιον τοῦ γὰρ αὐτῷ πλείον τῷ ὡμογενές εἶναι τοιοῦτον ἔξει τὸν λόγον. 35 ἀλλὰ μὴν οὖν αὐξήσεις ἂν εἰη κατ' Ἐμπεδοκλέα, ἀλλ' ἦ 333b κατὰ πρόσθεσιν πυρὶ γὰρ αὐξεῖ τὸ πῦρ, "αὐξεῖ δὲ χῶν μὲν σφετερὸν δέμας, αἰθέρα δ' αἴθηρ", ταῦτα δὲ προστίθεν 333b ται· δοκεῖ δ' οὖν οὕτως αὔξεσθαι τὰ αὔξανόμενα. πολὺ δὲ χαλεπώτερον ἀποδούν περὶ γενέσεως τῆς κατὰ φύσιν. τὰ 5 γὰρ γνώριμα φύσει πάντα γίγνεται ἢ ἀεὶ ὡδὶ ἢ ἦ ὡς ἐπὶ τὸ πολὺ, τὰ δὲ παρὰ τὸ ἀεὶ καὶ ὡς ἐπὶ τὸ πολὺ ἀπὸ ταυ-
25. TO TO'IS (kaiivovTai incertum ro vioOta-Oai 49 TO 1 TOVTWV 22 31 TOVTWV TOVTOV 23 17 TO 8')

26 8'
<fiia iovr\v Kadairep Tf om. TVX*) TOUTOIS J om. 20 9 Trjv EL Bekker criv (f)V(nv TTvp TTapa Ata ravra. opicao-Oai etTretr dAA' vov TT], yeVrcoz; aAAa 877 ye over OTTCO? o-ews dAAa rojuarov avTTp avOpaiTrov.

20 Kario~0ai. E E E, prius a;r6 y6 ro
KaiToi kal om. 20 om. 28 jxXt'ai/ Katvdv 8e Kt^TJcret 22 aura
17 15 tujx\ vofis E 87) yap J'F tois scripsi, cf. Empedokles fr. 8 (Diels, p. 175): to 'I\ovn JG; toitou FHL et fort. E1: toitou secit E2 (suprascr. oia) 16 etu\xvn tujx L -17 d\] de F 18 o\v\en ante \ra incertum E 19 ka\ prius om. E, spatio durarum litterarum relicito kai secundum om. E, to secundum habent FJ^2F, om. E]H1L m\p\n L 20 kai\o ... 22 ta\ta fort. supra post 13 a\t\ovn legenda 20 ye) te EFL diakri\eni J 22 de kai peri L 23 filiak] fili\\n E]L 24 to secundum om. EFJL e\\n] dei H: incertum E om. H 25 ano\a\xai[ apo\o\vai E 26 \\va\n coni. Bekker to\\ wos ye F. faiv\n\\\n E]L 27 to om. E 28 ou om. E to de bia to kat\\a FH 31 kat\\\n\\ an\o FL, Bonitz diakri\\\e] \\a kina\ coni. Bonitz. Nihil tamen mutandum: scilicet \\
a\t\a f\\\n kina\\ (cf. v. 32) t\n g\n k\\\n k\\, kai diakri\\ \\e\k
PERI GENESIEWS KAI PHIOPAS B

aītivn tīs kath fūsin kūnīsewos h ' kūlia, dōste kai ēlōs parā fūsin h ' fūlia ἀν ἐν μάλλον. ἀπλῶς δέ, εἴ μη ἡ fūlia h ' tō neikos kivēi, aītvōn tōn swmátōn oúdēmía kíni-
35 sīs ēstivn oude μονή. ἀλλά ētoston. ēti δὲ kai faiwetαι kivōn-
334μενα—diēkoume mēn γάρ το νείκος, ηνέκηθι δ' ἂνω ὁ aītēr
oūx ὑπὸ τον νείκου, αλλ' ὅτε μὲν φησιν ὡσπερ ἀπὸ τύχης
("οὗτω γάρ συνέκυρον θέων τότε, πολλάκις δ' ἄλλως") ὅτε
d' ἄνω φησιν ἐπικεύεται τὸ πῦρ ἄνω φέρεσθαι, δ' δ' aītēr,
5 φησὶ, "μακρήσι κατὰ χθόνια ὄντε κόκκοι". ἀμα δὲ καὶ
tōν κόσμου ὄνομα ἔχειν φησιν ἐπὶ το τον νείκουν νῦν καὶ
πρότερον ἐπὶ τῆς φιλίας τί οὖν ēstti τὸ κυριον πρῶτων καὶ
aītvou τῆς κυκῆσως; οὐ γάρ δὴ ἡ fūlia kai τὸ νείκος αλλά
τινος κυκῆτως ταύτα aίτια, εἴ <γ>' ēstivn ēkēwν ἀρχή. ētost-
10 πον δὲ καὶ εἴ ἡ ψυχή ἐκ τῶν στοιχείων ἡ ἐν τι aītvōn. αἱ
γὰρ αλλιώσεις αἱ τῆς ψυχῆς πῶς ēsosvat, οὖν τὸ μουσ-
κὸν εἶναι καὶ πάλιν ἀμονικον, ἡ μυήμη ἡ λήθη; δῆλον γὰρ
ὅτι εἰ μὲν πῦρ ἡ ψυχή, τὰ πάθη υπάρξει αὐτή ὅσα πυρὶ
7 πῦρ, εἴ δὲ μικτόν, τὰ σωματικὰ τούτων δ' ύποῖν σωμα-
15 τικόν. ἀλλὰ περὶ μὲν τούτων ἔτερας ἔργων ēstti theōrias, περὶ 7
dὲ τῶν στοιχείων <εν δὲ τὰ σώματα συνέστηκεν, δόσως μὲν
δοκεῖ τι εἶναι κοινὸν ἢ μεταβάλλεις εἰς ἀλλήλα, ἀνάγκη
ei thāteron toúton, καὶ thāteron συμβαίνεινν; <οὐσι δὲ μη ποι-
 odioν εἰς ἀλλήλων γένεσιν μηδ' ως εἰς ἐκάστου, πλὴν όσ ἐκ
20 τούχου πλήθους, aītovn πῶς εἰς εἰκόνων ēsosvat σάρκες καὶ
οστά καὶ τῶν ἄλλων ὀστῶν. ἔχει τί δὲ τὸ λέγομενον ἀπόριαν
καὶ τοὺς εἰς ἀλλήλων γεννῆσας, τόμα τρόπον γίγνεται εἰς aī-
tων ἔτερον τι παρ' αὐτά. λέγω δ' οὖν εἴκ πυρὸς ēstivn ὅδορ
c καὶ εἴκ τούτων γίγνεσθαι πῦρ (ἐστὶ γάρ τι κοινὸν τὸ ὑποκείμε-

25 νον), ἀλλὰ δὴ καὶ σάρξ εἰς αὐτῶν γίνεται καὶ μυελός;

b 33 | h secundum om. EFL | 34 h] kai E | kive] kivoi HJ:
κωνίθ L | a 2 per ἀπὸ τύχης supra lin. add. F | 3 θεόν νοὺς
tote E | πολλάκις F | 4 φησι] [φησι F | 5 δυαται rìγες (ut
videtur) E | rìges J | 6 te om. EL | 9 e]' estivn scripsi:
EI] ēstivn EHJ: ēstivn (ei δὲ in marg. additis) F: ei δ' ēstivn L: si
utique est Γ | 12 h λ.] καὶ λ. HJ: h καὶ λ. F | 14 σωματικῶν
σωματικὸ L | 15 ἀλλὰ γὰρ περὶ J | μὲν om. FH ēstivn ἔργον
HJ | peri secundum] ek J: peri fecerunt EF | 17 ti ēnai
eiwai ti F]: ēnai ti h H: ēnai τὸ φι 19 ēstivn ek pyrōs EL | 24 τούτων
23 par' auta] para taīta FHA ēstivn ek pyrōs EL | 24 τούτων
J | pūr om. E
ταῦτα δὴ γίνεται πῶς; ἐκεῖνοι τε γὰρ τοῖς λέγονσιν ὡς Ἠμπεδοκλῆς τὸς ἔσται τρόπος; ἀνάγκη γὰρ σύνθεσιν εἶναι καθάπερ ἐκ πλάθων καὶ λίθων τοῖχος· καὶ τὸ μίγμα δὲ τούτῳ ἐκ σωζομένων μὲν ἔσται τῶν στοιχείων, κατὰ μικρὰ δὲ παρ᾽ ἄλληλα συγκειμένων οὕτω δὴ σὰρξ καὶ τῶν ἄλλων 30 ἐκαστῶν. συμβαίνει δὴ μὴ ἐξ ὅποιον μέρους σαρκὸς γίγνεσθαι πῦρ καὶ ύδωρ, ὡσπερ ἐκ κηροῦ γένουσ᾽ ἄν ἐκ μὲν τούτῳ τοῦ μέρους σφαιρὰ, πυραμίς δ᾽ ἐξ ἄλλου τυπός, ἀλλ᾽ ἐνεδέχετο γε ἐξ ἐκατέρων ἐκάτερον γενέσθαι. τούτῳ μὲν δὴ τούτῳ γίνεται τὸν τρόπον, (τὸ) ἐκ τῆς σαρκὸς ἐξ ὅποιον ἀμφοῖ· τοῖς δ᾽ ἐκεῖνοι 35 λέγοντι οὐκ ἐνδέχεται, ἀλλ᾽ ὡς ἐκ τοῖχου λίθος καὶ πλάθος, 334b ἐκάτερον ἐξ ἄλλου τόπου καὶ μέρους. ὅμοιος δὲ καὶ τοῖς ποιοῦσι μιὰν αὐτῶν ὑλήν ἔχει τυχα ἀπορίαν, πῶς ἔσται τι ἐξ ἐμφοτέρων, οὕτων ψυχροῦ καὶ θερμοῦ ἡ πυρὸς καὶ γῆς. εἰ γὰρ ἔστω ἡ σάρξ ἐξ ἀμφοῖ καὶ μηδέτερον ἐκείνων, μηδ' ἂν σύνθεσις σωζομένων, τί λειτυπεῖ πλὴν τὴν ὑλήν εἶναι τοῖς ἐκείνων; ἡ γὰρ βατέρου φθορὰ ἡ βάτερον ποιεῖ ἡ τὴν ὑλήν. ἄρ' οὖν ἐπειδὴ ἐστὶ καὶ μᾶλλον καὶ ἦστον θερμοῦ καὶ ψυχροῦ, ὅταν μὲν ἀπλῶς ἡ βάτερον ἐντελεχεία, δυνάμει βατέρου ἔσται· ὅταν δὲ μὴ παντελῶς, ἀλλ᾽ ὡς μὲν θερμὸν 10 ψυχροῦ, ὡς δὲ ψυχρὸν θερμοῦ (ὅτι δὲ μηγνύμενα φθείρειν τάς ὑπερχαῖς ἀλλήλων), τότε οὖν 'ἡ ὑλή ἔσται οὕτω ἐκείνων τῶν ἐναυτῶν ἐκάτερον ἐντελεχεία ἀπλῶς, ἀλλὰ μεταξὺ, κατὰ δὲ τὸ δυνάμει μᾶλλον εἶναι θερμόν ή ψυχρόν, ή τούναντλον, κατὰ τούτον τὸν λόγον διάπλασις θερμοῦ δυνάμει ἡ 15 ψυχρόν, ἡ τριπλασίως, ἡ κατ᾽ ἄλλον τρόπον τοιουτοῦ· ἔσται

ΠΕΡΙ ΓΕΝΕΣΕΩΣ ΚΑΙ ΦΘΟΡΑΣ Β

οι μειθέντων τάλλ' εκ τῶν ἐναντίων ἡ τῶν στοιχείων, καὶ τὰ στοιχεία εἰς ἐκείνων δυνάμει ποὺς ὄντως, οὐχ οὕτω δὲ ὡς ἡ ὐλη, ἀλλὰ τὸν εἰρήμενον τρόπον—καὶ ἐστιν οὕτω μὲν μί-

εις, ἐκείνως δὲ ὡλη τὸ γνώμαμεν. ἐπεὶ δὲ καὶ πάσχει τα-

νατία κατὰ τὸν ἐν τοῖς πρῶτοις διορισμοῦ· ἔστι γὰρ τὸ ἐν-

εργεῖα θερμοῦ δυνάμει ψυχρὸν καὶ τὸ ἐνεργεῖα ψυχρὸν δυ-

νάμει θερμοῦ, ὡστε εἴαν μὴ ἵσταζη μεταβάλλει ἐν αλ-

λη, ὁμοίως δὲ καὶ ἐπὶ τῶν ἄλλων ἐναντίων· καὶ πρῶτων

οὐτω τὰ στοιχεία μεταβάλλει, ἐκ δὲ τούτων σάρκες καὶ ὀστᾶ

καὶ τὰ τοιαῦτα, τὸν μὲν θερμοῦ γιγνομένου ψυχροῦ, τοῦ δὲ

ψυχροῦ θερμοῦ, ὅταν πρὸς τὸ μέσον ἔλθη (ἐνταῦθα γὰρ οὐ-

dέτερον), τὸ δὲ μέσον πολὺ καὶ οὐκ ἀδιάφετον. ὁμοίως δὲ

cαὶ τὸ ἔχρον καὶ ὑγρὸν καὶ τὰ τοιαῦτα κατὰ μεσότητα

ποιοῦσι σάρκα καὶ ὀστοῦν καὶ τάλλα.

"Ἀπαντά δὲ τὰ μικτὰ σώματα, ὅσα περὶ τὸν τοῦ μέ· 8

σον τόπων ἐστὶν, εἰς ἀπάντων σύγκειται τῶν ἄπλων. γῆ μὲν

γὰρ ἐνυπάρχει πάσι διὰ τὸ ἐκαστὸν εἰναι μᾶλλον καὶ πλεῖστον ἐν τῷ οἰκείῳ τόπῳ· ὦδωρ δὲ διὰ τὸ δεῖν μὲν ὄρι-

35 35οι θαύμητον, μόνον δ' εἶναι τῶν ἄπλων εὐφροσύνην τὸ

35ν' ὦδωρ, ἐτί δὲ καὶ τήν γῆν ἄνευ τοῦ ὕγρον μὴ δύνασθαι συμ-

μένειν, ἀλλὰ τούτη εἶναι τὸ συνεχοῖ—εἰ γὰρ ἐξαρεθεὶς τε-

λέος εἰς αὐτῆς τὸ ὕγρον, διαπίπτοι αὐ. γῆ μὲν οὖν καὶ ὦδωρ δὲ

tαυτὰς ἐνυπάρχει τὰς αἰτίας, ἀλή δὲ καὶ πῦρ, ὅτι

5 ἐναντία ἐστὶ γῆ καὶ ὡδατι (γῆ μὲν γὰρ ἀέρι, ὦδωρ δὲ πυρὶ

ἐναντίον ἐστίν, ὥστε ἐνδέχεται οὔσιν ὀσφία ἐναντίων εἰναι). ἐπεὶ

οὖν αἱ γενέσεις ἐκ τῶν ἐναντίων εἰσὶν, ἐνυπάρχει δὲ βάτερα

ἀκρα τῶν ἐναντίων, ἀνάγκη καὶ βάτερα ἐνυπάρχει, ὥστε ἐν

ἀπαντὶ τῷ συνθέτῳ πάντα τὰ ἄπλα ἐνέσται. μαρτυρεῖν δ' οὐκεὶ καὶ ἣ τροφὴ ἐκάστων ἀπαντά μὲν γὰρ τρέφεται τοῖς

10 b 17 δή] μη Ε, et suprascr. J² τάλλ'] ἀλλ' Ε 19 οὕτω]


24 post πρῶτον add. γε Φ et (supra lin.)] J² 26 γενομένου F


in marg. F: cf. etiam Φ et Π 30 ὀστά] ὀστά (quod libris FH

perperam attribuit) Bekker τάλλα τὰ τοιαῦτα F]Η]J 31 ἀπαντὰ]


35 τὸν σύνθετον Τ] ἄλλων] ἄλλων Φ a 4 ενυπάρχου Φ

5 γὰρ om. F 6 ἐναντίον] ἐναντίον Η 7 βάτερα] βάτερον

L 8 ἄκρα om. Η, supra lin. add. ι] ἄκρον L βάτερα] βάτερον

ΗL 10 ἐκάστου Ε']Η': ἐκάστων Ε']Φ]L
11. 9 'Επει δ' ἐστίν ἐνα γενητὰ καὶ φθαρτά, καὶ ἡ γένεσις τυγχάνει οὐσία εν τῷ περὶ τὸ μέσον τόπῳ, λεκτέων περὶ 25 πάσης γενέσεως ὁμοίως πόσαι τε καὶ τίνες αὐτῆς ἀρχαι· μᾶν γὰρ οὕτω τὰ καθ' ἐκαστα θεωρήσομεν, ὅταν περὶ τῶν καθολοῦ λάβωμεν πρῶτον. εἰσίν οὐν καὶ τῶν ἁριθμῶν ἵσαι καὶ τῷ γένει αἰ αὐταί αἴτερ εν τοῖς ἄδιδοις τε καὶ πρῶτος· η μὲν γὰρ ἐστὶν ὡς ὑλή, η δ' ὡς μορφή· δει δὲ καὶ τὴν τρί- 30 την ἐτι προσυπάρχειν· οὐν γὰρ ἱκανα πρὸς τὸ γεννήσαι αἰ δύο, καθάπερ οὐδ' ἐν τοῖς πρῶτοι. ὡς μὲν οὐν ὧλη τοῖς γεν- νητοῖς ἐστὶν αἰτίων τὸ δυνατὸν εἶναι καὶ μὴ εἶναι—τὰ μὲν γὰρ ἐξ ἀνάγκης ἐστὶν, οὐν τὰ ἀδίδα, ὅ δ' ἐξ ἀνάγκης οὐκ ἐστίν (τοῦτον δὲ τὰ μὲν ἀδύνατον μὴ εἶναι, τὰ δὲ ἀδύνατον 35 εἶναι, διὰ τὸ μὴ ἐνδεχέσθαι παρὰ τὸ ἀναγκαῖον ἄλλος 335 ἐχείων), εἶναι δὲ καὶ εἶναι καὶ μὴ εἶναι δυνατόν—ὅπερ ἐστὶ τοῦ γενητοῦ καὶ φθαρτοῦ ποτὲ μὲν γὰρ ἐστὶ τούτο, ποτὲ δ' οὐκ ἐστίν· ὅστ' ἀνάγκη γένεσιν εἶναι καὶ φθορὰν περὶ τὸ δυνατὸν

5 εἶναι καὶ μῆ εἶναι. διὸ καὶ ὡς μὲν ἥλιος τοῦτ' ἑστὶν αἰτίων τοῖς γεννητοῖς, ὡς δὲ τὸ οὐ ἐνεκα ἡ μορφή καὶ τὸ εἴδος· τούτο δ' ἑστὶν ὁ λόγος ὁ τῆς ἐκάστου οὐσίας. δει δὲ προσείναι καὶ τὴν τρίτην, ἢν ἀπαιτεῖ μὲν ὑπερώττουσι, λέγει δ' οὐδείς. ἀλλ' οἱ μὲν ἰκανὴν ἠθῆσαν αἰτίαν εἶναι πρὸς τὸ γίνεσθαι τὴν τῶν εἰδῶν φύσιν (ἀπερ ὁ ἐν τῷ Φαίδωνι Σωκράτης—καὶ γὰρ ἐκεῖνος, ἐπιτιμήσας τοῖς ἄλλοις ὡς οὐδὲν εἰρηκόσων, ὑποτίθεται ὅτι ἐστὶ τῶν ὄντων τὰ μὲν εἶδα τὰ δὲ μεθεκτικά τῶν εἰδῶν, καὶ ὅτι εἶναι μὲν ἐκαστὸν λέγεται κατὰ τὸ εἴδος, γίνεσθαι δὲ κατὰ τὴν μετάληψιν καὶ φθείρεσθαι κατὰ τὴν ἀποβολὴν, ὥστε εἰς ταῦτα ἀληθῆ, τὰ εἴδη ῶνεται εἰς ἀνάγκης αὐτία εἶναι καὶ γενέσεως καὶ φθόρας), οἱ δ' αὐτὴν τὴν ἥλιον, ἀπὸ ταύτης γὰρ εἶναι τὴν κύψην. οὐδέτεροι δὲ λέγουσι καλῶς. εἰ μὲν γὰρ ἑστιν αἰτία τὰ εἶδη, διὰ τὶ οὐκ ἂν γεννᾷ συνεχῶς, ἀλλὰ ποτὲ μὲν ποτὲ δ' οὐ, ὄντων καὶ τῶν εἰδῶν αἰὲ καὶ τῶν μεθεκτικῶν; ἔτι δ' ἐπ' εὐνόων ἰθωροῦμεν ἄλλο τὸ αἰτίων ὦν ὑγιείαν γὰρ ὁ ἰατρὸς ἔμποιει καὶ ἐπιστήμην ὅ ἐπιστήμην, οὐσίας καὶ ὑγιείας αὐτής καὶ ἐπιστήμης καὶ τῶν μεθεκτικῶν, ὡςαυτῶς δὲ καὶ ἐπὶ τῶν ἄλλων τῶν κατὰ δύναμιν πραττομένων. εἰ δὲ τὴν ἥλιον τις φήσεις γεννᾷ διὰ τὴν κύψην, φυσικότερον μὲν ἂν λέγεων τῶν οὕτω λεγούμεν (τὸ γὰρ ἄλλωσι καὶ τὸ μετασχηματίζον αἰτιώτερόν τε τοῦ γεννᾶν, καὶ ἐν ἄπασιν εἰσώραμεν τότε λέγεων τὸ ποιεῖν, ὡς ὑπερώττουσι ἐν τοῖς φύσει καὶ ἐν τοῖς ἀπὸ τέχνης, δ' ἂν ἦν κυνηγικών), οὐ μὴν ἀλλὰ καὶ οὕτω οὐκ ὀρθῶς λέγοσθων. τῆς μὲν γὰρ ὦλης τὸ πάσχειν ἐστὶ καὶ τὸ κυνείσθαι, τὸ δὲ κυνεῖ καὶ τὸ ποιεῖτε ἐτέρας νυνάμεως—δήλον δὲ καὶ ἐπὶ τῶν τέχνη καὶ ἐπὶ τῶν φύσεως γνωμομένων. οὐ γὰρ αὐτὸ τοιοῦτο τὸ ὕδωρ ζύον εξ αὐτοῦ, οὐδὲ τὸ ἦδον κλίψῃ, ἀλλ' ἡ τέχνη—ὡστε καὶ οὕτω

9. 335b 5 — 10. 336a 27
55
diu to-to lēgousin ouκ ὀρθῶς, καὶ ὅτι παραλείπονοι τὴν κυριω-
τέραν αἰτίαν: ἡξαροῦντι γάρ τὸ τί ἦν εἶναι καὶ τὴν μορφὴν. 35
ἐπὶ δὲ καὶ τὰς δυνάμεις ἀποδιδόσαι τοῖς σώμασι, δὲ ὡς 336a
γεννᾶσθαι, λιᾶν ὀργανικάς, ἀφαιροῦτες τὴν κατὰ τὸ εἶδος
ἀιτίαν. ἐπειδὴ γὰρ πέφυκεν, ὡς φασὶ, τὸ μὲν θερμὸν
dιακρίνειν τὸ δὲ ψυχρὸν συνιστάναι, καὶ τῶν ἄλλων ἐκα-
στον τὸ μὲν ποιεῖν τὸ δὲ πάσχειν, ἐκ τούτων λέγουσι καὶ 5
diὰ τούτων ἀπαίτα τάλλα γίγνεσθαι καὶ φθείρεσθαι. φαί-
νεται δὲ καὶ τὸ πῦρ αὐτὸ κινοῦμενον καὶ πάσχοιν. ἐπὶ δὲ
παραπλήσιον ποιοῦσιν ὡσπερ εἰ τις τῷ πρῶτι καὶ ἐκάστῳ
tῶν ὀργάνων ἀπονέμων ἑαυτὸν αἰτίαν τῶν γνωμένων ἀνάγκη
gάρ πρώτους διαμειωθῆσαι καὶ ξέντωσι λειώσει, καὶ ἐπὶ τοῖς
τῶν ἄλλων ὀμολογῷ: ᾧστ' ὃ ὅτι μάλιστα ποιεῖ καὶ κινεῖ τὸ
πῦρ, ἀλλὰ πῶς κινεῖ οὐ προσθεωροῦσι, ὅτι χεῖρον ἡ τὰ ὀργανα.
ἡμῶν δὲ καθὸλον τε πρῶτον εἴρηται περὶ τῶν αἰτίων, καὶ
10 νῦν διώρισται περὶ τε τῆς ὑλῆς καὶ τῆς μορφῆς. ἐπὶ δὲ
ἐπεὶ ἢ κατὰ τὴν φορὰν κίμασι δεδεικτα ὅτι αἰδίοις, 15
ἀνάγκη τούτων ὄντων καὶ γένεσιν εἶναι συνεχῶς: ἢ γὰρ
φορὰ ποιήσει τὴν γένεσιν ἐνδειχθῆσι διὰ τοῦ προσάγειν καὶ
ἀπάγειν τὸ γεννητικὸν. ἰμα δὲ δήλον ὅτι καὶ τὸ πρό-
tερον καλῶς εἴρηται, τὸ πρῶτόν των μεταβολῶν τὴν φο-
ρὰν ἀλλὰ μὴ τὴν γένεσιν εἴπειν. πολὺ γὰρ εὐλογῶτερον ἰο
tὸ ὅτι τῇ μὴ ὄντι γενέσεως αἰτίων εἶναι ἢ τῇ μὴ ὅτι τῷ
ὄντος τοῦ εἶναι: τὸ μὲν οὖν φερόμενον ἑστι, τὸ δὲ γνωμένων οὐκ
ἐστὶν—διὸ καὶ ἢ φορὰ προτέρα τῆς γενέσεως. ἐπεὶ δὲ ὑπὸ-
κειται καὶ δεδεικτα συνεχῆς οὔσα τοῖς πράγμασι γέ-
νεσις καὶ φθορά, φαμέν δ' αἰτίαν εἶναι τὴν φορὰν τῷ γν
νεσθαι, φανερῶν ὡς μίας μὲν οὖσης τῆς φορᾶς οὐκ ἐνδει-
tα τὴν γίνεσθαι ἀμφοῦ διὰ τὸ ἐναντία εἶναι (τὸ γὰρ αὐτὸ

a 1 δὲ om. H ἀποδιδόσαι, suprascr. a, J  
2 ὀργανικᾶς ΕΗΛΦ: ὀργανικῶς FJΓ 3 ἐπειδὴ] ὡς FJH] φασὶ  
φησιν E 7 καὶ secundum om. F 9 ἀπονέμι F 10 πρῶτος  
πρῶτος ὄντος L 11 καὶ τοιού L 12 οὖν  
προσθεωροῦσιν fecit E: οὐ προσθεωροῦσιν H: οὐχ ὄροισιν E1 : οὐχ  
ὄροσιν FLL 13 ἐπὶ τοῦ H: τὸ F1 15 τῆς om. F 17 ἐν-
τελεχῶς E: actualiter F 18 καὶ ἀπάγειν om. F 17 γεννητικὸν Ε  
καὶ τά] καὶ τά FJL πρῶτορι F 19 τῆς om. E  
21 εἶναι αἰτίων L ἡ om. E ἰ ... 23 διὸ in marg. add. F 24 ante  
γένεσις add. καὶ EL 25 τὴν φορὰν om. E 26 ὡς] διῤ̣τι H  
τῆς (ut videtur) om. E1
καὶ ὡσατός ἔχουν ἀεὶ τὸ αὐτὸ πέφυκε ποιεῖν, ὡστε ἦτοι γένεσις ἐσται ἀεὶ ἡ φθορά), δεὶ δὲ πλείους εἶναι τὰς κυψές καὶ ἐναντίας ἡ τῇ φορά ἡ τῇ ἀνωμαλίᾳ—τῶν γὰρ ἐναντίων αὕτη τὰναντία. διὸ καὶ σὺ ἡ πρώτη φορά αἵτια ἐστὶ γενέσεως καὶ φθορᾶς, ἀλλ' ἡ κατὰ τῶν λοξῶν κύκλων· ἐν ταῦτῃ γὰρ καὶ τὸ συνεχὲς ἔνεστι καὶ τὸ κινεῖσθαι δύο κυψές· ἀνάγκη γὰρ, εἶ γε ἀεὶ ἐσται συνεχής γένεσις καὶ 336
φθορά, ἀεὶ μὲν τι κινεῖσθαι, ἵνα μὴ ἐπιλείπωσιν αὕτη αἱ μεταβολαὶ, δύο δ', ὧποι μὴ θάτερον συμβαίνῃ μόνον. τῆς μὲν οὖν συνεχείας ἡ τοῦ ὀλου φορὰ αἵτια, τοῦ δ' προσιέναι καὶ ἀπιέναι ἡ ἐγκλίσεις. συμβαίνει γὰρ ὅτε μὲν πόρρω γῆ-5 νεσθαι ὅτε δ' ἔγγυς, ἀνίσου δὲ τοῦ διαστήματος ὄντος ἀνω- μαλος ἐσται ἡ κύψεις, ὅπερ εἰ τῷ προσιέναι καὶ ἐγγύς εἶναι γεννήσεως, τῷ ἀπιέναι ταυτῶν τοῦτο καὶ πόρρω γίνεσθαι φθειρές, καὶ εἰ τῷ πολλάκις προσελθέων γεννησίας, καὶ τῷ πολλάκις ἀπελθεῖν φθειρές—τῶν γὰρ ἐναντίων τὰναντία αὕτη, καὶ ἐν 10 ἵστα ὁρῶν καὶ ἡ φθορά καὶ ἡ γένεσις ἡ κατὰ φύσιν. διὸ καὶ οἱ χρόνοι καὶ οἱ βίοι ἐκατόν ἀριθμοῦ ἔχουσιν καὶ τούτω διορίζονται. πάντων γὰρ ἐστὶ τάξις, καὶ πᾶς χρόνος καὶ βίος μετείπται περισσοῦ, πλὴν οὖν τῇ αὐτῇ πάντες, ἀλλ' οἱ μὲν ἐλάττων οἱ δὲ πλείονοι τοῖς μὲν γὰρ ἐναντίος, τοῖς δὲ 15 μείζων, τοῖς δὲ ἑλάττων ἡ περίοδος ἐστὶ, τὸ μέτρον. φαίνε-ται δὲ καὶ κατὰ τὴν αἰτιόθησιν ὁμολογούμενα τοῖς παρ' ἡμῶν λόγοις· ὀρὰμεν γὰρ ὅτι προσιόντος μὲν τὸ ἣλιον γένεσις ἐστὶ, ἀπιόντος δὲ φθοράς, καὶ ἐν ἑστὶ χρόνῳ ἐκατέρων· ἵστα ἐν χάρ

metabálleuw oun évdeχetai méneiν oúdeν αὐτῶν ἐν οὖδεμι
15 χώρα τεταγμένη.

διότι μὲν oun ἐστὶ γένεσις καὶ φθορά καὶ διὰ τῶν αἰτιῶν, καὶ τί τὸ γεννητὸν καὶ φθαρτὸν, φανερῶν ἐκ τῶν εἰρημένων. ἐπεὶ δὲ ἀνάγκη εἰναι τὸ τὸ κινοῦν ἐλ κύησις ἐσται, ὀσπερ εἰρηται πρότερον ἐν ἑτέροις, καὶ εἰ ἀεὶ, ὅτι ἀεὶ ἐστὶ τι εἶναι, καὶ εἰ συνεχὴς, ἐν τὸ ἀρδτο καὶ ἀκήκουνο καὶ ἀγέννητον καὶ ἀναλλοίωτον, καὶ εἰ πλεῖον αἰ ἐν κύκλῳ κυνήσεις, πλεῖον μὲν, πᾶσας δὲ πως εἶναι ταύτας ἀνάγκη ὑπὸ μίαν ἀρχὴν. συνεχοῦς δ’ ὅστος τὸν χρόνον ἀνάγκη τὴν κύησιν συνεχῆ εἶναι, ἐπείρ ἀδύνατον χρόνον χωρὶς κυνήσεως εἶναι: συνεχοῦς ἀρα τῶν ἀριθμῶν ὁ χρόνος, τῆς κύκλῳ ἁρα,
25 καθάπερ ἐν τοῖς ἐν ἀρχῇ λόγοις διωρίζεται. συνεχῆς δ’ ἡ κύησις πότερον τὸ τὸ κινοῦμενον συνεχῆ εἶναι ἡ τὸ ἐν φ' κυνεῖται, σὸν τῶν τῶν τῶν λέγω ἡ τὰ πάθος; ὁδῆν δὴ ὅτι τὸ τὸ κινοῦμενον (τῶν γάρ τὸ πάθος συνεχῆς ἀλλ’ ἡ τὸ τὸ πράγμα φ’ συμβέβηκει συνεχῆς εἶναι; εἰ δὲ καὶ τῷ ἐν φ’,
30 μόνῳ τοῦτο τῷ τῷ ὑπάρχει, μέγεθος γὰρ τι ἐξεῖ] τούτου δὲ τὸ κύκλῳ μόνῳ συνεχῆς ὡστε αὐτῷ αὐτῷ ἀεὶ συνεχῆς· τοῦτο ἁρα ἐστὶν ὃ ποιεῖ συνεχῆ κύησις, τὸ κύκλῳ σῶμα φερόμενοι, ἡ δὲ κύησις τοῦ χρόνον.

Ἐπεὶ δ’ ἐν τοῖς συνεχῶς κινούμενοι κατὰ γένεσιν ἡ II
35 ἀλλοιώσων ἡ ὅλωσ μεταβολὴν ὁρώμεν τὸ ἐφεξῆς ὅν καὶ γν.
337b νόμοι τὸ βεί τοῦ τοῦ ἐστὶ τοῦ ἀνάγκης ἐσται, ἡ ὀδεῖν, ἀλλὰ πάντα ἐνδεχέ- χεται μὴ γενέσθαι. ὃτι μὲν γὰρ ἔνια, δῆλον, καὶ εὖθες τὸ εἶσται καὶ τὸ μέλλει ἐτερον διὰ τοῦτο: ὃ μὲν γὰρ ἀληθὲς

a 15 διότι] ὅτι H 16 αἰτίαν ἐρρήσα τοι καὶ EL
(5) estat.] estiv E 7 yap anabadoioenv E badoieen] badoi F
6° te F 8 epeil] epeusde F] 9 ta ynavmenv HJL 10 oov]
di F toaauta] taua F 11 ynavmenv EL 12 ynavmenv F
15 oikian L 16 oikian] oikia E: kai oikian FHJ oukei ] ouk estiv
18 oikeian E yap aut ev F 19 di] os H estiv
20 ante ei add. ynavmenv FHJL 21 kai ... protetov
in marg. add. EFJ 25 eil ... 338a 9 ynavmenv] de hoc loco,
v. Alexandri d. c. a. ii. 22 (Bruns, pp. 71, 72) 25 to katw E
RZ): tode codd. omnes, φι (codd. GT), et Alex. l. c.
6° e] EJ, et Alex. l. c.: 6° e] EJ: ovd supra lin. add. etiam F
27 di] di F 29 di] did F 30 estiv F 31 ota
theomelios yeneta om. E
338a υχ είου τε μή ειναι, ὅστε ἐς την ἀνάγκην ἂν ἔχων, αὐτόν ἢ γένεσιν τε ἁπατεῖ. τοῦτων δ', εἰτέρος ἐσται ἀδίδος, οὐκ εἰς εὐθὺ εἰς τε ιδία τοῦ μιχαμηλός εἶ-
ναι ἀρχήν (μήτῃ ἀν κάτω ὡς ἐπὶ τῶν ἐσομένων λαμβανο-
μένων, μήτῇ ἀντὶ ὡς ἐπὶ τῶν γενομένων) ἀνάγκην δ' εἶναι ἀρ-
10 χήν... ἃ μήτε πεπερασμένης οὐσίας ἃ ἄδιδον εἶναι· διὸ ἀνάγκη
κύκλῳ εἶναι. ἀντιστρέφειν ἅρα ἀνάγκην ἄντει, οὐκ εἰς τοῦτο εἰς
ἀνάγκην, καὶ τὸ πρότερον ἄρα· ἀλλὰ μὴν εἰς τοῦτο, καὶ τὸ
ὕστερον ἀνάγκη γενέσθαι. καὶ τοῦτο ἁεὶ δὴ συνεχῶς—οὐδὲν
γὰρ τοῦτο διαφέρει λέγει διὰ διὸ ἡ πολλών. ἐν τῇ κύκλῳ
15 ἀρα κινήσει καὶ γενέσει ἄκτι τοῦ ἀνάγκης ἀπλώς· καὶ
ἐιπὲ κύκλῳ, ἀνάγκη ἐκαστοῦ γένεσθαι καὶ γεγονέναι, καὶ εἰ
ἀνάγκη, ἡ τοῦτων γένεσιν κύκλῳ. ταῦτα μὲν δὴ εὐλόγως,
ἐπεὶ ἄδιδοι καὶ ἄλλως ἐφάνη ἡ κύκλῳ κάψις καὶ ή τοῦ
οὐρανοῦ, ὅτι ταῦτα ἐκ ἀνάγκης γίνεται καὶ ἔσται, ὅσα ταῦ-
τον τῆς κινήσεως καὶ ὅσα διὰ ταῦτα· εἰ γὰρ τὸ κύκλῳ χινοῦ-

338b
μενον ἀει τι κουεί, ἀνάγκη καὶ τούτων κύκλω εἶναι την κί-

νησιν—οὐν τῆς ἀνώ φορᾶς οὔσης ὁ ἡλιος κύκλω ὁδι, ἔτει

δ’ οὕτως, αἱ ὁραὶ διὰ τούτο κύκλῳ γίνονται καὶ ἀνακάμ-

πτωσιν, τούτων δ’ οὕτως γυμνέων πάλιν τὰ ὑπὸ τοῦτων. 5

τί οὖν δὴ ποτὲ τὰ μὲν οὕτω φαίνεται, οὖν ύδατα καὶ ἄηρ

κύκλῳ γυμνέων, καὶ εἶ μὲν νέφος ἐσται, δεῖ ὅσοι καὶ εἰ

ὑσει γε, δεὶ καὶ νέφος εἶναι, ἀνθρωποὶ δὲ καὶ ζῷα οὐκ ἀνα-

κάμπτουσι εἰς αὐτοὺς ὡστε πάλιν γίνεσθαι τὸν αὐτὸν (οὐ

γὰρ ἀνάγκη, εἶ δ’ πατήρ ἑγένετο, σὲ γενέσθαι ὁλ’ εἰ σῦ, 10

ἐκεῖνον), εἰς εὐθὺ δὲ οὐκεν εἶναι αὐτὴ ἡ γένεσις; ἀρχῇ δὲ

τής σκέψεως πάλιν αὐτὴν, πότερον ὁμολογία ἀπαντα ἀνα-

κάμπτει ἡ οὐ, ἀλλὰ τὰ μὲν ἀριθμῷ τὰ δὲ εἶδει μόνον. 15

οὕσων μὲν οὖν ἀφθαρτοῦ οὔσα ἡ κυνομένη, φανερῶν ὅτι καὶ

ἀριθμῷ ταῦτα ἐσται (ἡ γὰρ κύνησις ἀκολουθεῖ τῷ κυνομένῳ), 15

ὡσον δὲ μὴ ἀλλὰ φθαρτῇ, ἀνάγκη τῷ εἴδει, ἀριθμῷ δὲ

μὴ ἀνακάμπτει. διὸ οὖσα εἰς ἀέρους καὶ ἄηρ εἰς ὑδατὸς εἰ-

δεὶ ὁ αὐτὸς, οὐκ ἀριθμῷ εἰ δὲ καὶ ταῦτα ἀριθμῷ, ἀλλ’ οὐχ

ὦν ἡ οὐσία γίνεται, οὕσα τυπαύτη ὑα ἐνδέχεσθαι μὴ εἶναι.

b 3 κύκλῳ ο ἡλιος F, Bonitz ὁδι om. E ἐπεὶ . . . 4 ἀνακάμ-

πτωσιν in marg. add. F 4 οὕτως] οὕτως J : οὕτως oὐτωs Bonitz


J ὑδατα] υδαρ L Φ 1 7 γυμνεύοντος Φ 2 δει καὶ ἔσται FH Φ 1

8 καὶ prius om. HJ 9 αὐτοῖς codd. omnes έαυτούς Φ 1 10 ὁ


HJ 15 ταῦτα ἐν ἐσται HJ : ταυτὰ ἐν ἐσται F 16 οὖν

ὁσον E 18 ταυτα] ταυτὰ J 19 ὁ om. F ἐνδέχεσθαι

ἐνδέχεται FJ
COMMENTARY

A. i

14\textsuperscript{a} 1-6. Περι... ὁνόμασιν. A rough sketch of the subject-matter of the work. Cf. Introd. §§ 7-11; and below, *20\textsuperscript{b} 34—21\textsuperscript{a} 29, *21\textsuperscript{b} 16-17, *27\textsuperscript{a} 32-34, *28\textsuperscript{b} 22.

14\textsuperscript{a} 1. δε. On the systematic connexion of this work with the de Caelo, see Introd. § 11. The δε is supposed to answer the μὲν οὖν in the last sentence of the de Caelo (313\textsuperscript{b} 21), cf. Philoponos and Zabarella.

φῶσει, to exclude the products of τέχνη and the results of προαίρεσις (Philoponos).

14\textsuperscript{a} 2. ὁμοίως κατὰ πάντων. Aristotle proposes to treat of γένεσις and φθορά in general, as πάθη predictable uniformly of (i.e. as processes exhibited uniformly by) all the γεννητὰ καὶ φθαρτὰ in nature. The scope of his present inquiry does not include an investigation of these processes in the special forms which they assume in the different kinds of perishable natural bodies, e.g. in the plants and animals: see Introd. § 11. For ὁμοίως, cf. *18\textsuperscript{a} 25-27, 35\textsuperscript{a} 26.

14\textsuperscript{a} 2-3. τὰς... αὐτῶν. αὐτῶν, sc. γενέσεως καὶ φθορᾶς. We shall find Aristotle distinguishing and explaining the formal, material, efficient, and final causes of these processes: hence διαμετέχων. In Book I he gives their nominal definitions, i.e. defines the meaning of the terms (cf. Introd. p. xxvi, note i; p. xxx): their adequate scientific definitions (τοῖς λόγοις) are to be gathered from the discussions in Book II, from which we can obtain an exact conception of their cause (cf. Introd. § 9).

14\textsuperscript{a} 3-6. ἦτι... ὁνόμασιν. The scope of the work includes a similar treatment of αἰτίας and ἀλλοίωσις. Aristotle, as we shall see, restricts the term αἰτίας, as he here investigates it, to the growth of τὰ ἐμφάνα. We must therefore not press ὁμοίως κατὰ πάντων (a 2) as regards αἰτίας. The meaning of ἀλλοίωσις will appear later. The problem whether γένεσις and ἀλλοίωσις are two distinct processes, or one only, is expressly mentioned, because many of Aristotle's predecessors identified them, i.e. denied that there was any 'coming-to-be' proper: cf. next note.

14\textsuperscript{a} 6—17\textsuperscript{a} 31. τῶν... φασίν. Zabarella’s account of the general
purport of this passage is right. The review of the theories of the early philosophers in Chapter 1 shows that it is a matter of dispute whether γένεσις and φθορά are, i.e. occur as facts distinct from ἀλλοίωσις; and it is therefore necessary explicitly to discuss εἰ ἔστι γένεσις, and to prove ὅτι ἔστι (cf. 15a 26-27). But even those philosophers, who did distinguish γένεσις from ἀλλοίωσις, misunderstood γένεσις. For γένεσις is the emergence of a new substance (cf. 17a 20-22), and not—as they supposed—the ‘association’ e.g. of ‘indivisible bodies’ (or ‘indivisible surfaces’) to form an aggregative whole. Hence the long discussion in Chapter 2 of the theories of Leukippos and Demokritos (and incidentally of the cognate theory of Plato) is primarily directed to show that σύγκρισις and διάκρισις cannot be identified with γένεσις and φθορά, although they may facilitate the latter processes. The proof ὅτι ἔστιν ἡ γένεσις (i.e. that the emergence of a new substance occurs in fact) begins with Chapter 3.

14a 6—b 8. τῶν ... μιγέντων. Outline:—The ancient philosophers may be grouped as (i) those who recognized only one elementary substance, and (ii) those who recognized more than one. The monists are logically bound to identify, and the pluralists to distinguish, γένεσις and ἀλλοίωσις (a 6-13). It is only because Anaxagoras failed to understand the logical implications of his own statements, that he appears to be an exception to this rule. He says that γένεσις and φθορά are identical with ἀλλοίωσις, and yet he is a pluralist no less than Empedokles, Leukippos, and Demokritos. These philosophers are all pluralists, though their theories differ, and though the theory of Empedokles is actually ‘contrary’ to that of Anaxagoras (a 13—b 1). The monists must identify γένεσις and ἀλλοίωσις, because all change must, on their view, be the modification of a single persistent substratum. The pluralists must distinguish γένεσις and ἀλλοίωσις, because γένεσις and φθορά result, on their view, from the ‘consilience’ and ‘dissolution’ of the Many—as in fact Empedokles says (b 1—8).

14a 6-7. τὴν ... γένεσιν, ‘the so-called “unqualified coming-to-be”’. Cf. τὰ καλοῦμενα στοιχεῖα, *22b 1-2, 28b 31. According to the monists the so-called ἀπλή γένεσις is really ἀλλοίωσις. Similarly, according to Aristotle, the so-called ‘elements’ (Earth, Air, Fire, and Water) are really derivative.

14a 9. καὶ ... γεννᾶσι. Explanatory of δόσοι ... λέγονσι. Thales, e.g., said that ‘the universe was one something’, in the sense that all things were made out of Water.
Anaxagoras accused the Hellenes of miscalling the facts: οὐδὲν γάρ χρῆμα γίνεται οὐδ' ἀπόλλυται, ἀλλ' ἀπό ἑντὸν χρημάτων συμμισγεται τε καὶ διακρίνεται. καὶ οὕτως ἂν ὧρθως καλοῦμεν τὸ τε γίνεσθαι συμμίσγεσθαι καὶ τὸ ἀπόλλυσθαι διακρίνεσθαι (fr. 17; Diels, pp. 320-1). At first sight, this dictum, since it identifies γένεσις and φθορά with σύμμειξις and διάκρυσις, distinguishes γένεσις from ἀλλοώσις: for Anaxagoras’s view looks like the views of Empedokles and Leukippos. But Aristotle’s interpretation is justified by the peculiar character of τὰ ἐόντα χρῆματα in Anaxagoras’s system, which gives a special meaning to σύμμειξις and διάκρυσις. Cf. e.g. fr. 1, 4, 10, 12 (Diels, pp. 313-18) and Arist. Phys. 187a 26-30.

It is difficult to reproduce the force of γε (a 13): perhaps ‘Anaxagoras himself failed to understand his own utterance’—viz. statements like that in fr. 17. ἡγνώσεις i. q. non intellecit (Bonitz, Ind. s.v.). It is Anaxagoras who misuses language. If he had understood his own utterance, he could not also have said that the elements were many.

καθάπερ καὶ ἔτεροι, ‘in common with others’, e. g. those whom Aristotle has quoted as typical pluralists.

τὰ . . . ἀριθμόν. τὰ κυνοῦντα are Love and Strife (Φιλότης and Νέικος). Empedokles conceived them as corporeal elements (cf. * 33a 19-20; Burnet, p. 232) as Aristotle is well aware. Still it is natural enough to call Earth, Air, Fire, and Water τὰ σωματικὰ in his system par excellence.

In Aristotle’s system the ὄμοιομερηί are the first, or most rudimentary, compound natural bodies (Introd. § 11). Every ὄμοιομερές is a chemical compound of the same four ‘simple’ bodies (Earth, Air, Fire, Water) or—more precisely—of the same four ‘elementary qualities’ (Hot, Cold, Dry, Moist). The four constituents enter into combination in a determinate quantitative proportion, which differs in the different ὄμοιομερηί; so that each ὄμοιομερές is characterized by its distinctive ‘combining-formula’ (λόγος τῆς μίξεως). Under the head of ὄμοιομερηί are included the metals, wood and bark in plants, bone, flesh, marrow, blood, &c., in animals. Such compounds are called ὄμοιομερηί, because (however far they may be subdivided) each portion retains the character of the whole: bone, e. g., will not cease to be bone by subdivision, but only by chemical analysis. In Aristotle’s system the ὄμοιομερηί are intermediate between the ‘simple’ bodies and the ἄνομοιομερηί or ὁργανα, each of
which is a complex of different ὁμοομερή. An eye, e.g., or a hand, is a σύνθεσις of many different ὁμοομερή. (Cf. * 21b 19–22, A. 10, B. 1–3, 7, 8 with the notes: and my paper on Aristotel's conception of chemical combination' in the Journal of Philology, No. 57.)

Aristotle employs his own technical terms in his accounts of the views of his predecessors. Thus the terms ἀγγ and στοιχεῖα were not used by Empedokles, Leukippos, Demokritos, or Anaxagoras, though Aristotle's statements here and elsewhere might lead us to suppose that they were (cf. Burnet, § 14, § 130). Similarly there is no evidence that Anaxagoras used the term ὁμοομερή. He may have used the term ὁμοομέρεια, but even that is doubtful. We know, however, that Aristotle applies the term ὁμοομερή to what Anaxagoras called στέρματα (cf. de Caelo 302a 31–b 3), but we do not know how far the characteristics of the Aristotelian ὁμοομερή attach to Apaxagoras's 'seeds'. Were the στέρματα πάντων χρημάτων (cf. e.g. fr. 4; Diels, p. 315) ὁμοομερή merely in the sense that each 'seed' retained its distinctive character however minutely it was subdivided, and is this all that Aristotle meant to imply? Or were the 'seeds'—either in Anaxagoras's own intention, or at least in Aristotle's interpretation—quantitatively different combinations of the same contrary 'qualities'?

It is impossible to answer this question with any certainty. The reader should consult Burnet (§§ 127–31) and Carlo Giussani's edition of Lucretius (1896, vol. ii, pp. 147–50). These are, so far as I know, the best attempts to reconstruct Anaxagoras's theory of matter: but neither of them is completely successful, since each leaves some of the fragments inexplicable.

14a 20. τῶν . . . ἔστιν: 'everything else which is such that part and whole are the same in name and nature.' For συνώνυμα λέγεται δν τό τε ὄνομα κοινὸν καὶ δι' αυτὰ τούνομα λόγος τῆς οὐσίας συνώνυμος ἡ αὐτός, Cat. 1a 6.

14a 21–24. Δημόκριτος . . . τοῦτων. According to Leukippos and Demokritos the 'indivisible bodies', or 'atoms', are infinite in number and infinitely various in shape. Everything else in the universe is put together out of these atoms: and the compounds (αὐτά, a 23) differ from one another because of (i) a difference in the shape, or (ii) a different position or 'turning', or (iii) a different ordering or 'grouping', of the component atoms. (Cf. Metaph. 985b 15–19; also below, 15b 6–15, 15b 33–16a 2, * 25b 36–26a 24.)

\[\text{aŭtā πρός aŭtā (EJL) is clearly right, and is accepted by Diels}\]
(p. 345). The compounds differ 'one as compared with another', not 'as compared with themselves'. For the idiom, cf. perhaps ἄλλος πρὸς ἄλλο.

For θέσει (i. q. τροπή) and τάξει (i. q. διαθηγή), cf. * ι5b 33—ι6a 2.

14a 24. γάρ. There is no sufficient reason to desert EJ and read δέ for γάρ. The logical connexion is rather complicated, but it is not made clearer by δέ. The comparison of Anaxagoras with the Atomists (a 18—24) is parenthetical, and at a 24 Aristotle returns to justify the original statement (a 16—18) that Empedokles postulates six elements, whilst Anaxagoras postulates an infinite number. The statement is correct, 'for the views of the school of Anaxagoras seem diametrically opposed to those of the followers of Empedokles', &c. (a 24 — b 1). It is assumed throughout that the ὁμοιομερή are infinite in number, as indeed Anaxagoras says with regard to his στέρματα (fr. 4; Diels, p. 315).

14a 24—b 1. ἐναντίως . . . τοῦτων. Cf. de Caelo 302a 28—b 5. Aristotle there says that Anaxagoras (i) regarded Air and Fire as μῦγματα of all the ὁμοιομερή, i.e. of all the 'seeds', (ii) used the term 'Aether' for Fire, and (iii) held therefore that all things come-to-be out of Air and Fire (cf. fr. 1; Diels, pp. 313—14).

Nothing in the fragments justifies Aristotle's assertion here that Earth and Water (as well as Air and Fire) are each a πανσπερμία. On the contrary, Aristotle's statement appears to conflict with fr. 4 (Diels, p. 315), where Earth seems to be on the same level of simplicity as the 'contraries' and the 'seeds'.

14a 27—28. σάρκα . . . ὁμοιομερόν, 'flesh, bone, and bodies which, like these, are "homoeomeries":' cf. 14a 19—20, and de Caelo, l. c., τὰ γάρ ὁμοιομερή στοιχεία (λέγω δ' οἶν σάρκα καὶ ὄστοι καὶ τῶν τοιούτων ἐκαστον).

14a 29. πανσπερμίαν. This appears to be a technical term of Demokritos: cf. de Anima 404a 1—5, Phys. 203a 18—23. But it is probable enough that Anaxagoras used it, since he used the term στέρματα (Burnet, p. 265a). The same meaning is expressed in de Caelo, l. c., by the words ἀέρα δὲ καὶ πῦρ μῦγματα τοῦτων καὶ τῶν ἄλλων σπερμάτων πάντων.

14b 3. μένειν, sc. 'for they must affirm that the underlying something always remains ....' It is not necessary to read μένει (cf J Fl) with Bonitz.

14b 3—4. τὸ δὲ τοιοῦτον, sc. τὸ μεταβάλλειν τοῦ αὐτοῦ καὶ ἐνὸς μένοντος, τοῦ ὑποκειμένου δηλονοτί (Philoponos).

14b 7—8. λέγει ... μιγάτων. καὶ Ἐμπεδοκλῆς, i.e. Empe-
dokles as well as Anaxagoras (cf. 14A 14). Aristotle is abbreviating Empedokles, fr. 8 (Diels, p. 175). The words μίξις ... μυγέν-

14B 8-12. ἄτι ... λεγόμενα. Aristotle recapitulates, and prepares to criticize, the pluralist position. ‘It is clear (i) that to describe coming-to-be and passing-away in these terms is in accordance with their fundamental assumption, and (ii) that they do in fact so describe them.’

δ λόγος, sc. the description of γένεσις and φθορά as a consilience and dissociation of the many elements. τὴν ὑποθέσει, viz. their assumption that there are more elements than one. καὶ τοῦτοι, i.e. ‘the pluralists as well as ordinary people’, e.g. as well as Aristotle himself. Aristotle appeals in confirmation to ordinary experience: ὀρὸμεν, B 13.

14B 12-13. τότῳ ... συνίσταυ. τοῦτο, sc. that the pluralists (i) must recognize ἄλλοιώσις as a distinct fact from γένεσις, and (ii) cannot do so consistently with their statements. The first point is established (B 13-15) by an appeal to the obvious facts of perception: and the second point is argued B 15-26.

14B 15-26. οὐ μὴν ... ἄλλοιώσις. This argument is intended to apply to all the pluralists, since Aristotle has set out to prove that their statements are incompatible with the recognition of ἄλλοιώσις. Yet, at B 20, he quotes Empedokles, and thenceforward proceeds as if Empedokles alone were in question. Thus, though he speaks as if all ‘those who posit more “original reals” (ἀρχὰς, B 16) than one’ regarded the πάθη involved in ἄλλοιώσις as constitutive of their ‘elements’, he offers no evidence of this assertion except so far as it applies to Empedokles.

14B 17. τὰ ... συμβαίνειν. Aristotle here assumes his own theory of ἄλλοιώσις, viz. that it is a process in which a perceptible substratum passes from one πάθος to another contrasted πάθος. The πάθη in question are the παθητικάλ ποιήσεις of the Categories (9b 28 ff.). Cf. 17A 23-27, 19B 6—20A 7, 19B 8—10, 31A 8—10.

14B 20. Ἐμπεδοκλῆς. Cf. fr. 21, vv. 3 and 5 (Aristotle omits v. 4); Diels, p. 180.

14B 22. τῶν λοιπῶν, sc. στοιχεῖων, or possibly (as Philoponos interprets) παθῶν.

F 2
COMMENTARY

14\textsuperscript{b} 23-24. ὡστ’... γῆν. μὴ δύνατόν, sc. according to Empedokles: cf. *15\textsuperscript{a} 4-8.

14\textsuperscript{b} 24. έσται, sc. δύνατόν γίνεσθαι.

14\textsuperscript{b} 25-26. τοῦτο... ἀλλοιώσις. ‘Yet this is what Alteration essentially is.’ For ἦν, cf. * 28\textsuperscript{b} 2, 31\textsuperscript{b} 23.

14\textsuperscript{b} 26-15\textsuperscript{a} 3. ἕ... ἀλλοιώσις. Two corollaries. (i) Every change (viz. Alteration, Growth and Diminution, and Motion) takes place between contrary poles (cf. * 19\textsuperscript{b} 6-20\textsuperscript{a} 7); these contrary poles must be informations of a single matter. (ii) If A alters into B, A and B must be modifications of a single substratum: and, conversely, if A and B are modifications of a single substratum, change of A into B (or vice versa) is Alteration.

The second corollary (14\textsuperscript{b} 28 ἐτί... 15\textsuperscript{a} 3 ἀλλοιώσις) is not very clearly expressed. Aristotle appears to mean that so far as any changing things have a single substratum, their change is Alteration: and vice versa. The position of the monists (14\textsuperscript{b} 1-4) is an extreme case, where all things are modifications of a single substratum, and (correspondingly) all change is Alteration.

15\textsuperscript{a} 3-25. ἔμπεδοκλῆς... φύσιν. Not only does Empedokles so conceive his elements that ἀλλοιώσις becomes impossible (14\textsuperscript{b} 17-26); his whole position is in conflict with the facts and full of inconsistency.

15\textsuperscript{a} 4-8. ἄμα... ἐκαστον. According to Empedokles, the four ‘roots’ (Earth, Air, Fire, and Water) were eternal and unchangeable: cf. * 25\textsuperscript{b} 19-25, 29\textsuperscript{b} 1, 33\textsuperscript{a} 16-18; Burnet, p. 230. There is no coming-to-be or passing away: cf. fr. 8; 12; 17, v. 34; 21, v. 13 (Diels, pp. 175, 176, 179, 181). ‘Love’, when it has obtained the mastery, brings all things together into one, viz. into the ‘Sphere’; but it does not make a unity of them, but only a ‘together’. Aristotle substitutes for the ‘all-togetherness’ of Empedokles an ‘all-oneness’, i.e. he interprets the statement about Love bringing all things into one as if it meant that Love reduces all things to the One. But even when all things are together in the ‘Sphere’, the four roots remain ‘what they were’ and unreduced (cf. Burnet, p. 235). Hence Aristotle’s charge of inconsistency depends upon a misinterpretation. No doubt, he thought that the irreducibility of Empedokles’ elements was in conflict with the plain facts: for he regarded the transmutation of Earth, Air, Fire, and Water into one another as given in experience. But that is another matter.

15\textsuperscript{a} 8-II. ὡστ’... σκληρῶν. Assuming that in the ‘Sphere’ all
things are fused into a unity, Aristotle urges that, when Love begins to go out and Strife to come in, the elements come into being as distinct things. For an ‘addition’ and ‘subtraction’ of the πάθη which distinctively characterize the elements then occur: so that, whereas e.g. Moist and Hot were originally distributed uniformly over the ‘Sphere’, Hot is now added here and subtracted there, Moist subtracted here and added there. Hence this portion becomes separated from that, this being distinctively Moist (i.e. Water) and that distinctively Hot (i.e. Fire).

15\textsuperscript{a} 9. χωρίζομένων: genitive absolute, the implied subject being various portions of the ‘Sphere’, two of which are specified (τὸ μὲν... τὸ δὲ) as the subjects of the main sentence. For the construction, cf. 15\textsuperscript{b} 3; Bonitz, Ind. 149\textsuperscript{b} 37-45 and commentary on Metaph. 990\textsuperscript{b} 14. Just below (a 16) χωρίζοσθαι is applied to the πάθη.

15\textsuperscript{a} 14. οὐ... νῦν. τότε, sc. at the period when Empedokles seems to recognize that the elements come-to-be, viz. when Love first begins to go out of the ‘Sphere’ and Strife to come in.

νῦν, sc. at the period in which we are living, i.e. when Strife is gaining the mastery (cf. 34\textsuperscript{a} 6-7; Burnet, pp. 234-5).

15\textsuperscript{a} 15-19. ἐστὶ... πᾶν. ἐστὶ δυνάμενα, sc. τὰ πάθη.

According to Empedokles, it was the conflict between Strife and Love which caused the separation of the qualities when the disintegration of the ‘Sphere’ first began. Hence we have a right to infer that the qualities can be ‘added’ and ‘subtracted’ in the present state of the world too, since that conflict is still going on.

15\textsuperscript{a} 17-19. διὸπερ... πᾶν. ‘It was owing to this conflict of Love and Strife that they’ (i.e. the elements) ‘were generated from a One at the former period also. I say “generated”, for presumably Fire, Earth, and Water had no distinctive existence at all while merged in one.’

It is necessary for Aristotle to justify his use of the term ἐγεννήθησαν, since Empedokles asserts that the elements are eternal. Bekker reads ὅνωρ ὑπὶ ὅντα in a 19, which he wrongly attributes to HL. H has some illegible characters under ὅνωρ: otherwise there is no trace of anything between ὅνωρ and ὅντα.

15\textsuperscript{a} 22. μεταβάλλοντα... κίνησιν. The ‘Motion’ is the διάκρισις initiated by Strife: but Empedokles is severely criticized below (33\textsuperscript{b} 22—34\textsuperscript{a} 9) for the vagueness and inadequacy of his account of κίνησις.
A. 2

15\textsuperscript{a} 26-28. "Ολως... διλλοίωσες. Cf. *14\textsuperscript{a} 6—17\textsuperscript{a} 31. The real problem is:—How many distinct forms of change are there, and how precisely are they distinguished from one another? Are there three forms of change—Coming-to-be, Growth, Alteration—differing from one another in principle? And, if so, what is the distinctive manner of their occurrence?

15\textsuperscript{a} 27-28. περὶ... κινήσεις. It is difficult, if not impossible, to defend the accusative here, since the examples are in the genitive. Perhaps Aristotle wrote περὶ τῆς ἀλλής κινήσεως. The reading of D\textsuperscript{b} (περὶ τῶν ἄλλων κινήσεων) is an obvious attempt to emend the text. E adds ἀπλάς after ἀλλάς (cf. also F and Π): but this has probably arisen from a mere dittography of ἀλλάς. For the distinction between ἀπλαῖ and μικτά κινήσεις (cf. de Caelo 302\textsuperscript{b} 6, 303\textsuperscript{b} 5, and also Metaph. 1053\textsuperscript{a} 9) is between ‘simple’ and ‘composite’ movements (cf. Introd. § 10) and is totally irrelevant here. There is no manuscript authority for περὶ τῶν ἄλλων ἀπλῶν κινήσεων—the reading of Bekker and Prantl.

15\textsuperscript{a} 29-33. Πλάτων... πράγμασιν. Cf. Plato, Timaeus 52 d ff., where the γένεσις of the physical universe in its present orderly constitution is described. God shapes and orders the chaotic material, controlling it with figures and numbers, and bringing it into conformity with the Intelligible Pattern. In particular, God develops Earth, Air, Fire, and Water into their present distinctive characters out of their pre-existing chaotic rudiments. Each of these bodies, as the work of God has fashioned them, consists of particles whose shape is that of one of the ‘regular’ solids: and these solids are constructed out of planes whose ultimate components belong to one or the other of two types of triangle (cf. *16\textsuperscript{a} 2-4, *25\textsuperscript{b} 19-25, *29\textsuperscript{a} 13-24).

Later on in the Timaeus (73 b ff.) Plato describes the γένεσις of ‘flesh, bone, and the like’. He regards them as developed out of μυελός, which is itself formed by God out of selected elementary triangles by a process of μείξις. He does not, however, explain wherein precisely God’s ‘mixing’ of the triangles consists; and his account of the formation of bone and flesh from the μυελός (73 e ff.) is fanciful, and anything but precise. At the same time, it might fairly be said that Aristotle’s own account of the γένεσις of the ὄμοιομερή is equally vague. The difference between e.g. flesh and bone is a difference of the combining-formulae: but
we are never told what exactly the λόγος τῆς μίξεως of σάρξ or of ὀστοῦ is.

15a 32. τῶν τοιούτων, sc. τῶν ὅμοιομερῶν, cf. *14a 27—28. 15a 34—35. περὶ οὕδενός ... περὶ ἀπάντων. It is clear both from the neuter, and from the examples (15b 1—6), that Aristotle is accusing his predecessors of neglecting to explain 'every one of the problems which the subject involves' (e.g. μίξεις, ποιεῖν καὶ πᾶσχειν, ἀφήν) and not merely of neglecting to explain the different forms of change.

15a 35—b 1. οὕτως ... διαφέρειν. 'Demokritos, however, does seem not only to have thought carefully about all the problems, but also to be distinguished from the outset by his method.' The superiority of his method is explained below, 16a 6 ff.

15b 1—6. οὕτω ... ποιήσεις. These lines expand and enforce 15a 34 (δάλω ... ἐπέτησεν). Aristotle himself discusses the manner of the accession of new material in Growth (A. 5), ποιεῖν καὶ πᾶσχειν (A. 7—9), and μίξεις (A. 10). For the construction of προσώπωσις, cf. *15a 9.

15b 6—9. Δημόκριτος ... ἀλλοίωσιν. Cf. *14a 21—24. Aristotle's statement here must not be taken as meaning that the Atomists made no use of differences of figure in explaining the different 'secondary' qualities: see *15b 33—16a 2. The Atomists appear to have called their 'indivisible bodies' σχήματα or ἰδέαι: cf. Burnet, p. 336.

15b 9—10. ἐπελ ... φαίνεσθαι. Cf. 25a 23—24, de Anima 404a 25—31, Metaph. 1009b 11—17. In the last passage Demokritos is represented first as arguing from the conflicting appearances of sense 'that there is either nothing true, or what is true is not clear to us': and next as supposing that 'to know' is to perceive and 'to perceive' is to be changed in bodily state, and so concluding that 'what appears on the evidence of the senses must be true'. In the de Anima (l.c.) he is said to have identified ψυχή (i.e. the source of movement and sensation) and νοῦς, 'for τὸ ἀληθὲς is identical with τὸ φαινόμενον'.

It does not seem possible to extract from the fragments of Demokritos a consistent view as to (i) the 'reality' of the 'secondary' qualities, and (ii) the capacity of αἰσθησις and thought to attain to truth. We are told that flavours, colours, and perhaps temperature, are only by 'convention' (νόμος): whilst in reality (ἐτείρι) there are 'atoms' and the 'void'. Yet the 'secondary' qualities are explained as due to differences in the figure, 'grouping'
and 'turning' of the atoms: and differences of \textit{flavourat} any rate are treated as being \textit{really} differences of figure (cf. *15b 33—16a 2, *25b 36—26a 24). And although Demokritos condemns the 'bastard' (\textit{s\kappa o\tau i\gamma}) knowledge of sense and contrasts it with the 'true-born' (\textit{\gamma\nu\nu\sigma\iota\gamma}) knowledge of the understanding, he also denies that we can know anything as it really is and criticizes the understanding on the ground that it depends on the senses: cf. fr. 6—11, 117, 125 (Diels, pp. 388—9, 407—8).

\textit{15b II. \\'\alpha\pi\epsilon\rigma,} infinite both in number and in variety: cf. 14a 22.

\textit{15b II—15. \\'\omega\sigma\tau e \ldots \gamma\rho\alpha\mu\mu\acute{\alpha}t\omega n.} 'Hence—owing to the changes of the compound—\textit{the same} thing seems different and conflicting to different people: it is transposed by a small additional ingredient, and appears utterly other by the transposition of a single constituent. For Tragedy and Comedy are both composed of \textit{the same} letters.'

Tragedy and Comedy, though utterly contrasted in their effects on us, are really 'the same thing', i.e. composed of the same letters. The constituents are the same: the change is a change of the 'compound'. Similarly the same atoms, as constituting different perceptible things (different compounds), present conflicting appearances. The addition of a small ingredient (e.g. of a single new atom) may cause the original constituents to shift their places: and the transposition of even a single atom involves a 'change of the compound', and is thus enough to make the whole appear entirely different.

The illustration from Tragedy and Comedy is probably quoted from the Atomists (cf. Diels, \textit{Elementum}, p. 13). Philoponos gives other examples, which seem to be drawn from Demokritos: but his interpretation of \textit{\sigma\gamma\kappa\epsilon\iota\mu\epsilon\nu\nu} as \textit{\tau}\textit{\omicron\upsilon\nu\tau\iota\delta\epsilon\iota\upsilon\tau} \textit{\tau} \textit{\sigma\upsilon\nu\beta\epsilon\tau\omicron\nu} is impossible. Apart from the grammatical difficulty, Demokritos would never have admitted that the Atom itself changes.

\textit{15b 15—24. \\'\epsilon\pi\epsilon \ldots \pi\epsilon\rho\alpha\tau\epsilon\omicron\nu.} Leukippos, Demokritos, Anaxagoras, and Empedokles (according to Aristotle) maintain \textit{both} that \textit{\gamma\nu\varepsilon\omicron\iota\varsigma} is distinct from \textit{\d\alpha\lambda\lambda\omicron\iota\omega\varsigma\iota\varsigma}, \textit{and} that \textit{\gamma\nu\varepsilon\omicron\iota\varsigma} and \textit{\phi\theta\omicron\rho\acute{\alpha}} are respectively an 'associating' and a 'dissociating' of elementary constituents, whilst \textit{\d\alpha\lambda\lambda\omicron\iota\omega\varsigma\iota\varsigma} is a change of the thing's qualities. If we develop the logical implications of these theses, we shall find ourselves entangled in \textit{\d\alpha\pi\omicron\rho\omicron\iota\acute{\alpha}}—dilemmas, antinomies. An \textit{\d\alpha\pi\omicron\rho\omicron\iota\acute{\alpha}} is a pair of incompatible conclusions, both of which seem
to follow from logically convincing arguments. It is therefore like a tangle, or a knot, by which our intelligence is bound and enmeshed. We can neither accept nor reject it: and we cannot advance until we have 'unravelled' one or more of the arguments which form the knot (cf. e.g. *Metaph. 995a* 30–33, *E. N. 1146a* 24–27: Bonitz, *Ind. s.v. διαλύειν, 184a* 43 ff.; Burnet, *Ethics*, Introd. §25).

15b20–24. εἰ . . . πειρατέων: a somewhat hasty outline of the main ἀπορία to which the two theses lead. Thus (a) we cannot identify γένεσις and σύγκρουσις, for many impossible consequences result from the identification. And yet we must identify them, for convincing arguments compel us to do so. (b) We must identify γένεσις and σύγκρουσις: for if we do not, we shall have to choose between denying γένεσις altogether, and identifying it with ἀλλοώσις.

The second ἀπορία (b) is an indirect proof that γένεσις must be σύγκρουσις by a reductio ad absurdum. 'If γένεσις is not σύγκρουσις, a dilemma results, both limbs of which conflict with the pluralists' first thesis: for either there is no γένεσις at all, or it is identical with ἀλλοώσις.' Hence, if we still wish to maintain that coming-to-be is not 'association', 'we must endeavour to unravel this dilemma too' (i.e. as well as the λόγοι τέρτων ἀναγκαστικοί referred to at 15b21), 'and a stubborn one we shall find it'.

The proposed interpretation involves the omission of εἰ (with EHJ) in b24, as a dittograph of η. A possible alternative is to retain εἰ, and omit ἢν (with EI, cf. H) as a reduplication of the 'last syllable of χαλέπτων:' 'Or, however difficult it may be to unravel this dilemma too, we must make the attempt'.

15b26–27. τῶν . . . διαφέρετων, 'because the primary reals are indivisible magnitudes': cf. b28 εἰ μεγάθη, 'if the primary reals are indivisible magnitudes . . .' 

15b28. διαφέρει . . . πλείστον. If the primary reals are indivisible magnitudes, γένεσις must take place by σύγκρουσις. If there are no indivisible magnitudes, γένεσις need not (though it still may) take place by σύγκρουσις (Philonpons).


15b31. ἐν ἄλλοις. Cf. *de Caelo* Γ. 1, 7, Δ. 2, where Plato's theory is criticized. The paradox (cf. *de Caelo* Γ. 1, 299a 6–11) consists in stopping at planes (μέχρι εξτείλων): for the same principles, which induce Plato to resolve bodies into planes, ought
to have led him to resolve planes into lines and lines into points, and thus to have constructed bodies out of points or monads.

15\textsuperscript{b} 33—16\textsuperscript{a} 2. δμωσ... χρωματίζεσθαι. Cf. I4\textsuperscript{a} 21–24, I5\textsuperscript{b} 6–15, 25\textsuperscript{a} 23—b 5. We have sufficient evidence to justify Aristotle's statement that the Atomists explained γένεσις and φθορά by σύγκρισις and διάκρισις. They admitted as real an infinite plurality of 'indivisible bodies' (atoms), imperceptible owing to their minuteness, differing from one another in figure and size, and moving in the 'void' (which is also 'real' in a sense: cf. * 25\textsuperscript{a} 26–32) in all directions and with different velocities. The perceptible things of ordinary experience 'come-to-be', because many atoms of congruous figures are brought together by their movements. Being brought together, they 'hold together' in so far as they get entangled or mechanically attached (e.g. hooked together). And when their cohesion is overcome—e.g. by a more powerful movement of the surrounding atoms—the perceptible thing 'passes-away'. (Cf. Diels, pp. 343 § 1, 346 §§ 14–15, 359 § 37; Burnet, Greek Philosophy, §§ 77–83.)

On the other hand, there is considerable obscurity in the Atomists' theory of the 'secondary' qualities of the perceptible things (colour, sound, flavour, temperature, &c.) and consequently in their conception of the change of such qualities, i.e. in their account of ἄλλοιωσις (cf. * 15\textsuperscript{b} 9–10, * 25\textsuperscript{b} 34—26\textsuperscript{b} 6). The 'secondary' qualities, though 'conventional' and not 'real', have a real basis in the figures, the sizes, the 'grouping' and the 'turning' of the constituent atoms; and some of them at least (e.g. flavours) appear to be explained as really differences of figure (cf. Arist. de Sensu 442\textsuperscript{b} io–12, below * 25\textsuperscript{b} 36—26\textsuperscript{a} 24; Theophr. de Sensu, §§ 60–82, quoted by Diels, pp. 375–9). Now, if different flavours are really different figures, how can there be a change of flavour, i.e. ἄλλοιωσις in the qualities of taste? The atoms do not change their figure. Are we to suppose that a change in the 'grouping' or 'turning' of the atoms makes their figures appear different? But there is no indication that Demokritos distinguished between real and apparent figure, or that he ascribed flavour to apparent figure. Perhaps Demokritos would have appealed to the principle enunciated above (I5\textsuperscript{b} 11–15). When milk, e.g., 'alters' from sweet to sour, what has really happened is that a few atoms of one figure have gone out of the compound and been replaced by atoms of a different figure.
But if so, is there any difference in principle between ἀλλοιώσις and γένεσις or φθορά?

At 33, EJ read ὅμοιος; but ὅμοιος is clearly required. The Atomists’ technical terms for σχῆμα, θεωσ, and τάξις were ἰνσωμός, τροπή, and διαθηγή (Metaph. 985b 15–19). Diels (p. 710, note on p. 344, l. 4) interprets διαθηγή as ‘inter-contact’. Beare (p. 37) suggests it may be διαθηγή, i.e. a dialectic form of διαθήκη (sc. διάθεσις). EJLΦε read διαθηγή here (35): but, in view of 27b 18 (διαθηγή FHJ, om. E, διαθηγή L), we should hardly be justified in introducing διαθηγή or διαθήκη. For μετακινώντα, cf. 15b 13, 14.

16a 1–2. διὸ . . . χρωματίζεσθαι. A parenthetical corollary. Demokritos is entitled to deny the ‘reality’ of colour, since (according to his theory) things get coloured owing to the ‘turning’ of their constituent atoms. Demokritos appears to have recognized black, white, green, and red as primary colours, out of which all other colours were formed by mixture (Beare, pp. 30–7). He also seems to have identified ‘white’ with ‘smooth’ and ‘black’ with ‘rough’ (Arist. de Sensu 442b 11–12): and the present passage suggests that the ‘smoothness’ or ‘roughness’ depends upon the way in which the atoms are turned. The things which get coloured—or which appear coloured, owing to the ‘turning’ of their atoms—are the objects of vision, i.e. the ‘images’ (δικελα or εἴδωλα) thrown off from bodies (Burnet, Greek Philosophy, p. 196).

Theophrastos, however, represents Demokritos as ascribing the differences of texture (e.g. smoothness and roughness) in the objects of vision to differences of figure in the atoms, and not merely to differences of their ‘turning’: cf. Theophr. de Sensu, §§ 73–82 (Diels, pp. 377–9). In 16a 1 HJ read χροιή, which Diels (p. 715) rejects as probably not a genuine survival of the dialect.

16b 2–4. τοῖς . . . αὐτῶν. The Platonists cannot, with their assumptions, construct ἀλλοιώσις as well as γένεσις. Nothing but solids results from ‘putting together’ planes: but ἀλλοιώσις means change of qualities, and therefore presupposes qualities in the things which alter. And it is impossible to generate a quality by ‘putting together’ planes—the Platonists do not even attempt it. The last clause (πάθος γὰρ . . . αὐτῶν) supports the clause before it (οὐδὲν γὰρ . . . συντιθεμένων), which itself justifies Aristotle’s assertion that the Platonists cannot construct ἀλλοιώσις as well as γένεσις.

L and F (in the margin) read συντιθεμένων κατὰ πλάτος, which
would mean 'by being superimposed' (cf. de Caelo 299b 23–31). But the elementary triangles of the Timaeus are not superimposed to form the 'elements'. They are 'put together' so as to constitute the planes containing a solid, i.e. they are 'put together' κατὰ πλάτος as the addition of a scribe, who misunderstood Aristotle's criticisms both here and in the de Caelo, l.c.

16a 8. συνείρευο : intransitive, cf. 18a 13, Phys. 262a 16.

16a 8–10. οἱ . . . ἔρων : ' . . . those whom devotion to abstract discussions has rendered unobservant of the facts are too ready to dogmatize on the basis of a few observations.'

λόγου, sc. dialectical discussions: cf. 16a 11 (λογικῶς), Metaph. 987b 31, 1050b 35.

tὰ ὑπάρχοντα, sc. 'the facts' as contrasted with a priori theories: cf. Bonitz, Ind. s.v., who rightly quotes de Caelo 297b 22, Post. Anal. 81b 23 in illustration of the present passage.

16a 12. οἱ . . . ἔσται. The Platonists argue that there must be atomic magnitudes, 'because otherwise "The Triangle" will be more than one'. For their argument, cf. de Lin. Insec. 968a 9–14 with my notes.

In a 12, οἵτινες τὸ τρέγωνον (E) is on the whole the most probable reading. J's οἵτινες is an obvious correction due to misunderstanding of διότι.

16a 13–14. Δημόκριτος . . . προϊόντων. The 'arguments appropriate to the subject, i.e. drawn from the science of nature', which convinced Demokritos, are reproduced and answered in the discussion which follows.

16a 14—17a 17. ἔχει . . . ἑλαττώνων. (i) The thesis that a body is divisible through and through (i.e. the denial of indivisible magnitudes) leads to impossible results. Hence we seem to be forced to maintain that there are indivisible magnitudes (16a 14–b 16). But (ii) the latter thesis also leads to impossible results, as Aristotle claims to have shown elsewhere. Hence we seem forced to deny that there are indivisible magnitudes (16b 16–18).

We are thus entangled in an ἀπορία (cf. * 15b 15–24), and this is solved by showing that the arguments, which apparently compel us to accept indivisible magnitudes, involve a faulty inference (16b 18—17a 17).

16a 14. ἀπορίαν. The term is used rather loosely here: 'a difficulty'. But an ἀπορία in the full and strict sense is developed in the following passage: cf. 16b 19, and the preceding note.
A. 2. 316a 8–19

16a 15–16. εἰ τις . . . δινατών. The denial of indivisible magnitudes is equivalent to the thesis that ‘a body (i.e. a magnitude) is divisible through and through’. But this thesis, if interpreted without careful qualification, leads (as we shall see) to the absurdity that the constituents of a body are either ‘points’ or ‘nothings’— or that there is nothing in the body which escapes the division, i.e. that the whole body is consumed in the divisions.

16a 17–18. καν . . . διηρηται. It is tempting to omit τοῦτο in a 18 (with Φ'), since it must mean τὸ σῶμα, whereas in a 16 and a 17 it means τὸ πάντῃ διαιρεθήναι. F reads . . . τοῦτο πάντῃ διηρημένον, καὶ εἰ μὴ ἄμα τοῦτο διηρηται. The addition of πάντῃ, though it gives the right sense, is unnecessary, and is probably due to the πάντῃ in a 17. And the second τοῦτο only tends to throw suspicion on the first.

Translate: ‘then it might be at one and the same moment divided through and through, even though the divisions had not been effected simultaneously’.

16a 19. καν . . . ἀδύνατον. Cf. 27a 7–14, where Aristotle refers to the present passage. His argument presupposes the definition of τὸ δυνατῶν which is given in the Metaphysics (1047b 24–26):— ‘A thing is δυνατῶν so far as, if it actually does (or is) that which it has the power to do (or be), nothing ἀδύνατον results’. By ἀδύνατον we must understand ‘inconceivable’, ‘self-contradictory’ (cf. e.g. Metaph. 1047b 3–14). Hence x is δυνατῶν εἶναι y, provided that, if x actually is (or becomes) y, the ‘being’ of x is not ἐν ἰπσο destroyed; i.e. provided that y is not incompatible with some feature constitutive of the essential nature of x.

So, a body is πάντῃ διαιρετῶν (i.e. δυνατῶν πάντῃ διαιρεθήναι), provided that, if in fact this ‘through and through’ division takes place, nothing incompatible with the essential nature of ‘body’ results. But, as we shall see, the body’s dissolution into points would result: i.e. it would follow that a body ‘consists of points’, which is incompatible with the essential nature of ‘body’. Hence a body is not δυνατῶν πάντῃ διαιρεθήναι in the proper sense of δυνατῶν.

It must, however, be added that Aristotle here interprets the thesis (that a body is πάντῃ διαιρετῶν) as meaning that a body can be so divided through and through, that the results of the dividing are simultaneous. It would not follow that a body ‘consists of points’, if the thesis meant only ‘it is always possible to divide a given body anywhere, though not everywhere at once’.
The thesis thus interpreted is, in fact, maintained by Aristotle himself.

Aristotle developed his conception of δύναμις and δύνατόν in the Metaph. (1. c.) as the result of a controversy with the Megarians: see, on the whole subject, Maier's article in the Archiv f. Geschichte d. Philosophie, xiii, pp. 30 ff.

16a 19-21. οὐκοῦν ... γεγονός. 'Hence the same principle will apply, whenever a body is by nature divisible through and through —whether by progressive bisection, or generally by any method whatever: nothing impossible will have resulted, if it has actually been divided . . . '

The construction is a little harsh, but not impossible. Aristotle is urging that if a body is δύνατόν πάντα διαιρόταται, whether the διαίρεσις is by bisection (κατὰ τὸ μέσον, i.e. by progressive bisection ad infinitum: cf. a 18 καὶ εἰ μὴ ἀμα διήρηται), or by any other method (καὶ ὅλως δὲ), in all cases alike nothing ἀδύνατον will result if the body has actually been divided. Bekker and Prantl make nonsense of the passage by placing a full stop after ὀσαίτως.

For this use of οὐκοῦν, see Bonitz, Ind. 540a 28–30, and cf. below, 16b 10.

16a 22. διηρημένα (διαιρέθ)γ. An alternative emendation would be διηρημένα (διηρημένον) γ.

16a 25. ἢν ... διαιρέτων, 'whereas ex hypothesis the body was divisible through and through'. Aristotle is reproducing the original formulation of the thesis (16a 15): otherwise we should have expected διηρημένον instead of διαιρέτων.

16a 25-26. ἀλλὰ . . . δὲ ἐσται. 'But if it be admitted that neither a body nor a magnitude will remain, and yet "through and through" division is to take place . . . '

Εἰ μηδὲν ἐσται (sc. λοιπὸν) σῶμα μηδὲ μέγεθος resumes the result of the preceding argument as an admission which the advocates of the original thesis are forced to make. διαιρεσις δὲ ἐσται reaffirms the original thesis in spite of this admission. If the original thesis is to be maintained in spite of this admission, the body, which is πάντα διαιρέτων, will have to consist of points or of nothings, as Aristotle proceeds to state.

16a 26-34. ἢ . . . μέγεθος. The constituents of the body must be either (i) points, or (ii) nothings. If (i) they are points, they are without magnitude; and therefore the body, which they constitute, can have no magnitude, i.e. cannot be ποσὸν (a 29-34). If (ii) they are nothings, the body can come-to-be out of nothings,
and can exist as a composite of nothings: i.e. the body is simply an illusory appearance (a. 28-29).

The explanatory clause καὶ ἄμεγέθη εἰς ὅν σύγκειται has disturbed the natural statement of the alternatives. Aristotle began with the intention of writing ‘it will either consist of points or of nothings’. But he added to the first alternative the explanatory clause ‘i.e. its constituents will be ἄμεγέθη’; and then, treating this clause as if it were the main statement of the first alternative, stated the second alternative in a corresponding grammatical form. Thus the effect is the same as if he had written ἦ στιγμαί ἐσούσαι καὶ ἄμεγέθη (τὰ) εἰς ὅν σύγκειται, ἦ οὐδὲν παντάπασιν.

16a 29-34. ὅμοιος . . . μέγεθος: this disposes of the first alternative (see preceding note). The argument (a. 30-34) is:—
(i) Before the division, when the points were in contact and together, they did not increase the quantity of the whole (a. 30-31, ὑστερός . . . τὸ πάν). We can see this (ii) from the fact that, when the body was divided into two or more parts, the whole (i.e. the sum of the now separated parts) was not a bit smaller or bigger than it was before the division (a. 31-33 διαιρεθέντως . . . πρῶτερων). Hence (iii) even if all the points (into which the body has been dissolved by the ‘through and through’ division) be put together, they will not make any magnitude.

16b 34—b 8. ἀλλὰ . . . στιγμῆν. We have seen that, if a body has been divided through and through, we are left with points or nothings: i.e. the body has been dissolved into ‘constituents’ which never could constitute it. But it might be urged that, though nothing is left when the ‘through and through’ division is over, yet in the process of the dividing something evades the division: and that this ‘something’ sufficed to constitute the original body. It is suggested first (a. 34—b 2) that the ‘something’ which evades the division is itself a ‘body’, like sawdust: and when that suggestion is disposed of, it is suggested next (b 2—8) that the original body was ‘formed’ or ‘qualified’ points, and that the ‘form’ or the ‘quality’ goes out in the dividing. This suggestion also is shown to be impossible.

16b 2. ἀπέρχεται . . . διαιρέτων; ἀπέρχεται (and similarly ἀπῆλθεν, b 3) i.e. τὴν διαίρεσιν διαφείγει, 16b 16.

ὅ αὐτός λόγος: the same argument as above, a 24-25.

ἐκεῖνο . . . διαιρέτων; ‘For in what sense is that section divisible?’

It must be divisible in some sense, since the body is πάντη διαιρέτων.
COMMENTARY

EHJL omit γάρ, but the asyndeton is rather harsh.

16b 4. στιγμαί... παθόνσα. The 'points' or 'contacts' stand to the πάθος in the relation of matter to form. The μέγεθος is a τοῦδε ἐν τῷδε, or ὦδι ταῦτα (cf. Metaph. 1036b 23). The suggestion, then, is that the division separates the points or contacts (the matter) from their πάθος (the form), and that in the division an εἴδος τι χρωματὸν ἡ πάθος goes out.

Before proceeding, it will be as well to explain certain technical terms (viz. ἐφεξῆς, ἀπτόμενον, ἐχομενον, συνεχές), whose meaning Aristotle assumes throughout this passage and in what follows. They are defined in the Physics (226b 18—227b 2: cf. also 231a 18 ff., and de Lin. Insec. 971a 17—972a 6 with my notes).

(i) The widest term is ἐφεξῆς. It applies whenever there is a series with a first member (an ἀρχή) and an order of 'succession', provided that there is nothing of the same kind (συγγενεῖς) as the members of the series intervening between any two of them. In every such series each succeeding member is consecutive (ἐφεξῆς) to the preceding member. Thus, e.g., a line (or lines) may be consecutive to a line, a unit (or units) to a unit, a house (or houses) to a house, provided that no other magnitude, no other number, or no other building intervenes.

The members constituting the series may be selected on various principles; e.g. because they belong to the same species as the first member ('a row of houses'), because they have a determinate spatial relation to it ('a series of lines parallel to a given line'), and so forth. And, in relation to the selected ἀρχή, the 'succession' may be temporal (e.g. the 2nd of the month is consecutive to the 1st), or 'logical' (the number 2 is consecutive to 1, for 1 is πρότερον τῷ λόγῳ to 2), or spatial (the second house in the row is consecutive to the first), &c.

(ii) If, in a consecutive series, any member is in contact with the member to which it is consecutive, it is said to be 'immediately next' (ἐχομενον) to its predecessor.

Now, according to Aristotle's definition of τὸ ἀπτωσθα (Phys. 226b 21—23, and cf. * 22b 29), only spatial quanta (lines, surfaces, or solids) can strictly be in contact. Any two lines, surfaces, or solids are in contact when their 'extremes' (i.e. their containing points, lines, or surfaces) are 'together' (ἀμα), viz. are in one and the same 'immediately-continent' place. The 'immediately-continent' place of anything (τῶς ἵδιος or πρῶτος) is that which
contains that thing and nothing more (Phys. 209a 31–b 1). Hence the term immediately-next \( \epsilon \chi \omicron \mu \eta \nu \omicron \nu \) applies only to a series of consecutive spatial quanta. In such a series any member which is in contact with the preceding member (to which it is consecutive) is immediately-next to it. Thus, though the number 2 is consecutive to 1, 2 is not immediately-next to 1: for numbers cannot be in contact with one another. And though point may be said, in a less strict sense of \( \alpha \pi \tau \varepsilon \sigma \theta \alpha \iota \), to be in contact with point; yet, since in a magnitude point is not consecutive to point, point cannot be said to be immediately-next to point (cf. *16b 6–8, *17a 2–17).

Lastly (iii) \( \tau \omicron \sigma \nu \varepsilon \chi \acute{e}s \) is a special case of \( \epsilon \chi \omicron \mu \eta \nu \omicron \nu \). If the 'extremes' of two quanta (one of which is immediately-next to the other), instead of being merely 'together' (\( \acute{a} \mu \alpha \)), coalesce and become one, the quanta are 'held together' or 'continued' (\( \sigma \nu \varepsilon \chi \varepsilon \tau \alpha \iota \)) and are continuous or form a continuum (\( \sigma \nu \varepsilon \chi \acute{e}s \).

In order to prevent misunderstanding, it must be remembered that Aristotle regards continuity as primarily spatial, i.e. as characterizing a \( \mu \acute{e} \gamma \varepsilon \theta \omega s \). The 'continuity' of motion, or of change generally, is derivative, dependent upon the continuity of the moving or changing \( \sigma \omega \mu \alpha \). And the 'continuity' of time is dependent upon the 'continuity' of the \( \kappa \iota \nu \gamma \sigma \iota \sigma s \) which, \( q \omicron \alpha \) measured, is time. Similarly 'succession' (\( \tau \omicron \ \pi \rho \omicron \acute{e} \tau \rho \omicron \nu \kappa a i \ \upsilon \omicron \tau \omicron \omicron \rho \omicron \nu \omicron \nu \)) according to Aristotle, is primarily spatial, depending upon position (\( \tau \omicron \gamma \ \theta \omicron \sigma \epsilon \omicron \)). Cf. Phys. 219a 10 ff., 220b 24 ff.; below, *37a 22–25.

We can now explain 16b 4 a little further. The advocates of the 'through and through' divisibility of a \( \mu \acute{e} \gamma \varepsilon \theta \omega s \) may urge (Aristotle suggests) that a \( \mu \acute{e} \gamma \varepsilon \theta \omega s \) is 'points or contacts thus qualified': i.e. a continuous magnitude, they may say, results from the coalescence of two points, which are \( \acute{a} \mu \alpha \), into one point. Each couple of 'coincident' points is a 'contact' (\( \acute{a} \phi \gamma \)) and a 'contact', or many 'contacts', whose 'coincident' points fuse and become one, is a \( \sigma \nu \varepsilon \chi \acute{e}s \).

16b 5–6. \( \acute{e} \tau i \ldots \omicron \tau \gamma \omicron \mu \alpha i \); Each of the 'elements' (Earth, Air, Fire, Water) has its own proper place in the Cosmos and its own natural movement towards its proper place: and all 'places' are filled by elementary or composite bodies (cf. Introd. § 10). Since points are not bodies, they cannot have any 'place' and they cannot have any natural movement. Yet, if they are not 'in any place', i.e. if they are nowhere, how can they be the \( \omicron \tau i \ldots \omicron \tau \gamma \omicron \mu \alpha i \)
constituents of a body? And if they have no movement, how can they coalesce to form a συνεχές?

16b 6–8. ἀφή τε... στιγμήν. ‘Contact’ means, strictly speaking, the ‘coincidence’ (i.e. ‘togetherness in the same immediately-continent place’) of the ‘extremes’ or ‘limits’ of two μεγέθη (*16b 4). Hence it implies two ἀπτόμενα whose ‘limits’ are ‘together’. But points are themselves ‘limits’, and nothing but ‘limits’: hence point cannot (strictly speaking) be in contact with point. Two lines can be in contact, i.e. their ‘limits’ (from which they, as ‘the limited’, are distinguished) can be ‘together’. But a point cannot be distinguished into a ‘limit’ and a ‘limited’. If, therefore, we speak of a contact of points, we are using the term in a different (and a looser) sense: it is a ‘contact’, into which the whole of both ἀπτόμενα is absorbed (ὅλον ὅλον ἀπτεσθαι). And it is clear that from such ‘contacts’ no συνεχές could result (cf. Phys. 231a 26–29, b 2–6: de Lin. Insec. 971a 26 ff., with my notes).

16b 7–8. παρά... στιγμήν. On the supposition that a magnitude is ‘points or contacts thus qualified’, ἀφή, διαίρεσις, and στιγμή are equivalent terms: see de Lin. Insec. 972a 28–30, with my note.

16b 9–14. ἂντι... τάῦτα; Prantl brackets this passage as spurious. But, although it is difficult to see exactly how it connects with what has gone before, it is undoubtedly genuine; and it contains a new and important objection (b 13–14) to the view that a μέγεθος is ‘points or contacts thus qualified’.

If I divide a piece of wood into two, and then put the parts together again, the result is a single piece of wood of the same magnitude as before. The same principle applies, at whatever point I divide the wood. Let us suppose, then, that I have divided it at all points at once (i.e. through and through) and put it together again. It is now a magnitude, and one: and yet, since it has been through and through divided, it is still potentially through and through divided (b 11–12 πάντῃ ἄρα δύρηται δύναμι). What distinguishes its present potential ‘through and through dividedness’ from the preceding actual ‘through and through dividedness’ when it had vanished into points? If we say ‘the distinction depends on the presence or absence of a πάθος’, we must explain how the wood can be dissolved into quality + points (eis ταῦτα, b 13) and how it can come-to-be out of quality + points:—in other words, we must explain how πάθος and that which it qualifies (viz. points) can be separated from one another so as to exist apart.
16b 12. τί . . . διαφέρεν; 'What, then, is there in the wood besides the division (i. e. besides the points: cf. * 16b 7–8)?'

16b 17–18. ἐκεῖπατα . . . ἐτέρως. αὐτῶν, i. e. the ἀδύνατα resulting from the postulate of Indivisibles.

ἐν ἑτέρως, cf. Phys. 231a 21 ff., de Caelo 303a 3 ff. (cf. also de Lin. Insec. 969b 29 ff.).

16b 18–19. ἀλλὰ . . . λεκτέων. 'But we must try to disentangle these perplexities, and must therefore formulate the whole problem over again.'

ταῦτα, i. e. both sets of difficulties which together constitute the ἀπορία: cf. * 16a 14—17a 17. The argument which seems to force us to accept Indivisibles is restated (b 19–34): the fallacy underlying it is exposed, and the true theory set forth, thus solving the ἀπορία (17a 1–17).

16b 19–25. τὸ . . . σημεῖον. 'On the one hand, then, it is in no way paradoxical that every perceptible body should be indivisible as well as divisible at any and every point. For the second predicate will attach to it potentially, but the first actually. On the other hand, it would seem to be impossible for a body to be, even potentially, divisible at all points simultaneously. For if it were possible, then it might actually occur, with the result, not that the body would simultaneously be actually both (indivisible and divided), but that it would be simultaneously divided at any and every point.'

διαφερόν (which Bekker, following EL, inserts after δυνάμει in b 21) is probably due to accidental reduplication of διαφερόν in b 22; or it may have been a marginal note intended to explain τὸ μὲν γὰρ . . . ὑπάρξει (b 21).

δυνάμει (b 22) may have arisen by accidental reduplication of δυνάμει in b 21. If we retain it, it must be taken closely with εἶναι. It is not required with διαφερόν, since that means δυνατόν διαφερθῆναι. Aristotle may have been induced to qualify εἶναι with δυνάμει, owing to the antithesis between ὑπάρξει δυνάμει and ὑπάρξει ἐντελεχεία in b 21.

Ι suspect that the sentence ὅχι ὃστε . . . σημεῖον (b 23–25) was originally a marginal note, intended (like διαφερόν in b 21) to explain τὸ μὲν γὰρ . . . ὑπάρξει. This suspicion is confirmed by the fact that F1 reads διημεύον δυνάμει καθ' in b 24–25. When the marginal note got displaced and inserted in the text, δυνάμει became unintelligible. Accordingly it was dropped, F1 alone retaining it.

G 2
16b 28–34. ἀλλὰ ... συγκρίσει. This reproduces the experiential basis of the Atomists' theory. A body cannot be divisible through and through: for that would mean that it consists of points or nothings. On the other hand, we see that a body 'is in fact divided into separable magnitudes which are smaller at each division—into magnitudes which fall apart from one another and are actually separated' (cf. Phys. 231b 4–6). We have only to suppose this process of 'breaking-up' carried a little further, and we shall reach bodies too small to be visible (ἀόρατα, b 33: cf. 25a 30). These invisible, minute bodies (separated from one another by 'the void', and indivisible because not comprising any 'void' within themselves) are the Atoms of Leukippos and Demokritos.

ἀλλὰ μέχρι τοῦ (b 32), sc. εἶ ἂν ἢ θρόύμεν.

16b 33–34. ἀλλος ... συγκρίσει. Assuming that γένεσις and φθορά occur, and assuming that γένεσις is due to σύγκρισις and φθορά to διάκρισις, we seem to be forced to admit that the ultimate constituents of the perceptible bodies are 'invisible atoms'. For (a) an 'association' of points or nothings cannot produce a body, nor can a body be 'dissociated' into them; i.e. 'association' and 'dissociation' imply a limit to the body's divisibility: and (b) unless the 'associated' and 'dissociated' atoms were invisible, there would not be even an apparent emergence of what was not already there, or an apparent vanishing of what was there. But nobody would speak of γένεσις and φθορά unless there were, at least in appearance, a 'creation' and an 'annihilation'.

17a 1–2. παραλογιζόμενος. The Atomists argue, according to Aristotle, that there must be atoms; because, if not, a body is divisible through and through, and this leads to an absurdity. For,

'What is πάντη διαιρετῶν can be resolved into points or nothings:
'A body (ex hyp.) is πάντη διαιρετῶν:
'Therefore a body can be resolved into points or nothings'.

But this syllogism is a παραλογισμός (faulty in form), for its middle term (πάντη διαιρετῶν) is ambiguous. The major premiss is true, only if πάντη διαιρετῶν means 'divisible everywhere simultaneously'. But the minor premiss is true, only if πάντη διαιρετῶν means 'divisible everywhere successively, i.e. anywhere you please'.

17a 2–17. ἐπεῖ ... ἐπιτόμων. A can only be immediately-next (ἐχόμενον) to B, if A is (i) consecutive to (ἐφεξῆς) and (ii) in contact with (ἀπτόμενον) B (cf. *16b 4).
Now point cannot be consecutive to point; for, between any two points, something *συνγενές* (viz. a line) always intervenes (cf. e.g. *Phys. 231b 6–10*). Nor can point be in contact with point, except in the loose sense of ‘contact whole with whole’ (cf. *16b 6–8*). Hence point is not immediately-next to point in a magnitude.

From this it follows that, though any given magnitude can be divided ‘everywhere’ in one sense (viz. *anywhere, at any point*), it cannot be divided ‘everywhere’ in another sense (viz. *at all points simultaneously*). For though there is a point ‘everywhere’ in the magnitude, in the sense that a point can be taken ‘anywhere’ within it, these points (i.e. ‘all’ the points of the magnitude) are not immediately-next to one another: i.e. they are not ‘everywhere’ in the sense that *at all places of the magnitude simultaneously* there are points. If, e.g., the given magnitude has been divided at its centre, it cannot also be divided at a point immediately-next to its centre: for there is no such point. On the other hand, the magnitude might have been divided at a point immediately-next to its centre, instead of at its centre: for a point might have been taken there, instead of at the centre.

Hence every magnitude is *πάντα διαιρετόν*, and yet no magnitude can be *πάντα ἃμα διαρρημένον*. And it is possible to take a point ‘everywhere’—i.e. at any place, or *successively* at all places—in a magnitude: but not to take points ‘everywhere’ in a magnitude, i.e. simultaneously at all places within it.

*τούτο* (17* a* 4), sc. *τὸ πάντα ἐίναι διαιρετόν*.

καὶ δὴ πηγοῦν ... ἐίναι (a 5), ‘that there is a point not only anywhere, but also everywhere, in the magnitude’.

17* a* 7–9. *τὸ δὲ ἐκ τὸν πάρτα* . ‘But it is only *in one sense* that the magnitude is divisible through and through, viz. in so far as there is one point anywhere within it and all its points are everywhere within it if you take them singly one by one. But there are not more points than one anywhere within it, for the points are not consecutive: hence it is not simultaneously divisible through and through.’

*τὸ δὲ* (*a 7*), sc. *τὸ διαιρετὸν ἐίναι*.

ὁστ’ ὦ τὸ πάντα (*a 9*), sc. *διαιρετὸν ἔσται τὸ μέγεθος*. Grammatically it would be possible to interpret *τὸ δὲ* (*a 7* as τὸ δὲ *οὗ τιμιμῆν ἐίναι, and ὦστ’ ὦ τὸ πάντα* (*a 9*) as ὦστ’ ὦ τὸ πάντα ἀνακριμή ἔσται: but this would not enable us to connect the passage with the next sentence (εἰ γὰρ κατὰ μέσον κτλ.).
17\textsuperscript{a} 10–12. εἰ...σωθείσ. 'For if it were divisible through and through, then, if it be divisible at its centre, it will be divisible also at a point immediately-next to its centre. But it is not so divisible: for position is not immediately-next to position, nor point to point—in other words, division is not immediately-next to division, nor composition to composition.'

In \textsuperscript{a}11, EFHL\textsuperscript{Phi} read διαιρέτων' οὗ γάρ κτλ. Philoponos remarks that Aristotle meant to say τοῦτο δ' ἀδύνατον, and \textsuperscript{I} reads 'non autem possibile'. J alone reads διαιρέτων' οὐχὶ δὲ οὗ γάρ κτλ. Mr. T. W. Allen pointed out to me that οὐχὶ δέ (sc. οὐκ ἢ δέ) might represent οὔκ ἐστὶ δέ (sc. κατ' ἐχομένην στιγμήν διαιρέτων): and I have adopted this conjecture, though ἄλλ' ἀδύνατον (cf. \textsuperscript{I} and \textsuperscript{Phi}) would be more in accordance with Aristotle's usage.

17\textsuperscript{a} 11–12. σημεῖον...στιγμῆς. If any difference of meaning between σημεῖον and στιγμὴ is here intended, σημεῖον is probably employed as the wider term, to include an 'instant' (τὸ νῦν) as well as a spatial point. Aristotle uses σημεῖον of a 'point' of time (e.g. \textit{Phys.} 262\textsuperscript{b} 2, 25; \textit{de Caelo} 283\textsuperscript{a} 11, 13), and the doctrine that point is not consecutive to point is expressly applied to τὸ νῦν as well as to στιγμὴ, e.g. \textit{Phys.} 231\textsuperscript{b} 6–10.

17\textsuperscript{a} 12. τοῦτο...σωθείσ. For the interpretation given above, cf. *16\textsuperscript{b} 7–8. Possibly, however, these words have got displaced, and should be read after διάκρισιν in \textsuperscript{a}I3.

17\textsuperscript{a} 16. εἰς μικρὰ καὶ ἐλάττω, 'into small (i.e. relatively-small) parts.' 'Dissociation' need not result in small constituents, but it must result in constituents which are relatively-small, i.e. smaller than that which is 'dissociated'.'

17\textsuperscript{a} 17–31. ἄλλ' οὐχ...φασιν. Aristotle here lays down the meaning which he is going to attach to γένεσις, φθορά, and ἄλλοιώσις —i.e. their nominal definitions: cf. Introd. § 8 and *14\textsuperscript{a} 6—17\textsuperscript{a} 31.

17\textsuperscript{a} 18–19. τὴν...ἄλλοιώσιν: the accusative depends upon φασιν.

17\textsuperscript{a} 22–23. οἱ δὲ...διαφέρει. οἱ δὲ, the philosophers whom we are criticizing, i.e. primarily the Atomists.

τουαύτην, sc. τὴν ἐν τῷ συνεχεῖ μεταβόλῃν, 'the change which takes place in what is continuous'; in contrast to the change by which a thing is 'dissociated' into discrete parts or a discrete plurality 'associated' to form a thing.

τὸ δὲ διαφέρει, 'whereas in fact there is a difference'. For there are two kinds of change, both of which may be called 'change in what is continuous'. Of these, (i) change in the constitutive
factors of the thing (a change of its 'substance') is γένεσις or φθορά: whilst (ii) a change in the thing's properties, where the substance of the thing is unaffected, is ἀλλοίωσις.

17a 23–27. ἐν γὰρ . . . ἀλλοίωσις. 'For in that which underlies the change there is a factor corresponding to the definition, a formal factor, and there is a material factor. When, then, the change is in these constitutive factors, there will be coming-to-be or passing-away: but when it is in the thing's qualities, i.e. a change of the thing per accidens, there will be Alteration.'

The phrase τὸ μὲν . . . ἦλθεν (a 24) is hardly more than a paraphrase for τὸ μὲν λόγος (or ἐἴδος), τὸ δὲ ἦλθεν (cf. e.g. Metaph. 1033b 13, 1033a 1). The ἐἴδος of a thing is strictly correlative to its λόγος, for a thing's 'form' is that of which the definition or formula (λόγος) states the constitutive moments (cf. Introd. § 7). The ὑποκείμενον—that which underlies the change—is a formed-matter or embodied-form, i.e. a σύνθετος οὐσία (cf. Introd. § 5). A change 'in' the form and matter—a change of the σύνθετος οὐσία as a whole—is γένεσις or φθορά. But a change 'in' the thing's properties, which leaves it, qua this composite of form and matter, unchanged, is ἀλλοίωσις: and this change is predictable of the thing only κατὰ συμβεβηκός (a 26), not καθ' αὐτό. For, strictly-speaking, it is not the thing, qua thing, which changes: the thing changes only in respect to some one of the properties which 'go along with' it, which may or may not attach to it.

The full significance of Aristotle's present account of the distinction between γένεσις and ἀλλοίωσις will emerge gradually in the course of Chapters 3 and 4.

17a 27–28. διακρινόμενα . . . γίνεται. As the illustration shows, this is a brachylogy for εὖφθαρτα καὶ ἄφθαρτα (δύσφθαρτα) γίνεται. 'Association' and 'dissociation' are not γένεσις and φθορά, but 'dissociation' may facilitate or hasten, and 'association' may retard, γένεσις and φθορά.

17a 28–29. εἰπόν . . . βραδύτερον. As we shall learn presently (cf. * 18a 23–25), the γένεσις of one thing is always εὖ ἐξο the φθορά of another. Here, therefore, θάττων ἄπρ γίνεται necessarily implies that θάττων ὅπωρ φθείρεται.

εἰπόν δὲ συγκρίθη, i.e. if small drops of water have first been 'associated' together (so as to form a big sheet of water).

17a 30. ἐν τοῖς ὑπερον. Cf. 28a 23–b 22, where it becomes clearer how 'association' and 'dissociation' affect a thing's susceptibility to φθορά.
17\textsuperscript{a} 31. ὑπὲρ ... φασιν, i.e. (as Philoponos rightly explains) γένεσις cannot be identified with σύγκρισις ἐς ἀτόμων.

A. 3

17\textsuperscript{a} 32—19\textsuperscript{b} 5. Διωρισμένων ... εἰρήσθω. Having defined the meaning of the terms γένεσις and ἕθος (having given their ‘nominal definitions’), Aristotle proceeds to prove ὅτι ἔστι, i.e. that corresponding processes do in fact occur in Nature (cf. *14\textsuperscript{a} 6—17\textsuperscript{a} 31). According to their ‘nominal definitions’, γένεσις and ἕθος must be distinguished from ἰδίωσις, σύγκρισις, and διάκρισις.

The terms mean processes in which a composite of form and matter changes as a whole, so that a new composite (a new ‘substance’) emerges, or so that a given composite vanishes (cf. *17\textsuperscript{a} 23—27).

The terms are commonly applied, in the sense defined, to many processes in Nature:—e.g. to the reciprocal ‘transformations’ of Earth, Air, Fire, and Water, and to the coming-to-be of plants (cf. 19\textsuperscript{a} 11). Aristotle shows (a) that such an interpretation of these and similar processes is possible, since it does not necessarily conflict with the admitted postulates that ‘Nothing can come-to-be out of Nothing’ and that ‘No property can exist per se, apart from a substance’; and (b) that such an interpretation follows logically from his own theory of the physical Cosmos. For the conceptions of πρῶτη ὑλή and of ‘the efficient cause of motion’, which are established in the Physics, are adequate to account for the actual occurrence of γένεσις and ἕθος (in the sense defined), and indeed for their occurrence with unbroken continuity in Nature.

17\textsuperscript{a} 32. πρῶτον. The second main topic of investigation is formulated at 17\textsuperscript{b} 34—35.

17\textsuperscript{a} 32—34. ἔστι τι ... καὶ τί. Since γένεσις is a πάθος, its ‘being’ is its ‘inhering in’ a substance (cf. Introd. p. xxvi,). Strictly, therefore, the question εἰ ἔστι γένεσις should be formulated as Aristotle here formulates it:—‘Is there anything which comes-to-be in the unqualified sense? Is there anything of which ἄπληγ γένεσις can be predicated?’

The ‘proper’ sense (κύριός, a 33) is the ‘unqualified’ sense (ἀπλός). If there is substantial change, i.e. if a new ‘substance’ emerges or an existing ‘substance’ vanishes, we say, without qualification, γένεσεται or ἕθεσεται. If, on the other hand, a thing remains substantially unaltered, but changes its quality, its size,
or its position, we add a qualification to the verb. We say 'it comes-to-be-ill', 'comes-to-be-white', 'comes-to-be-big', &c. This is τις γένεσις or τις φθορά. Since, when that is so, we also qualify the thing (e. g. 'the black thing comes-to-be white', 'the small thing comes-to-be big'), the processes are sometimes called γένεσις τινος or φθορά τινος. Or, as Aristotle expresses it, in the qualified processes 'a thing always comes-to-be-something out of being-something' (αἰεὶ δὲ ἐκ τινος καὶ τις " 34).

Thus the antithesis between γένεσις (or φθορά) ἀπλή and τις is between substantial change and change of πάθος, i. e. change in Categories other than that of Substance. We shall see presently that Aristotle also uses the antithesis in a different sense: for (i) amongst substantial changes, some are regarded as ἀρκετοὶ in contrast to others, and (ii) amongst changes of πάθη, some are regarded as relatively ἀρκετοὶ. Cf. * 18* 27—19* 22, 19* 14—17.

Zabarella rightly compares Post. Anal. 89* 36—90* 5. For just as γένεσθαι ἀπλῶς means 'to come-to-be', whilst γέγενθαι with a qualification means 'to come-to-be-so-and-so'; similarly εἰναι ἀπλῶς means 'to be' ('to exist'), whilst εἰναι with a qualification functions as the copula and means 'to be-so-and-so'. Hence Aristotle (l. c.) distinguishes the question εἰ ἔστιν ἀπλῶς (e. g. 'Does the moon exist? Is there a moon?') from the question εἰ ἔστι τι (e. g. 'Is the moon eclipsed?'). The former (existential) question is an inquiry into the being of the thing as a ὑποκείμενον—a 'substance', or whole of form and matter: the latter (which Aristotle also calls the question εἰ ἔστιν ἐπὶ μέρος, or an inquiry into τὸ ὅτι) is an inquiry into a part of the thing's being, its being in a certain respect, i. e. its possession of a property.

17* 1—13. εἰ . . . γινόμενον. An argument to show that unqualified γένεσις is impossible, because it would involve either that something can come-to-be out of sheer nothing, or that πάθη can exist apart from substances: and both of these alternatives are admittedly absurd.

The argument runs thus:—If a thing is to 'come-to-be-healthy', it must start from a state in which it is ill, i. e. 'is-not-healthy'. Similarly, if it is to 'come-to-be', it must start from 'not-being'. As qualified γένεσις presupposes qualified not-being, so unqualified γένεσις presupposes unqualified not-being. Now 'unqualified not-being' means either (i) the absence of all 'being' belonging to the Category in question, or (ii) the absence of all 'being' in any
and every sense of the term. Whichever interpretation we adopt, ‘unqualified γένεσις’ (we shall be forced to admit) presupposes a ‘not-being’ which is sheer nothing. This follows at once if we adopt the second interpretation. But it follows no less if we adopt the first. For the Category here in question is the Category of Substance. Hence ‘unqualified γένεσις’ presupposes ‘what is not in any sense a substance’. But what is not a substance cannot be qualified or quantified or in any way determined: for all πάθη are πάθη of a substance, and their ‘being’ is to characterize a substance. Hence ‘what is not in any sense a substance’ is not in any sense at all: i.e. is sheer nothing.

17b 2. ἄπλως ἢν ... ὄντος. ἄπλως grammatically qualifies the whole clause: but the point is that such γένεσις presumes a μὴ ὄν which is ἄπλως μὴ ὄν.

τι is of course the subject of the clause.

17b 3. οτι ὑπάρχει τισὶ τὸ μὴ ὄν. Probably this is intended as a reminiscence of Plato, Sophist. 237 ff. It is self-contradictory to say that unqualified not-being ‘belongs to’ (is a predicate of) certain subjects: for a subject, if it is to be conceived or mentioned at all, must ‘be’ in some sense. τι means ὄν τι.

17b 5-7. τὸ ... περιέχον. The two senses of τὸ ἄπλως μὴ ὄν correspond to two senses of τὸ ἄπλως ὄν. For τὸ ἄπλως ὄν may mean either (i) that which ‘is’ in the most general and indeterminate sense—a sense which includes any and all of the Categories, without specifying which: or (ii) that which ‘is’ in the sense of one of the Categories—a sense which is determined e.g. as ‘substantial’ or as ‘quantitative’ being, without further specification of the type of substantial or quantitative being affirmed. Thus you would affirm οτι έστων ἄπλως of a man in sense (i) if you said simply ‘he is’; and in sense (ii) if you said ‘he is a substance’. Similarly, if e.g. ‘white’ came-to-be out of what was not a quality at all, or ‘man’ out of what was in no sense a substance, there would be γένεσις out of τὸ ἄπλως μὴ ὄν in the sense specified by Aristotle first (17b 6): whilst, if ‘white’ or ‘man’ came-to-be out of what could not be said to ‘be’ in any sense whatever, there would be γένεσις out of τὸ ἄπλως μὴ ὄν in the second sense specified by Aristotle (17b 7).

17b 6. τὸ πρῶτον ... ὄντος. On Aristotle’s theory of the Categories, see Apelt, Essay III.

‘That which is first in each several mode of predicating “being”’ is (as Philoponos rightly explains) τὸ γενικότατον, or
\( \text{τὸ ἀνωτάτω γένος.} \) The ‘mode of predicating’ in question (i.e. the Category) is named after this ‘first (most general) predication of “being”’ within it, and is indeed generally identified with it. Thus, in the first Category, \( \text{τὸ πρῶτον} \) would be \( \text{oūσία} \) in general, in the second \( \text{ποιόν} \) in general, in the third \( \text{ποσόν} \) in general, and so forth. The first Category is \( \text{oūσία} \): for, ‘in this mode of predicating “being”, the \( \text{ὁν} \) which is predicated is always \text{substantial being}—viz. either \( \text{oūσία} \) in general or some specified type of \( \text{oūσία}. \)

17\( ^b \) 7-13. \( \text{εἰ . . . γενόμενον.} \) ‘If then unqualified \text{not-being} means the negation of “being” in the sense of the primary term of the Category in question, we shall have, in unqualified \text{coming-to-be}, a coming-to-be of a substance out of not-substance. . . . If, on the other hand, unqualified \text{not-being} means “what is not in any sense at all”, it will be a universal negation of all forms of being . . .’

The two alternatives correspond to the alternative senses of \( \text{ἀπλῶς} \) (cf. \( \text{b 5-7} \)), and both lead to the conclusion that \( \text{ἀπλὴ γένεια} \) involves that ‘something can come-to-be out of sheer nothing’: this absurd consequence follows at once on the second alternative, and could only be avoided on the first alternative by the (equally absurd) supposition that ‘properties can exist apart from substances’ (cf. * \( \text{I7}^b \) 1-13).

With \( \text{εἰ μὲν οὖν τὸ πρῶτον (sc. μὴ ὁν)} \) in \( \text{b 7} \), and with \( \text{εἰ δὲ τὸ μὴ ὁν ὀλως} \) in \( \text{b II} \), we must, I think, supply \( \text{σημαίνεττ} \) \( \text{τὸ ἀπλῶς μὴ ὁν}. \) In \( \text{b II} \), Bekker and Prantl place a comma after \( \text{δὲ}, \) which makes nonsense of the passage.

In the \text{first} sense of \( \text{τὸ ἀπλῶς μὴ ὁν}, \) ‘white’ e.g. would come-to-be out of \( \text{τὸ ἀπλῶς μὴ ὁν} \) if it came-to-be out of \( \text{μὴ ποιόν}, \) \( \text{πρῶτον} \) if it came-to-be out of \( \text{μὴ ποσόν}, \) and so forth. Since, however, \( \text{ἀπλὴ γένεια} \) is the coming-to-be of a \text{substance}, the Category of Substance is \text{here in question:} and the \( \text{ἀπλῶς μὴ ὁν} \) presupposed by \( \text{ἀπλὴ γένεια} \) is \( \text{μὴ ὁσία} \) (\( \text{b 8} \)).

17\( ^b \) 10. \( \text{τὸ ποῦ}. \) This is the reading of \( \text{EF}^b \text{HL}. \) \( \text{J} \) has \( \text{τόπος} \) (cf. \( \Gamma \)), and \( \text{F} \) writes \( \text{τόποι} \) above the line. Grammatically of course \( \text{ποιόν}, \) \( \text{ποσόν} \) and \( \text{ποὐ} \) are the subjects to \( \text{ὑπάρχει}. \)

17\( ^b \) II. \( \text{ἀλως}, \) i. q. \( \text{καθάλου} \) (\( \text{b 7} \)).

17\( ^b \) 13. \( \text{ἐν ἄλλους}. \) \text{Phys. A. 6-9}.

17\( ^b \) 14. \( \text{διώρισται τοῖς λόγοις}. \) \( \text{λόγοι} \) probably means ‘definitions’. Aristotle is referring to his definitions of the various senses in which a thing comes-to-be out of \( \text{τὸ μὴ ὁν} \) and out of \( \text{τὸ ὁν} \): and again to his definitions of the parts which \( \text{στέρησις} \) and \( \text{ἄλη} \) respectively
play as the presuppositions of \( \gamma \varepsilon \varepsilon \varepsilon \varepsilon \) (cf. Phys., e.g. \( 191^{b} 9-10, 13-16, 192^{a} 31-32, \&c. \)).

\( 17^{b} 14-18. \ \sigma \nu \tau \omicron \omicron \omicron \omicron \ldots \ \dot{\alpha} \mu \varphi \theta \dot{\epsilon} \rho \omega \ldots )

This ‘concise restatement’ of the doctrine of the Physics leaves it as yet uncertain what exactly the presupposed basis of substantial \( \gamma \varepsilon \varepsilon \varepsilon \varepsilon \) is, and indeed whether there can be \( \gamma \varepsilon \varepsilon \varepsilon \varepsilon \) of a substance at all—as Aristotle himself points out immediately (\( 17^{b} 18 \) ff.).

All that we have learnt so far is:—\( \gamma \varepsilon \varepsilon \varepsilon \varepsilon \) presupposes something which can be truly called both \( \delta \nu \) and \( \mu \eta \ \delta \nu \) (\( 17-18 \ \lambda \varepsilon \gamma \omicron \dot{\omicron} \varepsilon \varepsilon \nu \ \dot{\alpha} \mu \varphi \theta \dot{\epsilon} \rho \omega \nu \) : so Zabarella and Pacius interpret these words, undoubtedly correctly). For \( \gamma \varepsilon \varepsilon \varepsilon \varepsilon \) presupposes that which is-potentially but is-not-actually. Hence, in one sense, things come-to-be out of \( \mu \eta \ \delta \nu \ \dot{\alpha} \pi \lambda \omega \) : and yet, in another sense, they always come-to-be out of \( \delta \nu \).

This description of the presupposed basis of \( \gamma \varepsilon \varepsilon \varepsilon \varepsilon \) (as ‘that which is-potentially but is-not-actually’) would apply either to the proximate \( \dot{\alpha} \lambda \eta \) of \( \tau \delta \ \gamma \iota \varepsilon \nu \dot{\omicron} \varepsilon \varepsilon \nu \) (i.e. a formed-matter, a concrete substance) or to \( \pi \rho \omicron \omicron \omicron \ \dot{\alpha} \lambda \eta \), the \( \dot{\omicron} \pi \omicron \omicron \omicron \dot{\omicron} \varepsilon \varepsilon \nu \nu \) conceived in abstraction from all the forms which it acquires in its transformations. Both interpretations are so far possible: and both interpretations are required in supplementation of one another, if the description is to be an adequate summary of the doctrine in the Physics.

Consider, e.g., the \( \gamma \varepsilon \varepsilon \varepsilon \varepsilon \) of Air. This presupposes as its basis a proximate \( \dot{\alpha} \lambda \eta \) which is itself a concrete substance, viz. Water. ‘Air comes-to-be out of Water’ (i) in so far as the \( \text{substratum} \), which is-actually Water, is-potentially Air: i.e. in so far as the conditions for the development of Air are present in this actual formation of the \( \text{substratum} \) : and (ii) in so far as the \( \text{substratum} \), which is Water, is-not-actually Air. For, though capable of receiving the form of Air, it is actually ‘without’ it, or ‘deprived of’ it. Thus (i) Air comes-to-be ‘out of’ something which is-potentially Air, and which may therefore be called \( \delta \nu \). And yet (ii) Air also comes-to-be ‘out of’ the \( \sigma \tau \rho \rho \varphi \sigma \rho \varsigma \) of Air; or rather (since a \( \sigma \tau \rho \rho \varphi \sigma \rho \varsigma \) is \( \kappa \alpha \beta \ \alpha \nu \tau \omicron \omega \mu \eta \ \delta \nu \), cf. Phys. \( 191^{b} 13-16 \) ) ‘out of’ something which (in so far as it is-not-actually Air) may be called \( \mu \eta \ \delta \nu \). The proximate \( \dot{\alpha} \lambda \eta \), in short, is the basis presupposed by \( \gamma \varepsilon \varepsilon \varepsilon \varepsilon \) both (i) in respect to its positive ‘potential-being’ (which becomes actual as the result of the \( \gamma \varepsilon \varepsilon \varepsilon \varepsilon \)), and (ii) in respect to its ‘actual not-being’, i.e. in respect to its ‘want’ of a form which it is capable of acquiring—a ‘want’ which is removed as the result of the \( \gamma \varepsilon \varepsilon \varepsilon \varepsilon \).
At the same time, the γένεσις of Air (if we carry our analysis further back) presupposes as its basis πρότη ὕλη. For, in the γένεσις of Air, the substratum, which was informed as Water, casts off that form and takes on a new one—i.e. is ‘transformed’. The substratum, indeed, never exists except qua determined by some form. But we can in thought abstract it from all its forms, and conceive it as matter undetermined, though determinable. Aristotle’s description would apply to this logical abstraction—πρότη ὕλη—as well as to the proximate matter. For πρότη ὕλη is ‘that which is-not-actually (Water or Air or any concrete substance), but is-potentially (Water and Air and every concrete substance)’. Cf. * 18a 23–25.

17b 15. έκ μὴ ὄντος ἀπλῶς. The basis of γένεσις only is with a qualification, i.e. it is-δυνάμει. τὸ ἀπλῶς μὴ ὅν means ‘that which is, without qualification, devoid of being’: but τὸ μὴ ὅν ἀπλῶς means ‘that which is devoid of being, unless you qualify the term “being”’ (cf. * 19b 29 – b 4).

17b 18–19. ὁ ... ἐπαναποδιστέων. The problem, which Aristotle is about to discuss, emerges (on re-examination of the question as to the presuppositions of ἀπλή γένεσις) precisely because of the vagueness of the ‘concise restatement’ in b 14–18.

How are we to interpret ‘that which is-potentially, but is-not-actually’? (i) If as the proximate ὕλη, then it looks as if γένεσις is after all not the coming-to-be of a substance: for the proximate ὕλη is itself already formed-matter, i.e. a substance. (ii) If, on the other hand, as πρότη ὕλη, we are confronted with serious difficulties. ἐπαναποδιστέων apparently occurs only here. But ἀναποδίζειν means ‘to recall for further examination’: cf. Herodot. v. 92, § 6, with Stein’s note.

17b 19–20. πῶς ... ἄλλως: this whole clause is the appositional antecedent of ὅ (b 18).

17b 23. εἰ ... γίνεται, ‘for if a substantial thing comes-to-be...’ The manuscripts and Bekker read εἰ γὰρ τι γίνεται: but the meaning is determined by l. 21i (ἀρ’ τοῦτε), and I suspect that Aristotle wrote εἰ γὰρ τὸ δέ τι γίνεται.

17b 27–28. τὸ ... ὅν; καὶ ὅν is explanatory of τὸ δέ, and μὴ ὅν is explanatory of μὴ τὸ δέ. The basis of γένεσις, qua only potentially ‘this’ (or ‘substance’), only potentially ‘is’: and, qua not actually ‘this’, it has no actual ‘being’. All further determinations of ‘being’—quality, quantity, position, &c.—are dependent upon substantial ‘being’. 
COMMENTARY

17\textsuperscript{b} 29. τὸ μῆς οὖτως ὄν. The reading of FHJ (cf. Γ), τὸ οὖτω (or οὖτως) μῆς ὄν, is an attempt at correction. Bonitz (Ind. 539\textsuperscript{a} 36–37) treats τὸ μῆς οὖτως ὄν as a mere idiomatic transposition of the negative, and as equivalent to τὸ οὖτως μῆς ὄν. But the words mean, I think, ‘a being which is no determined-being’ (cf. also Bäumker, p. 234\textsuperscript{b}). Aristotle is repeating in different words what he had already said above (\textsuperscript{b} 23–25). The completely indeterminate, though determinable, basis of substantial γένεσις, which is really only isolable by definition, threatens to become a really-existent antecedent of γένεσις. According to his own theory, the ultimate logical presupposition of γένεσις is a substratum conceived in abstraction from all forms, i.e. πρώτη ὄλη. But πρώτη ὄλη does not exist. It is not a real antecedent of any γένεσις, in the way in which the proximate ὄλη (e.g. Water) is the real antecedent of a given γένεσις (e.g. of Air): cf. * 18\textsuperscript{b} 23–25; * 29\textsuperscript{a} 24 – b 3.

17\textsuperscript{b} 31–32. ei... ὅπαρξει, ‘but if it is not a this-somewhat or a substance...’. In Aristotle’s usage τοδὲ (cf. e.g. 17\textsuperscript{b} 9, 21, 27; Metaph. 1038\textsuperscript{b} 24) means ‘a this’, i.e. ‘this or that or any designable’: τοδὲ τι (cf. e.g. 18\textsuperscript{b} 1, 15, 32; 19\textsuperscript{a} 12; Metaph. 1038\textsuperscript{b} 25) means ‘a designable somewhat’—i.e. any that with a what, provided the what belongs to the first Category. (For the substance of this note I am indebted to my friend, Professor J. A. Smith, who has convinced me that Burnet is mistaken in what he says about τοδὲ τι in his Ethics, p. 66; cf. Classical Review, vol. 35, p. 19).

17\textsuperscript{b} 33. καθάπερ εἰπομεν: 17\textsuperscript{b} 10–11.

17\textsuperscript{b} 34–35. καὶ... μέρος. The solution of this second main problem (cf. * 17\textsuperscript{a} 32) carries with it the solution of the first: cf. * 18\textsuperscript{a} 10–13. The meaning of ἀεὶ is explained more fully below, cf. * 37\textsuperscript{b} 29–38\textsuperscript{a} 3. The ‘fact’, for which Aristotle is to seek the cause, is an unbroken succession of γενέσεις and φθοράι, and generally of all forms of change, in the sublunary sphere. Under γενέσεις Aristotle here includes (i) substantial coming-to-be and passing-away (ἀπλὴ γένεσις and ἀπλὴ φθορά), and (ii) the three forms of process in which a perceptible substance changes its quality, quantity, or place (ἀλλοιωσις, αὖξησις καὶ φθοιρις, φορά). These last three forms of process are here called γενέσεις ἡ κατὰ μέρος, because in them the thing comes-to-be not as a whole (or as regards its ‘substance’), but in respect to a part of its being (or as regards its συμβεβηκότα): cf. * 17\textsuperscript{a} 32–34, and 17\textsuperscript{b} 3–5. Aristotle’s usual practice is to draw a sharp distinction between the
three εἰδὴ κινήσεως (άλλωσις, αὐξήσις καὶ φθίσις, φορά) and γένεσις and φθορά, and to use the term μεταβολή to cover all forms of change (i.e. γένεσις and φθορά as well as the three species of κίνησις): cf. * 19b 6—20a 7. But this practice is by no means invariable.

The distinction between ἀπλὴ γένεσις and γένεσις ἡ κατὰ μέρος (b 35) has nothing to do with the distinction within substantial changes between ἀπλὴ γένεσις and τίς γένεσις (cf. * 17b 32—34) which is drawn for the first time at 18a 27 ff.

18a 1—2. οὖσα... ὅλης. αἰτίας, sc. τοῦ γένεσιν ἄει εἰναι. The explanation of the perpetuity of γένεσις depends primarily on the material and efficient causes: but Aristotle’s account of the efficient cause (B. 10) includes a consideration of the End towards which its activity is directed, i.e. of the final cause of γένεσις, viz. the eternal conservation of the species or ‘form’ of the γεννητά (cf. 36b 25—37a 1).

18a 3—4. εἰρήται... λόγοις. Phys. Θ. 3 ff., especially 258b 10 ff. 18a 4—5. τὸ μὲν... ἄει. The first is the πρῶτος κυνών, i.e. God. The second is τὸ πρῶτον ὑπὸ τούτου κυνώμενον (Phys. 259b 33), i.e. the πρῶτος οὐρανός, the outermost shell of the Cosmos—the sphere in which the fixed stars are set—which is eternally and uniformly revolving (cf. Introd. § 10). Philoponos calls it τὸ κυκλοφορητικὸν σώμα: cf. also * 36a 14—b 10, * 36a 14—18, * 37a 30—31.

18a 5—6. τούτων... ἔργον. ‘The other, or prior, philosophy’ is πρώτη φιλοσοφία or θεολογικὴ: cf. Introd. §§ 3, 4.

The reading and interpretation of this passage are confirmed by de Caelo 298b 19—20. The variants in E1 and L are to be rejected as blunders.

18a 7. ὅστερον: B. 10.

18a 8. τί... ἕστων, ‘which amongst the so-called “specific” or “concrete” causes exhibits this character’, i.e. τῶλλα καὶ χαὶ διὰ τὸ συνεχῶς κυκλοθα. Perhaps we ought to read αἰτίων instead of αἰτιῶν. For τὰ καθ’ ἐκαστα λεγόμενα αἰτία, as opposed to causes in the universal sense, cf. Phys. 195a 27 ff. on the τρόποι τῶν αἰτίων.

18a 9. τὴν... τιθεμένην. For this use of ἐθιος, cf. Bonitz, Ind. 218b 13 ff., and Metaph. 984b 17 αἰτίαν... τὴν ἐν ὅλης ἐθεὶ λεγομένην. Cause is not a γένος, of which the four types of cause are εἰδή (species), as Philoponos and Zabarella remind us.

18a 10—13. ἀμα... γενέσεως. When we have learnt the material cause, we shall understand both why γένεσις and φθορά never fail to occur in Nature, and what is that ‘potential substance’ which unqualified γένεσις and φθορά presuppose.
The καὶ after λέγειν (a 12) is explanatory: ‘it will simultaneously become clear what account we ought to give of that which perplexed us just now, i.e. of unqualified passing-away and coming-to-be’.


18a 20–21. τότο . . . διαίρεσιν. Aristotle had shown in the Physics (Γ. 5 ff.) that there is no actual Infinite. ‘Infinite’ is always a predicate (e.g. of body, of number, of time). It expresses the possibility e.g. of dividing a given finite body, or of adding to a given finite number, ad infinitum. But this possibility can never be completely realized: there will never actually be an infinite plurality of parts or of units.

δυνάμει δ’ ἐπὶ τὴν διαίρεσιν, sc. ἐστίν ἀπειρον. Cf. Physics, l.c., 206a 9–b 33. Aristotle there recognizes a ‘potential infinite’ in two complementary senses, in both of which the same principle is involved; viz. an ἀπειρον κατὰ διαίρεσιν (or ἀδαιρέσει) and an ἀπειρον κατὰ πρώσθεσιν. You can go on dividing a given finite magnitude ad infinitum, since there are no indivisible magnitudes. And if, e.g., having divided a given magnitude by progressive bisections, you take the successive ‘halves’, you get an endlessly diminishing series of fractions (½, ¼, ⅛ . . . ) which will never exhaust the original magnitude. Nor, conversely, can you reconstruct the whole, if you start with one of these fractions and add to it the succeeding terms of the series. For 1 = ½ + ¼ + ⅛ . . . ad infinitum; i.e. such a series could only be summed in an ‘infinite’ time, viz. never.

18a 21–23. ὧστ’ . . . ὀρώμεν. Assuming that the material of γένεσις, although actually finite, is infinite δυνάμει ἐπὶ τὴν διαίρεσιν, the succession of γενέσεις might continue for ever, provided that what came-to-be dwindled progressively in the same ratio in which the material was diminishing. The race of mankind, e.g., would have to dwindle so that the sizes of the succeeding generations of men would correspond to an infinitely diminishing series of fractions. Unfortunately, however, this ingenious suggestion for solving the difficulty is negatived by the facts.

Translate: ‘so that we should have to suppose that there is only one kind of coming-to-be in the world:—viz. one which never fails, because it is such that on each successive occasion what comes-to-be is always smaller than before’.

18a 23–25. ἄρ’ . . . μεταβολὴν; This sentence contains Aristotle’s solution of the difficulty as to how perpetual γένεσις is
possible, and also (implicitly) his answer to the former question, viz. in what sense ἀπλῆ γένεσις presupposes ‘potential substance’.

The difficulty as to the perpetuity of γένεσις depended on the assumption that τὸ φθειρόμενον passes-away into τὸ μὴ ὄν, and that τὸ μὴ ὄν is nothing (cf. ὁ 14–15). But Aristotle maintains that what occurs is always a two-sided process, one concrete substance being converted into another (e.g. Water into Air) so that the passing-away of the one is the coming-to-be of the other, or vice versa. This two-sided process is, in ultimate analysis, the transformation of a permanent substratum (πρῶτη ὕλη) whereby it drops one form and takes on another. Since the substratum never exists as bare matter, but always is formed, there always is a positive actual substance. Hence φθορά is not annihilation. There is no passing-away into nothing and therefore no gradual exhaustion of τὸ ὄν. Matter is eternal, but it exists always, and only, as formed-matter: and the succession of γένεσις is perpetual, for matter is always being transformed, though never annihilated.

The two-sided process, which is the γένεσις of one concrete substance and the φθορά of another, is thus (in respect to πρῶτη ὕλη) the substitution of one positive form for another positive form. But each of these positive ‘poles’ of the process has also a negative side: and, strictly speaking, it is the negative side which constitutes the terminus a quo of γένεσις and the terminus ad quem of φθορά. If e.g. Air comes-to-be out of Water, what is relevant in the antecedent is not the positive form which the substratum in fact possesses (not its being Water), but its στερῆσις of Air—i.e. the fact that the substratum is ‘without’, and yet is by nature capable of acquiring, the form of Air. Air, in fact, comes-to-be-out-of Water-quā-not-Air: and this same change is φθορά, in so far as in it Water passes-away-into Air-quā-not-Water. The antecedent of the γένεσις must be a positive concrete substance, but need not be this one (viz. Water): and the φθορά must terminate in some positive concrete substance, but not necessarily in Air. Hence the γένεσις of Air is per se ἐκ τῆς στερῆσιος and only per accidentem ‘out of’ Water.

Thus the ‘potential substance’ presupposed by γένεσις is some indeterminate one out of a number of alternative actual formations of πρῶτη ὕλη. Cf. also * 29a 24–3.

18a 25–27. περί ... αἵτιαν. ‘The cause just suggested’ (ταύτην) is the ‘material cause’ in the sense of πρῶτη ὕλη: cf. the recapitulation (19a 18–22) and the preceding note. We should
perhaps have expected τὸν γένεσιν εἶναι (γινεχόσ) in 18a 26 (cf. 19a 19). But Aristotle claims to have stated the material cause which is adequate (ἰκανή, a 27) to account for the ‘being’ (as well as the perpetuity) of γένεσις and φθορά. And in fact, since substantial γένεσις and φθορά are not creation and annihilation, but transformation, given πρώτη ἡ λή—a transformable ὑποκείμενον, which is able to accept every form and always exists under some form—these processes can take place and can perpetually continue: and they can do so under no other condition. Hence πρώτη ἡ λή is the condition sine qua non of their ‘being’ and their perpetuity: i.e. it is their adequate ‘material cause’.

قضي (a 26) must be taken closely with περὶ ἱκανοῦ τῶν ὄντων (cf. * 14a 2, 33a 26). Aristotle professes, in accordance with his original programme, to have stated the material cause of γένεσις and φθορά ‘in their general character, as they occur in all existing things alike’. In the next sentence, τὰ μὲν ... τὰ δὲ (a 28) are contrasted withقضي ... ὄντων and πᾶσιν (a 27). For the next problem arises precisely because linguistic usage distinguishes between the γένεσις of some things and that of others, although (as Aristotle has maintained) these processes exhibit the same general character uniformly in all things.

18a 27—19a 22. διὰ τί ... γένεσις. If Aristotle's theory of substantial γένεσις is true, we ought never to speak of ἀπλΗ γένεσις or of ἀπλΗ φθορά, but always and uniformly of a two-sided process which is both the γένεσις of something and ἐστὶν also the φθορά of something else. But linguistic usage appears to conflict with the theory. For (i) of changes within the Category of Substance some are called γένεσις without qualification, or φθορά without qualification, whilst others are qualified. The birth of a man, e.g., is called γένεσις ἀπλῶς, and not φθορά at all: his death is called φθορὰ ἀπλῶς, and not γένεσις at all. Or, if we speak of φθορά when a man is born, we qualify it as 'the passing-away of the seed': and if we speak of γένεσις when a man dies, we qualify it as 'the coming-to-be of a corpse'. And (ii), using γένεσις and φθορά in the broad sense which includes changes in the Categories other than Substance, some things (e.g. 'the growing thing') are said γίνοσθαι ἀπλῶς, whilst others (e.g. 'the learning thing') are said to come-to-be only with a qualification (e.g. 'to come-to-be-learned').

In the present passage Aristotle endeavours to account for this apparent conflict of linguistic usage with his theory. He begins
by formulating both applications of the distinction of appellation—
the first at 18a 31–33, and the second at 18a 33–35. Next (18a 35–
19a 3) he suggests three different grounds on which the distinction
of appellation is based within substantial changes: and of these
three, the second alone is endorsed by him as sound. Then
(19a 3–11) he restates the second use of the distinction (viz. its
application to all changes), and marks it off carefully from the first
which he has already discussed (cf. 19a 5–8 νῦν μὲν ... μεταβάλ-
λοντος). He shows that this second application of the distinction
is based upon the difference of the Categories, so that substantial
change is called unqualified, and change of accidents is called
qualified, γένεσις or φθορά (19a 11–14). But he adds a note to
explain that nevertheless, in all the Categories, some changes are
called γενέσεις (only) and others φθορά (only) by an analogous
application of the same principle which justified the distinction
between unqualified and qualified γένεσις and φθορά within sub-
stantial changes alone (19a 14–17). Finally (19a 17–22) he re-
capitulates the purport of the whole passage from 17a 32.
18a 29. τάλινυ, 'once more': for it was from this same pecu-
liarity of linguistic usage that Aristotle started (17a 32 ff.) to
establish the being of ἀπλή γένεσις.
18a 31–33. λέγομεν ... φθορά. The first peculiarity of linguistic
usage: cf. *18a 27–19a 22. When e.g. a man dies, we say
simply φθείρεται, instead of φθείρεται (μὲν) τοδ' ἡ γίνεται δὲ τοδ'.
and we call the change φθορά simply, instead of φθορά (μὲν τονδ',
γένεσις δὲ τονδ').
18a 33–35. τοδ' ... ὦ. The second peculiarity of linguistic
usage: cf. *18a 27–19a 22, and 19a 8–11. On Aristotle's theory,
the coming-to-be of a plant is the passing-away of a seed: and the
coming-to-be of a scholar is the passing-away of a dunce. But,
in fact, we call the first change 'coming-to-be' simply, and the
second 'coming-to-be-learned'.
18a 35– b 12. καθάπερ ... μὴ δὲν. All three defences of
the distinction of appellation (as applied to changes within the
Category of Substance) are grounded on a difference—real or
supposed—in the 'proximate matter' of the change:—viz. in the
ἀλη ἢς καὶ εἰς ἢν μεταβάλλει (cf. 18b 33–19a 3), or in 'that
into which the changing thing changes' (18b 2–3).
The first defence is grounded on the supposed fact, that the
proximate matter' of all substantial changes is in the end a
modification of one of two fundamental materials, viz. a material
H 2
which has 'positive being' (τὸ ὀν) and a material which has 'negative being' (τὸ μὴ ὀν). It is suggested, then, that a substantial change into τὸ ὀν is called ἀπλὴ γένεσις (or φθορά τινος), whilst a substantial change into τὸ μὴ ὀν is called ἀπλὴ φθορά (or τὶς γένεσις).

18a 35—b 1. καθάπερ . . . τὰ ἄ τι ὀ. The distinction (as is clear from the context) is not between Substance and the remaining Categories, but between terms signifying 'positive reals' and terms with a 'negative' signification. As here employed, the distinction is Pythagorean (see next note). But (cf. *18b 14-18) Aristotle himself adopts a modified form of it to justify the distinction of appellation: and perhaps this is why he says πολλάκις διωρίζομεν. Apparently καθάπερ is answered by διὰ τοῦτο. The construction is irregular, to say the least, and I have not been able to find any parallel.

18b 6-7. ὠτερ . . . γίνεται. According to Burnet's punctuation, which I have adopted as on the whole most probable, Parmenides 'says that the things into which change takes place are two' (λέγει δὲν, sc. τὰ εἰς ἀ μεταβάλλει τὸ μεταβάλλον): 'and he asserts that these two, viz. what is and what is not, are Fire and Earth'.

Aristotle ascribes this view to Parmenides in many other places also: cf. Metaph. 986b 27 ff., and see below, *30b 13-19, *35b 16-17, *36a 1-12. But it is put forward by Parmenides himself in the second part of his poem (i.e. in 'the Way of Opinion') as the prevalent, but erroneous, theory: cf. Parmenides, fr. 8, ll. 51 ff. (Diels, pp. 121-2). Burnet (§§ 90, 91) is almost certainly right (i) in maintaining that 'the Way of Opinion' is 'a sketch of contemporary Pythagorean cosmology', and (ii) in suggesting that Aristotle never intends to ascribe the theory to Parmenides himself, but merely to cite 'Parmenides', i.e. the poem of Parmenides, as a work in which the theory is expounded.

18b 8-9. τὸν . . . ὑποκείμενον: 'for we are trying to discover not what undergoes these changes, but what is their characteristic manner.'


18b II. διάφοραί, sc. τὰ εἰς ἀ μεταβάλλει τὸ μεταβάλλον, or τὰ ὑποκείμενα.

18b 14-18. ἄλλον . . . διάφοραί, sc. τὰ εἰς ἀ μεταβάλλει τὸ μεταβάλλον, or τὰ ὑποκείμενα.

This is the second defence of the distinction of appellation, and it is grounded on a difference in the degree of reality possessed by the 'proximate matter' of the various substantial changes. The γένεσις or the φθορά of
a relatively more real substance are γένεσις or φθορά ἀπλῶς: whilst
the γένεσις or φθορά of a relatively less real substance are γένεσις
τις (or τινος), or φθορά τις (or τινος).

This defence of the distinction of appellation is accepted by
Aristotle himself as sound. According to his own theory, the
things in the universe are graded in their reality so as to form
a kind of hierarchy. Their degree of reality is determined by
their approximation to the absolutely real, i.e. to Substance
which is ἐνέργεια ἁνεῦ δυνάμεως or pure Form (cf. Introd. §§ 3 and
4). Every composite substance, or formed-matter, is the ἕλη or
dύναμις of a substance higher in the scale of being, and the
actualization (or more perfect development) of a less-real substance.
Thus, e.g., Earth, Air, Fire, and Water are the ἕλη or δύναμις of
the ὄμοομερή, which are themselves further developed and formed
to constitute the 'organs' of the living thing's body: and the
latter is the δύναμις, of which ψυχή or 'life' is the ἐνέργεια. And
ψυχή itself is manifested in three main grades of reality, of which
the first is related to the second, and the second to the third, as
dύναμις to ἐνέργεια.

We gather from Aristotle's statements that the predicates under
any Category fall into two contrasted Columns or ὁντοχώια
(cf. * 10a 14-15). One Column consists of positive determinations
(18b 15 κατηγορία τις καὶ εἴδος: for this use of κατηγορία, cf. e.g.
Pr. Anal. 52a 15), the other of privative terms (b 17 στέρησις).

In the Category of Substance, with which we are here concerned,
Fire, e.g., and Earth are differentiations of the same material,
according as it is informed by 'the Hot' or 'the Cold'. But
Fire is more real (more 'substantial') than Earth, because the
dιαφορά or 'constitutive quality' (cf. e.g. * 15b 8-11, * 29b 7—
30a 29, * 29b 24-26) of Fire—viz. the Hot—is a 'positive character'
or a 'form', whilst the 'constitutive quality' of Earth belongs to
the privative Column. 'Cold', in fact, indicates the στέρησις of
heat, i.e. its absence from a material by nature fitted to receive it.

18b 18-27. δοκεῖ . . . ἄλθθες. This is the third (and most
commonly accepted) defence of the distinction of appellation.
Most people identify the real with the 'perceptible', and the
'imperceptible' with the unreal. Hence they call those changes,
in which a perceptible material emerges or disappears, γένεσις and
φθορά without qualification: but those in which an imperceptible
something takes the place of, or gives place to, a perceptible
substance, qualified γένεσις or φθορά.
COMMENTARY

18\(^b\) 19. \(\deltaια\phiερε\upsilon\), sc. το ἀπλῶς γίνεσθαι καὶ φθείρεσθαι τού μὴ ἀπλῶς.

18\(^b\) 21–27. τὸ γὰρ . . . ἀληθὲς. Aristotle explains why 'most people identify the real with the perceptible, and the imperceptible with the unreal'. They treat ἀισθησις as equivalent to ἐπιστήμη, and then proceed on the principle (which Aristotle himself accepts) that 'what is knowable is real, and what is unknowable is not real'. Hence, just as they identify their own 'being' or 'life' with actual perceiving or with the power to perceive (rightly enough: cf. Eth. Nic. 1170\(^b\) 13 – b 19), so they suppose that the 'being' of the things—the objects of their perception—is 'to be perceived or perceivable'. From the true principle that the esse* of animals and men is percipere, they draw the false corollary that the esse of things is percipi.

18\(^b\) 27–33. συμβαίνει . . . γῆς. Aristotle contrasts the third defence with the second. The latter is in accordance with his own view, and is based on the true conception of degrees of reality and of the significance of ἀπλή γένεσις and ἀπλή φθορά (cf. b 28, 32 καὶ ἀλήθειαν): the former is the popular view, and is based on an erroneous conception of what is more or less real and of the significance of ἀπλή γένεσις and ἀπλή φθορά (cf. b 27 κατὰ δόξαν, b 29 κατὰ τὴν ἀισθησιν).

According to the common opinion, e.g., Earth is more real than Wind or Air, since it is more perceptible: but, in truth, Wind and Air are more real than Earth, since they have a more 'positive being' than it. Hence, e.g., the transformation of Air into Earth is really φθορά, but is commonly and erroneously called γένεσις.

In b 30, ἀπλῶς must be taken with φθείρεσθαι.

18\(^b\) 33–35. τοῦ . . . αἰτίων. 'We have now explained why there is unqualified coming-to-be (though it is a passing-away-of-something), and why there is unqualified passing-away (though it is a coming-to-be-of-something).'

Bonitz's excision of τὴν before ἀπλήν in b 34 is wrong.

19\(^a\) 3–14. τοῦ . . . γίνεσθαι. Having explained the first apparent anomaly of linguistic usage, Aristotle now turns to the second (cf. * 18\(^a\) 27—19\(^a\) 22, * 18\(^a\) 33–35).

The distinction of appellation here depends on the Category to which the change (the thing qua changing) belongs. Substantial change is—and is rightly called—γένεσις or φθορὰ ἀπλῶς: but change in any other Category is—and is rightly called—γένεσις or φθορὰ τις.
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Thus by τὸ φυόμενον we mean a certain kind of thing or 'substance', the growing substance or plant. But by τὸ μανθάνον we mean a 'substance' qua in a certain state or condition, and by τὸ τρίπτηνα a 'substance' qua of a certain length. When, therefore, τὸ μανθάνον (or τὸ τρίπτηνα) is that which γίνεται, the process is really a change of state or quality (or a change of length or quantity). The 'substance' does not, qua substance, enter into the process, but only in respect to its quality or quantity. But when τὸ φυόμενον is that which γίνεται, the change is the emergence of a new 'substance' (the transformation of the seed into the plant). The 'substance' qua substance enters into the change, and the change is ἀπλὴ γένεσις.

19a 14–17. οὐ . . . ἄνεπιστήμον: on the significance of these lines, see Alexander (quoted by Philoponos) and * 18a 27—19a 22.


ἡ ἐτέρα συστοιχία means 'the one Column of the two': the context determines which of the two Columns is intended. Thus, in Phys. 201b 25 and Metaph. 1004b 27 ἡ ἐτέρα συστοιχία is the Column of privative terms: but in Metaph. 1072a 31 and here the phrase clearly means the Column of positives. Hence F's reading (ἐτέρα τοῦ κρέατονος συστοιχία) is unnecessary, though it gives the right sense.

19a 18. καὶ δὲς . . . αὐταῖς, 'both in general' (19a 11–14), 'and in the special case when the changing things are substances and nothing else' (18a 35—19a 3).

19a 22–29. ἄλλα . . . ὃντος. The perpetuity of γένεσις, as Aristotle has explained, is really a perpetual transformation, the possibility of which depends upon the nature of πρῶτη ἠλη.

He now shows that the argument formulated above (18a 13–23), to prove that perpetual γένεσις is impossible, involves a fallacy and does not constitute a genuine difficulty at all. For it depended upon the assumption that τὸ φθειρόμενον passes-away into τὸ μὴ ὃν,
and that τὸ γεγονόμενον comes-to-be out of 'what is'. But (i) if τὸ μὴ ὄν means 'nothing', it is false that φυσικά is a passing into τὸ μὴ ὄν: whilst (ii) if τὸ μὴ ὄν means 'the imperceptible', then, though it is true that φυσικά is a passing into τὸ μὴ ὄν, it is equally true that γένεσις is 'out of' τὸ μὴ ὄν.

The whole appearance of a difficulty rests on a confusion between two senses of τὸ μὴ ὄν. In the popular sense τὸ μὴ ὄν is simply τὸ ἀναμεθητοῦν: and the material 'out of' which a thing comes-to-be, and 'into which' it passes-away, may be 'imperceptible' and therefore μὴ ὄν—and yet it is not nothing, but ὄν τι.

19a 25–26. εἰτ'... ὄντος. A thing γίνεσθαι ἐκ μὴ ὄντος (i.e. ἐκ ἀναμεθητοῦν), whether 'that out of which it comes-to-be' is, or is not, something:—i.e. the imperceptibility of the material is irrelevant to the question of its 'being' or 'not-being'.

19a 28 and 29. τοῦ μὴ ὄντος, sc. τοῦ ἀναμεθητοῦν.

19a 29–b 4. ἀλλὰ... αὐτό. The 'matter' of substantial change is μὴ ὄν in the popular sense of 'imperceptible'. But, according to Aristotle's own theory, it is also μὴ ὄν ἀπλῶς: for it is διαμεῖε τις οὐσία, ἐντελεχείᾳ δὲ ὄν, i.e. it is not, unless you qualify 'is' and say it 'is-potentially' (cf. *17b 14–18, *17b 15). This 'matter' is πρότη ὄλη, and the substantial changes primarily in question are the reciprocal transformations of τὰ ἀπλὰ σώματα, viz. Earth, Air, Fire, and Water (cf. Introd. § 10). Aristotle speaks of them here as τὰ ἐναντία (a 30). They are, as we shall learn (cf. B. 1–3, with the notes), the first concrete substances resulting from the information of πρότη ὄλη by the coupled 'contrary qualities' (Cold–Dry, Hot–Moist, Hot–Dry, Cold–Moist). Two questions concerning this 'matter' are here discussed.

First Question (a 29–33):—In the transformation of one elementary body into another, are we to identify one of the two with τὸ μὴ ὄν ἀπλῶς, i.e. with πρότη ὄλη? The answer is in the negative. The 'matter' in this sense is the matter equally of both. They are formations of it; in each formation one of two contrasted qualities determines it so that it is something ὄν, an actual substance.

Second Question (a 33–b 4):—Is the matter of each of the elementary bodies different? The answer is that it is in one sense the same for them all, but in another sense different in each of them.

19a 30–31. οἶν... κοῦφον ὄν. Earth is contrasted with Fire as
the heavy with the light (cf. Introd. § 10): but (cf. 29b 20–24) this Contrariety plays no part in the transformation of the ‘simple bodies’. It is a pity that Aristotle did not here illustrate from the Contrarieties of Hot–Cold and Dry–Moist, on which the transformation depends. Perhaps the reason is that Fire, though it is hot–dry, is primarily hot: and Earth, though it is dry–cold, is primarily dry (cf. 31a 3–6). Hence Earth and Fire are not obviously ἑνατία to one another in respect to these Contrarieties.

19a 31–33. ἦ... ὀπαντῶς; ‘Or, on the contrary, does “what is” include Earth as well as Fire, whereas “what is not” is matter—the matter of Earth and Fire alike?’

19a 33—b 1. καὶ... ἑνατίων. ‘And again, is the matter of each different? Or is it the same, since otherwise they would not come-to-be reciprocally out of one another, i.e. contraries out of contraries?’

19b 3–4. δ... τὸ αὐτό. ‘For that which underlies them, whatever its nature may be ἰδια underly ing them, is the same: but its actual being is not the same.’

The matter of Earth, Air, Fire, and Water, conceived simply as that which undergoes transformation (i.e. πρώτη ἡλη), is ‘the same’. But it exists only in its various informations: and the informed-matter, which is e.g. Air, is different from the informed-matter which is Water.

The familiar Aristotelian formula ἐστὶ μὲν τὸ αὐτό, τὸ δ’ εἶναι οὐ τὸ αὐτὸ is used to express that A and B are ‘materially’ (potentially, or abstractly considered) identical, but ‘formally’ (actually, or concretely considered) different: cf. e.g. *22a 25–26.

A. 4

19b 6—20a 7. περὶ... τρόπων. In this chapter the distinction between ἄλλοιωσις and γένεσις καὶ φθορά (formulated above, 17a 20–27) is restated a little more precisely: and ἄλλοιωσις is marked off from ἀνεξης καὶ φθόσις and from φορά, which together with it constitute the three εἰδη κινήσεως in contrast to ‘substantial change’ (cf. *17b 34–35).

The account of ἄλλοιωσις in this chapter is, however, still too wide, and it has to be corrected and supplemented by the Physics and by subsequent statements in the present work.

The doctrine of the Physics (224a 21—226b 17) is as follows. Change (μεταβολή) is either (a) from a ὑποκείμενον to a μη ὑποκείμενον, or conversely from a μη ὑποκείμενον to a ὑποκείμενον.
The first of these changes is φθορά and the second γένεσις: and their ‘poles’ (viz. ὑποκείμενον and μη ὑποκείμενον) are contradictorily opposed to one another. Or (b) change is from a ὑποκείμενον in one state to that ὑποκείμενον in a contrary state. All change of this kind is ψυχής, and it is subdivided into three species. For the ‘poles’ of the ψυχής may be (i) contrary ‘states’ in the Category of Quantity; i.e. the Substance may change in size, and the ψυχής is then Growth or Diminution: or (ii) contrary ‘states’ in the Category of Place; i.e. the Substance may change its position, and the ψυχής is then Motion (φορά): or (iii) contrary ‘states’ in the Category of Quality; i.e. the Substance may change its πάθη (its perceptible qualities), and the ψυχής is then Alteration (ἀλλοίωσις). The ‘poles’ between which every ψυχής takes place, are ‘contraries’: but Aristotle includes under this head τὰ μεταξύ, because they function, in relation to one another or in relation to either extreme (or ‘contrast’ proper), as contraries. Thus, e.g., an ἀλλοίωσις may be the passage from hot to cold, from white to black, from sweet to bitter, &c.: these qualities are ἑναιτία to one another and constitute ἑναγωνία. But an ἀλλοίωσις may also be from hot to warm or from warm to cold, from white to grey or to any other intermediate shade of colour, &c.—i.e. between intermediates on the scales of temperature, colour, taste, &c.

19b 8-10. ἐπεὶ δὴ ἡ ποιήσις τῶν. Cf. * 17a 23–27. Change in the πάθη (provided certain conditions are fulfilled, which Aristotle specifies immediately) is Alteration. But it is not here explained what πάθη are the ‘poles’ of ἀλλοίωσις, and we have to supplement Aristotle’s account from other passages.

Aristotle here (e.g. 19b 33) and elsewhere describes ἀλλοίωσις as ψυχής κατὰ τὸ ποιήμα. Now in the Categories (8b 25—10a 26) four main types of ποιήμα are distinguished, viz. (i) ἔξις καὶ διάθεσις, (ii) δύναμις καὶ ἀδύναμις φυσικά, (iii) παθητικά ποιήματε καὶ πάθη, and (iv) σχῆμα καὶ μορφή. The examples of ἀλλοίωσις given just below (19b 12–14) are (a) ‘change from illness to health’ and vice versa, i.e. change of ἔξις or διάθεσις (Categories 8b 35 ff.), and (b) ‘change from spherical to angular’ and vice versa, i.e. change of σχῆμα or μορφή (Categories 10a 11–16). Nevertheless Aristotle expressly denies (cf. Physics 245b 3 ff.) that change of figure or shape, and change of ἔξις (i.e. acquisition or loss of a ἔξις) are ἀλλοίωσις. He insists (cf. e.g. Physics, 2nd version, 244b 27—25; Metaphysics 1022b 15–18) that the term ἀλλοίωσις
properly applies only to change of those qualities which are the objects of the five special senses, i.e. the qualities which constitute the 'contrarieties' of Touch, Vision, Hearing, Taste, and Smell (cf. also * 31a 8-10). Such qualities are classed in the *Categories* (9a 28 ff.) as παθητικαὶ ποιότητες καὶ πάθη, because all of them (with the exception of black, white, and the colours, which are called παθητικαὶ ποιότητες for another reason) 'produce a πάθος in our senses'.

19b 10-12. ἄλλοισις . . . μεταξὺ. Change in the πάθη is ἄλλοισις, provided (a) that the Substance, which is changing its πάθη, is perceptible and persists unaltered through the change, and (b) that the 'contrary' or 'intermediate' πάθη in question (the 'poles' of the change) are predicable directly of the persisting perceptible Substance as its own (b11 ἐν τοῖς ἐκατόν πάθεσιν).

The *first proviso* is necessary, because even in γένεσις and φθορά some ὑποκείμενον (viz. πρώτῃ ὀλη) persists through the change. But in ἄλλοισις the persistent ὑποκείμενον must be 'perceptible', i.e. a συνθετὸς οὐσία (cf. Introd. p. xxxiii.).

The *second proviso* (I owe the following interpretation to Zabarella) is also necessary to distinguish ἄλλοισις from γένεσις and φθορά. Thus, e.g., in the transformation of Air into Water (which is a γένεσις and φθορά) the Hot–Moist is transformed into the Moist–Cold. The passage is a change from the πάθος Hot to the πάθος Cold: but it is not ἄλλοισις, because there is no persistent perceptible ὑποκείμενον of which hot and cold are directly predicable. There is, indeed, a persistent perceptible ὑποκείμενον: for both Air and Water are σῶμα διαφανές. But hot and cold are not properties directly predicable of 'transparent' or 'transparent body': it does not possess them as 'its own' πάθη. Air, which is transparent, is also hot: and Water, which is transparent, is also cold. But hot and transparent (or again, cold and transparent) are πάθη coexisting in the same subject; just as e.g. λευκός and μονοσίκος coexist in Sokrates, without being directly and properly predicable one of the other (cf. also * 19b 26-27).

19b 12-14. οἶνος . . . ὄν. Though these examples are not instances of ἄλλοισις strictly-speaking (cf. * 19b 8-10), they illustrate the persisting identity of the ὑποκείμενον in ἄλλοισις. On χάλκος, see * 28b 12-13.

19b 14-21. ὅταν . . . ἀναίσθητον. ὅλον (b 14), as Zabarella points out, does not mean that, in γένεσις or φθορά, the whole substance
changes: for πρώτη ὕλη persists unchanged. The substance changes as a whole, i.e. as this specific information of matter. The change affects the combination of form and matter, which makes the thing what it specifically is.

ὅς ύποκειμένον (b 15), i.e. something perceptible may persist, but not a something, of which the new form is predicable in the way in which a πάθος is predicable of its Substance: cf. *19b 10–12, *19b 21–24.

πάσης, παντός (b 16, 17) must not be interpreted merely in a quantitative sense. Aristotle's point is that the seed or air as a whole (in its 'substance', its specific character) has been transformed.

ηδη (b 17), i.e. a change of this kind is no longer merely ἀλλοίωσις: we are already in presence of γένεσις and φθορά.

19b 16. οἶνον ... πάσης. It was objected, Zabarella says, that 'the seed comes-to-be out of the blood, not the blood out of the seed'. He suggests that Aristotle is referring to the common (though erroneous) belief 'semen in utero transmutari in sanguinem, i.e. in embryonem qui sanguineus esse videtur'.

19b 18–21. μάλιστα ... ἀναίσθητον. Since the popular identification of γένεσις and φθορά with the change from 'imperceptible' to 'perceptible' and vice versa has already been repudiated (cf. 18b 18–33), we must interpret Aristotle's words here as meaning that such changes are the most obvious and generally-recognized instances of γένεσις and φθορά.

19b 21–24. ἐν ... ἀλλοίωσις. 'But if, in such cases, any property belonging to a “contrariety” persists in the thing that has come-to-be, the same as it was in the thing which has passed-away—if, e.g., when water comes-to-be out of air, both are transparent or cold—the second thing, into which the first changes, must not be a property of this persistent identical something. Otherwise the change will be Alteration.'

The point of this passage is to enforce and explain the qualification ὅς ὕποκειμένον (b 15) in the definition of γένεσις: in a change, which is γένεσις, nothing perceptible can persist as the subject of which the new form is predicable. Otherwise the change would be ἀλλοίωσις: for we should have a persistent perceptible substance changing in 'its own' πάθη (cf. *19b 10–12).

In b 23–24 θάτερον εἰς ὁ μεταβάλλει is the subject, and πάθος the predicate. The antecedent of τούτων (b 23) is the πάθος ἐναντιώσεως of b 21.
In b 23 there is no reason to alter the manuscripts’ reading ψυχρά. Aristotle is not saying that water and air are in fact ‘cold’, but only quoting a common view in illustration. Air, according to Aristotle, is Hot–Moist (cf. e. g. 30b 4): but Philoponos (p. 224, ll. 13–16) tells us that it was thought to be Cold–Moist.

19b 25–31. οἶον ῥα τοιαῦτα. I follow Philoponos in transposing νῦν . . . ὑπομένουτος, which the manuscripts read after φθορά in l. 30.

Translate:—‘Suppose, e. g., that the musical man passed-away and an unmusical man came-to-be, and that the man persists as something identical. Now, if “musicalness and unmusicalness” had not been a property essentially inhering in man, these changes would have been a coming-to-be of unmusicalness and a passing-away of musicalness: but in fact “musicalness and unmusicalness” are a property of the persistent identity, viz. man. (Hence, as regards man, these changes are “modifications”; though, as regards musical man and unmusical man, they are a passing-away and a coming-to-be.) Consequently such changes are Alteration.’

Aristotle’s doctrine is:—(i) If ‘musicalness and unmusicalness’ were not a property of man, the change in which ‘a musical man becomes unmusical’ would be a φθορά of musicalness and a γένεσις of unmusicalness. But (ii) since ‘musicalness and unmusicalness’ are a property of man, the change is in fact an Alteration of man from a state of musicalness to a state of unmusicalness. At the same time, (iii) the change is a φθορά of musical man and a γένεσις of unmusical man.

In b 29 πάθη apparently means ἀλλοιώσεις—a sense of the term expressly recognized in Metaph. 1022b 18. This interpretation, though difficult, is helped by the antithesis, ἀνθρώπων μὲν . . . πάθη, ἀνθρώπων δὲ μονοικοῦ . . . γένεσις καὶ φθορά.

19b 26–27. εἰ . . . ἀμοιβαία. The singular (πάθος) is used, because the whole ἐναντίωσις is predicable of Man, as ‘odd-or-even’ is predicable of Number and ‘straight-or-curved’ of Line. ‘Musical-or-unmusical’ is a disjunctive proprium of Man, and is a καθ’ αὑτὸ πάθος of Man in that sense (cf. Introd. § 8).

But ἀλλοιώσεις is not confined to change in πάθη which are propria, and ‘musical-or-unmusical’ is a καθ’ αὑτὸ πάθος of Man in a wider sense also.

Man can ‘alter’ from musical to unmusical, because Man is the ‘owner’ of this πάθος—the substratum, in which it inheres, and not merely a subject of which it can grammatically be predicated. On the other hand, τὸ λευκὸν could not ‘alter’ from
musical to unmusical, because 'musical or unmusical' is a πάθος of τὸ λευκὸν only κατὰ συμβεβηκός, not καθ' αὐτό. It is indeed grammatically possible to say τὸ λευκὸν ἐστὶ μουσικόν, but the statement only means that an unexpressed substratum (e.g. Sokrates), ὃ συμβεβηκέν εἶνα τελικῷ, is also musical. Cf. 21b 3–4, * 19b 10–12, Post. Anal. 83a 1–21.

19b 31—20a 2. ὅταν ... φθορά. A summary statement of the distinction of the three εἰσφερέως (a) from one another, and (b) from substantial change.

κατὰ ... ποιῶν (b 33), i.e. πάθος is to be interpreted as παθητικῆς ποιότητος: cf. * 19b 8–10.

πάθος ... δλως (b 1), i.e. πάθος is to be interpreted in the widest sense, so as to include all forms of 'Accident'.

20a 2–5. ἔστι ... τινος. Matter in the primary and strict sense is identical with the substratum of substantial change (ἳλη γεννητῇ καὶ φθαρτῇ). But the other forms of change also presuppose a substratum which is-potentially, but is-not-actually, that which results from the change. Hence we must recognize a ιλη πόθεν ποι (or ιλη τοπικῆ), a ιλη of αὐξήσεως καὶ φθορᾶς, and a ιλη of ἀλλοίωσις. Cf. Introd. p. xxxiv, Μεταφ. 1042a 32–b 7.

20a 5–7. περὶ ... τρόπον. The first part of this epilogue refers back to 15a 26–27.

After γενέσεως (a 5) Bekker adds καὶ φθορᾶς, which he wrongly attributes to E. The addition is not wanted: cf. 19b 6.

A. 5

20a 8. περὶ ... εἴπειν. λοιπῶν: the reference is to the plan of the work, cf. 14a 1–6, 15a 26–28.

The processes hitherto considered (γένεσις and φθορά, ἀλλοίωσις) occur in all sublunary natural bodies. But growth and diminution, as here defined (cf. * 20b 34—21a 29), are the two complementary forms of a process which is confined to the ἐμψυχα. We should therefore expect to find them discussed in Aristotle's treatises on living things. And he does in fact treat (a) of food, and the bodily organs involved in assimilation, nutrition, and growth in the de Part. Anim., (b) of the organs of reproduction in the de Gen. Anim., and (c) of the soul (as the efficient cause of nutrition, growth, and reproduction) in the de Anima. Moreover, there are grounds for thinking that he wrote—or at least planned—a special treatise περὶ τροφῆς or περὶ αὐξήσεως καὶ τροφῆς: see Bonitz, Ind. 104b 16–28. Nevertheless it is natural enough that the present
work should include a treatise on αἰτίωσις καὶ φθώσις. For (i) the four kinds of change are distinguished in the Physics, and φορά is discussed there and in the de Caelo. And since Aristotle has just discussed γένεσις and ἀλλοωσις, the investigation of growth and diminution—the remaining kind of change—is appropriate here. Moreover (ii) αἰτίωσις (as we shall discover) is most intimately connected with γένεσις and ἀλλοωσις, and cannot be explained without them. Hence it is convenient to treat of the general character of αἰτίωσις in close association with the treatment of γένεσις and ἀλλοωσις.

The passage in the de Anima (B. 4, especially 416a 19—b 31) supplements Aristotle's present account. We learn from it that the primary or basal soul (ἡ πρώτη ψυχή, i.e. the soul whose functions distinctively characterize the lowest grade of ἐμψυχα, viz. the plants) is the 'efficient cause' of all those vital acts which operate with food. For (i), as converting food into the substance of the tissues of the ἐμψυχον, this soul is θερητική, i.e. originates the processes of nutrition; (ii), as employing the assimilated food to increase the living body up to the size which it possesses in maturity, it is αἰτητική, i.e. originates and controls the process of growth; and (iii), as winning from the food that secretion (viz. the seed) from which a new specimen of the living body can develop, it is γεννητική, i.e. originates and controls the reproductive process. Since the aim and end of this soul is to reproduce the living body of which it is the 'form' (τὸ γεννήσαι ὅνον αὐτό), and since it is best to call things after their 'end', the basal soul may be called γεννητική ὅνον αὐτό. It is the 'reproductive' soul *par excellence*, since its other functions are subservient and instrumental to reproduction.

Aristotle's terminology in the de Anima should also be noted in connexion with the present passage. The soul is τὸ τρεφον—that which nourishes: the living body *qua* living (τὸ ἐμψυχον ἡ ἐμψυχον) is τὸ τρεφομενον—that which is nourished: the food is that ὦ τρέφεται, the 'stimulus' (cf. *21b 5—6), i.e. that which stimulates the θερητικὴ δύναμις to exercise its power: and the natural heat of the living body (τὸ θερμόν: cf. *29b 24—26) is that. ὦ τρέφεται, i.e. that the soul employs as the instrument of nutrition, to digest and assimilate the food.

20a 9—10. καὶ πῶς . . . φθωνύοντω, i.e. we have to explain the general character of the processes of growth and diminution wherever they occur: cf. *14a 2, *18a 25—27.
20\textsuperscript{a}10—22\textsuperscript{a} 33. σκεπτέον ... μένει. The chapter discusses two topics (20\textsuperscript{a} 8–10), viz. (i) how growth is distinguished from coming-to-be and from alteration, and (ii) how growth takes place. It may be divided into two parts. The first part (20\textsuperscript{a} 10—b 34) contains a preliminary and somewhat confused treatment of both topics. Thus, the difference of αὔξησις from γένεσις and ἄλλωσις is considered, but not adequately stated (20\textsuperscript{a} 10—27); and there is an obscure and unsatisfactory discussion whether (and, if so, in what sense) the matter, out of which things grow, is potentially μέγεθος (* 20\textsuperscript{a} 27 — b 34). The second part (20\textsuperscript{b} 34—22\textsuperscript{a} 33) distinguishes growth from γένεσις and ἄλλωσις by a precise definition of the term: and elucidates the way in which growth takes place, by an account of the nature of the growing thing, of the part played by food in growth and the relation of nutrition to growth. Cf. also * 21\textsuperscript{b} 10—16.

20\textsuperscript{a}12. δέ, sc. ἐστίν ἢ πρὸς ἄλληλα διαφορὰ διὰ κτλ., 'Do they differ from one another, because ...?'

20\textsuperscript{a}13. οἷον, vide litter. Cf. e.g. 21\textsuperscript{a} 35, 26\textsuperscript{a} 27.

20\textsuperscript{a}15. ἀμφότερα, i.e. the last two forms of change, αὔξησις and ἄλλωσις.

20\textsuperscript{a}16. τὸν εἰρημένων. τὰ εἰρημένα ἐστὶ μέγεθος καὶ πάθος.

20\textsuperscript{a}16—25. ἤ ... φθίνοντος. Growth and diminution are necessarily accompanied respectively by the expansion and contraction of the growing and the diminishing thing in all three dimensions of space. This phenomenon may accompany γένεσις and ἄλλωσις, but it need not do so. From this peculiar necessary concomitant Aristotle infers that the change, which is growth (or diminution), must be distinguished 'in manner' from the changes which are γένεσις and ἄλλωσις: but we are not here told what this 'distinctive manner' is.

20\textsuperscript{a}19—25. ἄλλον ... φθίνοντος. The change of place, which necessarily accompanies growth and diminution, (a) is not a movement of translation. For the growing or diminishing thing as a whole retains its position, although its parts change their places as it expands or contracts: whereas the moving body, in a movement of translation, changes its position as a whole. Nor (b) is it a movement of rotation, like that of a revolving sphere. For the sphere as a whole continues to occupy an equal space, within which its parts change their places: but the parts of the growing thing expand, and those of the diminishing thing contract.

Aristotle here (b 20—21) compares the expansion of the growing
thing to that of a metal when beaten. Even this comparison, however, is inaccurate (as Philoponos points out) because the growing thing expands in all three dimensions of space at once.

In the *Physica* (211a 12-17, 213b 5) φορά is quoted as one type of κίνησις ἢ κατὰ τότον, and αὔξησις καὶ φθίσις as the other.

It has been suggested that the sphere in which growth operates (its περὶ ὁ) is μέγεθος, i.e. that growth is a change from ‘potential’ to ‘actual’ μέγεθος (20a 12-16). Starting from this suggestion, Aristotle discusses in what sense the terminus a quo of growth is δύναμεν μέγεθος. He is thus inquiring ‘What is the matter out of which things grow?’ And this inquiry is at the same time a preliminary investigation of the problem, ‘How does growth take place?’ (cf. * 20a 10—22a 33).

But the discussion is obscure in many of its details. This obscurity is largely due to the fact that Aristotle has not yet pointed out that there is a twofold matter of growth:—viz. (i) the *materia in qua*, i.e. τὸ αὔξανομένον, the growing thing itself, and (ii) the *materia ex qua*, i.e. τὸ ἃ αὔξανοται, the food (cf. * 20b 34—21a 20). Hence ‘the matter of growth’, of which he here speaks, includes both ‘the growing thing’ and ‘the food’: and the emphasis falls sometimes on one, and sometimes on the other, of these two aspects of ‘the matter’.

The general conclusion is that the περὶ ὁ of growth is μέγεθος, in the sense that growth is a change of, and within, actual μέγεθος. Thus ‘the growing thing’ must be an actual body which already possesses some actual magnitude (cf. e.g. 20b 31-33): and the same is true, as we learn later, of ‘the food’. Nevertheless the matter of growth is also in a certain sense (cf. * 20a 29, * 20b 12-14) only potentially a body and a magnitude, which it will become actually. This is clearly explained in respect to ‘the food’ (cf. 21b 35—22a 33): but it is also true of ‘the growing thing’, as we can infer from 20b 12-25.

The *ποτέρως υποληπτέων*. That the περὶ ὁ of αὔξησις καὶ φθίσις is μέγεθος, is generally believed; but a special interpretation of the relation of a change to its περὶ ὁ has been suggested (20a 12-16), according to which growth would be ‘a process from what is potentially, to what is actually, a magnitude’. Now this description is ambiguous, and the ambiguity lies in the phrase ἐκ δύναμιν μέγεθος. Aristotle expresses only one of its two possible meanings here: viz. that growth is a process, in which σῶμα καὶ μέγεθος
result from a matter actually incorporeal and devoid of magnitude, though potentially magnitude and body. And the main object of the ensuing discussion is to negative this description of growth.

According to the other possible meaning of ἐκ δυνάμει μεγέθους (which is not here directly stated, though it is implied below: see * 20b 12–14), the matter of growth would be actually corporeal and actually possessed of magnitude, though only potentially ‘corporeal and possessed of magnitude’ in the same sense in which the result of growth is actually so. The main result of the later discussion (from 20b 34 onwards) is to explain and justify this conception of the matter of growth.

20a 29–31. πότερον . . . μέγεθος; Growth, as we shall learn later, presupposes nutrition, i.e. the transformation of food into (e.g.) flesh, or the γένεσις of a σῶμα. Now, since γένεσις is transformation, nutrition—qua the γένεσις of a σῶμα—presupposes an already formed matter (i.e. an actual σῶμα), and not an incorporeal matter.

Hence the view here suggested—that in growth σῶμα καὶ μέγεθος come-to-be out of a matter which is actually incorporeal and sizeless—is clearly false, at least in so far as ‘the matter’ means or includes the food (cf. * 20a 27–b 34), which the phraseology implies.

20a 31–34. καὶ τούτου . . . ἀμφοτέρως; The matter of growth (we are supposing at present) is actually incorporeal and actually devoid of magnitude. It is no mere feature of actual body, which we can isolate by definition. It is an incorporeal and sizeless something, having an independent existence, really ‘separate’ from what is corporeal and possessed of magnitude (* 33 κεχωρισμένης, a 34 χωριστῆ).

But an incorporeal and sizeless matter, which is thus real independently of body, may be supposed either (a) to exist alone, per se; or (b) to exist within (to ‘inexist in’) an actual body, without being in any sense a part of the body which contains it (* 33–34: the matter is supposed to be κεχωρισμένη in both alternatives). Is growth a process in which σῶμα καὶ μέγεθος result from (a), or from (b)? Aristotle is going to show that growth cannot take place in either of these two ways (* a 34 ἡ ἀδύνατον ἀμφοτέρως; sc. τὴν αὔξησιν γίνεσθαι, cf. a 32).

toútou (* 31), sc. τοῦ ἐκ δυνάμει μὲν μεγέθους καὶ σώματος, ἐντελεχεία δ’ ἀσωμάτου καὶ ἀμεγέθους γίνεσθαι σῶμα καὶ μέγεθος.
Both alternatives are impossible, because both assume an incorporeal and sizeless matter which is 'separate': and if it is 'separate', it must be conceived either (a) as occupying no place, or (b) as a 'void'. But (20b 2–12) it cannot be conceived in either of these two ways.

By the excision of η before οἶνος (b 1), we get two alternative ways of conceiving the 'separate' matter, and τὸ μὲν (b 2) and τὸ δὲ (b 3) become intelligible. The first alternative way (a) is that the matter 'occupies no place', and Aristotle suggests 'the point' as an illustration. For though the point 'possesses position' (θέσιν ἔχει), it cannot be said to 'occupy place' (τόπον κατέχειν), since nothing can 'occupy place' except κατητόν σῶμα, i.e. a body subject either to φορά or to αἰσθήσεις: cf. Aristotle's discussion of τόπος, Physics Δ. 1–5, e.g. 212a 5–7, b 7–8, 28–29. The second alternative way (b) is that the matter is 'a void'. Now Aristotle explains, in the passage of the Physics (Δ. 6–9) where he argues that there is no 'void', what τὸ κενὸν is commonly supposed to mean. By τὸ κενὸν is meant a διάστημα ἐν ὑ μηδὲν ἐστὶ σῶμα αἰσθητόν: i.e. there is supposed to be a place filled (or capable of being filled) by tangible body, and then, within this filled place, a gap devoid of tangible body (cf. Physics, l. c., 213a 27–31, 213b 31–214a 11). Hence the words καὶ σῶμα οἷκ αἰσθητόν (b 2) are rightly added here, as explanatory of κενὸν. If the matter is 'a void', it is the empty place of a perceptible (i.e. tangible) body. It is the spatial content of a body, a body without the perceptible qualities of a body.

To identify the 'incorporeal separate matter' with 'a void' is to suppose that it exists independently within another body; and we are therefore maintaining the second alternative formulated above (20a 34: cf. * 20a 31–34). Aristotle shows that this alternative is untenable, 20b 5–12.

(a) The matter of growth cannot be conceived as occupying no place.

Aristotle's argument may be put thus:—What results from the matter of growth (viz. a body possessed of magnitude) is καθ' αὐτῷ (per se, intrinsically) somewhere (ποῦ). Hence the matter must be somewhere, either 'intrinsically' (per se), or at least 'indirectly' (κατὰ συμβεβηκός, per aliud). But 'that which does not occupy place'—e.g. a point—is not somewhere, either per se or per aliud.
The argument turns on the meaning of 'being somewhere' (εἶναι ποῦ), which is explained in the Physics. 'To be ποῦ' is 'to be in τόπῳ': and this means to be contained by an including body, in such a way that the 'limits' or mathematical outlines (τὰ ἔσχατα, τὰ πέρατα) of the contained and its continent are 'in contact'. When that is so, the outline of the contained body is its μορφή or εἶδος: and the outline of the continent is 'the primary place' (τόπος εἰς ὁ πρῶτῳ ἑστὶν, or τόπος εἴδος: cf. *16b 4) of the contained body. Hence Aristotle defines τόπος as 'the limit of the containing body'; and explains that only a σῶμα κυνητὸν ἢ κατὰ φορὰν ἢ κατ' ἀδέξησιν can be per se 'in place' or 'somewhere'. Other things, however, e.g. the soul, can be ποῦ or εἰς τόπῳ per aliud: i.e. indirectly, in virtue of a κυνητὸν σῶμα of which they are, e.g., constituents or adjectives. (Cf. Phys. e.g. 211b 10–14, 212a 5–7, 31–32, 212b 7–12, 27–29.)

Now it is clear that a point is not 'in place' καθ' αὐτό, since it is not a κυνητὸν σῶμα. But it is not 'in place' κατὰ συμβεβηκός, e.g. as a part or an adjective of some other κυνητὸν σῶμα? A point is 'in' a line, a line is 'in' a surface, a surface 'in' a solid: and is not a solid 'in' a κυνητὸν σῶμα? The answer, according to Aristotle's doctrine, is 'No'. For the 'mathematical things' are not 'contained in' the actual bodies: they are adjectival characters abstracted from the latter (cf. Introd. § 5). Hence none of the 'mathematical things' are 'in place': cf. e.g. Phys. 208b 22–25, de Caelo 305a 24–31.

20b 5–12. ἀλλὰ . . . ὑπομένοντος. (b) The matter of growth cannot be conceived as 'contained in' an actual body, whilst retaining a 'separate' being of its own.

If the 'incorporeal and sizeless' matter were thus in an actual body, without being in any sense of it—i.e. neither a part of its substantial being (καθ' αὐτό, b 4) nor an adjective of it (κατὰ συμβεβηκός)—it would be enclosed within it, as within a vessel. It would be a κενὸν: and the actual body would include it, much as an ἀγγεῖον comprises its contents.

Such a conception of the matter of growth is impossible, as we can see from the impossibility of an analogous conception of the matter of γένεσις. Suppose, e.g., that, when Air comes-to-be out of Water, the matter of its γένεσις, whilst in no sense a part or an adjective of the Water, is 'contained within' it, as in a vessel. Then (i) the γένεσις of the Air would be simply its withdrawal from the Water, the latter being left unaltered; but this is not
what in fact occurs (b 11-12): and (ii), since there would be nothing to limit the quantity of the matter 'contained in' the Water, there would be nothing to limit the volume of the resulting Air (b 10-11). But in fact a given volume of Water generates only a determinate volume of Air.

I have followed Zabarella in my interpretation of b 10-11 (ἀπείρους ... ἐντελεχεία).

20b 12-14. βάλλεται ... μὴ μίαν. 'It is therefore better to suppose that in all instances of coming-to-be the matter is inseparable' (sc. from the actual body in which it is contained) 'being numerically identical and one with the containing body, though isolable from it by definition.'

This suggestion is the opposite of the supposition just negated. Hence we may regard it as the affirmation of the unexpressed alternative implied in the formulation of that supposition: cf. 20b 5 ff. εἰ μὲν κεχωρισμένον οὕτως κτλ. Aristotle is suggesting the right interpretation of ἐκ δύναμει μεγέθους, i.e. the true sense in which the matter of growth is δυνάμει μέγεθος: cf. *20a 29.

When Air comes-to-be out of Water, the matter of this γένεσις is really ἀκόφρωτον from the Water. It is numerically identical with it. But it is distinct and isolable by definition (τὸ λόγῳ) from it. The same principle applies in all cases of γένεσις (b 13 πᾶσιν). When, e.g., σῶμα καὶ μέγεθος 'come-to-be' (i.e. in growth, cf. *20a 29-31), the matter of this process is really inseparable from an actual body possessing magnitude. Hence the matter of growth is not an 'incorporeal and sizeless something' with an independent being of its own (cf. *20a 31-34). But from an actual body, actually possessed of magnitude, we can abstract by definition the matter of growth. The matter of growth—this abstracted feature of the actual body—is only potentially (not yet actually) that actual body of a determinate size, which will result from the process of growth: hence in this sense, and in this sense only, the matter of growth is δυνάμει μέγεθος καὶ σῶμα.

20b 13-14. τὴν αὐτὴν ... ἀριθμῶ, i.e. numerically identical with the actual body 'in which' it is (or rather, from which we can isolate it by definition).

The inseparability of the ἀριθμός of γένεσις from that of αὐξησις and of ἀλλοίωσις is a different, though a closely-connected, point which Aristotle develops below, b 22-25.

20b 14-16. ἄλλα ... ἀντίας. 'We saw that body and magnitude cannot come-to-be out of an incorporeal and sizeless something,
existing in its own right, but occupying no place: 'the matter', in short, cannot be a kind of 'point' (cf. *20a 34—b 2, *20b 3—5).

Aristotle now urges that none of the geometrical things—viz. neither points, lines, planes, nor solids—can be 'the matter' out of which body comes-to-be. He is referring to a type of theory which he criticizes more fully elsewhere (cf. e.g. de Caelo 298b 33 ff., Metaph. 1001b 26 ff., 1036b 7 ff.). The type of theory in question regards the products of mathematical analysis as the real primary constituents of things. From the point of view of mathematical analysis, the perceptible physical bodies 'pre-suppose' (are resoluble into) geometrical solids: solid presupposes the planes which define and contain it: plane similarly presupposes lines, line points, and points are arithmetical units plus position. Hence (it was argued) the physical bodies, with all their sensible qualities, can be generated by a gradual synthesis of the elementary mathematical entities. Units—or at least points, lines, and the geometrical figures—are 'the matter' of body.

The theories of the Atomists (cf. e.g. *15b 33—16a 2) and of Plato in the Timaeus (cf. *15a 29—33, *15b 31) are examples (more or less imperfect) of the type which Aristotle here condemns. The fundamental error of all such theories lies in the assumption that τὰ μαθηματικά are independently real; whereas in fact they are adjectival features of the perceptible bodies, isolable only by definition (cf. *20b 3—5).

οüδὲ στιγμᾶς . . . οὐδὲ γραμμάς (b 14—15) is, I think, equivalent to the denial that τὰ γεωμετρικά—i.e. the entities whose 'being' the geometer ἐπιστῆται, and whose essential properties he proves—can be 'the matter' of body: cf. e.g. Post. Anal. 76b 3—5, Introd. § 6.

διὰ τὰς αἰτίας αίτια (b 15—16) is not very clear. The reference appears to be to the whole preceding argument (20a 29—b 12) which proves that the matter, out of which a body (with magnitude) comes-to-be, cannot be something actually incorporeal (and sizeless).

20b 16—17. ἔκεινο . . . μορφῆς. Aristotle here begins the statement of his own conception of the matter out of which body (and magnitude) comes-to-be. The statement is completed in the next sentence, b 17—25.

The matter, out of which body comes-to-be, is that of which 'points and lines' are the limits: but it can never exist apart
from a definite physical shape (μορφή) and perceptible qualities (πάθος). In other words, 'the matter' is always an actual body, having a certain shape and magnitude, and certain sensible qualities. As we shall see in a moment, however, we can isolate by definition different features of its being: and these isolable features are respectively (a) the ἡλη οὐσίας σωματικής (i.e. πρώτη ἡλη, the fundamental logical presupposition of γένεσις), (b) the ἡλη of growth and diminution, and (c) the ἡλη of 'alteration'.

20\textsuperscript{b} 17–25. γίγνεται ... χωριστά. Aristotle has just stated that the matter, out of which a body comes-to-be, is itself another actual perceptible body. But though this is true, and has been established elsewhere as well as in the present argument (\textsuperscript{b} 17–19 γίγνεται μέν ὅν ... διώρισται), 'nevertheless' (\textsuperscript{b} 22–25 ἐτεί ... χωριστά) 'since there is also a matter out of which corporeal substance itself comes-to-be (corporeal substance, however, already characterized as such-and-such a determinate body, for there is no such thing as body in general), this same matter is also the matter of magnitude and quality—being separable from these matters by definition, but not separable in place unless Qualities' and Attributes generally 'are, in their turn, separable from Substance'.

Aristotle's doctrine may be summarized thus:—Any actual perceptible body is corporeal substance of a certain size and with certain αἰσθητὰ πάθη. Its μέγεθος and its πάθη are inseparable from its 'corporeal substantiality', which they qualify, and inseparable from one another: i.e. neither corporeal substance, nor size, nor any πάθος exists per se and in the abstract. What exists is this determinate body of such-and-such a size, and of such-and-such a temperature, colour, smell, &c. One and the same actual body (this individual corporeal substance) is the subject, of which a certain μέγεθος and certain πάθη are predicable: and its 'place' is the 'place' in which these adjectives (whose 'being' is their inherence in the body) inseparably coexist. On the other hand, scientific analysis may—and indeed must—distinguish the body (a) qua πρώτη ἡλη thus-formed, but capable of accepting a different form, (b) qua so-big, but capable of becoming bigger or smaller, and (c) qua so-hot or so-coloured, but capable of a different temperature or a different colour. Hence scientific analysis distinguishes within the actual body (a) a ἡλη σωματικῆς οὐσίας, (b) a ἡλη μεγέθους (i.e. a matter of growth and diminution), and (c) a ἡλη πάθους (i.e. a matter of alteration).
Thus the matter of growth is a certain μέγεθος, the matter of alteration a certain πάθος, and the matter of γένεσις the 'corporeal substantiality'—of an actual body. These three διὰ, though not really separable, are separable by definition (isolable by scientific analysis) both from the actual body and from one another.

To suppose that the matter of growth and the matter of alteration are really separate from the actual body or from the matter of γένεσις, would be equivalent to maintaining the separate existence of πάθη—i.e. that an actual μέγεθος and an actual sensible quality can 'be', without inhering in a substance. Cf. b 24–25 εἰ ὑπὸ καὶ τὰ πάθη χωριστά. The term πάθη here includes all 'adjectivals', i.e. determinations under any Category other than that of Substance: cf. *27b 17–22. On the other hand, the word is used in b 17 and b 23 in the restricted sense of παθητική ποιότης or αἰσθητόν πάθος: cf. *19b 8–10.

20b 18–21. ὥστεπ... γίνεται. καὶ ἐν ἄλλως: Aristotle is probably referring to Metaph. 1032a 12 ff., rather than to Phys. A. 7. For in the former passage he establishes two universal laws of γένεσις, viz. (i) 'One actual thing comes-to-be out of another actual thing' and (ii) 'The efficient cause of every γένεσις is something actual'. Hence he is reminded of the second law here, and repeats it although it is not strictly relevant to his present argument. We must, then, regard b 19–21 (καὶ ὑπὸ τινος... γίνεται) as a digression, suggested to Aristotle by association. The words σκληρὸν γὰρ οἷς ὑπὸ σκληροῦ γίνεται (b 21), if they are genuine, must be read after ὄμογενος (b 19) as an explanatory parenthesis.

The doctrine may be stated thus:—The efficient cause of γένεσις is always 'actual', either (i) an actual thing, form embodied in matter, or (ii) an actuality, i.e. a 'form' (b 21 ἦ ὑπὸ ἐντελεχείας). (i) If it is an actual thing, it is identical (with the thing produced by the process) either (a) in species or (b) in genus. Thus (a) the father is the efficient cause of the coming-to-be of the child: and father and child are identical specifically. On the other hand, (b) a hard thing (e.g. ice or terra-cotta) is not produced by a hard thing, but by something cold or hot (a freezing wind or a baking fire); cf. Meteor. 382a 22 ff. But though what is cold or hot is different in species from what is hard, 'cold', 'hot', and 'hard' are generically identical: for all three belong to the class of τὰ ἀπτά. (ii) At other times (viz. in those γενέσεις which are properly called ποιήσεις) the efficient cause is not an actual thing,
but an *actuality* or ‘form’. When a work of τέχνη comes-to-be, the process is initiated by the ‘form’ qua present as an ideal in the soul of the *τεχνίτης*. Thus the efficient cause of the coming-to-be of a house is the *οἰκοδομικὴ τέχνη* in the architect’s soul: and the *οἰκοδομικὴ τέχνη* is the ‘form’ of House, or *is* the λόγος in which that ‘form’ is precisely analysed and resynthesized. Cf. *35b* 34–35, *Metaph.* 1032a 25 ff.

20b 25. έκ τῶν διηπορημένων. The reference is to 20a 27—b 12.

20b 27–28. χωριστὸν . . . πρότερον. If we suppose that the matter of growth is devoid of actual μέγεθος, we shall be postulating within it—e.g. within the growing thing, or again within the food (cf. *21a* 5–9)—real ‘gaps’ or ‘voids’, having an independent existence of their own. The growing thing (or the food) will then be conceived as a body with ‘pores’—with ‘places’ for tangible body, but devoid of it (cf. *20a* 34—b 2). But a really-existent, independent ‘void’ has been shown to be impossible elsewhere (*Phys.* Δ. 6–9).

Zabarella prefers the variant τὸ κοινὸν, which he interprets as σῶμα οἷκ αἰσθητῶν, i.e. ‘corpus indifferens, potentiale, et nulli certae naturae alligatum’—or, in other words, as πρώτη ἡλη. But (i) σῶμα κοινὸν in b 23 does not mean σῶμα οἷκ αἰσθητῶν. It means perceptible body in general, i.e. the indeterminate universal of the definite perceptible bodies. And (ii) σῶμα οἷκ αἰσθητῶν in b 2 is identified with τὸ κενὸν, not with τὸ κοινὸν.

The false reading, τὸ κοινὸν, probably led to the omission of ἐν ἐτέρωι in b 28. For (so far as I am aware) there is no proof ἐν ἐτέρωι that τὸ κοινὸν cannot exist in separation.

20b 30. δῆλω, i. q. ἀπλῶσ: cf. 26a 28.

20b 33–34. γένεσις . . . αὐξήσις. As Zabarella rightly observes, Aristotle does not mean that the ἡλη of γένεσις is devoid of actual magnitude, i.e. only potentially a body. All that he says is that ‘a process from an ἀμεγέθης ἡλη’, *if it could occur at all*, ‘would not be growth, but rather (μᾶλλον) a body’s coming-to-be’.

20b 34—21a 29. λπτυῖον . . . τοιοῦτον. Aristotle here begins a more thorough treatment of the two topics formulated at 20a 8–10: cf. *20a* 10—22a 33. We are ‘to come to closer quarters with the subject of our investigation’, ‘to grapple with it (as it were) from its beginning’, ‘to get to the root of it’ (b 34—21a 1. Since ἀπεσεθαύ literally applies only to something corporeal, Aristotle says οὖν ἀπτομένους. Probably μᾶλλον goes with ἀπτομένους: cf. *Rhet.* 1358a 8).
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With a view to this more thorough treatment, 'we must determine the precise character of the Growing and Diminishing whose causes we are investigating' (21\textsuperscript{a} 1–2: πολυον, as Zabarella rightly says, 'non significat qualitatem, sed essentiam, augmentationis'). In other words: we must formulate the precise nominal definitions of αὐξησις and φθορα. If we then discover the causes of growth, we shall be able to convert its nominal into its adequate scientific definition: cf. Introd. §§ 7–9, *I4\textsuperscript{a} 2–3, *21\textsuperscript{b} 16–17.

It will be convenient to anticipate Aristotle's discussion and to give a summary statement (i) of the meaning here attributed to αὐξησις, and (ii) of the causes of αὐξησις. The reader should consult de Anima B. 4 (cf. *20\textsuperscript{a} 8), Alexander's περὶ κράσεως καὶ αὐξησεως (ed. Bruns, pp. 233 ff.), and above all Zabarella's excellent treatise de Augmentatione.

(i) The term αὐξησις is here restricted to the growth of living things, though it is used more widely elsewhere. Thus it is applied (e.g. Phys. 214\textsuperscript{a} 32 ff.) to the increase of volume when 'air' (e.g. steam) is generated from water—a case expressly excluded here (21\textsuperscript{a} 9–17). A process, which is to be αὐξησις in the sense here recognized, must fulfil three conditions:—(a) the substance of the growing thing must persist, retaining its identity through the process, (b) the growing thing, as a whole and in every particle, must get bigger, i.e. must expand so as to become larger in all three dimensions, and (c) it must get bigger by taking into itself, and assimilating, food.

Growth, thus conceived, involves γένεσις καὶ φθορά, ἀλλοιωσις, and φορά. For the food must pass-away, i.e. be transformed into the tissue of the growing thing. There must, e.g., be a φθορά of the bread, which is a γένεσις of the blood. Again, in the process of digestion which growth presupposes, food and stomach reciprocally 'act' and 'react' on one another, i.e. reciprocally 'alter' one another: cf. the notes on A. 7. Or, as Aristotle also expresses it, the food is at first 'unlike' the tissues which it is to increase. It has to be 'made like' them, and this assimilation is a change from contrary to contrary qualities, i.e. ἀλλοιωσις (cf. Phys. 260\textsuperscript{a} 29 ff.; below, 21\textsuperscript{b} 35—22\textsuperscript{a} 4). Finally (cf. *20\textsuperscript{a} 16–25), growth is necessarily accompanied by a peculiar kind of φορά.

(ii) There is a twofold matter (i.e. material cause) of growth (cf. *20\textsuperscript{a} 27 – b 34), viz. (a) the growing thing whose size increases:
this is a body animated by the basal or 'reproductive' soul* and (b) the food which 'accedes to', and increases, the growing thing. There is also a twofold efficient cause of growth, viz. (a) the basal soul, and (b) the 'natural heat' of the living body (cf. * 20a 8).

Aristotle refers to the soul as the efficient cause of growth at 21b 6-10, 22a 12, 22a 28-33: but his references are very brief, and the last passage is obscure. There does not appear to be any reference in this chapter to the 'natural heat'. The 'final cause' of growth (to which there is no reference here) is the attainment by the living thing of its 'normal' size—i.e. the size which it ought to have in maturity, if it is to fulfil its vital functions adequately.

The question as to what cause (or causes) must be specified in the scientific definition of growth, is discussed below: cf. * 21b 16-17.

21a 2-29. φαίνεται... τοιούτον. The 'nominal definitions' of αικήνας and φθίσις (in the sense here given to these terms) emerge from this passage. The growing and diminishing thing exhibits three characteristics: growth and diminution must conform to three conditions (cf. preceding note). The first two conditions are stated at once (* 2-5), whilst the third is formulated in the course of the discussion from * 9-29.

21a 5-9. ἀναγκαῖον... ἀδύνατον. An apparent dilemma concerning the food. The datives (ἀσωμάτω, σώματι) show that Aristotle is referring to the materia ex qua of growth (τὸ ὁ αἰκήναται, or τὸ αἰκίνον): cf. * 20a 8, * 20a 27—b 34, and the terminology throughout the rest of the chapter.

The food must be either ἀσωμάτων or σώμα: and yet it cannot be either. For (a) if the food be ἀσωμάτων, 'there will exist separate a void' (* 6 ἔσται χωριστὸν κενὸν): i.e. the food will be the empty place of a body, existing independently of a body (cf. * 20a 34—b 2), and thus there will be a ὑλὴ μεγέθους existing in separation from actual body. But this was shown to be impossible: cf. e.g. * 20b 17-25. But (b) if the food be an actual body, there will be two bodies—the growing thing and the food—in the same place. Yet such reciprocal interpenetration of two bodies is also impossible.

It will be observed that Aristotle here assumes that the growing thing is a σῶμα, i.e. through and through tangible body. In the Physics (213b 18-20) he says that growth was universally
supposed to imply the real existence of a ‘void’, i.e. of actual gaps or ‘pores’ in the growing thing: for it was assumed that the food was a body, and that two bodies could not be ἄμα, i.e. could not interpenetrate.

The apparent dilemma, which is here developed with regard to the food, does in fact also apply to the materia in qua of growth, viz. τὸ αἰθανόμενον. That too must be either ἄσωμα (i.e. a body with real ‘voids’ or ‘pores’) or σῶμα (i.e. through and through tangible body): and yet it cannot be either. When Aristotle reformulates the problem of growth, with a view to its solution, he recognizes that this apparent dilemma applies to the growing thing: cf. 21b 15, where τὸ σῶμα is clearly τὸ αἰθανόμενον.

On Aristotle’s own theory, both the food and the growing thing are actual ‘bodies’. Yet there are no ‘pores’ (no real ‘voids’): and reciprocal interpenetration of bodies is impossible. The solution lies in his conception of matter as a δύναμις τῶν ἐναντίων (cf. Phys. 217a 21—b 28: and see below, * 26b 34—27a 1). One and the same ὁλη (an actual body of a certain size and, e.g., a certain density) is capable of becoming actually bigger or smaller, denser or rarer, &c. But we must not think of a ‘dense’ body as one in which there are few or small ‘pores’, and of a ‘rare’ body as one with large or many gaps interspacing its corporeal particles. We must rather conceive of ὁλη as a material capable of filling space with all possible degrees of intensity, or capable of expanding and contracting without a break in its continuity. In this respect Aristotle’s ὁλη resembles ‘das Reale’, as Kant conceives it: cf. Kritik d. r. Vernunft, ‘Anticipationen d. Wahrnehmung’.

21a 9—29. ἀλλὰ . . . τοιοῦτον. We cannot evade the apparent dilemma as regards the matter of growth, by quoting the generation of air (e.g. steam) out of water. It is true that there is an increase of volume; that the matter—viz. the water—is not incorporeal; and that yet there is no reciprocal interpenetration of two bodies. But the change is not αἰθερίς in the sense here defined, for two of the three characteristic conditions are unfulfilled: (i) there is no accession of fresh material, and (ii) there is no perceptible substance persisting through the change (cf. * 20b 34—21a 29, * 21b 2—29). The change is a φθορά of water and a γένεσις of air (cf. 19b 16—18): it is not a growth of either, since neither persists. It might, indeed, be suggested (21a 14—17) that something common to water and air—e.g.
'body'—persists, and that the increase of volume is a growth of this persisting 'body'. But no actual body—no perceptible substratum common to water and air—does persist: for πρώτη ἔλη, which 'persists' and is transformed in the change, is not an actual body and has no 'separate' existence. Hence the change is not a κίνησις at all (and therefore not a κίνησις κατὰ ποιόν, not αἰξησις), but γένεσις καὶ φθορά: cf. *17b 34–35, *19b 6—20a 7.

21a 18. τῷ λόγῳ. As Zabarella points out, it comes to the same thing whether we translate 'we must preserve by our account' or 'by our definition': for our account is to be the nominal definition of αἰξησις.


21a 27. μηδὲ ὑπομένωντος. These words rather disturb the logic. Still it would be rash to excise them, for Aristotle is not as a rule pedantically accurate.

21a 29. τοῦτο, sc. τὸ ὑπομένει τὸ αἰξανόμενον, the third characteristic condition of growth. We should rather have expected ταίτα: but Aristotle is thinking of the attempt to view the generation of air from water as αἰξησις. The primary ground of the failure of this attempt is the violation of the third condition of growth: cf. *21a 9–29. It is also true that 'there is no accession of fresh material': but that is an inevitable consequence of the absence of a persisting substratum, since there is nothing to which fresh material could accede.

21a 29—b 10. ἀπορήσει ... τοῦτῳ. The matter of growth, as we have seen, includes the food as well as the living body. Which of these is it that grows? We speak of a man 'growing in his shin': i.e. we regard the shin (the matería in qua) as 'that which grows'. Is this because the shin is that to which the new material (the food) is added, and therefore that which has increased in size? But if B is added to A, both B and A have increased: so that, from that point of view, both the shin and the food have increased in size, and both have 'grown'. We should expect τὸ αἰξανόμενον to include both: just as, when wine is mixed with water, the volume of the mixture as a whole—i.e. the volume of both and of either of the ingredients—is greater. The real reason why the shin only (and not the food, nor both shin and food together) is said to have 'grown', is that the substance of the shin persists, whilst that of the food is transformed: and that the efficient cause of the process (i.e. the αἰξησική ψυχὴ) is in the shin, but not in the food.
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21a 30. προστίθεται. It is not really πρόσθεσις, but more like μίξις (cf. a 33, 22a 9): though, as we shall see, it is not (strictly speaking) μίξις either. Cf. *27b 13-17.

21a 31-32. οὖν . . . οὖ, 'e.g. if a man grows in his shin, is it the shin which is greater?' and thus has 'grown', 'whilst that "whereby" he grows, viz. the food, is not greater, and has not "grown"?'

No mark of interrogation is required after οὖ, because the question is indirect, depending on ἀπορήσεις ὁ ἄν τις. In a 31 αὐξάνει is intransitive both times (cf. e.g. Post. Anal. 78b 6, Hist. Anim. 629a 21), the implied subject is ὁ ἄνθρωπος or τὸ ζῷον, τὴν κνήμην is an 'internal' accusative, and the dative ὅ (for which F wrongly gives ὃ) is undoubtedly right: cf. e.g. ὧν ἡ ἄλλοιωσις (21b 5), and * 21a 5-9.

21a 33-34. ὠμοίως . . . ἐκάτερον. πλεῖον (not μεῖον) shows that this clause refers to the ingredients of the μιγμα. ὠμοίως, i.e. if the wine has increased in volume, so—on the same principle—has the water.

21b 35 - b 2. ἐτεὶ . . . μιγμα. Even the example, which seemed to show that τὸ αὐξανόμενον includes both the shin and the food, really confirms the true view, viz. that only the shin 'grows'. For it is the 'prevailing' ingredient only which is said to have increased in volume (*35 λέγεται, sc. πλεῖον: *1 ὁτί οἶνος, sc. πλεῖον). If the mixture as a whole acts as wine, then wine is the 'prevailing' ingredient and its volume is said to have increased. So, in growth, the substance of the shin persists and prevails over the food, which is transformed. Hence the shin alone is said to have grown.

21b 2-10. ὠμοίως . . . τούτῳ. Alteration is here adduced as a parallel to growth: for τὸ ἄλλου ὁμόμενον and τὸ ὃ ἄλλοιωταί correspond respectively to τὸ αὐξανόμενον and τὸ ὃ αὐξάνει, and τὸ ἄλλοιον (the efficient cause of ἄλλοιωσις) corresponds to τὸ αὐξητικόν (cf. 22a 12).

Aristotle illustrates by an alteration of flesh (b 3), because he is thinking primarily of ἄλλοιωσις qua contributory to αὐξήσις: cf. * 20b 34—21a 29.


21b 5-6. ὃ . . . κάκεινο. τὸ ὃ ἄλλοιωταί is the external stimulus (cf. * 20a 8) of alteration, corresponding to the materia ex qua of growth (the food). The fire, e.g., is 'that, whereby' our temperature is altered.
On the distinction here implied between (i) an ‘altering agent’ which is itself affected by the reaction of the patient, and (ii) an ‘altering agent’ which is ἀπαθές, see *24a 24 — b 22.

21b 6—10. ἀλλὰ ... τοῦτον. The ἀλλοιωσις is not predicated of the ‘stimulus’, even though (in some alterations) the latter is itself affected. The flesh or the stomach, e. g., (not the food) is τὸ ἀλλοιωμένον, the proper subject of the process. For the ‘altering agent’ proper (τὸ ἄλλοιων in the sense of the ἀρχὴ τῆς κινήσεως or τὸ κινοῦν) is ‘in’ the flesh or the stomach, not ‘in’ the food.

Similarly the food is not τὸ αἰθανόμενον, even if it gets larger in some instances of growth. For (a) the food’s substance does not persist, and (b) ‘the agent’ of the growth—its efficient cause—is not ‘in’ the food, but ‘in’ the living body. For ‘the agent’ proper (τὸ κινοῦν) is the soul: cf. *20a 8, and 22a 12 (τὸ ἐνὸν αἰθητικὸν).

21b 9. οἶνον ... πνεύμα. Aristotle may be thinking of the conversion of a flatulent food into wind, as Zabarella suggests. But more probably he has in mind the maintenance and growth of the ἐμφύτων (or σύμφυτων) πνεύμα: cf. de Spiritu 481a 1 ff.

21b 10—16. ἐπειδὲ ... αὐξάνεσθαι. In order ‘to find a solution of the problem’ (*b 11 τῆς ἀπορίας, sc. the entire problem of growth), Aristotle reformulates the results of his discussion of the process and the matter of growth. In *b 11 αἰτῶν refers to the two questions, viz. (i) what is Growing or Diminishing (21a 1—2), and (ii) what is τὸ αἰθανόμενον (21a 29—32)? These two questions are themselves only restatements of the two topics put forward at 20a 8—10, viz. (i) how growth is distinctively defined, and (ii) how growth takes place: cf. *20a 10 — 22a 33.

21b 14. ὀρτίον σμήνεον αἰσθητόν. ‘Every perceptible particle’: for a body does not consist of points.

21b 15—16. καὶ ... αὐξάνεσθαι. Aristotle here assumes (i) that the food is a ‘body’, and (ii) that the growing body (*b 15 τὸ σῶμα, i. q. τὸ αἰθανόμενον) has no real ‘voids’ or ‘pores’ in it: cf. *21a 5—9.

21b 16—17. λιπτεῖν ... αἰτίων. We have formulated the ‘nominal definition’ of growth: for (i) we have stated the kind of process which growth is, and (ii) we have indicated what τὸ αἰθανόμενον is, i. e. the substance in which growth ‘inheres’ or of which it is a πάθος. If we can discover the adequate cause connecting growth with the substance which grows, we shall be able to construct a scientific definition, specifying (a) the substance in
which, (b) owing to a determinate cause, (c) that determinate process, which 'growth' means, must occur. Cf. Introd. §§ 8, 9: * 14a 2-3, * 20b 34—21a 29, * 28b 22.

What is this 'adequate cause' of growth? What corresponds in the scientific definition of growth to 'extinction of fire' and 'interposition of the earth' in the definitions of thunder and eclipse (cf. Introd., 1. c.?)

On the whole, I think that Zabarella has given the right answer to this question:—see, besides his note on the present passage, his Commentary on Post. Anal. 94a 20–35, and his treatise De medio demonstrationis, ii, especially Chapters 4–7.

The gist of the matter is as follows. Thunder and eclipse are πάθη linked to their subjects by causes 'external to' (i.e. separated in space from) those subjects. The nature of the clouds or of the moon is not per se (does not contain in itself) an adequate ground for the occurrence of thunder or eclipse: 'external' causes (in these instances, external 'efficient causes') are required to determine their inheritance in their subjects.

But growth is linked with its subject by an 'immanent' cause, viz. by the nature or 'form' of the growing thing itself. The growing thing is an ἐμφυσον σώμα—a body, whose 'form' is the basal soul (the ψυχή γεννητική or αἰειητική, cf. * 20a 8)—and, as such, it is (i) necessarily receptive of growth, i.e. of a process fulfilling the three characteristic conditions (cf. * 20b 34—21a 29). Such a process can occur in a σώμα quae informed by the basal soul; and it can occur nowhere else. The 'form' of the growing thing is thus the adequate ground of the possibility of growth. From this point of view, the growing thing, in virtue of the basal soul which is its 'form', may be called the material cause of growth—in the sense which Aristotle gives to 'material cause' in Post. Anal. 94a 20–35. But (ii) the same basal soul is also the (immanent) efficient cause of growth, though Aristotle says very little about it here from that point of view. Apparently, however, the occurrence and continuance of growth, and also its cessation and reversal (i.e. 'diminution'), are to be ascribed to the basal soul quae efficient cause: cf. 22a 28–33. If that is so, then the 'form' of the growing thing is the adequate cause, not only of the possibility, but also of the actual occurrence, of growth and diminution.

If the proposed interpretation be right, the unsatisfactoriness of Aristotle's doctrine is obvious enough. He is 'explaining' growth
by referring it to the basal soul—i.e. to τὸ αἰθητικὸν—as its cause. Incidentally, however, as we shall see, there are details of considerable interest in his account.

21b 17—22a 33. διώρισμένως . . . μένει. The plan of this passage, in which Aristotle expounds his own theory of growth, is as follows:

(i) 21b 17—22. The cause of growth is the 'form' of the growing thing (see preceding note). Hence, if we are to grasp the cause, we must determine precisely what the growing thing is: and for that purpose our attention is drawn to two preliminary distinctions.

(ii) 21b 22—22a 4. The growing thing, whether 'tissue' (ὁμοομερές) or 'organ' (ἀνομοομερές), grows—i.e. gets larger—as a whole (as form-in-matter), and does so by the accession of food. But this does not mean that food accedes to every part of the matter of the tissue or organ. The matter is in constant flux, always flowing in and out, and no material particle endures. We can only say that food accedes to every part of the tissue or organ qua form: i.e. the growth of the whole is a uniform proportional expansion of its 'figure' or 'structural plan'. The food is at first 'unlike' the growing thing: but in the process it is transformed and thus 'assimilated'.

(iii) 22a 4—16. An attempt is made to explain more precisely how the food is related to the growing thing, what its 'assimilation' is and how it is effected.

(iv) 22a 16—28. Growth is distinguished from nutrition: and it is explained more definitely in what sense (in growth) a determinate amount e.g. of flesh comes-to-be out of a food which is only potentially so-much-flesh.

(v) 22a 28—33. The 'form' of the growing thing—i.e. the basal soul, which shows itself as the 'structural plan' of the matter wherein it is immersed (cf. * 21b 24—25)—is the efficient cause of growth and diminution.

21b 17—19. ἐν . . . ἐκαστον. First preliminary distinction. The growing thing is either a ὅμοομερές, or an ἀνομοομερές (cf. * 14a 19): but the latter grows only by the growth of its constituent ὅμοομερή. The ὅμοομερή here in question are the 'tissues' of plants and animals, though Aristotle illustrates only from animals.

21b 19—22. ἐπειδὴ . . . ὀστοῦν. Second preliminary distinction. Flesh, or bone, or any tissue, is double in its nature: a fact which is indicated by linguistic usage. For these terms are...
applied ambiguously, so that they mean *sometimes* the tissue *qua* matter, and *at other times* the tissue *qua* form.

A tissue (e.g. flesh), considered in abstraction from the living body to which it belongs, is simply a μιχθέν—a mere chemical compound. Its *matter* is the four ‘simple bodies’ (or rather the four ‘elementary qualities’) and its *form* is adequately expressed in their ‘combining-formula’ (λόγος τῆς μιξεως). Similarly an organ (e.g. the hand), considered in abstraction from the living body to which it is organic, is simply an aggregate of tissues. Its *matter* is the tissues, of which it is composed, and its *form* their ‘synthesis’ (cf. *14a19*). It is in this sense that Alexander (περὶ κράσεως καὶ ανιερατείας, ed. Bruns, p. 235, ll. 17 ff.) interprets the distinction between *matter* and *form* of tissues and organs in the present passage.

But it is clear from what follows that Aristotle is thinking of tissues and organs as *constituents of the living organism*, i.e. as themselves ‘besouled’ or alive. The matter of the *living* tissue is the chemical compound, i.e. the tissue itself *qua* μιχθέν: and its form is the soul or ‘life’. And the matter of the *animate* organ (the living hand, e.g.) is the synthesized tissues. Its form is the soul, which manifests itself in the organ’s function (ἐργον), originating the movements and vital processes whereby the organ contributes to the maintenance of the life of the whole ἐμφυον (cf. e.g. *21b28–32, Metaph. 1036b28–32, 1025b32—1026a6, Meteor. 389b23—390b14).

21b24–25. ἰπο... γνώμενον. The primary object of this simile is to illustrate the flux of the flesh *qua matter*, and its persistence *qua form*. The *form* is the soul: but it is manifested in the matter as a ‘figure’, a ‘structural plan’ or a ‘scheme of proportions’, which limits or measures the matter. The use of the term μέτρον suggests the application of the illustration to growth. If we suppose the ‘measure’ of the flowing water to be, e.g., a bag of skin, open at both ends, inherently capable of expansion and contraction, the simile will illustrate the growth and diminution of a tissue. For a tissue—e.g. a bone or a muscle (a piece of σάρξ)—may be compared to a ‘duct’ (an αἰλός: cf. *22a28–33; Philoponos, pp. 169, 110; Alexander, l.c., p. 237, ll. 25 ff.), capable of expansion and contraction according as the matter, which flows through it and fills it, increases and diminishes in amount. The duct, as that which limits and measures the tissue, may be regarded as its ‘figure’ or ‘form’. But the duct is the
embodied vitality—the embodied power of expanding and contracting, growing and diminishing—which is the basal soul: for that soul is δύναμις τις ἐν ὑλῇ (22\textsuperscript{a} 29).

The words ἄει ... γινόμενον (\textsuperscript{b} 25) refer, I think, to the matter of the tissue, not to the water: ‘for particle after particle comes-to-be, and each successive particle is different.’

21\textsuperscript{b} 25-28. οὕτω ... μορίῳ. Growth is a uniform proportional expansion of the figure or structural plan of the tissue, an increase in which every part of the 'form' gets larger.

The form of the living tissue, as we know (* 21\textsuperscript{b} 19-22), is the soul: but the soul is essentially an εἶδος ἐνυλον, a δύναμις ἐν ὑλῇ, and it is manifested in the figure or 'scheme of proportions' which limits or 'measures' the tissue. Hence Aristotle can speak of 'an accession to each part of the form' (cf., however * 21\textsuperscript{b} 33-34), i.e. to each part of the embodied soul or materialized power. It is essential to the soul to animate a corporeal material, i.e. a quantum: and, in so far as the whole tissue is larger or smaller, its 'form' (i.e. its soul or vitality) is expanded or contracted, informing a greater or smaller quantum.

21\textsuperscript{b} 28-32. ἐπὶ ... βραχίων. Though what grows is the animated matter as a whole (as a σύνολον of form and matter), its growth is a uniform expansion of structural plan—an expansion of the scheme of proportions measuring the matter, not an addition to persisting material constituents. This fact—viz. ὅτι ἀνάλογον ηὐξηρατ, \textsuperscript{b} 29—is more manifest in the growth of the 'organs' than in that of the 'tissues', because the distinction of the form (the life embodied in the proportional structure, and expressed in the vital function, or ἐργον) from the matter is more obvious in the former than in the latter (cf. Meteor. 389\textsuperscript{b} 29—390\textsuperscript{b} 2). For the same reason (\textsuperscript{b} 31-32), conversely, there is more tendency to attribute 'flesh' and 'bone' to the corpse than 'hand' and 'arm'. In fact, what really persists for a time in the corpse is neither 'hand' and 'arm', nor 'flesh' and 'bone', but lifeless μυχθέντα (which we may mistake for 'tissues') and συνθέσεως-όλ-μυχθέντα bereft of the life which made them 'organs': cf. * 21\textsuperscript{b} 19-22.

21\textsuperscript{b} 33-34. κατὰ ... οὖ. 'For there has been an accession to every part of the flesh qua form, but not qua matter'—a more accurate statement of the doctrine than that given above, \textsuperscript{b} 27-28 (τοῦ δὲ χόρματος καὶ τοῦ εἶδους ὅτως μορίῳ, sc. προσγίνεται). But the fundamental difficulties of the doctrine, it need hardly be
said, remain unsolved. *How* can the ‘form’—the soul, or the embodied soul—expand? And what is meant by ‘accession to every part’, whether of the flesh *qua* form, or of the form itself? Aristotle attempts, in the following passage, to explain in what sense the food ‘accedes’.

21\(^{b}\) 35—22\(^{a}\) 4. μείγνω... ἀνωμοίω. The acceding body (the ‘food’) is at first ‘unlike’ the growing tissue, and is called ‘contrary’ to it. But in the process it is ‘transformed’ so as to be ‘assimilated’, i.e. made ‘like’ the tissue. Expressing this in the current contemporary phraseology (cf. e.g. 23\(^{b}\) 1—15), we can say ‘In one sense *Like grows by Like*, but in another sense *Unlike grows by Unlike*.

In 22\(^{a}\) 1 EJ read ἐναντίον, perhaps rightly. If we adopt this reading, we must take δ καλεῖται τροφῆ as a parenthesis. ἐναντίον, i. q. ἀνώμοιον: cf. de Animæ 416\(^{a}\) 29—34.

22\(^{a}\) 4—16. ἀπορήθειε... γένεσις. Aristotle restates—in his own terminology, and more fully—his doctrine concerning the food.

The food is *at first* only potentially the tissue, actually a different body: actually e.g. bread, only potentially flesh. ‘Assimilation’ is transformation, the passing-away of the bread and the coming-to-be of flesh. But it is a ‘transformation’ with two peculiar features: for (i) it presupposes that the food and the tissue have been ‘mixed together’, so as to be contained within one and the same immediately-continent place, and (ii) the agent of the transformation is not in the food (the food is not *of itself* transformed into flesh), but in the tissue. The ἀνεξητικῶν, immanent in the tissue, converts the food into flesh.

22\(^{a}\) 6—10. φθαρέν... μιχθέν; ‘This actual other, then, viz. the food, has passed-away and come-to-be flesh. But it has not been transformed into flesh alone by itself (for that would have been a *coming-to-be, not a growth*): on the contrary, it is the growing thing which has come-to-be flesh [and grown] by the food. In what way, then, has the food been modified by the growing thing so as to be transformed into flesh? Perhaps we should say that it has been mixed with the growing thing, as if one were to pour water into wine, and the wine were able to convert the new ingredient into water.’

The subject of παθῶν in \(^{a}\) 8 is not τὸ ἀνεξητικῶν, but τὸ ἀνεξητικῶν, i.e. the food: for (i) it is more natural to suggest that the food is ‘mixed’ with the tissue, than *vice versa*, (ii) the whole
problem concerns the food (cf. \( a^4 - 5 \) ἀπορήσετε... αὐξάνεται), and (iii) ὑπὸ τοῦτον \((a^8 - 9)\) ought to mean 'by the agency of this, i.e. the growing thing', and not simply 'by this', i.e. 'by the food' as τὸ ὀ αὐξάνεται. But if so, then γινεθῇ \((a^9)\) is impossible. We may either (i) reject γινεθῇ as a misplaced and mistaken marginal gloss on ἀλλὰ τὸ αὐξανόμενον τοῦτο \((a^8)\), or (ii) accept it as genuine, and read it after τοῦτο \((a^8)\), or (iii) correct it into γινεθῇ (cf. \( Φ\)).

(i) The excision of γινεθῇ is the simplest remedy. We should then have to supply in thought σάρξ γέγονεν \((a^7)\) as the verb, of which τοῦτο \((a^7)\), τὸ αὐξανόμενον \((a^8)\), and the substantive implied by παθῶν \((a^8)\) are the subjects. (ii) If we read γινεθῇ after τοῦτο \((a^8)\), we must regard it as an equivalent, but more natural, expression for σάρξ γέγονεν. If flesh grows, more flesh comes-to-be: but it is more natural to say 'the growing-thing—i.e. the flesh—has grown', than to say, 'the growing-thing has come-to-be flesh'. We must still supply σάρξ γέγονεν as the verb for τοῦτο in \( a^7 \), and for παθῶν in \( a^8 \). (iii) The chief objection to γινεθῇ is that it is so obvious a correction.


22a 9-10. ὁ... μιχθέν; ὃ δῆ, sc. ὃ δῆ ωῖνος. τὸ μιχθέν according to Aristotle's usual terminology means the compound which results from combining two or more ingredients. But, in view of \( a^9 \) (ἡ μιχθέν), it should probably be interpreted here as the new ingredient, i.e. the water.

22a 10-13. καὶ... σάρκα. Fire lays hold of the inflammable material and converts it into fire. Similarly the αὐξητικόν, immanent in the flesh, lays hold of the food (which is potentially flesh) and converts it into actual flesh. It consumes the food, as the fire consumes the wood. The comparison is specially appropriate, owing to the part played by τὸ σύμφυτον θερμῶν in digesting, and thus assimilating, the food: cf. * 20a 8, * 20b 34—21a 29, * 29b 24-26.

The unexpressed main verb, of which τὸ πῦρ \((a^10)\) is the subject, is ἐποίησεν ἐντελεχεία πῦρ: and προσελθόντος δυνάμει σαρκός \((a^12-13)\) is the object of an unexpressed ἄφαμενον. It would be easier, no doubt, if Aristotle had written \( τοῦ \) προσελθόντος \( καὶ \) δυνάμει σαρκός.

COMMENTARY

22^a 15. αὐξησις. This is not αὐξησις in the sense given to the term in the present chapter: cf. * 20^b 34—21^a 29. It is, however, analogous to growth, because—as Zabarella expresses it—‘ignis ex propria et insita virtute convertit combustibilia in se ipsum’.

22^a 16–20. ποσὸν ... ποσῆς. The food is an actual body of a certain size, e.g. a piece of bread of such and such cubic content. This actual body is potentially another actual body (the bread is potentially flesh), and its actual size is potentially a different size. Hence what comes-to-be in growth is not quantum-in-general out of the mere potentiality of quantum, but a tissue or an organ of a determinate size out of (by the accession of) e.g. a piece of bread of a (different) determinate size.

A similar principle holds in γένεσις. What comes-to-be is not animal-in-general, but such-and-such a specifically determinate animal (in a 17 we should probably read μὴτε τι τῶν with ΗΦΙΤ).

Philoponos points out that the parallel, as Aristotle here states it, breaks down if pressed. For man, e.g., comes-to-be out of a matter which is not an ‘animal’, whereas a piece of flesh of such-and-such a size does not come-to-be in growth out of a matter devoid of magnitude. But Aristotle is thinking primarily of the resultant, and not of the matter: otherwise he could have made the parallel exact. For just as the food, out of which the new quantum comes-to-be, is itself an actual quantum; so the matter, out of which the new body comes-to-be, is itself an actual body (cf. * 20^b 16–17).

22^a 19. σάρξ ... ἄνομομερῆ. ‘But what does come-to-be in growth is a something-quantified—so-much flesh or bone; or a hand or arm of such-and-such a size, i.e. the quantified tissues of these organic parts.’

I have added ἦ βραχίων after χεῖρ by conjecture: cf. 21^b 32. D^b reads ἦ χεῖρ ἦ νεῦρα. But νεῦρον is a ὁμοιομερῆ (cf. e.g. Meteor. 385^a 8), and we want a second ἄνομομερῆ to justify the plural τοῦτον.


22^a 20–22. ἦ ... σάρκα. ‘In so far as this acceding food is potentially the double result—e.g. is potentially so-much flesh—it produces growth: for it is bound to become actually both so-much and flesh’ (cf. 22^a 26–28). τὸ συναμφότερον is the predicate. It means ‘that which combines both the new substance and the new quantity’.

22^a 24. καὶ φθίνων. Nutrition continues through life: whether
there is growth (or diminution) as well, depends upon whether the living thing is able to assimilate more (or only less) food than is required to repair the waste of its tissues.

22a 25-26. kai . . . ἀλλο. Cf. * ι9b 3-4. The same difference is expressed above (a 23-24) in the words ταύτη . . . τῷ λόγῳ: for the definitions of nutrition and growth state what τὸ τροφή ἔλαιοι and τὸ αἰείσθεν ἔλαιοι respectively are.

22a 28. τροφή, i.e. 'nourishment', 'food quae nutritive': not (as e.g. at a 25) 'nutrition'.

22a 28-33. τοῦτο . . . μὲνει. 'As to this form' (the 'form' which grows in every part of itself, cf. 21b 22-34), 'it is a kind of power immersed in matter—a duct, as it were. If, then, a matter accedes—a matter, which is potentially a duct and also potentially possesses determinate quantity—the ducts to which such matter accedes will become bigger. But if this form or power is no longer able to act—if it has been weakened by the continued influx of matter, just as water, continually mixed in greater and greater quantity with wine, in the end makes the wine watery and converts it into water—then it will cause a diminution of the quantum of the tissue in which it is; though still the form persists.'

All the manuscripts, Bekker, and Prantl read ἀὖλος, ἀὖλοι. But ἀὖλος does not occur elsewhere in Aristotle, makes nonsense of the passage, and leaves ἐντοι (a 30) without an antecedent. After ἑστίν (a 29) J has, in the first hand, ὄμοίως δὲ καὶ ἀλλο ὅ τι οὖν ὅργανον, and the same words are implied in Π and Vatablus. Moreover, Vatablus renders ἀὖλος, ἀὖλοι by 'tibia', 'tibiae'. Clearly, then, there was a reading ἀὖλος, ἀὖλοι.

I have excised ἀνευ ὕλης (a 28) as a marginal note intended to explain or correct the un-Aristotelian ἀὖλος: and I regard the additional clause in J, Π, and Vatablus as a marginal note intended to explain the variant ἀὖλος—the annotator having misinterpreted ἀὖλος as 'flute', i.e. the stock Aristotelian example of an ὅργανον (cf. e.g. Meteor. 380b 31—390a 2).

Aristotle uses ἀὖλος for various kinds of 'ducts' or 'channels' in an animal's body: cf. Bonitz, Ind. 122a 26 ff. My conviction that Aristotle wrote ἀὖλος, ἀὖλοι here (in the sense of 'duct') is confirmed by 21b 24-28 (see * 21b 24-25). It is noticeable also that Philoponos, although he reads ἀὖλος, ἀὖλοι here, in a previous note (pp. 109, l. 26—110, l. 7) illustrates growth by ἀὖλοι ἑδύν Keyros, uses ἀὖλος in the sense of a 'duct' or 'channel', and speaks of τὰ ἀὖλοι ἑδύν ὅστα.
COMMENTARY

22\textsuperscript{a} 31–33. \(\lambda \alpha n \ldots \mu \varepsilon \nu e i\). The ‘form’ is the embodied \(\psi v u c h\) \(\alpha i \varepsilon \gamma t i k \iota\), the \(\delta \nu a m a s \alpha i \varepsilon \gamma t i k \iota\) which is essentially immersed in matter: cf. * 21\textsuperscript{b} 25–28. As the animal grows old, this ‘power’—the efficient cause of nutrition and growth—becomes weaker, i.e. unable to assimilate sufficient food to balance the waste of the tissues (cf. * 22\textsuperscript{a} 24). Aristotle compares this enfeeblement of the \(\alpha i \varepsilon \gamma t i k o w\) to the weakening of wine, when more and more water is mixed with it. But the parallel is not exact: for the ‘form’ of the tissue remains (a 33), whereas the wine is ultimately converted into water (a 32).

Aristotle’s meaning is clear: but the illustration (a 31–32 \(\alpha l l \ldots \kappa a i \, \ddot{o} \nu o p\)) is rather loosely attached to the main sentence. What has to be illustrated is the decay of the power embodied in the tissue: but what is expressed in the illustration is the action of the water in weakening the wine.

A. 6

22\textsuperscript{b} 1–26. \'Epe\(i \ldots \, \nu o \iota \sigma i s\). Aristotle has completed the first part of his task. He has given the ‘nominal definitions’ of \(\gamma \nu e \nu o s\) and \(\phi b o r \alpha\), of \(\alpha l l \nu o \nu o s\) and of \(\alpha i \varepsilon \gamma t i s\), thus distinguishing these changes from one another: and he has shown that \(\gamma \nu e \nu o s\) and \(\phi b o r \alpha\) actually occur. He now prepares to attack the second part of his task, viz. the discovery of the causes of \(\gamma \nu e \nu o s\) and \(\phi b o r \alpha\) (cf. e.g. * 14\textsuperscript{a} 2–3, * 17\textsuperscript{a} 32–19\textsuperscript{b} 5, * 20\textsuperscript{b} 34–21\textsuperscript{a} 29).

He selects as first for treatment ‘the matter’, the material constituents out of which the composite natural bodies come-to-be and into which they pass-away. These material constituents are, as we shall learn later, ‘the simple natural bodies’—Earth, Air, Fire, and Water. For in the last resort every \(\gamma \nu e \nu o s\) of a composite natural body is the coming-to-be of one or more new \(\delta \mu o \iota \mu e \rho \eta\), and every \(\phi b o r \alpha\) of a composite body is the disappearance of one or more existing \(\delta \mu o \iota \mu e \rho \eta\). And every \(\delta \mu o \iota \mu e \rho \varepsilon\) is a chemical compound whose constituents are Earth, Air, Fire, and Water (cf. * 14\textsuperscript{a} 19).

The first eight chapters of the second book—a section of the work to which Aristotle refers (de Anima 423\textsuperscript{b} 29; de Sensu 441\textsuperscript{b} 12) as \(\tau \alpha \, \pi e r \alpha \, \sigma t o \chi e l o v\)—are devoted to the consideration of these material constituents of the \(\delta \mu o \iota \mu e \rho \eta\). But these material constituents—‘the so-called elements’—constitute the \(\delta \mu o \iota \mu e \rho \eta\) by chemical combination (\(\mu i \varepsilon i s\)): ‘combination’ implies action and passion (\(\nu o i \varepsilon i \kappa a i \, \pi o \chi e i n, \nu o \iota \sigma i s\): and both \(\mu i \varepsilon i s\) and \(\nu o \iota \sigma i s\)
imply physical contact \((\Delta \phi) \eta \epsilon \tau \nu \zeta \phi \upsilon \kappa \iota \kappa \omega \iota \)\. Hence Aristotle explains \(\Delta \phi (22^b 26-23^a 34), \tau \nu \epsilon \iota \varsigma \delta \tau \psi \alpha \chi \varepsilon \nu \) and \(\mu \iota \xi (27^a 30-28^b 22)\), as a necessary preliminary to his treatment of the material constituents of the \(\delta \mu \omega \iota \omega \mu \varepsilon \rho \) (cf. also Introd. § 12).

22\(^b\) 1-2. \'Ετει ... ἐπείν\. In discussing the causes of coming-to-be ‘we must first investigate the matter, i.e. the so-called elements’ ... Zabarella is, I think, right in taking \(\pi \rho \omega \tau \omicron \nu \) to refer to the order in which Aristotle proposes to investigate the causes of \(\gamma \varepsilon \nu \varepsilon \iota \varsigma \) and \(\phi \theta \omicron \rho \alpha \)\. We are to begin with the material cause, i.e. ‘the matter’ in the sense of those material constituents of the \(\delta \mu \omega \iota \omega \mu \varepsilon \rho \) which are generally called ‘the elements’.

The words \(\acute{\kappa} \alpha \iota \tau \omega \nu \kappa \alpha \lambda \omicron \nu \eta \mu \epsilon \mu \epsilon \nu \alpha \nu \varepsilon \iota \chi \varepsilon \iota \varsigma \varepsilon \iota \varsigma \) are explanatory of \(\tau \eta \varsigma \) \(\upsilon \lambda \gamma \). Aristotle has already treated of the \(\upsilon \lambda \gamma \) of \(\gamma \varepsilon \nu \varepsilon \iota \varsigma \) and \(\phi \theta \omicron \rho \alpha \) in the sense of \(\pi \rho \omega \tau \omicron \nu \upsilon \lambda \gamma \) (cf. A. 3, and e.g. * 17\(^a\) 32—19\(^b\) 5) he is now to treat of the \(\upsilon \lambda \gamma \) in a different sense. He is not now concerned with that \(c o n d i t i o \ s i n g u a \ n o n \) of unqualified \(\gamma \varepsilon \nu \varepsilon \iota \varsigma \) and \(\phi \theta \omicron \rho \alpha \) which ultimate analysis forces us to ‘isolate by definition’ (cf. * 20\(^b\) 17-25), but with the actually-existent antecedents of \(\gamma \varepsilon \nu \varepsilon \iota \varsigma \)—the proximate materials out of which the \(\delta \mu \omega \iota \omega \mu \varepsilon \rho \) come-to-be and into which they pass-away. These are themselves ‘bodies’, perceptible things, viz. Earth, Air, Fire, and Water. According to Aristotle’s own doctrine, they are ‘simple’ or elementary \(b o d i e s \) (\(\tau \alpha \ \alpha \eta \pi \lambda \alpha \ \sigma \o\omega \mu \alpha \tau \)\), i.e. they cannot be dissolved into any more primitive corporeal constituents. But they presuppose (logically, though not temporally) more primitive ‘constitutive moments’: for they are informations of \(\pi \rho \omega \tau \omicron \nu \upsilon \lambda \gamma \), explicable in terms of \(\pi \rho \omega \tau \omicron \nu \upsilon \lambda \gamma \) and ‘the contrary qualities’ (Hot, Cold, Dry, Moist). Aristotle prefers to reserve the term \(\sigma \tau \omicron \chi \varepsilon \iota \) for the absolutely underivative and unanalyisable immanent \(\alpha \rho \chi \alpha \) of ‘body’, viz. \(\pi \rho \omega \tau \omicron \nu \upsilon \lambda \gamma \) and the \(\xi \iota \varsigma \) and \(\sigma \tau \omicron \rho \rho \sigma \iota \varsigma \) which are its primary ‘constitutive moments’: cf. e.g. \(M e t a \varphi h. \ 1070^b 22-30, * 29^a 5\). Hence here and elsewhere (cf. Bonitz, \(I n d . \ 702^b 2-7\) he refers to the simple bodies as \(\tau \alpha \ \kappa \alpha \lambda \omicron \nu \eta \mu \epsilon \mu \epsilon \nu \alpha \nu \varepsilon \iota \chi \varepsilon \iota \varsigma \varepsilon \iota \varsigma \), the commonly so-called ‘elements’ (cf. e.g. 28\(^b\) 31, * 29\(^a\) 24—3; and see Diels, \(E i m e n t u m\), p. 25\(^a\)).

22\(^b\) 2-3. \(e\upiota\) ... \(\gamma \iota \gamma \nu \varepsilon \tau \alpha \iota \rho \nu i\). This is the first of two questions (to be discussed in the second book) concerning the material constituents of the \(\delta \mu \omega \iota \omega \mu \varepsilon \rho \)\. ‘Are they really \(\sigma \tau \omicron \chi \varepsilon \iota \) (as they are commonly called) or not? In other words, are they eternal, or is there a sense in which they come-to-be?’
The words καὶ ὑγνεῖαι πως are explanatory of ἐστι ὑπερὰνετεῖν. The question is not whether Earth, Air, Fire, and Water exist, but whether they are στοιχεῖα, i.e. primary and underivative constituents of things. If they are στοιχεῖα, they must be ἄδια, as e.g. Empedokles maintained (cf. * 15a 4–8).

It will be convenient at this point to restate Aristotle's doctrine of the simple bodies as constituting the physical universe. In rough outline, as the reader will remember (cf. Introd. § 10), that doctrine is as follows:—The physical universe is divided into the Upper Cosmos or heavens, and the Lower Cosmos or sublunary world. The Upper Cosmos consists entirely of the Aether. The Lower Cosmos is a series of concentric spherical strata. The lowest of these strata—the central region both of the sublunary world and of the whole universe—is Earth. The next stratum, immediately surrounding Earth, is Water. Air immediately envelopes Water: and the uppermost stratum, immediately surrounding Air, is Fire.

This rough outline must now be supplemented and corrected. For though it is an accurate summary of Aristotle's doctrine as that is stated in many passages, it totally neglects another most important side of his teaching: and, by that omission, it suggests the erroneous view that the physical universe, as he conceives it, is a static arrangement of quiescent strata.

(i) Not much need at present be said with regard to the Upper Cosmos (see, for a fuller account, e.g. * 36a 14–b 10). The Aether, which constitutes it, is anything but quiescent: on the contrary, it is eternally-revolving. But there is no interchange between the Aether and the simple bodies of the Lower Cosmos. The Aether is in no sense identical with, or akin to, Earth, Air, Fire, and Water. Hence there can be no ποιεῖν καὶ πᾶσα ἁπάσαι, and therefore no reciprocal contact, between the two worlds. Yet Aristotle maintains that there is a one-sided connexion. For the lowest sphere of the heavens is conterminous with the uppermost stratum of the sublunary world. Hence the Upper Cosmos 'touches' and 'moves' and 'steers' (cf. Meteor. 339a 21–24) the Lower, without itself being 'touched' or moved or in any way affected by the latter (cf. * 22b 32—23a 34, * 23a 12–22, * 23a 25–33).

But (ii) as regards the Lower Cosmos, we must recognize not only that each stratum is far from quiescent, but also that all four simple bodies are in constant process of reciprocal transformation. It is thus somewhat dangerous to speak of strata at all. It is
true, no doubt, that each of the four bodies tends to move towards, and to stay in, its own proper region: but there is a continuous interchange of matter from region to region. The sublunary world, we must remember, is the proper sphere of γένεσις and φθορά. The four simple bodies are for ever coming-to-be out of, and passing-away into, one another: and it is primarily in virtue of this unbroken cycle of reciprocal transformations that they constitute and maintain the structure of the sublunary world.

A full account of Aristotle's theory would involve a close examination of his statements concerning 'the twofold exhalation' (διπλή ἀναθυμίασις), which plays a central part in the interchanges of the simple bodies constituting the Lower Cosmos (cf. Meteor. e.g. 341 b 5 ff., with Alexander's commentary: Gilbert, e.g. pp. 460 ff.). But, for our present purpose, the following brief indications must suffice. The earth, owing to the heat of the sun, gives off a twofold exhalation, which is partly hot-moist and partly hot-dry. The hot-moist exhalation (ἄτμις, ἀτμιδώδης ἀναθυμίασις) is drawn from the water on the surface of the earth. It is—Aristotle says in one passage (Meteor. 360 a 21-27)—'in its own nature cold, like water before it has been heated': and it retains a watery character throughout (it is δυνάμει ὁλον οὖδωρ). We must conceive it as a kind of mist or aqueous vapour: water in process of transition to air, or air still capable of reverting to water. The simple body, which Aristotle usually calls 'air', is a hot-moist body, formed in part from the moisture in the ἄτμις and in part from the heat in the other exhalation (cf. *31 a 24). This other exhalation (πνευματώδης or καπνώδης ἀναθυμίασις, or sometimes par excellence ἀναθυμίασις simply) is a hot-dry vapour drawn by the sun 'from the earth itself', and not from the water on the earth's surface. (On this puzzling exhalation, see Gilbert, pp. 465 ff.) Aristotle speaks of it as δυνάμει ὁλον τῷ, and conceives it as rising above the ἄτμις owing to its greater lightness. Hence above the 'air'—i.e. above the region where the ἄτμις predominates, and where clouds are formed—there comes-to-be a simple body, which Aristotle usually calls 'fire'. In reality it is a hot-dry body, constituted by the πνευματώδης ἀναθυμίασις. It is a highly-inflammable stuff (ὁλον ὑπεκκαμα), of which fire proper is an intensification: cf. Meteor. 340 b 21-23, *30 b 33-30, *31 b 24-26. Aristotle explains 'shooting stars' and 'meteors' (and even the light and heat of the stars and planets, cf. Introd. p. xxxvi.), as the bursting into flame of parts of this combustible stuff, owing
to the friction produced in it by the movement of the conterminous sphere of the aetherial Cosmos (cf. Meteor. 341b 1 ff.).

22b 3-4. καὶ ... ἐστὶν. This is the second of the questions (to be discussed in the second book) concerning Earth, Air, Fire, and Water. Aristotle's own view is that 'they all come-to-be in the same manner, reciprocally out of one another'; though he thinks that there is a certain cyclical order in which their transformation is most easily and naturally effected. But various philosophers had selected one or other of these four bodies as primary and eternal, i.e. as the original stuff out of which everything else came-to-be and into which everything else passed-away. Thus, e.g., Thales had selected 'Water', Anaximenes and Diogenes of Apollonia 'Air', and Heracleitos 'Fire'.

22b 6-9. πάντες ... σαφῶς. All the pluralist philosophers—viz. (a) those who (like Anaxagoras, Leukippos, Demokritos, and Plato) regard Earth, Air, Fire, and Water as derivative, and trace them (as well as the composite bodies) to prior 'reals' as their constituents, and (b) those who (like Empedokles) regard Earth, Air, Fire, and Water as genuine 'elements', i.e. as underivative, and derive the composite bodies from them—employ, in their 'derivations', association and dissociation, and action and passion. And by 'association' they mean combination.

(Cf. 29a 1-5. For Empedokles, cf. 14b 7-8, 15a 23-25; for Anaxagoras, * 14a 13-15, 14a 24—b 1; for Leukippos and Demokritos, * 14a 21-24, 15b 6-15, * 15b 33—16a 2; for Plato, * 15b 29-33, 15b 28—16a 4.)

22b 9-II. ἀλλὰ ... πάρχοντος. 'But, again, there cannot be Altering, any more than there can be Dissociating and Associating, without an Agent and a Patient.'

Aristotle has just shown that all pluralist philosophies must employ combination and action—passion. He had also argued (cf. * 14a 6—b 8) that all monistic theories must identify γένεσις with ἀλλοίωσις. He now maintains that ἀλλοίωσις necessarily involves action—passion, so that the monists (as well as the pluralists) must employ action—passion.

22b 12. καὶ τοῖς, sc. γεννῶσιν. The emphasis is on this clause: for Aristotle's point is that the monists, no less than the pluralists, are forced to employ ποιήσις, i.e. ποιεῖν καὶ πάρχειν. The variant καίτω is a stupid correction due to misunderstanding.

22b 13-21. καὶ ... ἐστὶν. Diogenes of Apollonia (cf. fr. 2; Diels, p. 334) argued that 'all things are derived from one, because
otherwise reciprocal action—passion could not have occurred'.
In this he was so far right, that all things between which reciprocal action—passion occurs must be derived from one; but he was wrong in supposing that all things are transformations of a single substratum (b 20 τοιαῦτα). Between the οὐφανὸς and the things of the Lower Cosmos, e.g., there is no reciprocal action—passion.

22\textsuperscript{b} 18—19. ἀνάγκη . . . φύσις: 'that which underlies them must be a single something.' For this use of φύσις, cf. \textit{Phys.} 191\textsuperscript{a} 8, Bonitz, \textit{Ind.} 838\textsuperscript{a} 8 ff.

22\textsuperscript{b} 25. πρῶτον. Philoponos takes πρῶτον with ἀφάμενα, but the aorist alone is sufficient. Perhaps the meaning is 'things cannot combine at all—combination is utterly impossible—unless they have come into a certain kind of contact'.

22\textsuperscript{b} 28. τοῦτοις, sc. ἀνάγκη εἶναι ἀλλήλουν ἀπτικοῖς.

22\textsuperscript{b} 29. διὸ . . . ἀφῆς. According to the definition of contact in the \textit{Physics} (cf. 226\textsuperscript{b} 23, 231\textsuperscript{a} 18 ff.; * 16\textsuperscript{b} 4), which is presupposed throughout the present passage, there is contact when the 'extremes' of any two things are 'together', viz. are in the same immediately-continent place.

But contact thus defined is manifested by τὰ μαθηματικά as well as by τὰ φυσικὰ: the things, whose extremes are together, need not be 'perceptible bodies', but might equally well be mathematical solids, surfaces, or lines.

Hence, since Aristotle's object here is to determine the conditions of contact between φυσικὰ σώματα (cf. 23\textsuperscript{a} 34 ἀφῆς τῆς ἐν τοῖς φυσικοῖς), the definition of the \textit{Physics} requires further specification: see * 22\textsuperscript{b} 32—23\textsuperscript{a} 34.

22\textsuperscript{b} 29—32. σχεδόν . . . ἀφῆς. 'Now every term which possesses a variety of meanings includes those various meanings either owing to a mere coincidence of language, or owing to a real order of derivation in the different things to which it is applied. This may be taken to hold of Contact as of all such terms.'

Aristotle assumes that ἀφῆ is a term with many meanings, and urges that therefore (like all such terms) it includes its many meanings either (1) by a mere linguistic accident or (2) because of a real affiliation, viz. because the different things meant all derive from, or all contribute to, one and the same primary thing meant.

The stress is on ὁσπερ (b 30), which is answered by οὕτως . . .
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\(\text{άφη} \) \(\text{σ} \) \(\text{ς} \) \(\text{(b 32)}\): and the precise meaning of \(\text{φυσικά} \) is explained in the clause \(\text{καὶ...προτέρων} \) \(\text{(b 31–32)}\). In other words, the correspondence between \(\text{άφη} \) and every other term with many meanings lies in the manner in which the term possesses its variety of significance, viz. that the variety must be connected in one of two different ways.

For the well-known Aristotelian distinction between (i) \(\text{τὰ καθ' ἐν λεγόμενα} \) (i.e. \(\text{τὰ συνώνυμα} \)) and (ii) \(\text{τὰ πολλαχῶς λεγόμενα} \), including (a) \(\text{τὰ ὀμονύμως λεγόμενα} \) and (b) \(\text{τὰ πρὸς ἐν καὶ μίαν τινὰ φύσιν λεγόμενα} \) (or \(\text{τὰ ἀφ' ἐνός λεγόμενα} \), cf. e.g. \(\text{Metaph. 1003a 33 – b 19, 1004a 21–31, Eth. Nic. 1096b 26–29}. \)

As a rule it is not the terms, but the different things denoted by the terms, which are said \(\text{λέγεσθαι} \) \(\text{συνώνυμως} \), or \(\text{λέγεσθαι} \) \(\text{πολλαχῶς} \) (\(\text{ὀμονύμως} \), or \(\text{πρὸς ἐν καὶ ἀφ' ἐνός} \). But, if the text of the present passage is right, \(\text{τὰ μὲν} \) and \(\text{τὰ δὲ} \) \(\text{(b 31)}\) must mean ‘some of the \(\text{ὄνόματα} \), ‘others of the \(\text{ὄνόματα} \)’. And, if so, it is strange that Aristotle should not have expressly stated that some of these \(\text{ὄνόματα} \) with many meanings fall under both headings. That is the case, e.g., with \(\text{άφη} \). For (i) it is a mere accident of language that \(\text{ἄπτεσθαι} \) is applied to ‘the man who grieves us’ (cf. \(\text{23a 32–33}\)) as well as to ‘two bodies, the extremes of which are together’. On the other hand (ii) the different meanings of \(\text{ἄπτεσθαι} \) as applied (a) to \(\text{γεωμετρικά} \), (b) to the physical bodies in the sublunar world, and (c) to the \(\text{οὐρανός} \) in its relation to the uppermost \(\text{stratum} \) of the Lower Cosmos, have a genuine logical affiliation.

For the idiomatic use of \(\text{σχεδόν} \) in \(\text{b 29} \) (‘modeste affirmantis, cf. \(\text{τῶς} \)’), see Bonitz, \(\text{Ind. s. v.} \). The concessive \(\text{μὲν} \) \(\text{ὅν} \) is answered by \(\text{οἷς} \) \(\text{δὲ} \) \(\text{(b 32)}\).

\(\text{22b 32–23a 34. ὀμως} \ldots \text{τρόπων}. \) Contact in the strict sense, from which all its other senses (except those due to a mere linguistic coincidence) derive, applies only to ‘things which have position’. But in order to ‘have position’ a thing must be ‘in place’, i.e. must be a body with magnitude. And a body which is ‘in place’ must be heavy or light. Finally, bodies, which are heavy or light, are \(\text{παθητικά} \) καὶ \(\text{πουθητικά} \). Hence the full definition of \(\text{contact} \), in the strict and primary sense, restricts the term to \(\text{reciprocal contact} \) of \(\text{φυσικά} \) \(\text{ὄνόματα} \): things which ‘touch’, in the strictest sense, must be such that ‘they are able to move, and be moved by, one another so that there is action—passion between them’ (cf. \(\text{* 23a 22–25} \)).
But (i) there is contact, in a wider and less strict sense, which is not reciprocal. Thus the ὀφανὺς moves the Lower Cosmos, and the latter is moved by it. But this moving and being-moved are not reciprocal action—passion: i.e. the ὀφανὺς is not moved by the Lower Cosmos, nor does the latter move it (cf. *23a 12—22).

Hence, though the ὀφανὺς ‘touches’ the Lower Cosmos (since the remaining conditions of contact are fulfilled), the ἀφή is not reciprocal. And (ii) we apply the term ‘contact’ in a still looser and more derivative sense to τὰ μαθηματικὰ (geometrical solids, surfaces, and lines). It is not really τὰ μαθηματικὰ as such—not the mathematical abstracta—which ‘touch’: for they are not ‘in place’. They are only ‘in place’ qua inseparable characters of the φυσικὰ σώματα: and it is only so far—only in virtue of the bodies to which they are adjectival—that they can be said to ‘touch’ (cf. *20a 34—b 2, *20b 3—5, *20b 14—16).

22b 33—23a 3. θέσις ... τόπος. Aristotle here (and below, 23a 6) restricts θέσις to the things which are ‘in place’, i.e. to κίνητα σώματα. Yet θέσις is attributed to the μαθηματικὰ (e.g. to the point, cf. *20a 34—b 2), and they are said to ‘touch’. Hence Aristotle finds it necessary to dispose of this apparent exception to his doctrine that only things, which are ‘in place’, can ‘have position’ and ‘touch’. Now Aristotle believed that there were in the physical Cosmos a real, or absolute, ‘Above’ and ‘Below’; and that e.g. each of the four simple bodies had its ‘proper place’ and its absolute position in the sublunary world (cf. Introd. §10, *22b 2—3, *23a 6—8). The θέσις, of which he is here speaking, is absolute position—i.e. position relative to the real ‘Above’ and ‘Below’ (cf. 23a 6—8). And, in this sense, only things which are ‘in place’—only the φυσικὰ σώματα—can have ‘position’.

In what sense, then, can the mathematical things be said to ‘have position’ and to ‘touch’? (i) As we saw in the preceding note, the quantitative determinations of things exist as adjectives of φυσικὰ σώματα which are ‘in place’, ‘have position’, and ‘touch’: and they may be regarded as sharing in the θέσις and ἀφή, which primarily belong to the φυσικὰ σώματα, in so far as they share also in their τόπος. But (ii) the isolated quantitative determinations—the abstracta which are τὰ μαθηματικὰ proper, the objects of mathematical science—have a position relative to us who conceive them, so that we distinguish e.g. the ‘right’ and ‘left’ of a figure (cf. Phys. 208b 22—25). They are located by
the mathematician’s conception in an *imaginary* place: and in that place they are assigned ‘positions’ relative to one another, and are capable of ‘contact’. Thus, when *θεωμα* is attributed to the abstract mathematical entities, ‘place’ is also attributed to them—not indeed the real place which contains the *ϕυσικά σώματα*, but an imaginary extension. For even the abstract geometrical figures involve an ideal or imaginary extension (τὸ *συνεχές*) as their matter (νοητὴ ἕλη). *This* geometrical circle, e.g., which cuts *that*, is a *σύνολον*: it is the form of circle (circularity) informing *this*, as distinguished from *that*, area or piece of τὸ *συνεχές*. Cf. e.g. *Metaph.* 1036a 2–12, 1036b 32—1037a 5.

23a 2–3. εἰτ’... πρόσων. The mathematical things can be said to *touch* only in the sense in which they can be said to be *in place*. This applies, whether they have an independent existence (as e.g. Plato wrongly supposed), or whether they ‘are’ in some other fashion (e.g. as inseparable adjectives of the *ϕυσικά σώματα*, or as abstracted objects of thought).

For *κεχωρισμένον* (here equivalent to ‘separate from perceptible body’), cf. e.g. *20a* 31–34. Zabarella, however, perhaps rightly supposes Aristotle to mean ‘whether by τὰ μαθηματικά we understand the abstracted forms of which the mathematician treats, or the quantitative characters of the perceptible things’.

23a 3. πρόσων. The reference is to the *Physics*: cf. *22b* 29.

23a 5. διηρημένα. The manuscripts and Philoponos all read διωρισμένα. It is true that ποσὸν διωρισμένον is contrasted with ποσὸν *συνεχές* (*Cat.* 4b 20–25): but it is clear from the context that the antithesis *there* is between Discrete Quanta (e.g. *Number*) and Continuous Quanta (e.g. *Figure*). The term διωρισμένον does not appear to be used in the sense here required, viz. to mark the distinction between two separate, but contiguous, μέγεθη and a single continuous μέγεθος. It would no doubt be possible to defend διωρισμένα by passages like de *Caelo* 275b 30 (διωρισμένα τῷ κενῷ) and *Phys.* 213b 24 (τὸ κενὸν, διωρίζει τὰς φύσεις): but in view of 23a 11 I have ventured to read διηρημένα here.

23a 6–8. τόπο... αὐτικειμένων. The primary differentiation of place (πρῶτη διαφορά τῶν) distinguishes it into (a) the *Above* (the periphery of the Lower Cosmos)—the region of the absolutely light body, ‘Fire’: (b) the *Below* (the centre)—the region of the absolutely heavy body, Earth: (c) the relatively *Upper* and *Lower* (τὰ τοιοῦτα τῶν ἀντικειμένων)—the regions of the relatively light

But in some passages (cf. de Caelo 284b 6—286a 2; de Anim. Incessu 704b 12-22, 705a 26 ff.) Aristotle develops a more elaborate doctrine with regard to the dimensions of 'place' and the distinctions of place within the Cosmos:

(i) In any body regarded as filling a place, or in the place containing any body, we must distinguish three dimensions, Length, Breadth, and Depth. Each dimension is the interval between a pair of opposites, viz. Above and Below (Top and Bottom), Before and Behind (Front and Back), Right and Left. One opposite in each pair is the 'origin' (ἀρχή) of the dimension in question, and is therefore 'prior' to the other: thus Above is prior to Below, Before prior to Behind, and Right prior to Left. And since length is the most fundamental of the three dimensions (for line can be conceived in abstraction from surface and solid, but not vice versa), the differentiation of place into Above and Below is the πρώτη διαφορά τότου.

(ii) We may call this the schematic significance of the differentiation of place. But Aristotle thinks that the ground of these differences in place lies in the κυρήσεις of living bodies: i.e. he maintains that their primary significance is functional. In all living things, the Above is that part of the body whence the food is distributed, i.e. whence αἰτήσις originates. In animals, therefore, 'the top' is the head or mouth: in plants, it is the roots. In animals, the Before is the region upon which their αἰτήσις is directed (that which is in front of them), or that part of the animal's body whence its αἰτήσις proceeds (the front of the animal). And in animals which move from place to place, the Right (as Aristotle labours not very successfully to prove) is that part of the animal's body from which its locomotion originates. Since all living things exhibit αἰτήσις, whilst only some perceive and move, the distinction of Above and Below, in this functional as well as in the schematic sense, is the primary differentiation of the three.

(iii) Now the οὐρανός—the physical universe—is ξύψινος καὶ ἔχει κυρήσεως ἀρχήν (de Caelo 285a 29-30). Hence we must ascribe to it an Above and Below, and a Right and Left, in the functional sense—as indeed Aristotle attempts to do. He identifies the South Pole with the Above, the North Pole with the Below, the East with the Right, and the West with the Left (cf. Heath,
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pp. 231–2. It is clear, however, that the intended analogy with the animals breaks down. For (a) the differentiation into Above and Below is, in the ὀὐρανός, connected with its circular movement, whereas in the animals it was connected with ἀείθεος: and (b) the differentiation into Front and Back disappears altogether, for an obvious reason. For if we attributed ἀείθεος to the ὀὐρανός, we should have to say of it, as Xenophanes said of his θεός, οὐλος ὀρῷ, οὐλος δὲ νοεί, οὐλος δὲ τ' ἄκονει.

23a 9. ἃ μφω ἃ θάτερον. If A and B are in reciprocal contact, either A must be heavy and B light, or A light and B heavy (ἁ μφω); or A and B must both be heavy, or both be light (ἁ θάτερον).

Or perhaps we should interpret this as applying to the different ἀλληλῶν ἀπτόμενα severally. For of these Earth is absolutely heavy and Fire absolutely light: whilst Air and Water are, each of them, both relatively light and relatively heavy.

23a 9–10. τὰ . . . ποιητικά. This is not inconsistent with 29b 20–22, where Aristotle denies that heaviness and lightness are the source of action–passion (cf. and contrast Bäumker, p. 242a). Earth, Air, Fire, and Water are necessarily heavy and light, and essentially ποιητικά καὶ παθητικά: but their action and passion are not the effects of their heaviness and lightness.

23a 12–22. ἐπεὶ . . . οὐ. Aristotle has substituted κυνητικῶν for ποιητικῶν and κυνητῶν for παθητικῶν (23a 12): but there is an ambiguity in both pairs of terms, to which he here calls attention. For (i) A may ‘move’ B without itself being moved by the latter: or (ii) A may ‘move’ B; and, in doing so, be itself moved by B (α 13–14 ἀλλὰ . . . οὐ. That this is the distinction here intended, is rightly emphasized by Zabarella and is manifest from Aristotle’s treatment below, 24a 24 ff.). Thus (i) the πρῶτος ὀυρανός (to take the chief instance which Aristotle here seems to have in mind), being itself moved by the πρῶτον κυνίν, imparts movement to the Lower Cosmos, and is relatively to the latter ἀκινητός: for the Lower Cosmos does not react upon the ὀυρανός. We may speak of the ὀυρανός as ‘acting upon’ the Lower Cosmos, and of the latter as ‘being acted upon’ by it. But though there is action and passion, and moving and being-moved, there is no reaction and re-passion in this relation and no reciprocal being-moved and moving. And though we may speak of ἄφνη, it is not ‘physical contact’ proper. What ‘touches’—viz.
the *óρανός*—is not heavy or light: hence there can be no reciprocal action—passion between it and the Lower Cosmos, and therefore the latter cannot ‘touch’ it. But ‘physical contact’ proper is reciprocal.

On the other hand (ii) the term ποιών in the strict sense applies only to a body which causes a change of πάθος in another body. The process here is διαλοίωσις, and the patient reacts upon the agent so that the latter is in turn itself patient. This kind of κίνησις can occur only between bodies which are heavy and light, or both heavy, or both light (cf. *23a* 9)—i.e. between bodies of the sublunary world. Thus, e.g., the hot body warms the cold body and, in doing so, is itself cooled by the latter. And this reciprocal κίνησις (i.e. διαλοίωσις) presupposes reciprocal contact, or ‘physical contact’ proper.

23a 17-20. εἰπερ...θερμόν: ‘if we are to speak of agent in a sense contrasted with παθέnt, and if this’ (πούτος, viz. the term πάσχων) ‘is to be applied only to those moved things whose motion is a qualitative affection—i.e. a quality, such as White or Hot, in respect to which they are moved only in the sense that they are altered.’

23a 22-25. ἄλλ...πάσχειν. The conditions which must be satisfied by two bodies, if they are to ‘touch’ in the widest and most general sense of the term (καθόλου μὲν), are (a) that they should have θέσις, and (b) that the one should be κινητικόν and the other κινητόν. These conditions are satisfied e.g. by the *óρανός* and the Lower Cosmos in their relation to one another. But if two bodies are to ‘touch one another’—i.e. if there is to be reciprocal contact (contact in the strictest sense) between them (πρὸς ἄλληλα δὲ, sc. ὁ διορισμὸς τοῦ πρὸς ἄλληλα ἀπτεσθαί)—they must (a) have θέσις, and (b) alter and be altered by one another. (The words ἐν οἷς ὑπάρχει τὸ ποιεῖν καὶ τὸ πάσχειν define the kind of κινητικόν καὶ κινητόν which reciprocal contact demands.) These conditions are satisfied only by the bodies of the Lower Cosmos; for they alone are capable of an action—passion which is simultaneously a re-passion and reaction. For διορισμός, cf. *34b* 20-30.

23a 25-33. ἔστι...ἐκεῖνον. In almost all the processes which we observe in the sublunary world that which moves or acts is in turn moved or acted upon by that which it moves or on which it acts. Hence we find it difficult to conceive a contact which is not reciprocal. Nevertheless we do sometimes speak of a ‘mover’ communicating motion by ‘just touching’ (*a* 29 µόνον) the moved:
as, indeed, we speak (metaphorically) of the man who grieves us as ‘touching’ us, without suggesting that we ‘touch’ him.

If a ‘mover’ communicates motion without being moved by that which it moves (\(\text{a} \ 31 \ \alpha \kappa \nu \gamma \tau \rho \nu \ \delta \nu \), cf. *23^a 12-22), we must admit a ‘contact’ which is not reciprocal.

23^a 26. \(\sigma \chi \varepsilon \delta \nu \). There are exceptions: e. g. (as Philoponos points out) the \(\epsilon \rho \omega \mu \varepsilon \nu \sigma \ \kappa \iota \nu \alpha \iota \) without necessarily being ‘moved’ in turn by the lover.

23^a 30. \(\delta \mu \alpha \gamma \varepsilon \nu \). For the form, see Bonitz, \(\text{Ind.} \ 51^b \ 10-11\). The meaning of \(\tau \alpha \ \delta \mu \alpha \gamma \varepsilon \nu \) here is explained below, 23^b 29—24^a 5.

23^a 34. \(\tau \iota \ \varepsilon \nu \ \tau \iota \iota \ \phi \sigma \iota \kappa \iota \iota \iota \), i. e. as contrasted with (a) \(\alpha \phi \iota \) between the mathematical things, and (b) the one-sided \(\alpha \phi \iota \) of the \(\omega \iota \rho \alpha \rho \alpha \varsigma \) and the Lower Cosmos: cf. *22^b 29.

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23^b 1—24^b 24. \(\pi \epsilon \iota \ldots \tau \rho \tau \omicron \omicron\). In this chapter, which together with the next two chapters explains \(\pi \omega \epsilon \nu \epsilon \nu \pi \alpha \omicron \chi \epsilon \nu \) (cf. *22^b 1—26), Aristotle discusses and answers the question ‘What kind of things can act and suffer action reciprocally?’

He begins (23^b 1—15) by quoting two apparently conflicting views, together with the arguments of their advocates. The first view—that Like cannot be affected by Like, i. e. that only Unlikes or Differents can act and suffer action reciprocally—he attributes to the majority of his predecessors. The second view—that what acts and suffers action must be Like, i. e. Identical—he ascribes to Demokritos. Next (23^b 15—24^a 9) he develops his own view by a criticism of his predecessors. The true doctrine is:—‘What acts and suffers action reciprocally must be contrasted \(\text{species} \) within the same \(\text{genus} \), or contrary forms of the same matter’. The views of his predecessors (he urges) each mistook a part of the truth for the whole. Each expressed an essential ‘moment’ of the truth; but since each claimed to express the whole, each became false and conflicted with the other. He then (24^a 9—24) confirms his own theory (a) by showing that it explains the fact that the agent assimilates the patient to itself, and (b) by tracing the origin of the rival—and mistaken—theories. Whereas what acts and suffers action must be contrary determinations of the same \(\text{substratum} \), linguistic usage attributes action and passion now to the \(\text{substratum} \) and now to the \(\text{contraries} \); and the false theories arose from exclusive attention to the one or the other of these subjects, of which action and passion are commonly predicated.
Finally (24ᵃ 24—ᵇ 22) Aristotle (a) contrasts primary and proximate agents, and explains that the primary agent is unaffected in its action as the first ‘mover’ moves without being moved: and (b) distinguishes agent from final cause.

23ᵇ 2. ὑπεναντίον. This word is repeated below (ᵇ 16), but at ὑπεναντίον is sometimes somewhat wider and vaguer in meaning. Thus, e.g., in Post. Anal. 76ᵇ 32 τὸ ὑπεναντίον τῶν μαθήματος τῇ δόξῃ covers the two cases specified in the preceding sentence, viz. (i) that in which the pupil has no opinion on the subject, and (ii) that in which the pupil’s opinion is contrary to the thesis assumed by the teacher.

The two views here in question are in contrary opposition: for in substance they assert (a) No agents and patients are identical, and (b) All agents and patients are identical.

The opposition between two particular propositions conflicting in quality (‘Some A is B’—‘Some A is not B’), which formal logicians call sub-contrary opposition (cf. e.g. Sanderson, Logicae Artis Compendium, 8th ed., p. 95), is not here in point. Moreover, Aristotle does not call the opposition of particular affirmative to particular negative an opposition of ὑπεναντία: he denies that it is anything more than a verbal opposition (cf. Prior Anal. 63ᵇ 27 τὸ γὰρ τῷ τῷ ὑπεναντίαν αὐτόκειται μόνον).

23ᵇ 5–6. πᾶντα . . . ὅμοιοις. Aristotle is quoting the authors of the theory. By ‘like’ they mean ‘absolutely identical’. If A is ‘like’ B (they argue) A and B have all the same properties and in the same degree (ὁμοίωσ). Hence there can be no ποιεῖν—πάσχειν between A and B. For although in action—passion the agent ἀντιπάσχει and the patient ἀντιποικί, one of the two things concerned in the transaction (viz. the ‘agent’) must be μάλλον ποιητικόν, and the other (viz. the ‘patient’) must be μάλλον παθητικόν.

The qualification ὅμοιως is important: for if A and B were both hot, but A were hotter than B, A might act on B. A’s action, however, according to the theory, would be due not to its ‘like-ness’, but to its ‘unlikeness’: cf. ὅμοιος.

23ᵇ 6–7. τὰ . . . πέφυκεν. τὰ δὲ ἀνόμως answers τὸ μὲν ὅμοιον (ᵇ 3–4), and πέφυκεν (after ὅς, ὅμοιον is necessary, though πέφυκεν is the better-attested reading. In ὅς and ὅμοιον:
but the accusative alone is more idiomatic. \( \text{ποιεῖν καὶ πάσχειν} \) is treated as a single verb with the same construction as if \( \text{ποιεῖν} \) stood alone: cf. also * 24b 25.

23b 7–10. καὶ... ὀλίγῳ. Cf. Parva Naturalia 469b 21—470a 7; Theophr. fr. 3 (περὶ πυρὸς) § 1 τὸ δὲ πῦρ γεννᾷ καὶ φθείρειν πέφυκεν αὐτῷ, γεννᾷ μὲν τὸ ἐλαττον τὸ πλέον, φθείρειν δὲ τὸ πλέον τὸ ἐλαττον. Aristotle's theory of the cause of Death seems to depend in part on an application of this principle (that 'the greater fire destroys the less'): cf. * 29b 24–26.

23b 10–11. Ἀμφόκριτος... μόνος. It is strange that Aristotle should attribute this view to Demokritos alone: for in discussing the theory of Empedokles that 'Like perceives Like', he treats it as an application to the relation of Percipient and Perceived of the general principle that 'Agent and patient are like'. Cf. de Anima, e.g. 409b 23 ff., 416b 33 ff., where there is a reference to the present discussion of action–passion.

Both views are attributed to groups of thinkers, below, 24a 22–24.

23b 16–17. ἀνάκασι... λέγειν. 'The two views seem to be (but are not really) in manifest conflict.' There is, however, no trace of \( 	ext{φαίνεται} \) in Γ or Φc.

23b 17–18. αἰτιον... ἑκάτεροι. The conflict is only apparent. For both views express a part of the truth; and they can be reconciled by being merged in a third view which adequately expresses the fact as a whole. The 'fact as a whole' is contrasted forms of the same matter acting and suffering action reciprocally. One view insists upon the identity of the matter, and the other view upon the contrariety of the forms, as the sole and sufficient condition of action–passion: cf. * 23b 1—24b 24, 24a 14–24.

23b 18–24. τὸ... πάν. It is false that 'Like is affected by Like', if this means that the identity of A and B is the sole and sufficient cause of their action–passion. For (i) if A and B are absolutely identical, neither will have any prerogative in any transaction between them (cf. * 23b 5–6): and (ii) if Like acts on Like qua like (i.e. identical), everything will be able to 'act on' (change, move, destroy) itself, and therefore there will be nothing \( 	ext{ἀφθαρτον} \) or \( 	ext{ἀκίνητον} \). But the change and movement in the physical universe necessarily imply some things which are \( 	ext{ἀφθαρτα}, \text{ἀδια}, \) and \( 	ext{ἀκίνητα} \): cf. Phys. Θ. 3 ff., Metaph. 1071b 3 ff.

In b 21 it is necessary to read \( 	ext{ἐῖ τε} \) (cf. Bonitz, Ind. 217b 9), instead of \( 	ext{ἐῖτε} \) with Bekker.
In b.22 I have accepted οὖτως ἔχοντων on the authority of L, though with great hesitation.

23b 24—29. τὸ ... ἐστίν. The opposite view is also false, if it means that the absolute otherness of A and B is the sole and sufficient cause of their action-passion. For to ‘act on’ a thing is to make it change its nature. But if two things are absolutely other (e.g. Line and Whiteness), neither can get any grip of the other, neither can affect the other’s nature. Only Contraries or Intermediates—i.e. only contrasted forms of the same—can ‘act on’ one another.

23b 26—29. πλὴν ... ἐστίν. A white thing may ‘act on’ a line which happens to be also black—i.e. it ‘acts on’ the black. It does not really ‘act on’ the line, for it does not alter the line’s nature. The line remains a line, even when its coincident property, black, has been altered into another coincident property—e.g. white or grey.

In b.28 the better-attested reading is ἐναντία (i.q. ἄλληλα). Philoponos rightly interprets ὅσα ἐx ἐναντίων ἐστίν (b.29) as τὰ μεταξὺ: cf. 24b.8. The general principle is that τὰ μεταξὺ ἐν τῷ ταῦτῳ γένει πάντα καὶ μεταξὺ ἐναντίων καὶ σύγκειται ἐκ τῶν ἐναντίων ἀπαντά (Metaph. 1057b 32–34). Thus the different species of the genus Colour form a scale. The extremes of the scale are White and Black: and these are ἐναντία to one another, for white is χρώμα διακριτικὸν ὀψεως, and black is χρώμα συγκριτικὸν ὀψεως (cf. Τοπίς 119a.30, Metaph. 1057b.8–9). The other colours are ἐκ λευκοῦ καὶ μέλανος (cf. e.g. Phys. 188b.24), i.e. ‘blends’ of white and black, and fall on the scale between its extremes. Each intermediate colour is relatively ἐναντίον, i.e. functions as an ἐναντίον relatively to any other intermediate and to either extreme. The intermediates are therefore said ἐναντίωσιν ἔχειν (cf. e.g. 23b.30–31). Since Aristotle conceives αἰσθήσεως as essentially a δύναμις κριτική, i.e. a power of discriminating between ἐναντία, or between the intermediates which are ‘blends’ of the ἐναντία, the general principle ought to apply to the field of each of the five senses. Taste, we are told, discriminates between sweet and bitter; hearing between treble and bass; touch between hot and cold, and hard and soft. But it does not seem possible to work out the conception of a scale in all the fields with the same precision as in those of colour and sound.

23b 29—24a.9. ἄλλα ... τούτοις. The true doctrine is that action-passion takes place between things which are contrary forms of the same matter, differentiations of an identical sub-
stratum, contrasted species within the same genus. Agent and patient, therefore, are both 'like' and 'unlike'. The result of action-passion is to assimilate the patient to the agent.

The doctrine is summarized in the de Anima (417a 20) in the formula πάσχει ... τὸ ἀνόμοιον, πεπονθὸς δ' ὁμοίῳ ἔστιν, and it is applied to Nutrition, Growth, Sensation, and (with modifications) to Thought. There is a reference to the present passage in the de Anima 417a 1–2.

Philoponos is right in calling the argument here διάλληλος. All that Aristotle does is to bring out the reciprocal implication of contrariety and action-passion. From the fact that contraries are such as to act and suffer action, he infers that agent and patient must be different forms of the same (23b 29—24a 5): and from the fact that agent and patient are different forms of the same, he infers that (only) contraries are such as to act and suffer action (24a 5–9).

For the form ὁμογενές (24a 1), see *23a 30.

23b 33—24a 3. πέφυκε ... ἀλλήλων. This parenthesis is intended to justify the assertion just made and the inference drawn from it. It is a law of nature (πέφυκε) that τὸ ὁμογενὲς ὑπὸ τοῦ ὁμογενὸς πάσχει: and the law holds good in all instances of action-passion precisely because 'contraries are in every case within a single identical kind, and it is contraries which reciprocally act and suffer action'.

24a 8–9. καὶ γὰρ ... τούτοις. The argument apparently is:—Action—Passion necessarily involves ἀλλοίωσις (cf. *23a 12–22) which is a form of γένεσις καὶ φθορά (it is γένεσις καὶ φθορά τις). Now there can be no γένεσις καὶ φθορά in any sense whatever except between ἐναντία: hence ποιεῖν—πάσχειν is necessarily between ἐναντία.

24a 9–14. διὸ ... γένεσις. Aristotle's doctrine, combined with the general principle that γένεσις is a change into the contrary, explains the fact that the agent assimilates to itself the patient.

24a 14–15. καὶ ... φύσεως. 'And, again, it is intelligible that the advocates of both views, although their theories are not the same, are yet in contact with the nature of the facts.'

κατὰ λόγον, ἰ. q. εἴλογον.

In spite of the overwhelming manuscript authority for ὁμοῖος, ὁμοιὸς is clearly required. For φύσις ('the essence of the matter'), cf. Bonitz, Ind. 839a 43—b 2.

In a 17 the reading of H (cf. Φε) is to some extent confirmed by τάλλα: but ‘the stone’ is not a very likely subject of ‘being heated’.

In a 22 ἐκεῖνο is of course τὸ ὑποκείμενον, and in a 23 θάτερα are τὰ ἑναντία. τοὐναντίον (a 24), ‘the opposite’, i.e. that agent and patient must be absolutely ‘other’.

24 a 24—b 22. τὸν... ἀληθῆς. At least in expression, if not also in substance, the doctrine of this passage is (i) ambiguous, and (ii) divergent from Aristotle’s doctrine elsewhere.

(i) Aristotle’s object is to establish a certain parallelism between πολύτις (i.e. ἀλλοιώσης, cf. * 23 a 12—22), τοιεῖν—πάσχειν, τὸ ποιοῦν, and κάνησις, κυνεῖν—κυνεῖσθαι, τὸ κινοῦν.

The term τὸ κινοῦν is applied (a) to that which contains ‘the originative source’ (i.e. the first in the series of causes, 24 a 27—28) of a movement: and also (b) to ‘that which is last’ (in the series of causes), i.e. to the cause ‘next to the body which is being moved and to that which is coming-to-be’ (24 a 29 τὴν γένεσιν—if the text is sound—must mean τὸ γεννώμενον).

Similarly τὸ ποιοῦν is applied (a) to that which contains ‘the originative source’ of a πολύτις—e.g. to the doctor, gua containing in his soul the τέχνη ἱατρική which is the first in the series of causes of the alteration called ‘healing’: and also (b) to ‘that which is last’, e.g. to the wine or the food prescribed by the doctor, which are the proximate causes of the patient’s recovery.

Now τὸ κινοῦν in sense (a) need not itself be moved by the body which it is moving. It is therefore—or it may be—relatively ἀκίνητον. The absolutely first moving cause must be ‘unmoved’ (cf. 24 a 31 ἐπ’ ἐνίον δὲ καὶ ἀναγκαῖον) and indeed absolutely ‘unmoved’: but even the πρῶτος οὐρανός, although it is itself moved by the absolutely first mover, is relatively ἀκίνητος, since it is unmoved by the bodies which it sets moving (cf. * 18 a 4—5, * 23 a 12—22). On the other hand, τὸ κινοῦν in sense (b) is, in moving, always moved by that which it moves.

Similarly τὸ ποιοῦν in sense (a) is relatively ἀπαθῆς. The doctor, e.g., or the τέχνη ἱατρική in his soul, ‘acts upon’ (‘alters’) the patient, without suffering reaction from (being ‘altered’ by) the latter. But τὸ ποιοῦν in sense (b) must, in acting, itself be ‘altered’ by that on which it acts. The food or the wine, e.g., can only ‘alter’ (i.e. heal) the patient in so far as they are ‘altered’ by the latter’s digestion.
Here, then, we have a relatively first, and therefore a relatively ἀπαθῆς, agent corresponding to a relatively first, and a relatively ἀκάνθηνον, ‘mover’ or efficient cause. And Aristotle explains (24a 34–35) that ἰατρική, e.g., is ἀπαθῆς in its action, because it is not (like e.g. the food) a form embodied in the same matter which τὸ ἴμαλόμενον involves.

But Aristotle proceeds to introduce, without further explanation, a new division of ποιητικά (agents or ‘active things’) into (a) those whose forms are not in matter at all, and (b) those whose forms are in matter (24b 4–13, cf. b 18–22). The first kind of ποιητικά—pure forms, i.e. ἐνέργειαι without any δύναμις—are clearly absolutely ἀπαθη and absolutely first agents: and they correspond to the absolutely first, and absolutely unmoved, ‘mover’ or ‘movers’. The second kind of ποιητικά would include not only ‘the food’, but also ‘the doctor’—and perhaps even the τέχνη ἰατρική (cf. * 24a 34–b 1). Such ποιητικά, because they involve matter, are always παθητικά, though some of them (e.g. the doctor) are relatively ἀπαθη since they are not subject to reaction from the things on which they act.

(ii) Elsewhere, when Aristotle is analysing κύριας and ποίησις, the final cause is regarded as the ἄρχη τῆς κυνήσεως—as the first in the series of moving or acting causes. Thus God is the πρῶτον κυνον as the ultimate object of love (cf. e.g. Metaph. 1072b 3). And though what moves the animal is the soul ψυχα containing νοσ or ὀρέξεις (τὸ ὀρεκτικόν), yet νοσ and ὀρέξεις are themselves moved by τὸ νοητὸν and τὸ ὀρεκτὸν:—i.e. the primary cause of the animal’s movement is that which it conceives or imagines as τὸ πρωτον ἄγατον, and which, as thus conceived or imagined, inspires desire (cf. de Anima 433b 9–30, b 11–12; de Motu Anim. 700b 4 ff., Metaph. 1072a 10–b 11). Similarly ἐγείρειa—the End at which the doctor aims—is prior to ἰατρική as the cause of healing (cf. Metaph. 1032a 32 ff., * 20b 18–21).

Here, however, Aristotle refuses to reckon the final cause as ποιητικόν, except in a metaphorical sense, for a reason explained below, 24b 14–18.

24a 27. ἄρχη: cf. * 29a 5.

24a 30–33. τὸ ἄπαθῆς. Since ἐν μὲν κυνήσει (a 31) corresponds to ἐν δὲ ποιήσεως (a 32), the passage would be simplified grammatically by E’s omission of κυνον (a 30). But the better-attested text is probably right.

24a 31. ἐνίων. The reference here and below (b 21 ἐνὶ τοιάντα)
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is no doubt to "the heavenly Intelligences", God and the Spirits of the Stars: cf. e.g. *Metaph. 1073a 23 ff.

24\textsuperscript{a} 34 — \textsuperscript{1} ι. δοσα ... ύγιαξομένου. We should have expected Aristotle to cite the doctor, rather than ιατρική, as an instance of a ποιητικόν whose matter is not the same as that of its patient: ιατρική, we might suppose, is a ποιητικόν whose "form is not in matter at all" (cf. \textsuperscript{b} 4–5). It must, however, be remembered that Health—the "form", of which ιατρική is the analysis and resynthesis (cf. * 20\textsuperscript{b} 18–21)—is an εἴδος ἐννόμω, and cannot be defined without including in its definition those material constituents of which it is the proportionate adjustment.

24\textsuperscript{b} 4. ἀπτόμενον: cf. * 23\textsuperscript{a} 12–22.

24\textsuperscript{b} 6–9. τὴν ... θερμαίνεσθαι. "For we maintain that one and the same matter is equally, so to say, the basis of either of the two opposed things—being as it were a kind of which they are contrasted species; and that that which can be hot must be made hot, provided the heating agent is there, i.e. comes near."

Thus the food (or wine), which cools (or heats) the patient's body, must be itself heated (or cooled) in acting, because it and the patient's body are contrasted forms of the same ὑποκειμένον. ὡς εἴπειν (\textsuperscript{b} 6) qualifies ὁμοῖος. The food and the patient's body can be said to have the same matter equally or alike only in a loose sense: just as it is only loosely that e.g. dog and bird are ὁμοῖος ζῴον.

24\textsuperscript{b} 13–18. ἐστι ... παθητικῶν. Aristotle briefly justifies the separation of efficient cause and final cause (cf. * 24\textsuperscript{a} 24–\textsuperscript{b} 22), and indicates the part played in ποιήσις by formal and material causes.

The final cause of a ποιήσις is an "established state" of τὸ πάσχον, in which it is completely itself. The final cause of healing, e.g., is health, which is the normal state or "form" of the living body. So far as health is there, the body is already completely itself—there is no further goal for it to attain (\textsuperscript{b} 17 ὅπερτι γίνεται, ἀλλ' ἐστιν ἡδη).

We can speak of a cause as ποιητικῶν, only when it is such that its presence starts its correlative πάσχον on a process of development, or coming-to-be. Thus, when the doctor is there—i.e. comes into active relation with his correlative πάσχον, a diseased body—a γένεσις is at once set up in the patient's body, in which it moves towards the attainment of its normal state, health.
COMMENTARY

24b 15–16. τοῦ . . . ὑπάρχῃ. The object of this irregular construction is to avoid the awkwardness of τοῦ μὲν ποιοῦντος ἵππαρ-χοντος.

24b 18. ἡ . . . παθητικῶν. It is matter, quae matter, which is παθητικῶν: i.e. matter (or the material cause) contributes to πούγαις, in so far as every ποιοῦν implies a correlative πάρχον. It follows from this—as Aristotle has already maintained—that if any παθητικῶν is itself absolutely without matter, it must be absolutely ἀπαθῆς (24b 18–22).

A. 8

24b 25—26b 28. πῶς . . . χωρίζεσθαι. Two typical theories of the mechanism of ποιεῖν-πάρχειν are examined in this chapter: viz. (i) the theory that the agent acts by penetration, since the patient has ‘pores’, and (ii) the theory of Leukippos and Demokritos, which explains action-passion, as it explains all other physical phenomena (e.g. growth, coming-to-be, passing-away), by the assumption of Indivisible Solids and a Void.

Of the advocates of ‘pores’, Aristotle mentions only Empedokles: but one other representative of the doctrine, who was probably its originator, can be named with certainty, viz. Alkmaion of Kroton. (On Alkmaion see Diels, pp. 100–104; Burnet, § 96; Beare, pp. 11 ff., 93 ff., 131 ff., 160.)

In the first part of the chapter (24b 25—25b 11) Aristotle shows that the theory of pores is equivalent to that of the Atomists, so far as an explanation of ποιεῖν-πάρχειν is concerned. He also traces the affiliation of Atomism to Eleatic Monism, and points out the superiority of the former. Νέντε (25b 12—26b 6) he begins to criticize Empedokles, contrasting his theory unfavourably with that of the Atomists. The latter explain the γένεως and φθορά of all physical bodies as a composition out of, and a dissolution into, the Indivisible Solids. But Empedokles treats Air, Earth, Fire, and Water as elementary: and hence neither explains nor could explain the γένεως or φθορά of the big masses of these ‘elements’ which we see in nature. This leads Aristotle to refer to Plato’s theory in the Timaeus, which postulates Indivisible Planes as the ultimate constituents of Air, Earth, Fire, and Water, and therefore of all physical bodies. Having distinguished this theory from that of Leukippos (for Leukippos postulates a Void, which Plato denies; and his Indivisibles are solids, whereas those of Plato are planes), he proceeds to criticize the view of
Leukippos and Demokritos. *Finally* (26\textsuperscript{b} 6–28) he returns to the doctrine of pores, which he subjects to an annihilating criticism.  

24\textsuperscript{b} 25. *πῶς ... λέγωμεν*. In the last chapter Aristotle has explained `what action and passion are, what things exhibit them, why they do so, and in what manner' (24\textsuperscript{b} 22–24).

The `next step' in the inquiry (\textit{πάλιν}; cf. e. g. \textit{Phys.} 214\textsuperscript{b} 13; Bonitz, \textit{Ind.} 559\textsuperscript{b} 13 ff.) is to explain how it is possible for action–passion, thus understood, to occur: i. e. what must be the structure of bodies, if action–passion is to take place.

τούτο, sc. τὸ ποιεῖν καὶ πάσχειν, which is treated as a single verb, cf.* 23\textsuperscript{b} 6–7.

24\textsuperscript{b} 27. τοῦ ... κυριωτάτου. In the strictest sense of the term ποιεῖν occurs only in ἀλλοίωσις, i. e. action–passion involves re-passion–reaction. Since it is only the last (or \textit{proximate}) agent whose action is re-passion, the last agent is `the agent in the strictest sense' (κυριωτατον). Cf. * 23\textsuperscript{a} 12–22, * 24\textsuperscript{a} 24–22.

Perhaps we ought to insert (τοῦ) before ἵσχατον.

24\textsuperscript{b} 27–32. καὶ τοῦτον ... μᾶλλον. The chief evidence for Alkmaion's theory of perception is Theophrastos, \textit{de Sensu}, §§ 25, 26 (quoted by Diels, p. 101: cf. Beare, ll. cc.). All that we are there told about `pores' is that (according to Alkmaion) 'all our perceptions are in some way closely connected with the brain. That is why, if the brain is disturbed or displaced, the perceptions are mutilated and arrested (\textit{πηροίσθαι}): for the brain then blocks the pores through which the perceptions come' (ἐπιλαμβάνειν γὰρ τὸν πόρον, δὴ ὁν αἱ αἰσθήσεις).


Theophrastos, l. c., § 7 (cf. Beare, pp. 204–5) reports that `Empedokles explains the perception of all the special senses on the same principle. He says that we perceive, because the objects of each sense fit into the pores of the sense in question. That is why one sense cannot discern the objects of another: for its pores are too wide or too narrow, so that, of the objects of the other senses, some go right through the pores without touching, whilst others cannot enter at all'. The objects, which fit (or fail to fit) the pores, are clearly the `effluences' (ἀπορροάι) which all
things give off: cf. Empedokles, fr. 89 (Diels, p. 197), Theophrastos, l. c., φέρεσθαι δὲ τὰ χρώματα πρὸς τὴν ὁφνὶ διὰ τὴν ἀπορρόην.

The first part of Aristotle's statement here (b 27–29 καὶ τῶν τρόφων . . . πάσας) refers to a theory of this kind. But the second part (b 29–32 ἕτεροι . . . μᾶλλον) refers to a theory which explains the greater or less transparency of different bodies by their possession of a greater or smaller number of pores and by the way in which their pores are disposed. We can see things through air and water, and in general through transparent bodies, because such bodies have a multitude of close-set pores, which are arranged serially so as to form straight channels or passages right through them. Does this mean that the 'effluences,' from the visible objects can travel more easily through bodies with such a structure? Or does it mean—as Philoponos (p. 153), interprets—that the ὅφεισ (i.e. the 'visual flames' or 'rays' proceeding from the eyes) can pass through such media and thus 'lay hold' of the visible objects?

On the whole, it would seem most probable that Philoponos is right; and that Aristotle is referring to a feature in Empedokles' theory of Vision which nobody has yet succeeded in reconciling with the doctrine of 'effluences'. For, as is well known, nothing is said in Empedokles' fragment on Vision (fr. 84: cf. also Plato, Timaeus, 45 b f.f.) about 'effluences' fitting into the pores of the sense of vision. Vision is conceived as an activity proceeding from the eye. The fire inside the eye flows through the pores of the membranes which contain it, much as the light inside a lantern 'leaps through' its transparent sides (cf. Burnet, pp. 248–249; Beare, pp. 15–16).

Aristotle himself complains (de Sensu 437b 23–438a 5) that Empedokles 'sometimes appears to think that we see owing to the light going forth from the eyes', whilst at other times he explains vision 'by the effluences from the things seen'.

24b 32—25a 2. οἱ . . . ἐστίν. The advocates of pores are contrasted unfavourably with the Atomists. For the theory of pores is a theory of the structure of some φυσικά σώματα only (b 32 ἐπὶ τῶν), viz. only of τὰ ποιωτάτα καὶ πάσχοντα and of τὰ μηγνύμενα. Hence it attempts to explain only ποιεῖν–πᾶσχειν and μῆνις. But Atomism is based upon principles which go to the root of things: for the Atomists postulate that all the perceptible bodies in nature are composed of Indivisible Solids interspaced by Voids. Hence their theory applies to the structure of all φυσικά σώματα (b 35–a 1 περὶ πάντων), and enables them to give a systematic and
consistent explanation of γένεσις and φθορά, of ἄλλοωσις and αἰτήσις, as well as of τοιεῖν—πᾶσχεν and μέτοις: cf. 15ᵃ 34–35, 16ᵃ 6–8.

In ³ 34 Prantl and Diels adopt φησιν (JL). But there is no reason to suppose that Empedokles was the only advocate of pores who applied the theory to explain μέτοις: and though the construction with φασιν is a little harsh, it is not impossible.

25ᵃ 1–2. ἀρχήν . . . ἄτομα. Apparently this means that the Atomists 'took as their starting-point what naturally comes first', i.e. based their theory on postulates expressing fundamental facts. They began at the beginning, and not in the middle. But, in view of the immediately following passage (25ᵃ 2 ἐνίοις γὰρ . . . ἀπερεῖν), in which Aristotle traces the affiliation of Atomism to the theory of the Eleatics, it is tempting to read κατὰ φύσιν, ἀπερ εἴτε. The words would then refer directly to Parmenides (cf. e.g. fr. 8, 1, Diels, p. 118, μοῦνοι δ’ ἔτι μῦθος ὁδὸν λειτουρται ὡς ἄτομο) and would mean that the Atomists' theory is not based upon mere δόξαι βρῶσαι, but upon a principle drawn from the Parmenidean 'Way of Truth'. They took as their starting-point the fundamental truth that the Real is.

25ᵃ 2–16. ἐνίοις . . . κενῶν. Aristotle here sketches certain arguments which led the Eleatics (ἐνίοις: the reference, as we shall see, is probably to Zeno, and certainly to Melissos, as well as to Parmenides) to maintain that 'what is' must be ἐν καὶ ἄκινητον.

The general form of the arguments is 'dialectical', i.e. the Eleatics show that their pluralist opponents cannot, on their own premisses, render intelligible the plurality and the motion which they advocate.

The pluralist views in question are two, viz. (i) that the real is Many and in no sense One, the Many being separated from one another by the Void: and (ii) that the real is 'discretes-in-contact', i.e. a Many not interspaced by a Void, but contiguous.

The advocates of the first view were, in all probability, the Pythagoreans (cf. * 25ᵃ 4–6): and the Eleatics claim to dispose of it, because—as they maintain—there can be no such thing as a Void. The second view is that of Empedokles: and the Eleatics urge against it, that it is no more able than the Pythagorean theory to render plurality and motion intelligible (cf. * 25ᵃ 6–13).

25ᵃ 4–6. κινηθήναι . . . διείργοντος. These theses as to the
implications of motion and plurality, which the Eleatics accept, are at the same time maintained by their opponents: and the opponents' theory, which rests upon them, is summarized below (7–8) in the words πολλὰ καὶ μὴ ἐν εἶναι καὶ κενὸν. The opponents in question cannot be the Atomists: for Atomism (cf. 25a 23 ff.) was developed under the influence of, and subsequently to, the Eleatic criticism of this particular theory of a Many and a Void. On the whole, there is very little doubt that the pluralists in question here, and in the second part of Parmenides' poem (cf. Burnet, pp. 182 ff., 314 ff.), are the Pythagoreans.

The admitted theses are: (i) if a body is to move, there must be an empty place for it to move into. Motion implies an independently existent empty place or 'void' (cf. 5 κεχωρισμένον). If there is to be motion, it is not enough that we can in thought abstract the place, which a body fills, from the body which fills it (cf. Aristotle's discussion of τὸ κενὸν, Phys. 213a 12 ff.): and (ii) a plurality of reals implies something other than the reals (a not-real) to separate them from one another. Thus, e.g., the Pythagoreans postulated a κενὸν, ὁ διώρισε τὰς φύσεις (Phys. 213b 22–27: cf. Burnet, p. 108).

25a 6–13. τοῦτο . . . κίνησιν. 'And in this respect' (i.e. for rendering intelligible the being of a Many), 'they insist, the view that the universe is not continuous, but discretes-in-contact, is no better than the view that there are Many (and not One) and a Void. For suppose that the universe is discretes-in-contact. Then, if it is through-and-through divisible, there is no One, and therefore no Many either, but the Whole is void; whilst to maintain that it is divisible at some points, but not at others, looks like an arbitrary fiction. For up to what limit is it divisible? And for what reason is part of the Whole indivisible, i.e. a plenum, and part divided? Further, they maintain, it is equally necessary to deny the existence of motion.'

Aristotle is here reproducing the gist of an Eleatic argument against a pluralist theory which dispenses with a Void. The Pythagoreans, as we saw, were obliged to postulate an existent Void in order to account for motion and plurality: and such a postulate (Parmenides and Zeno contend) is a contradiction in terms, for it is equivalent to the assumption that 'what is not' is. But another form of pluralism (viz. that of Empedokles, cf. 25b 5–10, * 26b 8–10) attempts to conceive the real as a Many, without introducing a Void. The Universe is not One, since
it is not continuous: it is divided into many constituents, which, however, are contiguous and therefore do not imply a Void.

Empedokles himself expressed his theory differently. He said that no part of the Universe was 'empty' (cf. fr. 13, 14; Diels, pp. 176, 177) and he denied that the Whole (i.e. 'the Sphere') was homogeneous, as Parmenides had maintained. It was full of diverse matters—i.e., in the end, full of the four 'elements': and these 'ran through one another' (cf. e.g. fr. 17; Diels, pp. 177–9). Moreover, he had demonstrated that atmospheric air is not empty space (not a kevón), but a thing or body (cf. Burnet, pp. 228, 229): hence, although he insists that bodies are porous, the pores are not 'voids', but 'full'—e.g. full of air, which is itself a body.

There is some evidence (Burnet, p. 312) that Zeno wrote an attack on Empedokles, and it is possible that the present argument (8 6–13) reproduces the substance of one of his criticisms.

25a 6. oibéν. EL have μνθέν, but oibéν is what we should expect consistently with the other negatives in the context.


25a 12–13. ἔτι . . . κινήσει. The addition of φάναι (FHL) is probably due to a misinterpretation of 8 6–8. The argument is:—The view of Empedokles is no better than the Pythagorean view as regards the explanation of plurality (8 6–8), and motion is as impossible on the former view as it is on the latter (8 12–13).

25a 15–16. ἀπερέον . . . κενόν. Parmenides and Zeno maintained that the one Real was finite: but Melissos held that it was infinite both temporally and spatially. Aristotle is no doubt quoting, or summarizing, an actual argument of Melissos. περαινειν should be taken intransitively, as in Melissos, fr. 5 (Diels, p. 144) ei μη ἐν εἰ, περαιει πρὸς ἀλλο.

Translate: 'Some of them add that it is infinite, since the limit (if it had one) would be a limit against the Void.'

25a 17. περὶ τῆς ἀληθείας: cf. Parmenides, e.g. fr. 8, l. 51 (Diels, p. 121).

25a 17–23. ἔτι . . . διαφέρειν. Though the Eleatic theory appears to be logically impregnable, it is in violent conflict with the facts. Even a lunatic does not go so far as the theory demands in identifying objects which his senses present to him as different: though some people are mad enough to confuse what they have been accustomed to regard as honourable with what really is honourable.

I have marked a lacuna after ἀληθείας in 8 17, as I think we must
assume that one or more arguments against the Eleatic theory have dropped out. L reads ἐπεί for ἐτι—an obvious, but ineffective, attempt to restore the logic of the passage.

25a 23—b 5. Λεύκιμπος ... στερεῶν. Leukippos recognized that coming-to-be and passing-away, motion and multiplicity, must be accepted as real on the evidence of sense-perception: but he also recognized the force of the Eleatic arguments. He was convinced by the latter that the Real—'that which is'—is a plenum; but he saw no difficulty in postulating empty space (τὸ κενὸν), provided it is not regarded as 'real' in the proper sense, i.e. in the same sense as body. Hence he supposed an infinite number of minute (and therefore invisible) bodies, each 'real' in the sense of the Eleatic 'One', i.e. each a plenum. And he further supposed these minute bodies—the atoms—to be moving in empty space. 'Coming-to-be' he explained as the aggregation of several atoms to form a perceptible body: and 'passing-away' as the dissolution of such an aggregate into its constituent atoms. Cf. above, 15b 6–15 with the notes.

25a 23–24. οἴτινες ... λέγοντες. Perhaps this explains 15b 9–10 ἐπεί δ᾽ φῶντο τάληθες ἐν τῷ φαίνεσθαι ...

25a 26. ταῦτα, sc. γένεσιν, φθοράν, κίνησιν, πλῆθος τῶν ὄντων.

25a 26–32. τοῖς δὲ ... φθοράν. For the punctuation, cf. Diels, p. 344. Leukippos conceded to the Eleatics that motion required a Void: and he says (in agreement with them) that the Void is μῆ ὁν and that no part of τὸ ὁν is a μῆ ὁν, for τὸ ὁν in the strict sense of the term is absolutely full, a plenum without any gaps. But he thinks (in contrast to the Eleatics) that there is an infinite plurality of such 'Reals', and that they move in the Void; for the Void exists, though it is not a 'Real'.

25a 33. ἴ τυχάνουσιν ἀπτόμενα. This is the point where Atomism becomes indistinguishable from the theory of Empedokles as Aristotle expresses it, viz. that the Real is 'discretes-in-contact': cf. * 25a 6–13.

25a 34. καὶ συντιθέμενα ... γεννάν. Philoponos interprets this as a reference to the Atomists' explanation of ἀλλοίωσις. He supplies τὰ τάθη as the object of γεννάν, and says that we are to understand the σύνθεσις and the περιπλοκή of the atoms as their θέσις and τάξις respectively: cf. 15b 9, 15b 33—16a 2. But, as the text stands, γεννάν can hardly mean anything but γένεσιν ποιεῖν, and the sentence simply repeats l. 32 with a slight variation. For the doctrine, cf. * 15b 33—16a 2.
25a 34–36. ἐκ ... ἀδώνατον. τὸ κατ’ ἀληθείαν ἐν, sc. an atom, i.e. that which is a plenum without interspaces. τὰ ἀληθικὰ πολλά, sc. the many aggregated atoms, which, though associated to form a perceptible body, never constitute a real One without interspaces.

For the principle here ascribed to Leukippos, cf. Metaph. 1039a 7–11, where it is attributed to Demokritos.

25b 36–b 5. ἀλλ’ ... στερεῶν. The theory of Alkmaion and Empedokles, which explained πάσχειν by the hypothesis of pores, is extended by the Atomists to explain ἀλλοωσις, φθορά, αἰξήσις, κτλ.: only, instead of ‘pores’, they speak of the Void, i.e. empty interspaces between the atoms. A perceptible body for Empedokles is a porous whole: for the Atomists, it is a grouping of atoms separated by interspaces.

ὑπεισδυνομένων στερεῶν (b 4–5) looks like a quotation from Leukippos.

25b 5–10. σχεδόν ... πόρους. We must not suppose that Empedokles would agree. As we know (cf. *25a 6–13; and below, *26b 8–10), he did not admit a Void, but insisted that the pores were ‘full’.

25b 7. τοῦτο, sc. τὸ πάντῃ πόρους συνεχεῖς εἶναι.

25b 10. οὗς ... πόρους. The word πόροι does not occur in this sense in the surviving fragments of Empedokles. We have instead e.g. χοιάναι (fr. 84, l. 9; Diels, p. 197), ἄλοκες (fr. 100, l. 3; Diels, p. 200), the meaning being fixed by periphrases.

25a 13–15. καὶ περὶ ... συμβαίνων. The Atomists’ explanation (cf. 25a 31–34) is clear in itself, and it is a fairly consistent consequence of the basal assumptions—that there are indivisible solids and a ‘void’—on which their whole philosophy depends.

τοῦτον (b.13), sc. τὸν περὶ Λεύκικπτον καὶ Δημόκριτον (Philoponos).

25b 15. τοῖς ... ἡττον. sc. τοῖς περὶ Ἐμπεδοκλέα ἡττον ὁμολογομένως πρὸς τὰς αὐτῶν θέσεις φαίνεται συμβαίνων.

25b 19–25. Ἐμπεδοκλεῖ ... Πλάτων. Empedokles regards the ‘four roots’—Earth, Air, Fire, and Water—as eternal and unchangeable: cf. *15a 4–8. But this view, as Burnet (p. 239a) justly remarks, had been rendered ‘almost unintelligible’ to Aristotle owing to ‘the criticism of the Pythagoreans and Plato’ (cf. especially Timaeus 48 b). Hence Aristotle, here and above (15a 3 ff.), assumes that Empedokles must have known that the origin and transformation of his ‘elements’ required explanation;
and regards it as an inconsistency and a failure of his theory that no explanation was offered.

*τὸ σωρευόμενον μέγεθος* (*b.22 : cf. *26a 30–31*) is the actual mass of the ‘elements’ as we see them. Empedokles’ ‘elements’ are present in masses which are clearly aggregates of smaller pieces: i.e. they are clearly composite bodies, divisible into simple constituents—not, like the ‘primary bodies’ of the Atomists (cf. *25b 17–19*), ἀδιάφρετα.

The reference to the *Timaeus* is to 53c ff., where the particles, of which Earth, Air, Fire, and Water consist, are viewed as solids reducible to planes whose components belong to one of two types of triangle (cf. *15a 29–33*). These triangles are the right-angled isosceles, and the right-angled scalene which is such that its hypotenuse is twice the length of its shorter side: cf. Martin, ii, pp. 234 ff.

*25b 27*. ὅ μὲν ... σχῆμασι: cf. *14b 21–24*.

*25b 28*. τῶν ... ἕκαστον. I have ventured to excise these words, since they would mean that each indivisible solid was defined by an infinity of figures and each indivisible plane by a finite number of figures—which is absurd.

*ὁματρένων*, i.e. the two typical triangular figures: see *25b 19–25*.

*25b 29–32*. ἕκ ... μόνον. The best remedy in this passage is, I think, the excision of δύο τρόπου ἄν ἔν. An alternative would be to read a colon after διακρίσεις (cf. J) and to insert γάρ after μὲν (cf. Γ).

*25b 31–32*. διά τε ... ἕκαστον. Both the Void and Contact are required by the Atomists to explain either γένεσις or διάκρισις (φθορά): cf. *25a 31–34*.

*25b 34*. ἐν τοῖς πρῶτοις λόγοις. The reference is to the *de Cælo* (cf. Introd. § 11, *14a 1*) Γ. 1, especially 298b 33 ff., Γ. 7, and Δ. 2.

*25b 34—26b 6*. περὶ ... διυπάμει. Aristotle’s deliberate compression of his present criticism of the Atomic theory within the limits of ‘a short digression’ (*25b 36*) has somewhat obscured the logical connexion of his arguments. It is, however, possible to trace a single line of thought through the argumentation from *26a 1–24*; and thus to exhibit it as a reasoned exposure of the central weakness of Atomism, i.e. its failure to explain the relation of the indivisible solids to the qualities which are the objects of the special senses (cf. *15b 33—16a 2*: and, for the meaning of πάθη, cf. *19b 8–10*). The criticisms in the re-
The remainder of the passage (26a 24—b 6) are disconnected, but not obscure.

25b 36—26a 24. ἀναγκαῖον ... ἀδιαφρέτοις. The argument may be thus expanded:—

According to the Atomists, the indivisible solids are characterized by figure alone (cf. *14b 21—24). And since, according to their theory, one body can be 'acted upon' by another only because it consists of Indivisibles interspaced by Void (i.e. only because the Indivisibles which compose it can move, shift their relative positions, come into contact with one another, &c.), the Indivisibles themselves cannot be 'acted upon'. They are ἀπαθητικά, i.e. they cannot receive any αἰσθητά πάθος. They are also necessarily unable to 'act', i.e. they cannot produce any πάθος, or any change of πάθος, in anything else. For (cf. e.g. 23b 29 ff.) if A is to make B hot, or to change B from cold to hot, A must itself be hot (26a 1—3).

Demokritos, it is true, attributes heat to the spherical Indivisibles. But if heat is the property of the spherical figure, it is a paradox not to assign cold to some other figure as its property (26a 3—6). Are we then to suppose that the Atomists do attribute heat and cold to the Indivisibles, as properties respectively characterizing the spherical and some other figure? If so, on what principle are the other qualities excluded? It is a paradox to deny that the Indivisibles are heavy and light, hard and soft (26a 6—8).

Indeed, Demokritos attributes not only heaviness to them, but different degrees of heaviness. 'The larger the mass of the Indivisible, the heavier it is', he says. But if so, he must admit that the larger the mass of a spherical Indivisible, the hotter it is (26a 9—11). And this admission is fatal to the thesis which, as we saw (26a 1—3), the Atomists must maintain. For if the Indivisibles differ from one another in degree of heat, they cannot be ἀπαθητικά (26a 11—12). But neither can they be ἀπαθητικά, if hardness be attributed to them. For if hardness be attributed to any Indivisibles, its contrary, softness, must be attributed to other Indivisibles. It is as paradoxical to attribute hardness but not softness, as it is to attribute heat but not cold. But softness means 'tendency to yield to pressure': i.e. nothing which is soft can be ἀπαθητικός (26a 13—14).

It is paradoxical, as we have seen, to deny to the Indivisibles all qualities except figure. But it is also paradoxical to attribute
to each Indivisible *one* quality, and *one only*, in addition to its figure. For these qualities necessarily go in pairs; i.e. if one Indivisible is *cold* + figured, another Indivisible must be *hot* + figured. What then becomes of the supposed 'uniformity of substance' in all the Indivisibles? And, finally, it is no less impossible to attribute to each Indivisible *more than one* quality in addition to its figure. For, being indivisible, it is without internal distinctions: all its qualities will belong to it in its single undifferentiated identity. Suppose, then, an Indivisible is e.g. hot, and therefore 'suffers action', is 'affected', in so far as it is chilled. Besides being hot, it will, on the hypothesis, also possess some other quality: e.g. it will be soft. And its softness will qualify its indivisible identity, which is also qualified by its heat. Hence *qua* itself—*qua* hot—it will 'yield to pressure' as well as 'grow cold', and will perhaps also produce heat, or some other sensible quality, in another Indivisible. The Law of Contradiction will thus be violated: for the same single Indivisible will in the same respect suffer diverse actions, or both 'act' and 'suffer action' (*26a* 14–20).

The same argument applies in principle whatever qualities are attributed to the Indivisibles. For it is their *indivisibility* which makes it impossible to ascribe a plurality of qualities to them: and any theory, for which the ultimate Reals are Indivisibles (whether solids or planes), is open to this criticism. For that which is *indivisible* cannot contain any empty interspaces, and cannot have a plurality of constituents. Hence there can be no differences of density within an Indivisible, nor can one Indivisible be, or become, 'rarer' or 'denser' than another. Now a composite body may have many different qualities, the qualities of one composite body may differ from those of another, and a composite body may change its qualities. For one and the same composite body may have within it different degrees of density, or may change its density: and one composite body may be, or become, denser than another. But, *ex hypothesi*, there are no inner differences in the Indivisible, and no differences of stuff or texture to distinguish one Indivisible from another. Hence to suppose that an Indivisible has, or acquires, a plurality of qualities, is necessarily to violate the Law of Contradiction (*26a* 20–24).

*26a* 3. ὡς τέω . . . εἶναι. 'For none of them can be, e.g., either *hard* or *cold*.’ Aristotle apparently selects 'hardness' and 'cold'
as examples of the πάθη which the Atomists cannot consistently ascribe to their Indivisibles, because (a) we should naturally have supposed that the Indivisibles are ‘hard’; and (b) since Demokritos expressly attributes heat to the spherical Indivisibles, it seems peculiarly paradoxical that he cannot attribute cold to any Indivisible. For heat and cold are the contrasted extremes of a single quality (temperature), and what is susceptible of the one is eo ipso susceptible also of the other.

26a 3-6. καίτοι... σχημάτων. Cf. de Anima 403b 31—404a 16, 405a 8-13; de Caelo 303b 14, 306b 29—307b 18.

σχήμα, i. q. σώμα ἀδιαίρετον: cf. * 15b 6-9, 26b 1.

26a 9-10. βαρύτερον... ἀδιαίρετων. Cf. de Caelo 308b 35—309a 2: Theophrastos, de Sensu § 61 (Diels, p. 375) βαρύ μὲν οὖν καὶ κούφον τῷ μεγέθει διαιρεὶ Δημόκριτος. On the vexed question as to whether, and in what sense, Leukippos and Demokritos attributed weight to their indivisible solids, see Burnet, pp. 341 ff.

26a 10. ὡστε... θερμότερον, i. e., as Philoponos explains, ὡστε, εἰ τὰ μείζω ὄσταμα βαρύτερα, δῆλον ὅτι καὶ τὰ μείζω σφαιρικὰ θερμότερα.

26a 12. θερμόν. ψυχρόν. EHJL: but θερμόν is clearly required by the argument.

26a 14. τὸ... μαλακόν: cf. * 30a 8-12.

26a 16. ψυχρόν. σκληρόν EHJL: but ψυχρόν is required by the argument. For, on the hypothesis here made (viz. that each Indivisible possesses one ‘sensible quality’ in addition to its figure), the Atomists would not be bound to admit that some Indivisibles were hard + figured, and others hot + figured. On the other hand, if they attributed heat (or cold) to any Indivisible, they were bound also to attribute cold (or heat) to some other Indivisible—or, at least, so Aristotle supposes, cf. * 26a 3.

26a 17. οὐδὲ... αὐτῶν. Cf. Phys. 203a 34—b 2, de Caelo 275b 31—32; Burnet, p. 336a.

26a 20—24. τῶν... ἀδιαίρετοι. For the most probable interpretation of this difficult passage, see * 25b 36—26a 24.

We must remember that the ‘sensible qualities’ (the ‘secondary’ qualities) of the composite bodies are, according to the Atomists, due to the number, grouping, and turning of their constituent atoms (cf. * 15b 33—16a 2). One and the same composite body possesses diverse qualities, because e.g. its atoms are concentrated in different degrees, or disposed differently, in different parts of it: i.e. because it is ‘denser’ or ‘rarer’ in different parts of its stuff.
Similarly differences of 'density', and change in degree of 'density', will serve to explain why the qualities of one composite body are different from those of another, and how composite bodies can change their qualities. But such an explanation is clearly worthless, when the supposed owner of the many qualities is an Indivisible.

toûto (a 21), sc. the impossible consequence—the violation of the Law of Contradiction—which was shown to follow from the supposition that e.g. a hot Indivisible possessed some other quality besides its heat (cf. a 18—20).

26a 24—29. ἢ...μικροῖς; 'It is a further paradox that there should be small Indivisibles, but not large ones. For it is natural enough, from the ordinary point of view' (νῦν, a 25), 'that the larger bodies should be more liable to fracture than the small ones, since the large bodies are easily broken up because they collide with many other bodies. But why should Indivisibility as such' (ὁλῶς, a 28, i. q. ἀπλῶς: cf. 20b 30) 'be the property of small, rather than of large, bodies?'

The atoms of Leukippos and Demokritos are indivisible, because they are 'absolutely full', i.e. without interspaces. They are physically, not mathematically, indivisible (cf. Burnet, § 174). Hence 'theoretically there is no reason why an atom should not be as large as a world' (Burnet, Greek Philosophy, § 79), as Demokritos appears to have said: see Aetios, quoted by Diels, p. 361 l. 9. (The statement of Dionysios, quoted by Diels, p. 360 l. 35, that 'Demokritos postulated very large atoms' is probably a misunderstanding of the remark correctly reported by Aetios.) But, in fact, the Indivisibles were all minute—their minuteness being probably postulated by the Atomists in order to account for their indivisibility (cf. 25a 30).

26a 29—30. μία...στερεῶν, as the Atomists in fact maintained: cf. the passages quoted above, * 26a 17.

26a 30—31. ἡ...δύκον; The alternative here suggested is that the Indivisibles form qualitatively-distinct groups, e.g. a group of fiery (i.e. spherical and therefore hot), and a group of earthy, Indivisibles. Cf. the expression τὸ σωματόμανον μέγεθος applied above (25b 22) to each of Empedokles' 'elements'.

26a 34. οὔδεν...πρωτέρου, i.e. if the substance of the Indivisibles is really uniform, the running together of drops of water is precisely parallel to the coming into contact of two or more Indivisibles.
26\textsuperscript{a} \textit{35—b} I. \textit{kai \deltaηλον... σχήματα}. ‘It is clear, too, that these’—i.e. these qualitatively-distinct sets of atoms—‘ought to be postulated as ‘original reals’, i.e. causes from which the phenomena result, rather than the ‘figures’. For \textit{σχήματα}, cf. *26\textsuperscript{a} 3-6.

26\textsuperscript{b} 2. \textit{kαν... πάσχοι}. According to 25\textsuperscript{a} 32-34, this is precisely what Leukippos maintained. But Aristotle has shown (25\textsuperscript{b} 36—26\textsuperscript{a} 3) that it follows from the conception of the Indivisible (as that which is without Void), combined with the Atomists’ theory that ‘πάσχειν is impossible except through the Void’, that every Indivisible must be \textit{ἀπαθές} and \textit{μηθενός} \textit{ποιητικόν πάθος}.

26\textsuperscript{b} 2-6. \textit{ἐτι... δυνάμει}. The Atomists maintain that there is an infinite multiplicity of indivisible solids moving in the Void. But this movement is inexplicable. For what sets them moving? (i) If that which moves them is other than themselves, they are \textit{παθητικά}: but (ii) if each Indivisible sets itself moving, \textit{either} (a) it is in fact \textit{divisible} (into that which moves and that which is moved), \textit{or} (b) it will unite in itself, \textit{and in the same respect}, action and passion (moving and being moved), i.e. contraries. Hence the ‘matter’ of contrary properties—the \textit{διοκείμενον} in which contraries inhere—will be identical-in-potentiality, as well as numerically-identical. But that is impossible: for if the \textit{slave} be identical-in-potentiality, the realization of its potentiality must be \textit{one}—i.e. the properties, in which the potentiality becomes actual, cannot be contraries, but must be identical.

For the general doctrine implied in \textit{b} 6 (\textit{γι\ ν\ λη... δυνάμει})—i.e. that the \textit{slave} is one ‘numerically’, but not one ‘in potentiality’—cf. \textit{Phys.} 190\textsuperscript{b} 24, 192\textsuperscript{a} 1 ff.

26\textsuperscript{b} 6-28. \textit{ἀσοι... χωρίζεσθαι}: criticism of the theory which explained action–passion by pores, cf. *24\textsuperscript{b} 27-32.

26\textsuperscript{b} 7. \textit{διά... κινήσεως}, ‘by means of the movement facilitated by the pores’. The construction of the genitive (\textit{τῶν πόρων}) is harsh: but the meaning is clear, and there is no need to alter the text.

26\textsuperscript{b} 8-10. \textit{εἰ... τρόπον}. If the pores be not \textit{vacua}, but full of some other body, the postulate of pores is superfluous. For if the agent can penetrate (and therefore act upon) a body under these conditions, it would be able to penetrate it equally well; if it were ‘just its own continuous self’, i.e. of one texture throughout. The conception of a porous body, whose pores are full of another body, is the same in principle as the theory \textit{μὴ συνεχέσ}
COMMENTARY


26b 10–12. ἐτι . . . λέγουσιν; Cf. * 24b 27–32.

26b 12–13. οὔτε . . . διαφανεῖν. The subject of διεύναι, as Philoponos rightly explains, is the visual ray or rays (the ὅψεις): and the ἀφαί are the points of juncture of the two bodies, i.e. the 'transparent' body itself and the body filling its pores.

26b 15–16. ἄλλα . . . πάλιν. Since, according to Empedokles, the pores are always full of some other body, Aristotle has maintained that the porous body is solid throughout and as impenetrable as if it were non-porous. The whole body—pores and all—is ὁμοίως πλήρες (b 14). This criticism will still hold, even if it be objected that the pores—though they must contain a body, and thus are always full—are themselves, qua pores, empty channels.

For even if we thus distinguish in thought between the pores and the body which fills them (even if, in this sense, the body is not as a whole ὁμοίως πλήρες), still the body will be impenetrable, since its pores will always in fact be full.

26b 16–18. εἰ . . . ὑπηλικονοῦν. Empedokles denied that any part of the Universe was empty (cf. * 25a 6–13): and the advocates of pores are here supposed to accept in principle the denial of a 'void', but to plead that the pores are in fact empty owing to their infinitesimal size.

26b 18. μέγα . . . ὑπηλικονοῦν, i.e. it is absurd to admit an infinitesimal 'void', and to deny that there is a big 'void', of whatever size (viz. however small) the 'big' may be. 'Big' is a relative term, and may include a 'void' in any degree bigger than the infinitesimal.

26b 18–20. ἢ . . . κενόν. The term κενόν means χωρὰ σώματος: i.e. when men dispute whether a 'void' exists, they are disputing whether there is a place capable of receiving a body, but deprived of it (cf. * 20a 34–b 2). If that is the only possible meaning of the term, it is clearly absurd to suggest that the pores are κενά if, and because, they are too small to admit a body.

26b 21–24. διάως . . . περικάτως. Action—Passion cannot be explained by pores: for even if there are pores, they can only serve to bring the agent into contact with the internal parts of the patient. If contact on the surface is not adequate to produce action—passion, neither will it be produced by contact internally: whilst if internal contact produces action—passion, why should not contact at the surface produce it?
In 1b 24 τῶν ... πεφυκότων means τῶν πρὸς ἄλληλα ποιεῖν καὶ πάσχειν πεφυκότων: cf. Philoponos, whose whole note on this passage is excellent.

26b 25. οὕτως. Aristotle does not deny that there are ‘channels’ in bodies—e.g. the πόροι in the animals, such as the mouth, the bowels, the veins, &c.—but he does deny that bodies are perforated by infinitesimal and invisible channels, as the advocates of pores maintained.

26b 26-28. διαπετόν ... χωρίζονται. The sense in which every μέγεθος (and therefore also every σῶμα) is through and through divisible was discussed at length above, 16a 14—17a 17.

Aristotle’s point here is that it is not necessary, in order to account for action-passion, to suppose that bodies are perforated with pre-existing infinitesimal channels. The agent can make a channel for itself in the patient, since the patient is ἀναλυόμενον: and, being διαπετόν, it can be actually divided so that its parts fall asunder—i.e. so that a channel is opened in it (1b 28 δινώμαι χωρίζονται).

A. 9

26b 29—27a 29. Τίνα ... τρόπον. In this chapter Aristotle briefly indicates his own theory of the mechanism of ποιεῖν—πάσχειν, emphasizing its superiority both to the theory of ‘pores’ and to the theory of ‘Indivisibles and Vacua’. Incidentally (27a 9-14) he criticizes the theory that a body is ‘discretes-in-contact’, and that action-passion takes place at the contacts.

26b 29—30. Τίνα ... πάσχειν. The phraseology, both here and in the epilogue (27a 25—29), reminds us of the original formulation of the problem (cf. 22b 6-13) and of the connexion of the discussion of ποιεῖν—πάσχειν with the plan of the whole work: cf. * 22b 1-26.

τῶν οὗτος is wide enough to include all possible subjects of ποιεῖν—πάσχειν, i.e. τὰ στοιχεῖα as well as τὰ ἐκ τῶν στοιχείων. On the other hand, τὰ οὕτα could not strictly be said γίνεσθαι: hence the active aspect of γένεσις (γεννᾶν) alone is mentioned here, whereas in the epilogue (27a 26) the passive aspect (γίνεσθαι) is mentioned too.

26b 30. ἀρχὴν ... εἰρημένην. The principle in question is, as appears from the next sentence, that if any property y is predicated of any subject x, x may ‘be-y’ either potentially or actually.
COMMENTARY

26b 31. τοιούτων: 'such-and-such', i.e. qualified by any quality, whatever the quality in question may be.

πεφυκέν, sc. τὸ δυνάμει τοιούτων.

26b 33. ἕττον δὲ καὶ μᾶλλον. Ἡ has 'magis autem et minus', which is more logical. But the reversed order is characteristic.

26b 34—27a 1. καὶ ταῦτῃ...συνεχεῖς. According to Aristotle's theory, the cold body, e.g., quae potentially-hot, is liable to 'suffer action' from a hot body—i.e. liable to be warmed. This susceptibility pervades the cold body throughout (because it is a consequence of its character quae potentially-hot) and is not restricted to parts of it or to channels within it. But though the cold body is potentially-hot throughout, its potential heat may vary in degree in different parts of it. There may be, as it were, lines or 'veins' of intense potential heat (and therefore of intenser susceptibility) in it, just as there are 'veins' in the metals, along which they are specially susceptible to action. If we are to talk of 'pores' at all, we should use the term to denote such lines of greater intensity and greater susceptibility: we must not suggest that the body is susceptible only along certain lines, and quite insusceptible in the rest of itself. Cf., for the general doctrine, * 21a 5—9.

The reading of EFJ in b 34 (μᾶλλον ἡ καθαρέα) is due to a misunderstanding of the illustration. The 'veins' in the metal are not 'pores' in the sense repudiated by Aristotle. Their substance is the same as that of the rest of the metal: it is only a difference of degree.

27a 1—6. συμφυές...πᾶσχειν. Passion implies (i) two distinct bodies: the patient must not be grown together with the agent, so as to form with it a single naturally-coherent body: (ii) contact, either immediate or mediated, between patient and agent. If the contact is mediate, the medium must itself be a body by nature such as to suffer action (from the agent) and to act (upon the patient).

27a 6. τῷ...μῆ. Aristotle's own view (cf. * 26b 34—27a 1) is that a body, if παθητικῶν at all, is παθητικῶν as a whole, through and through. This follows necessarily from his explanation of 'susceptibility' as due to the body's possessing a property potentially. Hence any explanation of πᾶσχειν, which implies that the patient is susceptible only in parts of itself, must be rejected as erroneous. Now all the attempts to explain πᾶσχειν, which Aristotle has been criticizing, do in fact imply the view τῷ μῆ
πάρχειν, τῇ δὲ μνή: for they ascribe the patient’s susceptibility to peculiarities within its structure, i.e. to features belonging to parts of it, and not to a property characterizing it as a whole.

Thus (i) the Atomists explained πάρχειν by the vacua inter-spacing the Indivisibles; (ii) Empedokles explained it by the ‘porosity’ of the patient, i.e. by the hypothesis that the apparently continuous body was really ‘discretes-in-contact’, or was traversed by ‘veins’ filled with a different material (cf. * 25* 6–13): and (iii) Plato viewed the body as ‘planes-in-contact’, and explained πάρχειν by penetration and division at the contacts (cf. 25b 24–33).

27a 6–7. διορίσαντας... λέκτέων. As the text stands, we must suppose that the reference (ἐν ἀρχῇ) is to 24b 26 ff., where Aristotle distinguished various forms of the supposition of ‘partial susceptibility’. The whole sentence (27a 6–7) would mean:—‘We distinguished above the various theories of partial susceptibility, and have now to make the following remarks’.

On the whole, however, it seems more probable from the next sentence (27a 7–14) that ἐν ἀρχῇ refers to the elaborate discussion (16a 14—17a 17) of the sense in which every magnitude is divisible through and through. I have accordingly ventured to mark a lacuna before διορίσαντας, and to interpret the passage as follows:—‘The supposition of partial susceptibility (is possible only for those who hold an erroneous view concerning the divisibility of magnitudes. For us) the following account results from the distinctions established at the beginning of our treatise’.

27a 7–14. εἰ... ἀδύνατον. The results established in Chapter 2 may be summarized as follows. (i) Every magnitude is divisible. There are no Indivisibles. (ii) No magnitude is πάντῃ διαμετέρων, i.e. no magnitude is such that ‘through and through’ division of it could ever actually have taken place: but (iii) every magnitude is πάντῃ διαμετέρων, i.e. it is always possible, given a magnitude, to divide it anywhere, though not everywhere at once. Cf. * 16a 19, * 17a 2–17.

Aristotle here presupposes and refers to these results, but his reference is brief and obscure. He makes no mention of (iii), though it expresses the truth as to the divisibility of magnitudes, presumably because this thesis would lend no support to the supposition of ‘partial susceptibility’.

He argues:—(a) If there is a limit to the divisibility of the magnitude, i.e. if there are indivisible solids (as the Atomists
maintained) or indivisible planes (as Plato thought), then no composite body will be susceptible through and through: for the Indivisibles are ἀναθῆ (cf. 25b 36—26a 3). But then no body or magnitude will be continuous: for πᾶν συνεχὴς διαμερῶν εἰς ἀεὶ διαμερὰ (Phys. 231b 16).

(b) But if—as is in truth the case—the hypothesis of Indivisibles is false, and every body is divisible, there is no ground for supposing that a patient is susceptible only in parts of itself. For, when once we have recognized that there are no Indivisibles, it is clear that the opponents’ description of a composite body as ‘discretes-in-contact’ means neither more nor less than that the body is divisible through and through.

There is no difficulty in the first part (27a 7—9) of this argument: but the second part (a 9—14) is most obscure. Aristotle’s opponents regarded a body as discretes-in-contact, and explained πάντες by the theory that a body so constituted ‘could be separated (i. e. by the agent) at the contacts’ (a 11—12). Now—Aristotle urges—since there are no Indivisibles, nothing is gained by describing the body as ‘discretes-in-contact’: all that the opponents can really mean is that the body is ‘divisible’ (i. e. divisible through and through). And if it is ‘divisible’ (or if, as they express it, ‘it can be separated at the contacts’), then—even though it has not yet in fact been divided—it will ‘be δισχημένον’, i.e. it will ‘be in a state of dividedness’ so far as is required for πάντες as they conceive it.

In 27a 11 ἦ διαμερῶν εἶναι must be interpreted as equivalent to ἦ πάντη διαμερῶν εἶναι. For, since there are no Indivisibles, the parts, which are in contact, will themselves contain smaller parts in contact—and so on ad infinitum.

We must, I think, supply for the whole argument the suppressed corollary that, γιὰ πάντη διαμερῶν, the body will be πάντη παθητικῶν, since its susceptibility is supposed to be due to its divisibility (cf. 27a 14—15).

27a 8. πλάτος. We should rather have expected ἐπίσκεδον (cf. e.g. 25b 26, 29a 22). The reference is no doubt to Plato.

27a 12. ὠπέρ φασὶ τινι, e. g. Plato, cf. 25b 32.

27a 13—14. διώνυσον . . . ἀδύνατον: ‘for—since it can be divided—nothing inconceivable results if this potentiality be supposed realized.’

The argument in a 11—14 depends upon Aristotle’s conception of τὸ διώνυσον, for which see * 16a 19.
27\textsuperscript{a} 14-25. ὁλος . . . μεταβάλλοντος. All the explanations of ποιεῖν—πᾶσχειν, which Aristotle has been criticizing, imply that the patient is susceptible only in parts of itself; and this, as we have just seen, presupposes erroneous views as to the 'divisibility' of magnitudes. But, in addition to this special difficulty, the theories in question are open to a general criticism (ποιεῖν ὁλος δὲ κτλ.): for they assume that A can only act on B by 'splitting' it, i.e. by dividing its particles from one another. This narrow conception of ποιεῖν—πᾶσχειν is absurd, for it makes it impossible for them to recognize either Alteration or Growth and Diminuation.

27\textsuperscript{a} 14. γίνεσθαι, sc. τὸ πᾶσχειν.
27\textsuperscript{a} 17. ὑγρὸν . . . πεπηγός. For this antithesis, cf. * 30\textsuperscript{a} 12-24.
27\textsuperscript{a} 18. οὐδὲ δὲ διαφυγῇ: cf. * 15\textsuperscript{b} 33—16\textsuperscript{a} 2.
27\textsuperscript{a} 19—21. οὗτε γὰρ . . . ὀγκοὺς. Since the indivisible solids are invisible owing to their minuteness (cf. 25\textsuperscript{a} 30), it is difficult to see what right Aristotle has to make these assertions. His appeal to perception (ὅσα ὀρῶμεν) is irrelevant.

27\textsuperscript{a} 21. σκληρά. For the meaning of σκληρόν, cf. * 30\textsuperscript{a} 8—12.
27\textsuperscript{a} 23—25. οὐ . . . μεταβάλλοντος. 'For if there is to be apposition (instead of the growing thing having changed as a whole, either by the admixture of something or by its own transformation), increase of size will not have resulted in any and every part.' Cf. * 20\textsuperscript{b} 34—21\textsuperscript{a} 29.

In 27\textsuperscript{a} 25 the genitive (μεταβάλλοντος) is at first sight perplexing. We should perhaps have expected ἡ καθ' αὐτὸ ἡ μιχθέντος τινός: but since the order of the alternatives is reversed, it becomes desirable to add a participle to καθ' αὐτό, and the added participle is naturally assimilated in case to μιχθέντος.

A. 10

27\textsuperscript{a} 30—28\textsuperscript{b} 22. λοιπὸν . . . ἐνσώις. By the account of μίξις (or 'chemical combination') in the present chapter, Aristotle completes the programme which he had sketched for himself at the beginning of Chapter 6: cf. * 22\textsuperscript{b} 1—26.

First, he explains the precise significance of μίξις, distinguishing it carefully from γένεσις καὶ φθορά, αἰξίησις, ἀλλοίωσις, and mere σύνθεσις ('mechanical mixture'). If there is to be μίξις in the proper sense of the term, two or more distinct and separate bodies must come together so as to form a single resultant in which they are merged. The properties of the resultant must be different
from those of the constituents: and it must be uniform in its properties throughout (not merely appear uniform to perception) so that every part of it, however small, possesses the same properties as the whole. Nevertheless it must be possible to recover the original constituent bodies from it by a process of 'separation' or 'chemical analysis' (27a 30—28a 17).

Next, Aristotle explains the conditions under which μίξις can occur. Such a process is possible (a) because there are bodies which are naturally active and reactive, passive and re-passive, in relation to one another, and (b) because everything can be what it is either potentially or actually. This distinction between the potential and actual grades of a thing's being accounts for the temporary submergence of the properties of the constituents, and again for their re-emergence under chemical analysis of the compound (28a 18—31).

Finally (having stated certain conditions which are specially favourable for the occurrence of the process, and having briefly considered certain exceptional instances of μίξις and explained them in terms of his general theory), Aristotle summarizes the results of the whole discussion in the form of a 'scientific' definition of 'the combinable' and 'combination' (28a 31—b 22).

The doctrine of the present chapter is briefly restated (and slightly supplemented) below: cf. * 34b 8—30. The reader who is interested in Aristotle's conception of μίξις should consult Alexander's περὶ κράσεως καὶ ατέχνεως: Zabarella's De Mistione, De Misti Generazione et Interitu, De Qualitatibus Elementaribus: and Zabarella's commentary on the present chapter, and on Meteorologica, Δ. 1. By utilizing these materials, I endeavoured some years ago to give a short and accessible account of Aristotle's theory in the Journal of Philology, No. 57.

27a 30—31. κατὰ . . . μεθόδου. Aristotle's treatment of μίξις follows the same general lines as his discussion of ἀφή (Chapter 6) and of τοιεῖν—πάσχειν (Chapters 7—9).

27a 31—32. τῶν . . . ἀρχῆς. The reference is to 22b 1—26, which is the ἀρχῆς of the present investigation. Chapters 6—10, with the addition perhaps of B. 1—8, appear to constitute one of the minor treatises of which the περὶ γενέσεως καὶ φθοράς is composed. On the relation of such subordinate constituent λόγοι or μέθοδοι to an Aristotelian 'work', cf. Jaeger, pp. 148 ff.

27a 32—34. σκεπτέον . . . ψεύδος. From the point of view of Aristotle's general logical theory, μίξις falls under the head of
Attribute (πάθος). It is an 'adjectival', whose 'existence' is its inherence in something other than itself as the subject of which it is predicable or the substance of which it is a property. Its esse is ἐσσε, its elnai is ὑπάρχειν. Hence the complete explanation of μέχρι must be such as to furnish the materials from which its 'scientific definition' can be elicited. Its 'scientific definition' must specify (a) the substance or substances in which, (b) owing to a determinate proximate cause, (c) that determinate process, which the term μέχρι properly means, must occur (cf. Introd. §§ 7–9, *14a 2–3, *20b 34—21a 29, *21b 16–17). Accordingly we shall find Aristotle claiming in the epilogue (28b 14–22) that he has shown (i) ὅτι ἐστι μέχρι, i.e. that it occurs in, or is predicable of, certain determinate substances, (ii) τι ἐστι, i.e. what the term properly means, and (iii) ἃ ἄν τι, i.e. to what precise cause its occurrence is due. And we shall find him concentrating the results of his discussion in a 'scientific definition' (cf. *28b 22).

In 27a 32–34 Aristotle enumerates five questions for discussion. The enumeration is tentative and preliminary: and we need not attach too much importance either to the precise significance of the different questions or to the order of their enumeration. The whole matter is exhaustively discussed by Zabarella, whose interpretation I accept with one slight modification. We are to ask:—What is the meaning (1) of combination, and (2) of the combinable (τι ἐστιν, i. q. τι σημαινεῖ)? (3) Of what existent things is combination the attribute (i. e. what is its primary and adequate subject)? (4) What are the conditions under which combination is predicable of these things (πῶς ὑπάρχει, sc. quomodo fit—a question including the inquiry as to the proximate cause of the occurrence of μέχρι)? (5) Does combination exist in fact, i. e. is there a distinctive subject of which combination is the distinctive and commensurate attribute?

27a 33—b 6. ἐκτι . . . ὄντα. Aristotle appears to begin with the question enumerated last: but in fact (as he points out, 27b 6–9) his discussion concerns the meaning of the terms μέχρι and τὸ μικτὸν. The doubt as to the existence of combination arises, as he shows, only from misinterpretation of the term. Hence he is really opening the discussion of questions (1) and (2).

According to Aristotle's own theory, as we shall see (cf. below, B. 8), all combination in the sublunary region involves all four 'simple bodies', and results in one or other of the ὄριομοερη: i.e. the resultant of μέχρι is always a quaternary compound, and
the combining constituents are always Earth, Air, Fire, and Water (cf. * 14*19, * 21*19–22). At present, however, Aristotle is considering the subject quite generally and assumes that every μιχθέν implies (at least) τω μικτά or μιγμένα.

Now certain thinkers argued that μίξις is impossible. For we must suppose either (a) that both constituents are preserved in the compound, or (b) that both are destroyed, or (c) that one is destroyed, whilst the other is preserved. But the characteristic conditions of μίξις cannot be satisfied under any of these suppositions, although no other alternative seems possible. (a) If both constituents survive unaltered, there is no μίξις: for μίξις implies that the constituents have merged in a new resultant (cf. * 27* 30—28*22). (b) If both are destroyed, ‘they’ are not at all and a fortiori are not combined: whilst (c) if one is destroyed and the other is preserved, the two do not contribute to constitute a joint resultant. They have not ‘combined’, but one is and the other is not.

27*2. δροινος εχειν, i.e. the constituents in the supposed ‘compound’ are in the same condition as they were before the supposed ‘combination’ took place. But in b 4 δροινος εχοντων refers to the condition of the constituents relatively to one another: i.e. ‘combination demands uniformity of condition in the constituents’, for both must contribute to the being of the resultant.

27*6–10. ουτος . . . λουστ' αν. The preceding argument rests on a misconception of the exact meaning of μίξις and το μικτόν, and a consequent confusion of these terms with γένεσις—φθορά and το γεννητόν και φθαρτόν. The difficulties it raises against the occurrence of μίξις will all disappear when this confusion has been cleared up. Accordingly Aristotle proceeds to discuss the precise significance of the term μίξις, and begins (27*10–22) by eliminating certain processes which are liable to be confused with combination.

27*10–13. αλλά . . . φθείρεσθαι. When fire burns wood, there is φθορά of the wood and γένεσις of the fire. There is no μίξις either (i) of fire and wood, or (ii) of the pieces of the wood with one another. This instance illustrates the second and third alternatives (cf. * 27* 33 — b 6): constituents, of which both or one are destroyed, cannot be said to ‘be combined’. At the same time, it prepares the way for the exclusion of αιξησις as not μιξις proper: for the ‘consumption’ of food by the αιξητικόν was compared to the ‘consumption’ of inflammable material by fire,
and Aristotle had suggested that the food was ‘mixed’ with the growing tissue (cf. 22\textsuperscript{a} 8–16).

27\textsuperscript{b} 13–17. τὸν ... ὑπάται. Combination is distinguished from (i) Growth and (ii) Alteration. Growth is an illustration of the third alternative (the destruction of one constituent), and Alteration illustrates the first alternative, viz. the preservation of both constituents: cf. * 27\textsuperscript{a} 33 – b 6.

(i) It was only by a loose use of the term that Aristotle spoke (22\textsuperscript{a} 9) of the food being ‘mixed’ with the growing tissue. For the tissue—qua animated with the indwelling αἰτιητικῶν—‘consumes’ the food and converts it into its own substance: it does not co-operate with the food to produce a new resultant different in character from both.

(ii) No change of quality on the part of a body is ‘combination’: for both ‘constituents’—viz. the body and the quality—coexist unaltered in the result. Thus, e.g., ‘the shaped lump of wax’, ‘the whitened body’, ‘the learned man’, are resultants of ἀλλοιωματικός and not of μίκης: for the substance which is qualified, and the quality (σχήμα, πάθος, or ἐκείνος) which qualifies it, manifestly both survive.

27\textsuperscript{b} 17–22. ἄλλα ... χωριστῶν. If the same substance ‘combines’ in itself two qualities (if e.g. a man is both ἑπιστημονικός and ἀληκτός), this coincidence of πάθη (or of ἐκείνος and πάθος) is not ‘combination’ of them: for only self-subsistents (only bodies, not their attributes) can ‘combine’. Combination implies combinables which exist per se before the combination: but no πάθος can exist per se. Every πάθος is an ‘adjectival’, its esse is inesse: cf. * 20\textsuperscript{b} 17–25.

Incidentally Aristotle criticizes those philosophers who postulated a primordial ‘togetherness’ of all things and described this as a μίγμα: for ‘all things’ would include πάθη, and these cannot ‘combine’. Philoponos supposes the plural (οἱ ... φάσκοντες) to mean οἱ περὶ Ἀναξαγόραν: but Aristotle is perhaps thinking of the ‘Sphere’ of Empedokles, as well as of Anaxagoras (cf. * 34\textsuperscript{a} 26–b 2, Phys. 187\textsuperscript{a} 20–23).

27\textsuperscript{b} 22–31. ἐπειδ ... αὐτῶν. The argument (professing to show that μίκης does not in fact occur) assumed that only three alternatives are possible and urged that, whichever of these three we accept, the process is not μίκης (cf. * 27\textsuperscript{a} 33 – b 6). In other words, the conception of μίκης is self-contradictory: for it demands both that the constituents shall be merged (i.e. destroyed)
in the resultant, and that they shall survive (i.e. not be merged), since they are to be recoverable by analysis. Aristotle here points out that there is a fourth possibility, which this argument has neglected. The argument assumes that a thing must either be or not-be x: but in fact we must recognize a distinction in the grade of a thing's being (cf. *26b 30). For a thing, which is x, may be-potentially x or may be-actually x; and a thing, which is not x actually, may nevertheless be-potentially x. If this distinction be applied, the conception of μικραί ceases to be self-contradictory: i.e. the different characteristics of 'combination' (or of the 'compound') are compatible with one another. Each of the constituents has, to begin with, its own distinctive character: they are, e.g., respectively actually-x and actually-y. In the process they merge in a resultant with a new character, z. Yet they have not been destroyed, but have simply sunk to a lower grade of being; i.e. they have become potentially-x and potentially-y. The character of the compound is neither x nor y, nor x+y; but an intermediate something, z, which participates in the characters of both constituents or results from the co-operation of both in a tempered and moderated form. And, under suitable conditions, the compound can be dissolved so that the constituents will re-emerge in their original state as actually-x and actually-y.

There are two difficulties in this passage. (i) The first is a question of fact. To what phenomena is Aristotle referring when he speaks of τὰ μικρά μενα as δυνάμενα χωρίζονται πάλιν? It seems certain from the sequel that he is thinking of the analysis of a genuine chemical compound: and therefore Philoponos is beside the mark, when he refers to the recovery of wine (from a mechanical mixture of wine and water) by filtering (cf. p. 191, φασὶ γοῦν διὰ τῶν καλομένων ἐν τῇ συνθεσίᾳ συντασσόντων ποταμῶν διηθούμενον τῶν κεκραμένων οίνον διακρίνειν τοῦ ἱδατος τῶν οῖνον). Yet what facts of chemical analysis were known to Aristotle? Or is he relying upon some of the phenomena of putrefaction?

(ii) The second difficulty is one of interpretation. In what precise sense are the constituents preserved potentially in the compound? What is meant by the statement (b 25-26) that 'each of them may still be-potentially what it was before they were combined', and again by the phrase (b 30-31) σώζεται γὰρ ἡ δύναμις αὐτῶν?

Readers of Aristotle are familiar with two senses in which
a thing is said to ‘be-potentially $x$’. Thus (i) a student of
geometry is δινάμει γεωμέτρης when he is acquiring, but has not
yet mastered, the εξεις of geometrical demonstration: and (ii) the
geometer is δινάμει γεωμέτρης when he is not actually solving
a geometrical problem. In sense (i), the δινάμει is contrasted
with the εξεις into which it may develop: in sense (ii), the εξεις
is contrasted with the ἐνέργεια (the θεωρία) in which it is
actualized (cf. e.g. de Anima 417$^a$ 22 ff., and often). But—as
Philoponos and Zabarella rightly observe—the constituents are
not preserved δινάμει in the compound in either of these senses.  
Not in the first sense: for, ex hypothesi, before they combine,
they are already actually-$x$ and actually-$y$, whereas the student is
not actually a geometer, but only on the road to become one.  
Nor in the second sense: for, ex hypothesi, the constituents have
lost their distinctive natures in the compound and have co-
operated to produce a resultant with fresh properties of its own.
But the geometer does not lose his εξεις when he is not θεωρῶν.

Philoponos (p. 188) compares the state of the constituents in
the compound to that of the geometer who is trying to solve
a problem when drunk—ἐνέργει μὲν κατὰ τὴν ἐξεις, οὐκ ἐλικρινῶς
δὲ. The constituents, he thinks, retain their distinctive ‘powers
of action’ in a diminished and tempered degree—κεκολασταί
γὰρ ἡ αὐτῶν ἐλικρινῆς ἐνέργεια, καὶ οὐκ ἐστιν οὖσας ἡν πρὶν μιχθήναι.
This interpretation is endorsed by Zabarella (the constituents are
‘non penitus corrupta, sed solum refracta et labefactata’) and
it is confirmed and further explained below, 28$^a$ 28–31 (cf. * 28$^a$ 29)
and 34$^b$ 8–30. Cf. also Journal of Philology, No. 57, pp. 81–6:
and below, 33$^a$ 28 and 32.

27$^b$ 26. καὶ οὐκ ἀπολολοῦτα, sc. ἐνδεχόμεν εἶναι ἀπολολοῦν.
Ought we perhaps to read ἀπολολοῦν;;?

27$^b$ 31—28$^a$ 18. διο...πάλιν. The first problem with its
difficulties has now been solved. The meaning of μιξεῖς has been
explained, and the explanation has dispelled all doubts as to its
occurrence. The constituents survive in the compound, for their
‘merging’ is simply a lowering of their grade of being: and they
can ‘re-emerge’, for they can recover their original fullness or
actuality of being. It is not a passage from being to nonentity,
and a return from nothing to something. It is merely a change
from more to less, and from less to more, a lowering and
a heightening of the degree of being.

We proceed therefore to the discussion of the problem im-
mediately connected with these difficulties as to the mode of survival of the constituents (\textsuperscript{b} 31 τὸ ... σωκῆς τούτους ἀπόρημα). This is formulated in a way which assumes that \( \mu\iota\varepsilon\iota \) (combination) is only a special case of \( \sigma\iota\nu\theta\varepsilon\iota\sigma\iota \) (mechanical mixing). ‘Is combination’, Aristotle asks (\textsuperscript{b} 32–33), ‘something relative to perception’, i.e. is it distinguished from \( \sigma\iota\nu\theta\varepsilon\iota\sigma\iota \) merely by the limitations of our vision? The question is developed by bringing out the alternatives which it implies (\textsuperscript{b} 32 διαπέρετον, cf. *14\textsuperscript{a} 2–3), thus:—(i) Is there \( \mu\iota\varepsilon\iota \) when the constituents have been divided into parts no longer distinguishable by our vision and when every such part of one constituent is juxtaposed to a corresponding part of the other constituent? Or (ii) does \( \mu\iota\varepsilon\iota \) require division of the constituents into \textit{ultimate} least parts, and must every minimal part of one constituent be juxtaposed to a minimal part of the other? Both these alternatives are then rejected by Aristotle (28\textsuperscript{a} 5–17), and the complete otherness of \( \mu\iota\varepsilon\iota \) and \( \sigma\iota\nu\theta\varepsilon\iota\sigma\iota \) is emphasized. He is consequently obliged to discuss ‘once more’ (28\textsuperscript{a} 18 πάλιν) \( \pi\omega\iota \ \varepsilon\nu\delta\varepsilon\chi\epsilon\tau\alpha\iota \ \gamma\iota\gamma\nu\varepsilon\sigma\battcorr{\theta}\iota\iota \ \hbar \ \mu\iota\varepsilon\iota \). In other words the problem raised at 27\textsuperscript{b} 32–33 is really the question \( \pi\omega\iota \ \upsilon\pi\alpha\rho\chi\epsilon\varsigma \) (or \( \pi\omega\iota \ \varepsilon\nu\delta\varepsilon\chi\epsilon\tau\alpha\iota \ \gamma\iota\gamma\nu\varepsilon\sigma\battcorr{\theta}\iota\iota \) \( \hbar \ \mu\iota\varepsilon\iota \): and the solution (28\textsuperscript{a} 18 ff.) involves the determination of the precise character of the combinables, i.e. (\textit{inter alia}) the exhibition of those features in the combining bodies which are the proximate cause of their combination (cf. *27\textsuperscript{a} 32–34).

27\textsuperscript{b} 33—28\textsuperscript{a} 17. οταν ... διαπέρθηκαί. This passage is unfortunately obscure, partly owing to difficulties of reading and partly owing to its compression. Aristotle’s treatment of a similar problem (the \( \mu\iota\varepsilon\iota \) of colours) in the \textit{de Sensu} (439\textsuperscript{b} 19—440\textsuperscript{b} 23) is, if anything, more obscure than the present passage (to which he refers at 440\textsuperscript{b} 3, 13), and it throws very little light on the discussion here.

The two views of \( \mu\iota\varepsilon\iota \) (\textit{see preceding note}), which Aristotle here puts forward for criticism, agree in recognizing no difference of principle between \( \mu\iota\varepsilon\iota \) and \( \sigma\iota\nu\theta\varepsilon\iota\sigma\iota \). According to both of them, \( \mu\iota\varepsilon\iota \) is a mechanical mixing or a shuffle, and not an interpenetration or a fusion, of the constituents. According to both, therefore, \( \mu\iota\varepsilon\iota \) is \( \pi\rho\delta\iota \ \tau\nu\ \alpha\iota\sigma\theta\nu\sigma\iota\iota \ \tau\iota \) (27\textsuperscript{b} 33), though Aristotle speaks as if this were true only of the first view; for, according to both, the resultant is not really, but only appears to be, a homogeneous compound. An ideally acute vision would discern the different constituents in the whole, and would see that they are juxtaposed,
not fused. The difference between the two views is one of degree. According to the first, the constituents have been divided into units, which our vision does not discriminate, but which are not supposed to be ultimate atomic parts. Thus we should speak of a μιζον of wheat and barley, if each grain of wheat were juxtaposed to a grain of barley (28a 2–3). But, according to the second, the constituents have been divided into ultimate parts—i.e. into atoms; and each atom of one constituent has been juxtaposed to an atom of the other. Aristotle urges against both views that the resultant is not διοιμερές, i.e. that the constituents are not merged in a new product, but simply shuffled to form an aggregate. And he urges against the second view that it assumes (what he has proved to be untenable) that a body can be divided into atomic parts.

His main contention is that μιζον proper is in principle distinct from σύνθεσις. For τὸ μιζον must be διοιμερές, whereas τὸ σύνθετον differs in quality in different parts of itself, since its components are not fused, but merely aggregated. The reader will observe that μιζον, as Aristotle conceives it, demands a more thorough union of the constituents than that assigned to the constituents of a chemical compound by modern chemical theory. In so far at least as modern chemistry regards a compound as a mere re-arrangement or shuffle of the atoms of the combining constituents, Aristotle would accuse it of confusing μιζον with σύνθεσις. Any such theory falls under the second of the two views which Aristotle here attacks.

27b 33–35. ὅταν . . . αἰσθήσει. οὕτως (b 33) and τοῦτον τὸν τρόπον (b 34) are both antecedents of ὤτε (b 35). The parts must be smaller than the minima visibilia, and they must be so juxtaposed as to be individually indiscernible.

28a 1–2. ἢ . . . μιζοντων; ‘Or ought we to say “No: but they have been combined when the result is such that any and every part of one constituent is juxtaposed to a part of the other”?'

I have ventured to read ἀλλ' (ὁτε) ἔστιν ὤτε . . .

For the two views here in question, see *27b 33—28a 17. According to the first, the supposed μιζον is really a σύνθετον in which small pieces of one constituent alternate with small pieces of the other: and the small pieces—though we cannot discern them—retain the characters of the whole constituents (cf. 28a 7 σωζόμενο). According to the second view, the supposed μιζον
is really a σώνθετον in which the atoms of one constituent alternate with the atoms of the other—the atoms being indiscernible even to an ideally-acute vision.

The first view—to judge by Aristotle's illustration (28a 2–3)—is merely a popular view implied in the common use of the term μίξις in everyday life. Alexander (περὶ κράσεως καὶ αἰδήσεως, ed. Bruns, p. 214) is mistaken in attributing it to Demokritos. The second view, as Philoponos rightly says, is that of Demokritos. If Alexander (l. c.) is right in attributing a view of this kind to Epikouros, we must suppose that here—as in other respects—Epikouros made no real advance on Demokritos.

28a 2–3. λέγεται . . . τεθη. Zabarella insists that we must suppose the wheat and barley to have been ground to powder, as otherwise the particles would not be indiscernible to sense: and Philoponos (p. 192, l. 26) paraphrases ὅπερ εἴ τις σεμίδαλυν λεπτῆν ἐκ πυρῶν μίξει ἀλέυρῳ κράσις. But the only natural interpretation of ἴτισον παρ' ὀντινοῦν is to suppose that the single grains are shuffled, and this is confirmed by de Sensu 44οb 4–6. In such a shuffle the single grains would not be 'discernible to vision', unless they were separated from the mass: and this is all that Aristotle means.

28b 3–5. εἰ . . . παρ' ὀντινοῦ. 'But every body is divisible and therefore, since body combined with body is uniform in texture throughout, any and every part of each constituent ought to be juxtaposed to a part of the other.'

The compound resulting from μίξις is uniform in texture, i. e. each of its minutest parts must exhibit the same character as the whole. If, then, μίξις is a shuffle, it is illogical to stop the division of the constituents at e. g. the single grains of wheat and barley. For the compound is divisible ad infinitum (since every body is divisible): and yet each of its minutest parts must contain a part (or parts) of both constituents. The only logical view, therefore, is the second one: viz. that the compound is a mosaic of the atoms of its constituents. This, of course (as Aristotle will point out immediately), is in the end impossible: for, since every body is divisible, there are no atoms.

For μικτόν (b 4), i. q. μιχθέν, cf. e. g. 34b 31.

28b 5–17. ἐπει . . . διαρεθήσαι. Aristotle lays down two theses: (i) Composition is quite other than combination, and (ii) No body can be divided into least, i. e. not further divisible, parts. It follows (a) that combination is not the juxtaposition of little x's
and little y's, small pieces of the constituents x and y (the first view must therefore be rejected); and (b) that the juxtaposition of atoms of x and y is impossible (i.e. the second view is untenable).

The whole is one sentence, including a long parenthesis (a 8–15 σύνθεσις . . . μεμυγμένον). The οὕτε of a 15 corresponds to the οὕτε of a 7.

28a 8. κράσις. Strictly speaking, κράσις is that species of μίξις in which the constituents are liquids: cf. Topics 122b 25–31; Journal of Philology, No. 57, p. 73. But Aristotle does not consistently employ κράσις in this restricted sense: in a 12, e.g., τῶν κραθέντων is equivalent to τῶν μιχθέντων. Moreover, in the end only liquids, or things qua liquefied, can combine: cf. *28a 24.

28a 9–10. οὐδὲ ξείλις . . . μόριον. The character of the compound depends upon the proportion in which its constituents are combined (*14a 19): and since the compound is ὀμομερής, the constituents must be present in the same proportion in every part of it as in the whole.

The amounts of Earth, Air, Fire, and Water must be proportionally identical (e.g.) in a lump of flesh and in the minutest particle of the lump. But this condition would not be satisfied if μίξις were what the advocates of the first view suppose.

28a 14–15. καὶ . . . οὖθέν μεμυγμένον. Aristotle was going to say 'the same thing will be combined to the short-sighted percipient, and not combined to the man with acute vision': but he substitutes τῶν Λυγκεὶ δ' οὖθέν μεμυγμένον ('to the eye of Lynkeus nothing will be combined') for the second clause, thus producing a slight anacoluthon.

H reads λυγκεί (i.e. λυγκεί, the dative of λύγκε): but I can find no evidence that Aristotle credited the lynx with sharp sight.

28a 18. πάλιν. Cf. *27b 31–28a 18. Bonitz (Ind. 559b 18) is, I think, mistaken in quoting this passage as an example of the use of πάλιν to mark the next step in the argument (cf. *24b 25).

28a 18–31. έστι . . . κοινόν. Aristotle's own account, which is here given, involves answering the questions:—(i) What is the primary commensurate subject of which μίξις is predicable? (ii) What is the proximate cause of the occurrence of μίξις? (cf. *27b 32–34).

(i) The things of which μίξις is commensurately predicable—the 'combinables'—must be (a) reciprocally active and reciprocally passive bodies, which (b) are easily-divisible, and (c)
are present in such amounts that their 'powers of action' are more or less balanced. If these conditions are satisfied, the combinables will produce, reciprocally in one another, (ii) that kind of ἀλλοϊωσις which is the proximate cause of the 'unification' called μίξις. The ἀλλοϊωσις in question is a reciprocal tempering of the distinctive qualities of the combinables such that a new substance emerges, whose qualities are a compromise between the qualities of the constituents (cf. *27b 22–31).

28a 18–23. ὡς φαμεν ... σώμασιν. Cf. e.g. *24a 24−b 22, *24a 34−b 1, *24b 13–18. Since ἰατρική and ἐγγεώ do not share in the ἕλη of bodies, they cannot 'act upon' and reciprocally 'suffer action from' the latter: hence they do not heal the patient by combining with his body.

28a 24. εὐθαϊρέτα. Since, as we shall see (28b 1–2), τὰ εὐφρωστά are most easily divided, and since τὰ εὐφρωστά are equivalent to τὰ ἔγρα, it follows that τὰ ἔγρα are the 'most combinable' of bodies. In the end, it is liquids that combine; or at least the presence of moisture is a conditio sine qua non of combination. The metals, e.g., have first to be liquefied (molten), in order to combine: cf. Alexander, περὶ κράσεως καὶ αὐξήσεως, p. 230, ll. 34 ff.

28a 24–25. πολλὰ ... συντιθέμενα: 'if a great quantity, or a large bulk, of one of these is brought together with a little, or with a small piece, of another ...'


28a 29. ταῖς δυνάμεσιν. Cf. *27b 22–31, 33a 28 and 32; Alexander, l.c., p. 230, ll. 29–30 διὰ τὴν τῶν δυναμένων [ἑ. δύναμεων] ἰσότητα καθ' ὅσοι καὶ πάσχει ... .

28a 29–31. τότε ... κοινὸν. Each of the constituents, quā active, is 'dominant' relatively to the other quā passive. Neither of them is absolutely dominant. Hence each of them is drawn out of its own nature towards the nature of the other: but neither of them becomes the other. Each meets the other half-way, and the resultant is a compromise between them.

28a 31–33. φανερὸν ... παθητικά. Cf. Alexander, l.c., p. 229, ll. 8–11. Aristotle is assuming the results of his discussion of action–passion in A. 7.

28a 34. μᾶν ... μεθιστάοι. Contact is required for action–passion (cf. *23a 12–22). Hence, since division of the con-
stituents facilitates their thorough contact, it facilitates their action—passion and therefore their combination.

28\textsuperscript{a} 35—b 1. διὸ . . . μικτά. 'Hence, amongst the divisible susceptible materials, those whose shape is readily adaptable have a tendency to combine.'

diairetōn, i. q. εἰδοπρότον (so also below, b 4).

28\textsuperscript{b} 2. ἦν. Bonitz (Ind. 98\textsuperscript{b} 17) interprets ἦν as a reference to de Caelo 313\textsuperscript{b} 8. But the imperfect is idiomatic: 'that is precisely what τὸ εἰνόριστο ἐἶναι means'. Cf. e. g. * 14\textsuperscript{b} 25—26, 31\textsuperscript{b} 23, and Bonitz, Ind. 220\textsuperscript{a} 45.

28\textsuperscript{b} 3—4. οἶνον . . . diairetών. τὸ ῥηγόν is defined as 'that which, being readily adaptable in shape, is not determinable by any limit of its own': cf. * 29\textsuperscript{b} 30—32.

28\textsuperscript{b} 4. γλύσχρον. On the contrariety γλύσχρον—κραύρον, see * 30\textsuperscript{a} 4—7. Instances of ῥηγά, which are γλύσχρα, are oil (30\textsuperscript{a} 5—6, Meteor. 382\textsuperscript{b} 16), pitch (Meteor., ib.) and bird-lime (ἰξός, Meteor. 385\textsuperscript{b} 5). On the whole, 'viscous' fairly represents the meaning. A substance, whether soft-solid or liquid, is γλύσχρον, when it is extensible (ἐλκτῶν), instead of falling readily asunder into drops or small particles (cf. Meteor. 387\textsuperscript{a} 11—15).

28\textsuperscript{b} 5—14. ταῦτα . . . ἔτερων. Aristotle calls attention to two typical cases of imperfect combination, of which the first is not properly-speaking 'combination' at all.

(i) If one constituent is a viscous liquid, it increases the volume and bulk, but otherwise produces no change. Thus, oil and water do not 'combine': the result is a mere admixture which is 'thicker' or 'coarser' than both the constituents (Meteor. 383\textsuperscript{b} 20—28).

(ii) If one only of the constituents is παθητικὸν—or is superlatively παθητικὸν relatively to the other (ἡ σφόδρα τὸ δὲ πάμπαυ ῥέμα)—the insusceptible constituent 'takes it up' with little or no increase of its own bulk. The susceptible constituent disappears, i. e. is entirely absorbed by the other. The only trace of its presence is a change of colour in the insusceptible constituent.

Thus bronze 'takes up' tin, the only apparent effect being a whitening of the bronze. This is to be regarded as a somewhat equivocal case of combination. The bronze and the tin behave towards one another partly as 'combinables' and partly as 'matter' and 'form':—they falter and hesitate, as it were, which attitude to adopt.

28\textsuperscript{b} 12—13. ὁ γάρ . . . μόνον. According to Kopp (Geschichte
der Chemie, iv, p. 113) χαλκός is used to denote both copper and brass (i. e. an alloy containing two-thirds copper and one-third zinc). Kopp (1. c., iv, pp. 125 ff.) is uncertain what is meant by κασσίτερος in Homer and Herodotos, but suggests that the Κέλτικος κασσίτερος (referred to in de Mir. Auscult. 834^a 6) is an alloy containing tin.

I have translated χαλκός 'bronze' (which contains ten parts of tin to ninety parts of copper), and κασσίτερος 'tin', because this seems to suit the phenomenon here described: cf. Roscoe, Lessons in Elementary Chemistry, ed. 1882, p. 155.

Aristotle recognizes two main classes of δομοιομερή, viz. (i) those which belong to animate nature, to plants and animals (e. g. ξύλον, φλοιός, σάρξ, ὀστόν, νεῦρον, δέρμα), and (ii) those which belong to inanimate nature. The latter are usually grouped together as τὰ μεταλλευόμενα, but they include (a) the metals proper (e. g. gold, iron, silver), and (b) τὰ ὀρνικτὰ, e. g. 'the insoluble kinds of stones' and σανδαράκη, ὀχρα, μέλτος, βεῦν (? = red sulphate of arsenic, ochre, ruddle, sulphur). The reader will remember that the heat of the sun draws from the earth and the waters on the earth a 'twofold exhalation' (cf. * 22^b 2–3), which is partly 'hot-dry' and partly 'hot-moist'. This plays a part in the formation of the δομοιομερή of inanimate nature. For it gets imprisoned in particles of the earth: and thus, γαῦa predominantly 'hot-dry', contributes to the formation of τὰ ὀρνικτὰ, and γαῦa predominantly 'hot-moist' (particularly when imprisoned in stones, whose dryness compresses and solidifies it) gives rise to the metals. When metals liquefy with heat, this is the setting free of the moisture belonging to the exhalation which contributed to their formation. Cf. Meteor. 378^a 12–4, 384^b 30–34.

28^b 12. ὡς . . . χαλκοῦ. ἄνευ ἀλης is used adjectivally, and is equivalent to the un-Aristotelian ἄλον: cf. * 22^a 28–33.

28^b 20. ἄλλα. The adversative is used, because the definitions of the combinable and combination, which follow, show that the combinable need neither be destroyed nor preserved unaltered, and that combination is neither composition nor relative to perception.

28^b 21. δομώνυμον. We should have expected συνώνυμον: for the combinable is combinable with a contrasted species of the same genus, i. e. a contrary information of the same ἀλη. Cf. * 14^a 20, * 22^b 29–32. But Aristotle does not always use δομώνυμον in the technical sense in which it is contrasted with συνώνυμον. He
sometimes uses it in its ordinary significance to mean merely that 'A has the same name as B', without implying that the nature expressed by the name differs in A and B: cf. Bonitz, Ind. s. v.

The meaning here is that τὸ μικτὸν is relative to something else which in that relation must also be called μικτὸν.

28b 22. ἡ . . . ἕνωσις. Combination is that kind of unification of 'combinable' substances (i.e. substances fulfilling the conditions specified in the definition of the 'combinable') which must occur in so far as they have reciprocally 'altered' one another's qualities in the manner explained.

In this 'scientific definition' of μίξις (cf. *27a 32–34), ἕνωσις is the genus of which μίξις is a species. The generic πάθος (ἕνωσις) is specified, or rendered determinate, by the proximate cause (ἀλλοωθείτων) which necessitates its inherence in its commensurate subject (τῶν μικτῶν).

B. 1

28b 26—35a 23. Περὶ . . . εἴρηται. On the connexion of this section (B. 1–8) with the plan of the work as a whole, see *22b 1–26.

It will be remembered that Aristotle propounded two main questions concerning 'the so-called elements':—viz. (i) Are Earth, Air, Fire, and Water really 'elements'? And, if not, (ii) Do they all come-to-be in the same manner, reciprocally out of one another: or is one amongst them relatively primary, the others being derivative forms of it? (cf. *22b 2–3, *22b 3–4). Aristotle answers the first of these questions in B. 1–3, where he maintains that Earth, Air, Fire, and Water are not really 'elements', i.e. not eternal and unchangeable. They are changing informations of πρώτη ὕλη, distinctively characterized by qualities which belong to certain primary contrarieties. Strictly speaking, πρώτη ὕλη and the ἐναντιώσεις are the real 'elements', i.e. the eternal elementary conditions of γένεσις and φθορά. Earth, Air, Fire, and Water are 'primary' and 'simple' bodies (for a qualification of this statement, see *30b 1–7, *30b 22): but, as bodies, they presuppose πρώτη ὕλη and the ἐναντιώσεις as their στοιχεία.

The second question is answered in B. 4. None of the 'simple bodies' is prior to the others. They all come-to-be out of one another. They are phases in a cycle of transformations through which πρώτη ὕλη passes.

In B. 5–7 Aristotle's doctrine of the 'simple bodies' is con-
firmed and further explained. Thus, in B. 5 it is restated, and Aristotle proves that no 'simple body' can be an ἄρχη of the others: in B. 6 Empedokles' general theory of the 'elements' is criticized: and in B. 7 Aristotle explains how the ὁμοιομερή come-to-be out of the 'simple bodies' by combination—a point left quite inexplicable by Empedokles.

Finally, in B. 8 Aristotle establishes that every ὁμοιομερές—and therefore (in the end) every composite natural substance in the sublunary world—consists of all four 'simple bodies' as its material constituents.

28b 27. τῶς . . . φύσιν. We must identify τὰ μεταβάλλοντα κατὰ φύσιν with the φυσικὰ σώματα of the Lower Cosmos, i.e. with τὰ γεννητὰ καὶ φθαρτά. For though contact is predicable of τὰ μαθηματικά, Aristotle restricted his discussion to ἀφη ἣ ἐν τοῖς φυσικῶις. And though the heavenly bodies, quia possessing an immanent source of movement, are φυσικὰ σώματα, Aristotle's discussion in A. 6 was primarily concerned with reciprocal contact, whereas the contact of the ὀφθαλμὸς and the Lower Cosmos is one-sided (cf. *22b 2–3, *22b 32—23a 34). Contact therefore, as defined in A. 6, is a πάθος of the changing natural bodies within the sublunary world, i.e. of τὰ γεννητὰ καὶ φθαρτὰ: and the same restriction applies to action—passion and combination.

28b 28–29. ἐτi . . . αἰτίαν. Aristotle is referring to A. 1–3, and particularly to A. 3. Unqualified γένεσις and φθορά are substantial coming-to-be and passing-away, as distinguished from change of πάθος, i.e. change in any Category other than that of Substance (cf. *17a 32–34): and the 'cause', which Aristotle claims to have explained, is πρῶτη ἴλη (cf. *18a 25–27).

28b 29–31. ὁμοίως . . . αὐτῶν: cf. 19b 6—20a 7, with the notes. αὐτῶν, sc. γενέσεως καὶ φθοράς τῆς ἀπλῆς. It is noticeable, as Zabarella points out, that Aristotle makes no mention of his discussion of αὔξησις in the present summary of the first book. As we saw (*20a 8), αὔξησις is a πάθος of the ἔμφυσια only: and though the discussion of it is germane to the subject-matter of the present work, its inclusion is not absolutely necessary.

28b 31–32. λοιπὸν . . . σωμάτων. λοιπὸν, 'reliquum est, i.e. sequitur' (Zabarella). The discussion of 'the so-called elements' does not complete Aristotle's task, for he has still to treat of the causes (especially the efficient and final causes) of γένεσις and φθορά. If we are to press the meaning of λοιπὸν, we must suppose that the ensuing discussion of the 'elements' is 'what remains'
in order to fulfil the plan which was sketched at 22\textsuperscript{b} 1-5. Cf. * 27\textsuperscript{a} 31: and, for a similar use of λοιπῶν, cf. * 20\textsuperscript{a} 8.

The construction of θεωρήσας with περί and the accusative is unusual. Bonitz (Ind. 328\textsuperscript{b} 33) professes to quote two instances, but the first (Metaph. 1027\textsuperscript{b} 28) is not an instance at all, since θεωρήσας has an object, and the second (Polit. 1325\textsuperscript{b} 34) is hardly parallel to the present passage. Philoponos feels the difficulty, but neither of the solutions, which he suggests, will do. We must, I suppose, account for the accusative as due to the desire of avoiding the ugliness and obscurity which the genitive would here entail.

τὰ καλοῦμενα στοιχεῖα τῶν σωμάτων might mean 'illa ex corporibus quae vocantur elementa'. But Zabarella seems to be right in interpreting the phrase as 'quaes vocantur elementa aliorum corporum'. For τὰ καλοῦμενα στοιχεῖα, see * 22\textsuperscript{b} 1-2.

28\textsuperscript{b} 32—29\textsuperscript{b} 6. γένεσις . . . τοσαύται. Aristotle proceeds to summarize and to criticize the erroneous views of his predecessors concerning 'the four simple bodies' (28\textsuperscript{b} 32—29\textsuperscript{a} 24). He then states his own theory in outline (29\textsuperscript{a} 24—b 6). All perceptible bodies presuppose Earth, Air, Fire, and Water: but these themselves presuppose, as their elementary 'constitutive moments', πρῶτη ὕλη and certain ἐναντίωσεις (cf. * 29\textsuperscript{a} 24—b 3). What these ἐναντίωσεις are, is explained in the next chapter.

28\textsuperscript{b} 32—33. γένεσις . . . τούτων. Zabarella (who professes to follow Aquinas and Averroes) interprets αἱ φύσει συνεστῶσαι οὐσίαι as 'corpora mista' (i.e. τὰ ὀμοιομερῆ), τὰ αἰσθητὰ σώματα as 'elementa', and τούτων as τῶν φύσει συνεστῶσων οὐσίων.

But the antecedent of τούτων must surely be 'the perceptible bodies': there is no reason to restrict the latter to 'the so-called elements': and the phrase αἱ φύσει συνεστῶσαι οὐσίαι includes much more than the ὀμοιομερῆ.

Thus e.g. in the Metaph. (1042\textsuperscript{a} 6—11) Aristotle enumerates certain things 'which everybody admits to be substances'. These are αἱ φυσικαὶ οὐσίαι, and they fall into three groups:—

(i) 'Fire, Earth, Water, Air and any other simple bodies' (τὰλα τὰ ἀπλὰ σώματα). With this group we are not concerned, since the οὐσίαι here in question are not 'simple', but the products of natural processes which have brought, and hold, together a plurality of constituents (φύσει συνεστῶσαι): (ii) 'the οὐρανὸς and its μόρια', i.e. the heavens, their component spheres and the heavenly bodies which are set in these (cf. e.g. Alexander
on the *Meteorologica*, ed. Hayduck, p. 4, l. 24). With these again we are not concerned; for they are ἀγένεσις and ἀφθαρσία, whereas Aristotle is here speaking only of those substances of which γένεσις and φθορά are predicative: finally, (iii) 'the plants and the animals, and the μόρια of both'. It is these—the organic things in nature and their μόρια—to which Aristotle is referring primarily, if not exclusively. The μόρια include (a) the αὐστιθετα μόρια, i.e. the ὀμοιωμερή: and (b) the σύνθετα μόρια, or the ἀνομοιωμερή, each of which is composed of two or more different ὀμοιωμερή. Thus the μόρια of animals include (i) 'the tissues'—flesh, blood, bone, &c.—(ii) 'the organic parts'—e.g. hand, leg, heart, eye—and (iii) 'parts' like the head, the face, &c. (cf. e.g. *Hist. Anim.* 486a 5–14, *de Part. Anim.* 640b 17–22).

Although the ὀμοιωμερή are ἀσυνθετα (i.e. not composed of two or more aggregated different constituents), they are not 'simple', but chemical compounds. The four 'simple bodies' have fused and coalesced to form them. Hence they are φύσει συνεστώτα, and are included in the ὄφσια of which Aristotle is here speaking. (For the application of συνίστασθαι to the ὀμοιωμερή, cf. e.g. *Meteor.* 384b 30 ff., 389b 25.) It is possible—though on the whole perhaps improbable—that Aristotle intends the phrase (αἱ φύσει συνεστώσαι ὄφσιαι) to cover also the ὀμοιωμερή of inanimate nature, cf. *28b 12–13.

Now the organisms and their 'parts' are through and through characterized by the soul or life which is their 'form' (cf. *21b 19–22). What comes-to-be, in the γένεσις of a plant or an animal or of any of their μόρια, is a living-body, a living-tissue, or a living-organ: and the essential and distinctive feature in this phenomenon is the emergence of a new soul or life, or the emergence of a new tissue or organ qua contributory to a new life. Nevertheless this γένεσις is not the coming-to-be of soul bare, but the coming-to-be of an ζυγμυχόν σώμα. Its indispensable condition is always the coming-to-be of a new 'perceptible body'—i.e. the development of certain perceptible bodily materials to that grade of complexity at which they are the appropriate matter to be informed by τοῦς soul. Hence Aristotle says here that the γένεσις (or the φθορά of every one of the φύσει συνεστώσαι ὄφσιαι implies, as its condition sine qua non, the αἰσθητὰ σώματα. The foundation of all the birth and death in the organic world is the γένεσις and φθορά of the αἰσθητὰ σώματα (cf. e.g. *de Caelo* 298b 3 ἐνεργεῖ γὰρ αἱ φυσικαὶ ὄφσιαι ἢ σώματα ἢ μετὰ σωμάτων γίγνονται καὶ μεγεθῶν).
The birth and the death of the organic substances and their constituent parts (so perhaps we may paraphrase Aristotle's doctrine) are not the emergence and the disappearance of immaterial 'forms'. These substances are embodied-souls or forms-in-matter; and we cannot understand their γένεσις or their φθορά, unless we study the γένεσις and the φθορά of their matter. For their matter is 'the perceptible bodies', i.e. a matter itself 'informed', itself the product of development, presupposing more elementary conditions for its emergence. What we have to do, therefore, is to trace the lower stages of that development which culminates in the emergence of the organic substances. We must discover what are the ἄρχαί of the αἰσθητὰ σώματα, i.e. from what primary material and formal conditions they result. Aristotle, as we shall see, reduces all αἰσθητὰ σώματα in the sublunary world to Earth, Air, Fire, and Water, or to compounds and composites of these; and regards Earth, Air, Fire, and Water themselves as resultants of πρώτη ὑλή and the two primary ἐναστικῶτα.

28\textsuperscript{b} 33—29\textsuperscript{a} 5. τούτων ... πράγμασιν. For a similar brief classification, cf. * 30\textsuperscript{b} 7–21.

The common and erroneous assumption of all the theories here quoted is that the underlying material, of which the perceptible bodies are made, is itself a body (or bodies) having separate existence. Thus, e.g., Anaximenes and Diogenes assumed Air as the underlying matter, Herakleitos and Hippasos Fire, Anaximander a body (28\textsuperscript{b} 35) intermediate between Fire and Air: Parmenides (cf. * 18\textsuperscript{b} 6–7, * 30\textsuperscript{b} 13–19) assumed Fire and Earth, Ion Fire, Earth, and Air, and Empedokles Fire, Earth, Air, and Water. The perceptible bodies ought (cf. * 14\textsuperscript{a} 6–8) to be derived by 'alteration' from the 'underlying matter' if it is a single body, by 'association and dissociation' if it is two or more bodies. But in fact the pluralists employ both methods of derivation (29\textsuperscript{a} 3–5; cf. A. 1 and the notes).

28\textsuperscript{b} 35. ἣ τι μεταξὺ τούτων. Aristotle is thinking of Anaximander: cf. * 32\textsuperscript{a} 20–25.

29\textsuperscript{a} 1–2. οἱ δὲ ... τριτον. Philoponos attributes this view to the poet Ion of Chios (cf. Diels, pp. 220–222). Aristotle refers to it again below: see * 30\textsuperscript{b} 15–17.

29\textsuperscript{a} 5. ἄρχαί καὶ στοιχεῖα: 'originative sources, i.e. elements'. The term στοιχεῖα is restricted to immanent ἄρχαί (the immanent originative sources of a thing's being), i.e. to ὑλή, εἴδος, and

Aristotle has no quarrel with his predecessors for calling the primary materials, out of which the perceptible things come-to-be, ‘originative sources’ (or ‘original reals’) in the sense of ‘elements’. But they were wrong, he thinks, in supposing that Earth, Air, Fire, and Water (all, or any, of them), or indeed any perceptible body, were such primary materials.

29a 6. ἐξ ὑπότροπον: the antecedent is of course τὰ πρῶτα (a 5).

29a 8–14. ἄλλα ... διορισμῶν. Anaximander and Plato are selected for special criticism. The other thinkers are sufficiently refuted by the subsequent exposition of Aristotle’s own theory which shows that Earth, Air, Fire, and Water are all equally derivative, since they are all transformations of a prior substratum.

Aristotle’s objection to Anaximander’s ἀπειρον is not that it was other than Earth, Air, Fire, and Water—for that is true also of Aristotle’s own πρῶτα ὑλή : but that, being other than these, it was nevertheless supposed to be a ‘body’, i. e. possessed of actual existence independent of, and separate from, Earth, Air, Fire, and Water.

29a 10–13. ἀδύνατον ... ἀρχήν. Since Anaximander’s ‘Boundless’ is an actual body, it must be characterized by one or the other of the contrasted qualities forming a ‘perceptible contrariety’ (cf. e. g. * 20b 16–17). It must e. g. be light or heavy, cold or hot. In other words (cf. Introd. § 10, and * 29b 7–30a 29), it must be Earth, Air, Fire, or Water.

In 29a 11 ἀιόδηθης (H) is clearly right. Aristotle could not have written αἰόδηθτον (E), τὸ ἀιόδηθτον (F), or αἰόθητον ὂν (L), since that would imply that Anaximander himself spoke of his ἀπειρον as ‘perceptible’.

29a 13–24. ὡς ... ἐπίπεδα εἶναι. Aristotle has already referred more than once to Plato’s attempt in the *Timaeus* to construct the perceptible bodies out of planes, i. e. out of two types of right-angled triangles: cf. * 15a 29–33, * 15b 31, * 16b 2–4, * 25b 19–25. He now attacks Plato’s statements about the ὑποδοχὴ πᾶσης γενέσεως, and its relation to the elementary triangles and to the four simple bodies, on the ground that ‘they are not based on any precisely-articulated conception’ (*οἶνδεα ἔχει διορισμῶν, cf. 23a 22 and 34b 21).

The perceptible things, Plato had said, are mere ‘imitations’ or ‘images’ of the real things—the intelligible Forms. And it is
the very nature of an 'image' to require a something in which it 'comes-to-be' and thus obtains apparent subsistence (cf. Timaeus 52 c). This something, in which the 'images' come-to-be, is accordingly postulated as a necessary pre-condition of the γένεσις of the physical Cosmos (ib. e.g. 52 d): and Plato describes its nature in various ways—mostly metaphorical, and partly (it would seem) irreconcilable with one another. Thus he speaks of it as 'the Place'—the empty Space or Extensity 'in which' the perceptible things appear (cf. 52 a, 52 d): as 'the receptacle of all coming-to-be, as it were its Nurse' (49 a, 52 d), or 'its Mother' (51 a): as 'a something which receives all bodies' (50 b περὶ τῆς τὰ πάντα δεχόμενης σώματα φόσσεως): 'a thing invisible and without shape, omnirecipient' (51 a ἀνόρατον εἴδος τι καὶ ἄμορφον, πανιδεχέσ). Such statements naturally suggest that 'the Omnirecipient' χωρίζεται τῶν στοιχείων, i.e. that it is an entity having a being of its own, separate from, and in independence of, Earth, Air, Fire, and Water and the perceptible bodies generally (29a 15 τῶν στοιχείων, i.e. τῶν καλομεμβρὸν στοιχείων, cf. a 16). We think of it as a Mirror in which the reflections appear, or a Frame in which the copies of the εἴδος are held. But Plato says other things about τὸ πανιδεχές which imply a quite different view of its relation to the perceptible bodies. For he speaks of this omnirecipient formless something as an ἐκμαγείον—a modifiable lump or mass—which is changed and transfigured by the incoming images of the real intelligible things, and thus itself appears with different shapes and qualities (50 c: for the meaning of ἐκμαγείον, cf. Theaetetus 191 c with Campbell's note). And he compares it, in its relation to Earth; Air, Fire, and Water, with a lump of gold in its relation to the golden things of various shapes which may be fashioned out of it. Earth, Air, Fire, and Water, he insists, are mere passing transformations of this something, which always retains its receptivity unchanged—just as this and that figured work of the goldsmith are such and such evanescent modifications of gold, which always remains 'gold', however its shape may vary (49 a—50 b).

If we are to press this analogy, the πανιδεχές is, it would seem, not only the receptacle in which all the perceptible bodies appear, but also the stuff of which they are fashioned or out of which they are made. And it is now no longer clear whether we are to attribute to it a 'being' separate from the στοιχεῖα which are its transformations.
29\textsuperscript{a} 15-24. ὁδὲ ... ἐπὶπέδα εἶναι. Plato, Aristotle has just complained (\textsuperscript{a} 13-15), does not explain whether the Omnirecipient is a continent subsisting in independence of the Earth, Air, Fire, and Water which ‘appear’ in it; or whether it is a stuff, logically distinguishable from, but existing only in, and as, those changing figurations which are called the ‘elements’. He now complains that Plato makes no use of the Omnirecipient in his theory of the γένεσις of the ‘elements’. He compared it to the gold, out of which the goldsmith’s works are fashioned: and this comparison implies that the πανδεχέσ is a stuff underlying, and prior to, the ‘elements’. Nevertheless (\textsuperscript{a} 21 ἄλλᾳ, i.e. in spite of his comparison of the πανδεχέσ with the gold), when he comes to treat of the γένεσις of the ‘elements’, he resolves them into triangular planes, without any hint as to how the latter are derived from the ὑποδοχή. Yet it is impossible to identify the ὑποδοχή or the τιθήνη with the planes.

In this passage \textsuperscript{a} 17-21 (καίτοι ... ἔκαστον εἶναι) is a parenthesis, in which Aristotle criticizes Plato’s use of the analogy of the gold: the rest forms a single argument, in which \textsuperscript{a} 21-24 (ἄλλᾳ ... ἐπὶπέδα εἶναι) justifies the opening assertion that Plato ‘makes no use’ of the πανδεχέσ.

The term ὑποκείμενον (20\textsuperscript{a} 16) is not used by Plato in the passage in question: Aristotle infers that this is in effect his meaning from the analogy of the gold and from the language in the context (\textit{Timaeus}, 49 a-50 b).

The words ὕπτων ... ἀνάλυσιν (\textsuperscript{a} 22-23) suggest a double reproach: for Aristotle has already urged (a) that it is impossible to construct ‘solids’, i.e. φυσικὰ σώματα, out of planes, and (b) that it is unreasonable, if you analyse solids into their containing planes, not to complete the mathematical analysis by resolving the planes into lines and the lines into their terminal points (cf. * 15\textsuperscript{b} 31, with the references to the \textit{de Caelo} there given).

In \textsuperscript{a} 23 Aristotle adds καὶ τὴν ἄλην τὴν πρώτην, because Plato’s τιθήνη or ὑποδοχή fulfils in the \textit{Timaeus} a function analogous to that of πρώτην ἄλη in Aristotle’s theory of the γένεσις of the perceptible things.

29\textsuperscript{a} 16. πρότερον: cf. preceding note. Plato would presumably say that the metaphor of the gold must not be pressed, and that his Omnirecipient is ‘prior’ to the ‘elements’ only in the sense in which Aristotle’s πρώτη ἄλη is ‘prior’ to its informations—i.e. logically prior. There is no trace of πρότερον in Philoponos.
29b 17–21. καίτοι . . . ἐκαστὸν εἶναι. Plato's analogy is not precise. For you can call a product by the name of that 'out of which' it has developed, only if it has resulted by the ‘alteration’ of a persistent perceptible substratum. If, e.g., the cold thing has become hot, the thing persists and has merely ‘altered’ from one αἰσθητὸν πάθος to its contrary: hence the product (the hot thing) is still called a 'thing'. Similarly, if the gold persists through the goldsmith's manipulations as a perceptible substratum, which 'alters' e.g. from triangular to square or circular, you can call the products 'gold'. But Earth, Air, Fire, and Water come-to-be and pass-away, and are not merely the 'alterations' of a persistent perceptible substratum. Hence, if they come-to-be out of the παντεχέσ, they cannot be called by its name, as the golden figures can be called, each of them, 'gold'. Yet Plato insists (cf. Timaeus 49d–50c) that if we are shown a work of the goldsmith, and asked what it is, far the safest answer (μακρῷ πρὸς ἀλήθειαν ἀρφαλέστατον) is to say 'It is gold': and that similarly, if we see what is commonly called 'fire', and are asked what it is, we ought to answer 'It is the Omnirecipient'.

Aristotle calls attention to this distinction of linguistic usage more than once: cf. Phys. 245b 3 ff., Metaph. 1033a 5 ff., 1049a 18 ff.

When a thing has come-to-be 'out of' a, though in certain cases it may be called by an adjective derived from a (ἐκέλνυν, though not ἐκέλνω). Thus, e.g., a man or a plant is not called that 'out of which' it has come-to-be, nor by an adjective derived from its name: and a house or a statue is not called πλάνθον or ξύλον, though they are called πλανθινη and χλινος respectively.

If, however, there is ἀλλοϊωσις (and not γένσις), the result is called by the name of the substratum which has 'altered'. Thus, e.g., if a sick man has recovered his health, we speak of him as 'a man' or 'a healthy man'.

The term ἀλλοϊωσις, according to Aristotle's strict usage, is limited to the change of παθητικαί ποιότητες καὶ πάθη, and does not include change of σχήμα καὶ μορφὴ (cf. *19b 8–10). Hence the ἔφαγα fashioned out of gold are not strictly products of 'alteration', and cannot rightly be called 'gold', but only 'golden'. If, then, ἀλλοϊωσις (29a 19) is to be taken strictly, Plato is being criticized (a) for confusing the γένσις (i.e. the ποιήσις) of the golden things with an 'alteration' of gold: and consequently (b)
for supposing that the correct account e.g. of a golden statue is to say ‘It is gold’: and finally (c) for extending this confusion, and the consequent error of terminology, to the ‘elements’, which—even on Plato’s own theory—are the results of a γένεσις.

But Aristotle may possibly be using ἀλλοίωσις more loosely, to cover any change in the Category of Quality. If so, ἀλλοίωσις would include change of shape (cf. *19b 12–14), and the works fashioned by the goldsmith would be results of ἀλλοίωσις. Plato would then be criticized for extending a terminological usage, which is correct in the example of the gold and the works fashioned out of it, to an instance of γένεσις, where it is no longer applicable.

29a 24 – b 3. ἡμεῖς . . . μεταβάλλουσιν. Aristotle now outlines his own view. Earth, Air, Fire, and Water are the primary perceptible bodies. But, as perceptible bodies, they are γεννητὰ καὶ φθαρτὰ, and their γένεσις presupposes the same fundamental conditions—the same ἄρχαι—as are presupposed by the γένεσις of any and every perceptible body.

The whole subject has been thoroughly discussed in the Physics (A. 6–9), and the ἄρχαι have there been accurately defined and distinguished from one another (29a 27 διώρισται . . . ἀκριβέστερον). The results of the discussion in the Physics were used above, 17b 13 ff.: cf. *17b 14–18, *17b 29, *18a 23–25.

The ultimate presuppositions of the γένεσις of any and every perceptible body are (i) πρώτη ἃλη and (ii) a contrariety of qualities for which the ἃλη is the substratum. This second presupposition is often expressed by Aristotle in a different manner, so as to bring out the negative ‘moment’ implied in γένεσις. If a body comes-to-be, the substratum passes from a formed-state to a contrarily-formed-state: but the initial formed-state is at the same time the στέρησις of the form of the new (emerging) body. And the distinctive feature of a γένεσις is the coming-to-be of a positive something, where previously it was not. Hence the second presupposition of γένεσις is an εἶδος with its contrasted στέρησις.

These ἄρχαι of γένεσις (it is all-important to remember) are not in any sense actually existent things. They are not rudimentary stages of a temporal development of the Cosmos, antecedent in time to the emergence of perceptible bodies. No doubt Aristotle’s language is at times ambiguous and misleading. But in the main he is clear (at least in the present work) that these
\(\alpha \rho \chi \alpha i\) are the logical, not the temporal, presuppositions. They are the indispensable ultimate \(''moments''\) which abstracting analysis forces us to recognize as logically presupposed in the \(\gamma \varepsilon \varepsilon \sigma i\) of any and every perceptible body.

Hence Aristotle is careful to insist that his \(\pi \rho \omega \tau \gamma \iota \lambda \iota\) is not \(\chi \omega \rho \iota \sigma \tau \iota\), like e. g. Anaximander's \(\alpha \pi \epsilon \iota \rho \omicron\) (cf. * 29\(\alpha\) 8–14). What \(\exists i\) is never \(\iota \lambda \iota\) bare, but always formed \(\iota \lambda \iota\): i.e. always \(\iota \lambda \iota\) along with certain qualities which render it a determinate perceptible body. What \(\exists i\) is a \(s\)ub\(s\)tratum which, being e.g. actually-hot, is therefore also potentially-cold. In other words, Aristotle's \(\iota \lambda \iota\) is \(\omicron\ \chi \omega \rho \iota \sigma \tau \iota\, \ \alpha \lambda \lambda^{' } \ \alpha e^{' } \ \mu e^{' } \ \varepsilon \nu \alpha \nu \tau \iota \omega \sigma \varepsilon \omega \varepsilon\) (29\(\alpha\) 25–26), or \(\alpha \chi \omega \rho \omega \sigma \tau \sigma \tau \sigma \omicron\ \mu \eta \nu \ \vpi \kappa \iota \mu \iota \nu \ \delta \gamma \ \tau \gamma \iota \zeta \ \varepsilon \nu \alpha \tau \iota \omega \sigma \omega \varepsilon\) (29\(\alpha\) 30–31).

And the same applies, \(m\)ut\(a\)t\(i\)s \(m\)ut\(a\)n\(d\)i\(s\), to the other \(\alpha \rho \chi \alpha i\) of \(\gamma \varepsilon \varepsilon \sigma i\). The opposition of \(\epsilon \delta \delta \sigma\) and \(\sigma \tau \epsilon \rho \sigma \sigma \iota\), which marks the \(t\)er\(m\)inus \(a\)d \(q\)uem and the \(t\)er\(m\)inus \(a\) \(q\)uo of the two-sided process (the \(\gamma \varepsilon \varepsilon \sigma i\) of one thing and the \(\phi \theta \omicron \alpha\) of another), is clearly the result of a logical analysis. And even the \(\varepsilon \nu \alpha \nu \tau \iota \omega \sigma \varepsilon \omega \varepsilon\)—i.e. the pairs of contrasted perceptible qualities—have no 'existence', except as qualifying the \(s\)ub\(s\)tratum.

'The Hot and the Cold', 'The Dry and the Moist', conceived in abstraction from the \(s\)ub\(s\)tratum which is hot–dry, hot–moist, cold–dry or cold–moist, are simply one of the two indispensable 'moments' in the constitution of the actual things—the other indispensable 'moment' being the \(s\)ub\(s\)tratum conceived in distinction from them. What actually exists is the \(q\)ual\(i\)f\(i\)ed \(s\)ub\(s\)tratum: i.e. (if we take it in its most rudimentary form) one or other of the four 'primary' or 'simple' bodies.

29\(\alpha\) 26. \(\epsilon \zeta \ \dot{\eta}\). The antecedent of \(\dot{\eta}\) is \(\iota \lambda \iota\) (\(\alpha\) 24), not \(\varepsilon \nu \alpha \nu \tau \iota \omega \sigma \varepsilon \omega \varepsilon\) (\(\alpha\) 26).

29\(\alpha\) 27. \(\alpha \omega \tau \omicron \omicron\), sc. \(\dot{\eta}\) \(\iota \lambda \iota\) \(k\alpha i\) \(\dot{\eta}\) \(\varepsilon \nu \alpha \nu \tau \iota \omega \sigma \omega \varepsilon\).

29\(\alpha\) 27–29. \(\omicron \ \mu \eta \nu \ldots \tau \omicron \tau \omicron \nu\). 'Nevertheless we must give a detailed explanation of the primary bodies as well, since they too are similarly derived from the matter.'

The account in the \(P\)h\(y\)s\(i\)s was general, applying to the \(\gamma \varepsilon \varepsilon \sigma i\) of any and every perceptible body. Aristotle now proposes to apply it in particular to the \(\gamma \varepsilon \varepsilon \sigma i\) of the \(p\)r\(i\)mary perceptible bodies.

29\(\alpha\) 29–32. \(\alpha \rho \chi \alpha i \ldots \ \alpha \mu \phi \omicron \iota\). The parenthetical clause (\(\alpha\) 31–32 \(\omicron \omicron \omicron \omicron \ldots \ \alpha \mu \phi \omicron \iota\)) justifies the assumption of a third something in addition to the two contraries as their \(s\)ub\(s\)tratum. We must reckon \(\pi \rho \omega \tau \gamma \iota \lambda \iota\) as an originative source and as primary,
because the contraries alone cannot serve as an ἄρχύ, since they presuppose ἀλη as their substratum if they are to act or suffer action. Cf. Physics, e. g. 189a 21—b 3, 191a 4—5, &c.

29a 32—35. οἱτε . . . τοιαύτα. Aristotle's language here is misleading, because it suggests three successive stages in the development of the perceptible bodies. But in fact (cf. * 29a 24—b 3) neither πρῶτη ἦλη nor the ἐναντιώσεις 'exist'. They do not precede the 'primary' bodies in time, but are abstract 'moments' logically presupposed in their being.

29a 35—b 1. ταύτα . . . ἀλληλα. This clause justifies a 34—35 (τρίτον δ' ἡδη). Earth, Air, Fire, and Water, since they change into one another, are composite of matter and form: i.e. they presuppose ἦλη and ἐναντιώσεις, and are therefore reckoned as an ἄρχύ of the perceptible bodies only in the third place.


29b 2—3. αἰ δ' μεταβάλλουσιν. The contrarieties, as contrasted with 'the primary bodies', do not change (cf. e. g. 22b 16—18), and are therefore rightly reckoned as ἄρχαὶ and placed before 'the primary bodies' in Aristotle's list.

29b 3—4. ἄλλα . . . ἄρχας; 'Nevertheless even so the question remains: What sorts of contrarieties, and how many of them, are to be accounted "originative sources" of body?' The use of ὡς for οὖτος is rare in Aristotle: but cf. de Caelo 302b 24. I can make nothing of Bekker's reading (καὶ ὡς σώματος). It seems best to read the sentence as a question, to supply ἐναντιώσεις as the noun to which πολας καὶ πόσας refer, and to take ἄρχας as predicate.

B. 2

29b 7—30a 29. Ἐπεὶ . . . ταύτας. In this chapter Aristotle establishes that the ἐναντιώσεις, which the 'simple bodies' presuppose as one of their 'constitutive moments', are θερμῶν—ψυχρῶν and ξηρῶν—γρήγρ. As we shall see in Chapter 3, each of the simple bodies (Earth, Air, Fire, and Water) is distinctively-characterized by θερμῶν or ψυχρῶν coupled with ξηρῶν or γρήγρ. The reader will remember that neither πρῶτη ἦλη nor the ἐναντιώσεις are anything but 'moments' abstracted by logical analysis (cf. * 29a 24—b 3). The ἐναντιώσεις therefore are couples of contrasted qualities, not of contrasted qualia: i.e. properly-speaking they are θερμῶτης—ψυχρῶτης, ἦ γρήγρ—ξηρῶτης (cf. e. g 29b 34, b 11—12), and not θερμῶν—ψυχρῶν, ἦ γρήγρ—ξηρῶν (cf
e.g. 29b 18-20). The neuter adjectives, especially when the article is prefixed, suggest the concretely qualified matter, which alone has actual existence: they suggest 'the hot-stuff', 'the cold-stuff', &c., i.e. the *qualia* instead of the abstract *qualities*. But though Aristotle is no doubt thinking of actual constituents, he defines them in respect to their *qualities*. He is speaking of *qualia*—of qualified stuffs; but he is attending to the *qualities* and trying to determine these in abstraction from the stuff which they qualify. On the whole, therefore, I have thought it best to speak throughout of 'elementary *qualities*', and to render e.g. τὸ *θερμὸν* by 'the hot' rather than by 'the hot stuff'.

From another point of view, the term 'quality' is somewhat misleading. For it is clear from Aristotle's definitions that *the hot, the cold, the dry, and the moist* are in fact certain characteristic powers of acting and susceptibilities to action. Aristotle himself constantly refers to them as *δύναμεις* (cf. e.g. Meteor. 378b 29 and 34, 379b 11, &c.). We might therefore be tempted to call them 'elementary forces', instead of 'elementary *qualities*' (cf. Dr. William Ogle's note in his translation of the *de Part. Anim.* 646a 16). But 'force' would not naturally include 'susceptibilities to action' (the *δύναμεις παθητικαί*). After much hesitation I have decided to use the term 'quality', which has at least one merit—viz. that it emphasizes the important fact that these *ἐναρτία qualify πρῶτη ὑλή* and thus constitute the distinctive characteristics of the primary bodies.

The meaning of *θερμὸν, ψυχρὸν, ὕγρον, ἔριστον*—and of the other tangible *qualities* discussed in the present chapter—must of course be gathered from Aristotle's definitions. It is not possible to find any English terms which are precisely equivalent. I use the terms 'hot', 'cold', 'moist', 'dry', as mere conventional symbols. 'Moist—dry', as we shall see, is an most inadequate rendering of *ὕγρον—ἔριστον* : and so also is 'fluid—solid', which Dr. Ogle (l. c.) prefers. And 'hot—cold' is defective as a rendering of *θερμὸν—ψυχρὸν*, in that it conveys no hint of the feature on which Aristotle lays stress. Cf. *29b 26-30, *29b 30-32.

29b 7-13. *Επει ἔτεκεν... στοιχεῖον.* We are to determine what 'qualitative differences' constitute the distinctive forms of perceptible body as such, i.e. differentiate perceptible body *in general* into its primary irreducible species. We must therefore look amongst the qualities which characterize *all* perceptible bodies. These are the 'tangible' *qualities*—those discriminated by the sense of
touch. For all perceptible bodies possess at least some of the ‘tangible’ qualities, whilst not all exhibit the further qualities which are the objects of vision, hearing, taste, and smell. Cf. de Anima, e.g. 423\textsuperscript{b} 27–29 which refers to the present chapter.

29\textsuperscript{b} 9. εἰδὴ ... ποιῶσιν: ‘constitute “forms” and “originative sources” of body’.

The qualities which belong to certain ἐναντίωσεις constitute the ‘forms’ of perceptible bodies, qua informing πρώτη ἡλη. Aristotle adds καὶ ἀρχάς, because we are looking for contrary qualities which are the forms of the primary perceptible bodies, and which are therefore ‘originative sources’ of perceptible body in general: cf. 29\textsuperscript{a} 33–34, 29\textsuperscript{b} 3–4.

29\textsuperscript{b} 10–II. κατ’ ... ἐναντίωσιν: ‘for the primary bodies are differentiated by a contrariety, and a contrariety of tangible qualities’.

The subject of διαφέρουσα has to be supplied from the context. It is—as Philoponos rightly explains—τὰ σώματα τὰ πρώτα, ὅν τὰς ἀρχὰς ζητοῦμεν.

The primary bodies, as Zabarella reminds us, must be characterized by contrary qualities, since they must be capable of combining: and combinables must be reciprocally ποιητικά and παθητικά, and therefore also ἐναντία (cf. e.g. * 22\textsuperscript{b} 1–26, * 23\textsuperscript{b} 1—24\textsuperscript{b} 24, * 28\textsuperscript{a} 18–31). And they must be differentiated by tangible qualities, because as perceptible bodies they must possess tangible qualities, even if—as the simplest of bodies—they possess no others (cf. * 29\textsuperscript{b} 7–13).

29\textsuperscript{b} 13. ποιεῖ στοιχεῖον. Aristotle sometimes calls the elementary qualities στοιχεῖα (cf. e.g. 30\textsuperscript{a} 30): but στοιχεῖον here means ‘primary body’, i.e. one of the ‘so-called elements’ (cf. * 22\textsuperscript{b} 1–2).

None of the contrary qualities, except those belonging to the primary contrarieties of touch, ‘makes’ a ‘primary body’, i.e. constitutes it as its form (for this sense of ποιεῖ, cf. 29\textsuperscript{b} 9 ποιῶσιν).

29\textsuperscript{b} 14–16. καίτοι ... πρῶτερον. Aristotle here anticipates and answers a possible objection. Vision is ‘purer’ than touch (cf. Eth. Nic. 1176\textsuperscript{a} 1): it is the ‘clearest’ of all the senses (Probl. 886\textsuperscript{b} 35): and if touch is the most indispensable sense, in that life is impossible without it, vision contributes to the comforts and refinements of life, and in particular helps us towards the attainment of knowledge (cf. e.g. de Anima 435\textsuperscript{b} 19–25, de
Sensu 436b 12—437a 18, Metaph. 980a 24—27). Vision therefore, it may be said, is prior to touch, in the sense in which the more perfect, and the more valuable and desirable, is prior to the less (cf. e.g. Metaph. 1050a 3 ff., 1077a 19—20, Categ. 14b 4—8). But if so, the contrarieties which are the subject-matter or ‘objects’ of vision are, similarly, prior to those which are the ‘objects’ of touch (cf., for this sense of ἵπποκείμενον, e.g. de Anima 425b 14, 426b 8—11, Rhet. 1355b 28—32: Bonitz, Ind. 798b 60—799a 27).

Aristotle does not discuss the question of fact. He is ready to admit that the qualities which make a body visible may very likely be ‘naturally prior’ to those which render it tangible. But this fact, if it be a fact, is (he urges) irrelevant. For we are looking for qualities which constitute the forms of perceptible, i.e. tangible, bodies as such—qualities, therefore, which belong to tangible bodies per se. Now the qualities, which are the objects of vision, do not belong to tangible bodies per se, but καθ ἐπερον.

Aristotle discusses in the de Anima (418a 26 ff.) what τὸ ὀρατὸν (the ἵπποκείμενον of vision) is. As the discussion proceeds, it appears that the ‘object of vision’ includes (a) colours, which are seen in light, and (b) a nameless quality, which is present in certain things and causes them to be seen in the dark, though they are not thus seen in the light. It is clear from Aristotle’s instances (μῆκος, κέρας, κεφαλὴ ἵχθυον καὶ λεπίδες καὶ ὀφθαλμοί, de Anima 419a 5) that he is thinking partly of what we should call ‘phosphorescent’ objects. I do not know any passage where he explains exactly what this ‘nameless quality’ is, which causes these various things to gleam in the dark: but colour (that subdivision of τὸ ὀρατὸν which is seen in light) is discussed in the de Sensu (439a 18 ff.) and defined (439b 11—12) as τὸ τοῦ διαφανοῦς ἐν σώματι ὀρισμένο πέρας. Colour, then, it is clear, belongs to the tangible body, in so far as that contains τὸ διαφανές in itself: and τὸ διαφανὲς (cf. de Anima 418b 4 ff.) is neither ἀπτὸν nor inherent in the body qua ἀπτὸν.

29b 16—18. αὐτῶν . . . ἐννοιώσεις. The qualities which differentiate the primary bodies are, as we have seen, those which belong to the contrarieties of touch. But some of the latter are derivative: our next task therefore is ‘to distinguish which amongst the tangible differences and contrarieties are primary’.

I have followed HJ and Π in omitting πρωτον in b 17: the passage is certainly better without it.
COMMENTARY

29b 18-20. εἰσὶ . . . λεπτῶν. All the qualities defined in this chapter (the reader will observe) are defined by reference to perception. Thus, e. g., hard and soft are the incompressible and compressible estimated by our sense of touch, not the absolutely impenetrable and its contrary. Cf. e. g. Meteor. 382a 17-21.

The omission of πυκνόν-μανόν from this list of the contrarieties of touch is to be explained by the fact that Aristotle denied the existence of dense and rare in the popular sense: i. e. he denied the existence of atoms and interspaces, and rejected all cognate conceptions of the constitution of matter (cf. * 21a 5-9). Hence, though he still employs the terms πυκνόν-μανόν, he treats the contrariety as a form of παχύ-λεπτον (cf. de Caelo 303b 22-25), or again as a form of βαρό-κοῦφον (cf. Phys. 217b 11-12).

29b 20-24. τούτων . . . ἀληθα. The primary bodies combine (μιγνυται) to form the ὄμοιομερή, and—as we shall see in Chapter 4—they are transformed into one another (μεταβάλλει εἰς ἀληθα). Hence (cf. * 29b 10-11) they must be reciprocally ποιητικὰ καὶ παθητικά: and the qualities which constitute them must express powers of acting and susceptibilities to action.

Now, although Earth, Air, Fire, and Water are all ‘light’ or ‘heavy’ (cf. Introd. § 10), and although all bodies which possess ‘weight’ or ‘lightness’ are in fact ποιητικά καὶ παθητικά, it is not qua light or qua heavy that they act upon, and are acted upon by, one another (cf. * 23a 9-10). Hence the contrariety ‘light-heavy’ is not constitutive of the primary bodies.

According to Philoponos (p. 214, ll. 31 ff.), ‘rough-smooth’, which is not expressly eliminated in what follows, is to be rejected for the same reason.

29b 22. ποιεῖν τι ἑτερον. For the construction, cf. e. g. Meteor. 385a 2-4 λευκὸν γὰρ καὶ . . . θερμὸν καὶ ψυχρὸν τῷ ποιεῖν τι δύνασθαι τὴν αὐτοθυών ἐστι.

29b 24-26. θερμὸν . . . λέγεται. (i) Hot-cold and dry-moist are reciprocally active and passive in the sense that the substratum, which is hot, is eo ipso both alterative of, and liable to be altered by, that which is cold; whilst the substratum, which is moist, is eo ipso both alterative of the dry, and subject to its action. Each of these four qualities, within its own contrariety, is both active and passive in relation to its contrary. The hot and the cold, qua contraries informing the same matter, act and react on
one another, and are each in turn both agent and patient. Each tends to assimilate its contrary to itself, and to be assimilated by it: and the result of this reciprocal action–passion is the tempering of both qualities and their fusion in an intermediate quality, which is less-cold-and-more-hot than the original cold and less-hot-and-more-cold than the original hot (cf. e. g. * 27b 22–31, * 28a 29–31, * 34b 8–16).

By a similar reciprocal action–passion, the moist and the dry tend towards an intermediate or tempered state, in which the dry is more pliable and more cohesive by admixture of the moist. But this tempering of the dry by the moist requires for its completion the 'active operation' of the hot–cold (or of the tempered-hot) in a sense which we have now to consider.

(ii) For although the reciprocal action–passion of the qualities within each contrariety is an essential condition of the emergence of a new ὑμωομέρεσ, another kind of action–passion, in which the hot–cold is agent and the dry–moist is patient, is also involved: and it is to this second kind of action–passion, where one contrariety is active and the other contrariety passive, that Aristotle is referring in the present passage (cf. Journal of Philology, No. 57, pp. 83–86). The whole subject is worked out in Meteor. Δ with great elaboration: I must content myself here with a brief outline, which will be sufficient for the understanding of the present sentence.

Aristotle maintains that everywhere, if we look at the physical phenomena, we shall see heat and cold functioning as active and controlling forces. They reduce the materials—whether these be the same in kind, or of different kinds—to definite shape, they cause them to grow together into a unity, and they introduce change into them. Moistening and drying, hardening and softening, are the work of heat and cold. On the other hand, the materials, which submit to these operations, are everywhere the dry or the moist or the things compounded of dry and moist (Meteor. 378b 10–20). Hence all birth and all death—the coming-to-be and passing-away of every ὑμωομέρεσ in a plant or animal, and thus indirectly of every plant or animal itself—are to be ascribed to the operation of the hot–cold on the dry–moist. Birth—the coming-to-be of any ὑμωομέρεσ in animate things—is, from this point of view, a change produced in the passive ὑννάμεας (i.e. a development of the dry–moist, which is the material) by the agency of the hot–cold, i.e. the tempered-hot (cf. e. g.
Zabarella, de Misti Gen. et Inter. i, ch. 5). When the hot and
cold are present in due proportion, they control the matter (the
dry–moist) and bring the ὑμούμερός into being (Meteor. 378b 28—
379a 1).

Death and the processes which lead to it—withering in plants,
senile decay in animals—are to be ascribed to the failure of this
control. For just as the hot–cold gave definite shape and con-
sistency to the dry by tempering it with the moist, and thus
brought the ὑμούμερός into being, so, as the inner heat grows
less, dissolution sets in. The inner cold predominates over the
inner heat: and the heat of the environment (i.e. in the
environing ‘element’ of the living thing) overcomes the now
defeated inner heat (cf. * 23b 7–10). It is drawn out, and with
it the inner moisture also evaporates. Moreover, when the inner
heat is gone or defeated, the living thing has lost the power of
drawing in fresh moisture from the environment, and of digesting
its food (cf., on the inner heat, * 20a 8, * 20b 34—21a 29, * 22a
10–13, * 36b 8–10). Hence the animate thing (e.g. the ὑμούμερός)
passes to its natural end. It putrefies, becoming first moist, and
finally—as the moisture evaporates with the vanishing inner
heat—dry. This putrefaction (σηψίς) is the natural end of all
animate ὑμούμερόν and of the organisms to which they belong.
They all collapse in the end into ἄτι καὶ κόπρος (Meteor.
379a 3–26).

Thus in the coming-to-be and passing-away of an animate
ὑμούμερός, two of the four elementary qualities (viz. the dry and
the moist) are par excellence ‘matter’: for their rôle is purely
‘passive’. The other two (viz. the hot and the cold) are ‘active’,
either to form and mould, or to dissolve and destroy. The
function of the cold is apparently subsidiary to that of the hot. It
is ‘active’ either qua tempering the hot, or—in the process of
dissolution—qua assisting the heat of the environment to overcome
the inner heat, and thus to wrest the dry–moist from its control
(cf. Zabarella, l.c.: Meteor. 382b 6–10). In order to prevent
a possible misunderstanding, the reader may be reminded that
the material constituents of every ὑμούμερός are the four ‘primary
bodies’ (cf. 34b 31—35a 9), which are distinctively characterized
each by a different couple of the four elementary qualities (cf.
* 29o 24—b 3, * 30a 30—31a 6). It is these four primary bodies
which qua hot and cold are par excellence ‘active’ and qua moist
and dry are ‘passive’, and therefore par excellence ‘matter’, in the
generation and dissolution of the ὀμοιομερῆ. Although, therefore, Aristotle attributes efficient operations to the hot–cold in the Meteorologica, their action is not external like that of an ‘efficient cause’ proper. It is an ‘immanent’ action—an action exerted by the material constituents of the ὀμοιομερῆ.

Not only birth and death, not only the coming-to-be and the passing-away of the animate ὀμοιομερῆ, but all kinds of natural processes within the already subsistent compound natural things are ascribed by Aristotle to the active operations of the hot–cold on the dry–moist. Thus (cf. Meteor. 379b 10—381b 22) he attributes to heat πέψις and all its sub-forms, viz. πέπανος (ripening) and the nameless natural processes corresponding to, and imitated by, ἔψις (boiling) and ὁστοσίς (baking). Similarly he attributes to cold ἀπεψία and its sub-forms (ἄμορς, μωλυσίς, στάτεσις), i.e. failures in natural development corresponding, each to each, to the successes effected by heat in ‘digesting’, ‘ripening’, and in the natural operations analogous to ‘boiling’ and ‘baking’.

29b 26–30. θερμὸν...μὴ ὀμόφυλα. The characteristic function of the hot and the cold, by which Aristotle here defines them, is that of bringing together and uniting. (i) The hot ‘associates’ things of the same kind, and if it also ‘dissociates’, that is a secondary function: for in bringing together the homogeneous, it incidentally eliminates the heterogeneous (cf. also de Caelo 307a 31–b 5). If e.g. wine be heated in a closed vessel, the heat will collect all the earthy particles at the bottom and all the vaporous particles at the top. (ii) The cold ‘associates’ homogeneous and heterogeneous things alike. If e.g. water freezes right through, the cold will bring, and hold, together everything which was contained in it—bits of wood, straws, animalculae, &c. (cf. Zabarella and Philoponos, ad loc.).

One of the functions ascribed to heat and cold in the Meteor. is the causing homogeneous and heterogeneous things ‘to grow together’ (378b 15 συμφύνονται: see preceding note). In other passages (384b 24–26, 388a 23–25, 390b 4) the work of the hot and the cold in the constitution of the ὀμοιομερῆ is summarized as a ‘thickening and solidifying’ (παχύνοντα καὶ πνεύμονα ποιεῖται τὴν ἐργασίαν αὐτῶν). But, consistently with Aristotle’s general view of the effect of contraries, τῆς ἐπαίσθεν as well as πῆς is ascribed to these forces. For the hot dissolves what has been solidified by cold (we may think e.g. of fire melting ice and
wax), and the cold dissolves what has been solidified by heat (e. g. water, qua cold, dissolves soda and salt): cf. Meteor. 382b 30—383b 17, and below, * 30a 4—7.

29b 27. φαιν. Cf. 36a 3—4. The people in question were probably Pythagoreans: cf. * 36a 1—12.

29b 30—32. ὑγρόν . . . δυσόριστον δέ. The 'passive' qualities are defined as (a) that which is readily adaptable to the shape of its continent, since it is not determinable by any characteristic outline of its own—τὸ ὑγρόν (cf. 28a 35—b 4): and (b) that which is readily determinable by its own characteristic outline, and is therefore not easily adaptable in shape—τὸ ξηρὸν.

The same definitions are assumed below (cf. * 34b 34—35a 3) and in the Meteor. (cf. e. g. 360a 23, 378b 23—25). The ὑγρόν and the ξηρὸν are in fact complementary to one another, each serving the other as a kind of glue: for though the ξηρὸν is ἐφόριστον οἰκεῖον ὀρφικόν, the cause of its getting and keeping its own shape is the ὑγρόν which is admixed with it (Meteor. 381b 29 ff.).

It is clear that 'moist' and 'dry' are quite inadequate renderings of ὑγρόν and ξηρὸν. I have retained them, partly because of the tradition, but mainly because there are no alternatives more satisfactory. Dr. Ogle prefers 'fluid' and 'solid' (cf. * 29b 7—30a 29). But though 'fluid' applies, like ὑγρόν, to Air as well as to Water, 'solid' is clearly inapplicable to Fire, which (according to Aristotle's doctrine) is θερμόν καὶ ξηρόν. Moreover, 'solid' is a useful term to translate τὸ πεπηγός, which (as we shall see) is a subordinate form of τὸ ξηρὸν proper.

29b 32—34. τὸ . . . τοῦτον. For the omission of τραχύ—λειόν, see * 29b 20—24. The words καὶ αἱ ἄλλαι διαφοραί probably refer not to τραχύ—λειόν, but to the varieties of ξηρόν—ὑγρόν: cf. * 30a 12—24.

Since Aristotle claims (30a 24—25) to have reduced all the other tangible differences to the first four, τοῦτον (29b 34) perhaps includes hot and cold as well as dry and moist. It is true that in what follows nothing is said of hot and cold: Aristotle derives fine and coarse, viscus and brittle, and hard and soft from the moist and dry. But Zabarella seems to be right in suggesting that they are in fact modifications of the moist and the dry, produced in them by the action of the hot and the cold: cf. the following notes.

29b 34—30a 4. ἐπεὶ . . . ξηρὸν. τὸ λεπτὸν is pervasive (cf. Meteor. 365b 33—35) and expansive (cf. e. g. de Caelo 303b 22—29,
304\xa 30–31: as we saw, * 29\xb 18–20, Aristotle connects μανόν–πυκνόν with λεπτόν–παχύν. Hence it tends to ‘fill up’ any vessel which may contain it, i.e. it is ἀναπληρατικόν, and this shows that it is closely connected with τὸ ϊγρόν. Since the hot is said to be the cause of rarefaction, and the cold of condensation (de Gen. Anim. 783\xa 37 – b 2; and cf. below, 30\xb 11–13), we may perhaps infer that λεπτόν–παχύ are derivative forms of ϊγρόν–ξηρόν produced by the agency of the hot and the cold respectively.

30\xa 1–3. λεπτομερεῖς . . . τοιοῦτον. If the text is sound, the argument seems to be that just as τὸ ϊγρόν is ἀναπληρατικόν because it follows the outline of the vessel containing it, so τὸ λεπτόν is ἀναπληρατικόν, because, owing to the fineness (i.e. the smallness) of its parts, it leaves no cranny of the containing receptacle unfilled.

Aristotle identifies τὸ λεπτόν with τὸ λεπτομερεῖς (cf. Bonitz, Ind. 427\xb 6–10), and the latter with τὸ μικρομερεῖς.

In a 3 τοιοῦτον, i. q. τοιοῦτον ὡστε δλον ὅλων ἀπεσθαί: ‘such as to be in contact with its continent, whole with whole’. This is only another way of saying that it is τοιοῦτον ὡστε ἀκολουθεῖν τῷ ἀπτομένῳ (cf. 29\xb 35–a 1), i.e. ‘such as to follow the outline of the continent which is in contact with it’.

30\xb 4–7. πάλιν . . . ϊγρότητος. On τὸ γλύσχρον, cf. * 28\xb 4. The following further information may be gathered from the Meteor. (i) Viscous liquids, though they may contain solid matter, refuse to precipitate it, owing to their viscosity (382\xb 13–16). (ii) Some viscous substances—e.g. bird-lime (ἰξός)—refuse to solidify (are ἀπηκτά) owing to their viscosity. Oil’s refusal to solidify, whether by heat or cold, is however attributed to the air, of which it is full, rather than to its viscosity (383\xb 20 ff., 385\xb 1–5: it appears from de Part. Anim. 648\xb 30–33, that oil does ‘become cool and solidify’—i.e. freeze—though more slowly than blood and than boiling water). (iii) Since τὸ γλύσχρον is ‘extensible’ or cohesive (cf. * 28\xb 4), it is sometimes contrasted with τὸ ψαθυρόν, the ‘non-cohesive’ or ‘friable’ (cf. e.g. Meteor. 385\xa 17, 387\xb 11–15). Thus, e.g., water is ψαθυρόν in contrast to oil. It falls apart into isolated drops: and therefore is more difficult to hold in one’s hand than oil. Oil can be ‘drawn out’ owing to its γλυσκρότης (de Sensu 441\xa 23–26).

Aristotle says here (30\xb 4–6) that τὸ γλύσχρον is a modification of τὸ ϊγρόν, but does not explain what the modification is, nor how it is produced. According to Zabarella, it is a ϊγρόν ‘which
has been very efficaciously combined with a little ἔγρον’. Can we perhaps infer from Aristotle’s instance (oil) that it is a ἔγρον which has become ‘full of air’—for that is the peculiarity of oil? We are not told what fills the ἔγρον with air—whether e. g. this is an effect of the hot or the cold.

Since Aristotle says that τὸ κραῖρον is ‘that which is so completely dry, that failure of moisture has actually caused it to solidify’ (30a6—7, cf. a 22—23), we may hope to gain some light on the subject from Meteor. 382b 31 ff. and 385a 22—33. For we are there told to distinguish, amongst the bodies ‘which solidify and harden’, (a) those which are forms of Water and (b) those which are forms of Earth. (a) The forms of Water are solidified by the cold, which crushes out the hot (ἐκθλίβοντος τὸ θερμόν)—the moist evaporating along with the vanishing hot. They solidify, therefore, owing to the absence of the hot: and they liquefy again by heat (cf. * 29b 26—30). Ice, lead, and bronze are given as instances. (b) The forms of Earth are solidified by the hot, which dries up the moist in them. They solidify, therefore, owing to the absence of the moist. The instances given are κέραμος (terra-cotta?), soda (νίτρον), salt, γη ἢ ἐκ πηλοῦ. Most of these liquefy again by the moist: κέραμος is an exception, and its refusal to liquefy is explained by Aristotle on other grounds. From the present passage we should naturally infer that τὸ κραῖρον is a form of Earth, which has solidified owing to the complete elimination of its moisture by the hot. If so, ice is not strictly speaking κραῖρον. For though it shares one characteristic property with τὸ κραῖρον, viz. that it is θραυστόν (cf. Meteor. 386a 10 and de Part. Anim. 655a 31—32), it is a form of Water, and its solidification is due primarily to the absence of the hot, not to the absence of the moist. Aristotle, however, says of the egg-shell that, when completely developed, it becomes σκληρόν καὶ κραῖρον, and he ascribes its solidification to the cold. It ‘comes out ’ soft, but is immediately cooled and thus solidified—the little moisture in it quickly evaporating, and only the earthy element of its consistency remaining (de Gen. Anim. 752a 30 ff.).

30a 8—12. ἐτι . . . ἔγρον. The matter of every composite body is an attemperament of dry and moist (cf. * 29b 30—32); and according to the proportion of dry and moist in this attemperament—which depends upon πῆξις—the body is either μαλακόν or σκληρόν. Since πῆξις is effected by the hot or the cold or by both together, μαλακόν and σκληρόν are modifications in the moist and
the dry produced by the agency of the hot and the cold (cf. *29b 26–30, Meteor. 382a 8–11, a 22 ff.).

The hard or rigid (σκληρόν) does not yield to pressure by withdrawing into itself, whereas the surface of a soft or plastic (μαλακόν) body retires under pressure upon the body itself (cf. de Caelo 299b 13–14). Water on the other hand—or any υγρόν—yields to pressure by total displacement (cf. Meteor. 382a I–11, 386a 24–25. Water ἀντιπεριβάλλεται or ἀντιμεθύσκεται).

30a 9. μεθύσαμεν, i. q. ἀντιμεθύσαμεν: see preceding note.

30a II–12. τὸ δὲ . . . ξηρὸν. This is not very clear: for (a) the μαλακόν as well as the σκληρόν involves πηχείς, and (b) the κραύγον as well as the σκληρόν is πετηγός (30a 6–7).

Perhaps Aristotle means, as Zabarella suggests, that a body becomes 'hard', if the πηχείς has been carried so far as to eliminate the moist. The result is then τελέως ξηρόν, and it is (i) κραύγον, quae deprived of its moisture and therefore easily βραντεύων, and (ii) σκληρόν, quae not yielding to pressure.

30a 12–24. λέγεται . . . υγρόν. Aristotle here distinguishes three subordinate senses of υγρόν and ξηρόν, and shows that they all derive from the moist and dry which were first mentioned, i. e. from υγρόν and ξηρόν in the sense defined above (29b 30–32).

The term υγρόν is applied (i) to that which has foreign moisture on its surface—the 'moistened' or 'damp' (διερόν), and (ii) to that which has foreign moisture penetrating to its core—the 'sodden', 'drenched', or 'sopping' (βεβρεγμένον: the term is used e. g. of wool and of earth, Meteor. 385b 14, &c., and of a sponge, ib. 386b 5).

Correspondingly, the term ξηρόν is applied (i) to the contrary of the διερόν, i. e. to that which (though it was, or might have been, damp) is 'dried' (*18–19); and (ii)—though Aristotle does not expressly mention this use of the term—to the contrary of the βεβρεγμένον, i. e. to that which (though it was, or might have been, sodden) is 'dried through and through'.

Finally (iii) τὸ υγρόν may mean that which contains moisture of its own; and may thus be contrasted with that form of the ξηρόν which is called πετηγός or 'solidified' (30a 20–24).

The antithesis υγρόν–πετηγός was used above, 27a 17–22. Philonos rightly explains that υγρόν in this sense applies to τὰ τηκτά, e. g. wax, lead, and the like. These 'liquefiable' substances differ from υγρά proper: for whereas the latter are nothing but υγρά (are υγρά through and through), the former ἐν τῷ βάθῳ
kekryptomenon εχει την οικειαν υγρότητα. They also differ from τα βεβρεγμένα (e.g. mud, or the sopping sponge), because the υγρότης in them is their own, and not imported from without: it is οικεία not άλλοτρία, or συμφυνής not έπακτός (cf. Meteor. 382b 11).

It is clear that these three subordinate senses of άγρον and ήπρον derive from the primary άγρον and ήπρον, because the latter are employed in defining them. Thus, e.g., the damp is that which has on its surface a foreign υγρότης, i.e. a άγρον in the primary sense. The solidified is that which has been deprived of a υγρότης (i.e. a άγρον in the primary sense) originally belonging to it, and is thus ήπρον in the primary sense, viz. δυσόριστος—not easily adaptable in shape.

30a 13–15. αντίκειται... λεχθέντων. βεβρεγμένον and its un-named contrary are not here referred to, and we have therefore two (not three) subordinate senses of άγρον–ήπρον: viz. (i) damp–dried and (ii) liquefiable–solidified.

άπαντα δὲ ταύτα (a 14), i.e. διερόν and its contrary ήπρον, πεπηγός and its contrary άγρον.

τῶν πρώτων λεχθέντων (a 15), 'those which were first mentioned': cf. ή πρώτη λεχθείσα ἀπορία (Polit. 1282b 1), ή πρώτη λεχθείσα ἀπεφία (Meteor. 381a 13).

Bonitz, however (Ind. 653a 50–51), interprets 'in their primary sense', and suggests πρώτως as an emendation of πρώτων: cf. 30a 19.

30a 21–23. άγρον... ταύτης. Aristotle here contrasts the sodden with the liquefiable: previously (a 16–18) the sodden was distinguished from the damp.

B. 3

30a 30—31a 6. 'Επεί... ήπροι. The doctrine of this chapter may be summarized thus:—It is mathematically possible to combine any four terms in six different couples. But, of the four elementary qualities, hot cannot be coupled with cold, nor dry with moist, since they are contraries. Hence the possible couples of these four qualities are really only four (30a 30–b 1).

Conformably to this result, each of the 'so-called elements', which appear to be simple bodies, is in fact characterized by (a different) one of the four possible couples of qualities: and there are four of these 'elements', corresponding in number to the four elementary qualities. This correspondence (of the 'simple bodies' to the qualities) is to some extent confirmed by reflection upon the views of previous thinkers (30b 1–21).
Earth, Air, Fire, and Water, however, are not really simple bodies. The real 'simple bodies' are like them, but more pure (30b 21-30).

The simple bodies fall into two pairs, according as they tend to move 'up' to the periphery or 'down' to the centre of the Cosmos. From this point of view, Fire and Air are contrasted with Earth and Water. From another point of view, Fire and Earth as extremes are contrasted with Air and Water as intermediates. But though they thus fall into pairs, they are four: and, qua four, each of them is primarily and distinctively characterized by (a different) one of the four qualities (30b 30–31a 6).

30a 30. στοιχεία: cf. * 28b 26–35a 23, * 29a 5, * 29b 2–3, * 29b 13. The word here and at a 33 means the elementary qualities, which are genuine (not merely 'so-called') στοιχεία.

30b 1–7. ἡκολούθηκε... λόγον. Aristotle has proved that there must be precisely four elementary qualities (hot, cold, dry, moist), capable of forming precisely four couples. It is in consonance with these results of theory (κατὰ λόγον, b 2, 7: εὐλόγως, b 6) that common opinion, resting on the evidence of perception, recognizes four 'simple' bodies, and attributes to them respectively, as their characteristic qualities, precisely these four couples.

ἀκολουθεῖν, i. q. ὑπάρχειν, κατηγορείσθαι (cf. Bonitz, Ind. 26b 1 ff.), but the term is used here with κατὰ λόγον to suggest that the attribution of these couples to Earth, Air, Fire, and Water is a logical consequence of the theory which Aristotle has developed.

There is a double antithesis implied in φαινοµένου (30b 2), viz. (a) that between appearance and reality, and (b) that between what seems on the evidence of the senses, and what is on the evidence of reasoning. Earth, Air, Fire, and Water appear to perception to be 'simple' bodies: but they are not really so, as reflection will show (cf. 30b 21–30).

30b 4. οἶον... ἀὴρ. It is evident to perception that 'air' is hot and moist, if 'air' is understood in Aristotle's sense as 'a sort of ἀτμός': cf. * 22b 2–3, * 31a 24. This is what ἀὴρ must mean, if it is distinguished from 'fire' (i.e. the 'fiery' simple body, which is οἶον ὑπέκκαιμα).

30b 7–21. ἀπαντεῖ... ἀντιπλῆσιν: cf. * 28b 33–29a 5. The chief object of this brief review is to confirm Aristotle's theory by showing (a) that in all previous theories the number of the 'simple bodies' depended upon the number of elementary qualities re-
cognized, and (b) that no previous theory recognized more than four 'simple bodies'.

30b 11. τὰς ἀρχὰς: 'originative sources', i.e. in effect here 'elementary qualities' (cf. e.g. 29b 4, b 9), for the underlying matter is separately reckoned (30b 12-13).

30b 12. η: 'or rather', for rarefaction is due to heat and condensation to cold (cf. * 29b 34—30a 4).

30b 13. δημιουργοῦντα. Aristotle himself applies this term to the hot and the cold as forces manipulating the dry-moist and thus producing a consistent and definitely-shaped compound: cf. e.g. Meteor. 384b 26, 388a 27, 389a 28.

30b 13—19. οἱ . . . ποιοῦντες. Aristotle here contrasts with the 'monists', and compares with one another, (i) those who postulated from the outset (b 13 εὖθες: for even the monists in effect assume two ἄρχαι, cf. b 11) two 'simple bodies' and (ii) those who postulated three 'simple bodies' as στοιχεία.

(i) The 'dualists' select, as their στοιχεία, two simple bodies, characterized respectively by the opposite qualities of a contrariety. As thus characterized, these two simple bodies are 'extremes': and the other supposed 'simple' bodies—the 'intermediates' or 'means' (b 14 τὰ μεταξῦ, b 19 τὸ μέσον)—are explained as 'blends' (b 15 μέγαμα ποιοῦσιν τούτων), i.e. as characterized by qualities intermediate between the contraries which were assumed to characterize the 'extremes'.

'Parmenides'—i.e. the Pythagorean theory criticized in the second part of his poem (cf. * 18b 6-7, * 35b 16-17, * 36a 1-12)—is quoted as a typical instance. In this 'dualistic' theory, Fire and Earth, characterized respectively by the hot and the cold, were selected as στοιχεία: and Air and Water were regarded as 'blends' of these two 'extremes'.

(ii) The second group of thinkers postulated three 'simple bodies' as στοιχεία. They regarded two of these as 'extremes', and the third—the intermediate or middle one—as a 'blend' of these. Hence, as Aristotle says, they only differ from the 'dualists' in that the latter 'split the intermediate into two', whilst they do not.

30b 15—17. ὀφθαλμῶς . . . ποιεῖ. 'The same course is followed by those who advocate three. (We may compare what Plato does in "the Divisions": for he makes the middle of his three kinds of substance a blend.)'

Aristotle mentioned a theory which postulated a triad of 'simple
bodies' (Fire, Earth, Air) in B. i, without naming the author. Philoponos, as we saw (* 29a 1-2), ascribes this theory to Ion of Chios.

(i) If we accept the usual interpretation of the present passage, Plato is accused of postulating three 'simple bodies' as στοιχεῖα, and of regarding two of them as extremes, the third being an intermediate produced by blending the extremes. He is said to have done this ἐν ταῖς διαμέτροσει ἀναθεμάτων—an addition which increases the obscurity of the passage.

According to Philoponos (p. 226, ll. 17 ff.), Alexander said that 'the reputed διαμέτροσει of Plato is a spurious work, but Aristotle is probably referring to the Sophist, διαμέτροσει καλῶν τὰ ἐν ἐκείνῳ'. On this, Philoponos remarks (a) that in his day there was no work called διαμέτροσει attributed to Plato, and (b) that there is nothing in the Sophist connected with the theory of a triad of 'simple bodies'. Accordingly he prefers another suggestion of Alexander's, viz. that the reference is to certain ἀγαράφα δόγματα of Plato, which Aristotle himself had written down (ἀπεγράφετο) under the title of διαμέτροσει (cf. also the exhaustive note in Zeller, ii. 2, p. 437s).

But if we identify the διαμέτροσει with a collection of Plato's 'unwritten opinions' (whether made by Aristotle or by some anonymous writer), we are still confronted with an insuperable difficulty. For how could Aristotle have credited Plato with a theory so utterly irreconcilable with the doctrine of the Timaeus, without a single word of explanation? And, on the other hand, if Plato had maintained a 'triad' of this kind (or if Aristotle thought that he had done so), is it not incredible that Aristotle should have omitted to emphasize its inconsistency with the Timaeus? The doctrine of the 'elements' in the Timaeus was criticized above (cf. * 29a 13-24): yet there is not a word there, or anywhere else in Aristotle, to suggest that Plato ever put forward a different, and an incompatible, theory.

For the theory is beyond question incompatible with the Timaeus. It is true, no doubt, that Plato (I. c., 31 b-32 c) treats Fire and Earth as 'extremes' requiring a 'mean' to unite them. But (as he immediately proceeds to say) 'extremes' which are solids require two 'means' to unite them, and accordingly there must be two intermediate bodies (Air and Water) between Fire and Earth.

Thus the doctrine of the Timaeus resembles the view attributed
by Aristotle to the ‘dualists’; cf. * 30b 13–19. Again, it is true that Plato (Timaeus 55 d ff.) groups Fire, Air, and Water together, as all three ultimately derived from the right-angled scalene, and contrasts them with Earth, which is derived from the isosceles (cf. * 25b 19–25). And he places Air midway between Fire and Water in respect to mobility, size of corpuscles and sharpness of their edge. But there is nothing in the Timaeus to suggest that ‘the so-called elements’ are really στοιχεία, or that they are three and not four, or that Air is a μίγμα, e. g. of Fire and Earth (cf. 29a 2).

(ii) I am therefore convinced that the usual interpretation of the present passage is wrong. Aristotle is not here attributing to Plato the doctrine of a triad of ‘simple bodies’ at all. All that he is saying is that the advocates of such a triad (e. g. Ion) made one of the three a blend of the other two, ‘just as Plato ἐν ταῖς διαφόρεσιν makes the middle a blend’.

What, then, are the διαφόρεσις in question, and to what Platonic triad is Aristotle referring?

Philoponos, supposing the διαφόρεσις to be a collection of Plato’s ἄγγελον ὁμομοία, suggests that Aristotle is referring to the Great and the Small and to a third ἄγγελον, playing the part of ἦλθ, ‘which Plato said was a μίγμα of the Great and the Small’. But though Aristotle constantly refers to Plato’s doctrine of ‘the Great and the Small’ (i. e. τὸ ἄγγελον of the Philebus) and ‘the One’ (i. e. τὸ πέρας), he always recognizes that ‘the Great and the Small’ play the part of ἦλθ, and ‘the One’ corresponds to ‘form’ (cf. e. g. Phys. 187a 17–18, 189b 11 ff., Metaph. 987b 20 ff.). Even Philoponos is obliged to admit that the third ἄγγελον (which he identifies with ἦλθ, i. e. with the ἀποδοχή) was not, according to Plato, a μίγμα of the Great and the Small, but that in which these were mixed.

Since we need not suppose that Aristotle is here imputing to Plato a doctrine so inconsistent with the dialogues as that of a triad of ‘simple bodies’, we are no longer forced to interpret ἐν ταῖς διαφόρεσιν as a reference to an unknown work. Nor is there any reason whatever to identify the διαφόρεσις here mentioned with αἱ γεγραμμέναι διαφόρεσις referred to in the de Part. Anim. (642b 12). In spite of Zeller’s denial (l. c.), I agree with Dr. Ogle that these ‘published dichotomies’ are probably the divisions in the Sophist and Politicus: but Aristotle does not attribute them to Plato by name, and in any case they need not have anything to do
with the διαφέρεις in the present passage. The latter, I venture to suggest, are simply Aristotle’s name for a famous passage in the Ἁτιμαύες (35 a ff.), where Plato describes the formation of the Soul. Plato there works with a triad, the third member of which is produced by blending the other two. God takes (a) the Indivisible and always Self-Identical Substance (Identity) and, blending it with (b) the Substance ἡ περὶ τὰ σώματα γεννομένη μεριστῇ (Otherness), produces (c) a third kind of Substance. Next, God mixes together all three, viz. Identity, Otherness, and their Blend; and having done so, divides the whole resultant Substance into parts. The division—or rather the divisions, for Plato distinguishes in the whole process two successive operations—is introduced with the words ἵρξετο δὲ διαφέρειν ὄντε (35 b), and is elaborately described (cf. Martin, i, pp. 383 ff.). It seems likely enough that this section of the Ἁτιμαύες should have been quoted by Aristotle as αἱ διαφέρεις.


30b 22. μικτά. None of ‘the so-called elements’ is a pure example of πρώτη ἡλη informed by a couple of elementary qualities: they are all more or less ‘blends’. The terms μῦγμα, μικτὸν in this chapter are not used in the strict sense of ‘chemical compounds’ (cf. A. 10), but simply in contrast to τὸ ἄπλοον, τὸ εἰλικρινές.

30b 23–25. τὰ . . . ἀλλων. To each of ‘the so-called elements’ there corresponds a really-simple body, which resembles it in character, but is not identical with it. Thus, e. g., πρώτη ἡλη informed by hot-dry is not the same as fire: but it is ‘fiery’ in character, and is the pure simple body, of which our fire is an impure or modified form (cf. 22b 2–3).

30b 25–30. τὸ . . . πυρός. Fire is to the really-simple body, which resembles it, as ice is to water: i.e. it is an exaggeration of it, in which its characteristic quality (the hot) is intensified (cf. Meteor. 340b 23: below, 31b 24–26), just as ice is an intensification of the cold which distinctively characterizes water.

That is why, as Aristotle adds, neither ice nor fire play any part, as constituent materials, in the coming-to-be of living things:—though the hot—dry and the cold—moist simple bodies (the first of which Aristotle calls ‘fire’) do enter into the constitution of every ὑμοιομερὴς (cf. 34b 31–32).

30b 30–33. ὄντων . . . μέσον. This passage presupposes the

The two τόπωι (30 b 31–32) are the ἄνω (the periphery) and the κάτω (the centre) of the sublunary sphere. Corresponding to these two regions there are two extreme simple bodies, viz. (i) the absolutely heavy (Earth), and (ii) the absolutely light (Fire). These two ‘extremes’ imply an ‘intermediate’ body, which Aristotle divides into two, Air and Water. Both of these are relatively both light and heavy; for Air πλὴν πυρὸς πᾶσιν ἐπιπολάζει, and Water πλὴν γῆς πᾶσιν ὑφίσταται (cf. de Caelo 312 a 25–27).

Accordingly Fire and Air are here reckoned as forms of the body which moves towards the ‘limit’, i.e. towards the periphery (b 32 τοῦ πυρός τὸν ὄρον φερομένου, sc. σώματος); and are contrasted with Water and Earth as forms of the body which tends towards the centre.

In b 31 the best reading is ἐκάτερα. ‘The simple bodies, since they are four, fall into two pairs which belong to the two regions, each to each.’ Bonitz seems to be right in taking τοῦ δύοιν as dependent on ἐκατέρων. The reading πρῶτων (instead of τόπων) in EJFl (cod. Z) is implied also by Γ’s ‘duorum utique primorum esse unumquodque’. Perhaps it was originally a gloss to explain what τόπωι Aristotle meant.

30 b 33 – 31 a 1. καὶ ἅκρα . . . ἅρ. Fire and Earth (i.e. the really-simple bodies which resemble these) exhibit their respective tendencies to movement, up and down, in the extreme or purest form. Hence they are grouped together as ‘extremes’, and contrasted with Air and Water.

31 a 1–3. καὶ ἐκάτερα . . . οὐνέστηκεν. Aristotle reverts to the previous grouping (30 b 31–33) of Fire and Air on the one hand, and Water and Earth on the other.

Philoponos rightly regards 31 a 2–3 (ταῦτα γὰρ . . . οὐνέστηκεν) as an explanation of how the simple bodies, although they are ὀδυσσα, can be said to be ‘contrary’ to one another (cf. e.g. Categ. 3 b 24–25). The contrariety depends on the elementary qualities which constitute them. Cf. also 35 a 6.

For παθημάτων (a 3), cf. e.g. 29 b 15 πάθος.

31 a 3–6. οὐ μὴν . . . ἔγροι. In the Meteor. (cf. e.g. 382 a 3–4) Water is treated as, of all the simple bodies, most typically exemplifying τὸ ὑγρὸν: and Aristotle builds his classification of the ὄμουμερη upon this assumption. He classifies them in three groups, according as their matter—which must be a temperament
of ἵψον and ἵψον (cf. * 29b 30–32)—is predominantly Water, predominantly Earth, or equally Earth and Water.

Yet here (31a 4–5 ἰδώρ ... θερμόν) he appears to view Air as more ἵψον than Water. Now, so far as the definition of ἱδώρ is concerned, Air might well be regarded as more ἵψον—i.e. as less determinate in its outlines—than Water: and so Philoponos (p. 230, ll. 29–30) explains this passage. But this interpretation is inconsistent with the doctrine of the Meteorologica: cf. also below, * 34b 34—35a 3.

It may perhaps be suggested that Aristotle does not say here—his words do not even necessarily imply—that Air is more ἵψον than Water. He is not comparing the simple bodies with one another. His immediate purpose is to insist that, within the couple of qualities characterizing each ‘element’, one quality is more distinctive of the ‘element’ than the other. Thus, though Water is ψυχρόν—ἵψον, it is par excellence characterized by cold rather than by moist; and though Air is ἵψον—θερμόν, it is par excellence characterized by moist rather than by hot.

B. 4

31a 7—32a 2. Ἐπει ... εἰκηναι. All the simple bodies are by nature such as to be transformed into one another (31a 7–21). This transformation occurs in various ways. The quickest and easiest method is for an ‘element’ to pass into the ‘element’ next to it in the natural series—i.e. Earth into Water, Water into Air, Air into Fire, and Fire into Earth. The transformation is then effected by the conversion of a single elementary quality into its contrary (31a 21–b 4). The slowest and most difficult transformation is that by which a single ‘element’ passes into another ‘element’ characterized by qualities the contrary of its own—i.e. Earth into Air, Air into Earth, Fire into Water, Water into Fire. For two elementary qualities have here to be converted into their contraries (31b 4–11). There is a third method, by which two ‘elements’ taken together, provided they are not ‘consecutive’, pass (by the elimination of a single quality in each) into either one of the remaining ‘elements’. Thus Fire + Water are transformed into Earth or into Air, according as either the hot and the moist or the dry and the cold are eliminated: and Air + Earth are transformed into Fire or Water by the elimination either of the moist and the cold or of the hot and the dry (31b 12–26). But this method of transformation does not apply if the two ‘elements’, which are...
taken together, are next to one another in the natural series. No third ‘element’ can be thus generated from Fire + Air, Air + Water, Water + Earth, or Earth + Fire. For the elimination of one elementary quality in each member of these pairs will leave either two identical or two contrary qualities—one of two qualities incapable of constituting a simple body (31\textsuperscript{b} 26-36).

31\textsuperscript{b} 7. διώρισται πρότερον. The reference is probably neither to 14\textsuperscript{b} 15—26, nor to 29\textsuperscript{a} 35, but rather to de Caeio 304\textsuperscript{b} 23 ff. Aristotle had there maintained (a) against Empedokles, who said that the ‘elements’ were ἀμα (cf. * 15\textsuperscript{a} 4—8), and (b) against Plato, who denied that Earth comes-to-be out of the other three (cf. Timaeus 54 b-d), that all four simple bodies come-to-be out of, and pass-away into, one another. He had also criticized the accounts given by Demokritos and the Platonists of the manner in which the ‘elements’ are transformed.

31\textsuperscript{b} 8—10. ἡμα . . . ἐτίν. Apparently the argument is:—
‘Perception attests the γένεσις of the “elements”. For ἀλλοιωσις is an undeniable fact of perception (cf. 14\textsuperscript{b} 13—15): and ἀλλοιωσις is the change of a tangible (cf. * 29\textsuperscript{b} 7—13) body in respect to its αἰσθητὰ πάθη (cf. e.g. * 19\textsuperscript{b} 8—10). Hence the observed fact of ἄλλοιωσις implies change in the πάθη of the ἄπτα.

If this be the argument (cf. also 14\textsuperscript{b} 15—26), it is clearly very weak. The πάθη of the ἄπτα include not only the derivative as well as the basal contrarieties of touch, but also the qualities of colour, sound, flavour, and scent. And even if Philoponos (p. 232, ll. 6—12) is right in suggesting that all these πάθη are effects of the various blendings of the hot and the cold, and the dry and the moist, still the fact of ἄλλοιωσις does not prove that the ‘elements’ come-to-be. For ἄλλοιωσις does not imply, in every instance, a change from cold to hot, or dry to moist, or vice versa. At most ἄλλοιωσις implies some modification in these basal contrarieties of touch, and shows therefore that the γένεσις of the ‘elements’ is possible.

31\textsuperscript{b} 24. σύμβολα. According to Liddell and Scott, σύμβολα ‘were strictly the two pieces of a bone or coin, which two εἴνοι, or any two contracting parties, broke between them and preserved, tallies, Latin tesserae hospitales’. In Aristophanes’ speech (Plato, Symp. 191 d) each of us is said to be ἄνθρωπον σύμβολον, ἄτε τετιμημένος ὄσπερ αἱ ψήφισι, ἐξ ἑνὸς δυο. We are, each of us, a half severed from the original whole human being—a half demanding its complementary half to constitute a complete
ἄθροις, much as a flat-fish, to judge by its appearance, requires to be joined to another flat-fish, blank underside to blank underside, to form a complete individual.

Aristotle uses the term here and elsewhere to mean a part of one whole, which is capable of fitting in with a complementary part so as to constitute another whole. Thus, e.g., the hot in Air can fit in with the dry, and thus constitute Fire: and the hot in Fire can fit in with the moist, and thus constitute Air. Hence the hot in Air and Fire is an interchangeable ‘complementary factor’. (Cf. Bonitz, Ind. 715b 1–8. He renders σύμβολον by ‘pars’, which is hardly adequate.) Perhaps the most instructive passage is in the Meteorologica, where Aristotle is explaining the formation of Air. Air in the strict sense—not in the more popular sense in which Aristotle sometimes (e.g. de Cae]o 289a 29, Meteor. 340b 21–32 : cf. Gilbert, p. 181, p. 476a, &c.) uses ‘air’ to include the ‘fiery’ body—is a hot-moist body, filling the lower atmosphere, the region where ἀτμύσ predominantly collects and clouds form. It is ‘a sort of ἀτμύς’ (*30b 4); yet, as Aristotle maintains (Meteor. 360a 21–27), καπνός—i.e. the πνευματώδης ἀναθυμίασις—as well as ἀτμύς (the ἀτμιδώδης ἀναθυμίασις) contributes to its formation. The ἀτμιδώδης ἀναθυμίασις, which, since it is drawn from the water, is really ‘in its own nature’ cold and moist (cf. *22b 2–3, *31b 24–26), supplies the moist, and the καπνός contributes the hot, ὡστε καθάπερ ἐκ συμβολαν συνιστατο ἐν ὁ ἄθρο ἔγρος καὶ θερμός.

31b 2–4. ὡστε . . . ἐφεξῆς. Aristotle has shown that, by the conversion of a single elementary quality in each case, Fire is transformed into Air, Air into Water, Water into Earth, and Earth into Fire (31a 26 – b 2). This is a cycle of transformations. At the same time, the ‘elements’ have been taken ‘consecutively’, i.e. in their natural order: for—working ‘downwards’ from the ‘uppermost’ stratum—Air comes next to Fire, Water to Air, and Earth to Water (cf. Introd. §10, *22b 2–3). Hence Aristotle says that the ‘elements’ taken in their natural consecution contain σύμβολα, and therefore cyclical transformation of the simple bodies is the easiest. For ἐφεξῆς, cf. *16b 4.

31b 5. έξ ὁδατος . . . πῦρ. ἀέρα και πῦρ by chiasmus for πῦρ και ἀέρα.

31b 11–24. ἄτη . . . πυρός. The transformation of Fire into Water or of Air into Earth, and vice versa, involves the ‘passing-away’ of both elementary qualities in each case, i.e. their conversion into their contraries (31b 4–11). Hence it takes a
longer time than the transformation of the ‘elements’ in their natural series, which involves only the conversion of one elementary quality into its contrary (31\textsuperscript{a} 23 – b 4). There is, however, a third method of transformation—though not of \textit{reciprocal} transformation (31\textsuperscript{b} 12–13 \textit{οὐκ} \textit{εἰς} \textit{ἄλληλα} \textit{δὲ} \textit{ἡ} \textit{μετάβασις})—whereby two ‘elements’ together generate a third. This involves the ‘passing-away’ \textit{(but not the conversion)} of one elementary quality in each of the generating ‘elements’, the new ‘element’ being formed out of the remaining two elementary qualities.

31\textsuperscript{b} 23. \textit{ἡ}: cf. *14\textsuperscript{b} 25–26, *28\textsuperscript{b} 2.

31\textsuperscript{b} 24–26. \textit{φύλογομομένη} ... \textit{γῆς}. Air (cf. *31\textsuperscript{a} 24) is formed out of \textit{ἀτμίς} and \textit{καπνός}: but this is not inconsistent with Aristotle’s statement here that \textit{καπνός} is derived from Air and Earth. For \textit{καπνός} is a hot–dry exhalation or smoke, and it may draw its \textit{hot} from Air and its \textit{dry} from Earth. Cf. e.g. \textit{Meteor.} 37\textsuperscript{a} 33–b 1 \textit{ὅτι} \textit{μὲν} \textit{γὰρ} \textit{ὁ} \textit{τε} \textit{καπνός} \textit{πνεῦμα} \textit{kai} \textit{κάσται} \textit{ὁ} \textit{καπνός}, \textit{φανερόν}, \textit{kai} \textit{εἰρήται} \textit{ἐν} \textit{ἐτέροις} \textit{πρότερον}. (Since \textit{πνεῦμα} is defined—\textit{Meteor.} 38\textsuperscript{a} 29—\textit{as} \textit{ρύσις} \textit{συνεχής} \textit{ἐπὶ} \textit{μὲν} \textit{άέρος}, Bonitz is probably right in interpreting \textit{εἰρήται} \textit{ἐν} \textit{ἐτέροις} \textit{πρότερον} as a reference to the present passage.) The same doctrine is implied in \textit{Meteor.} 34\textsuperscript{b} 21–22 (\textit{ἔστι} \textit{γὰρ} \textit{ἡ} \textit{φλὸς} \textit{πνεύματος} \textit{ἐγροῦ} \textit{ζέσις}), 36\textsuperscript{a} 2–3, 38\textsuperscript{b} 31 ff.: cf. also \textit{de Sensu} 44\textsuperscript{a} 27–28; and above, 30\textsuperscript{b} 29. At the same time, it must be remarked in general that it is extremely difficult to reconcile Aristotle’s various statements about the \textit{διπλῆ} \textit{ἀναθυμίασις} (cf. *22\textsuperscript{b} 2–3) and about \textit{ἀτμίς} and \textit{καπνός} which are typical of its two forms. We must always remember that the two forms of \textit{ἀναθυμίασις} never exist entirely apart from one another. The distinction between them is one of degree, and depends upon the relative predominance of \textit{the dry over the moist}, or \textit{vice versa} (cf. \textit{Meteor.} 35\textsuperscript{b} 28–34). The \textit{ἀναθυμίασις}, in so far as it is derived from water, is relatively \textit{moist}, and more like mist or aqueous vapour (\textit{ἀτμοδῶδης}, \textit{ἀτμοδωδεστέρα}). It is ‘hot’, indeed, since it has been drawn from the water by the sun’s heat: yet, as derived from water, it is (cf. *31\textsuperscript{b} 24) ‘in its own nature’ cold. On the other hand, the \textit{ἀναθυμίασις}, in so far as it is drawn up from earth, is relatively \textit{dry} and more like wind or smoke (\textit{πνευματωδεστέρα}, \textit{καπνώδης}: cf. e.g. \textit{Meteor.} 34\textsuperscript{b} 6–18).

31\textsuperscript{b} 27–28. \textit{φορέντος} ... \textit{στοιχεῖων}. Probably \textit{στοιχεῖων} is to be taken with \textit{θατέρων}, not with \textit{ἐκατέρω}. It will then mean ‘elementary qualities’: cf. *30\textsuperscript{a} 30.

31\textsuperscript{b} 28. \textit{τῶν} \textit{σωμάτων}, i. q. \textit{τῶν} \textit{ἀπλῶν} \textit{σωμάτων}. 
B. 5

32\textsuperscript{a} 3—33\textsuperscript{a} 15. o\omicron\upsilon \ldots \iota\sigma\tau\alpha\iota. On the connexion of B. 5—7 with B. 1—4, see \textsuperscript{28b} 26—35\textsuperscript{a} 23. B. 5 falls into two parts. (i) The doctrine already established—viz. that there must be four 'simple bodies', informations of a single incorporeal matter, constituted each by a couple of qualities drawn from two contrarieties, and all able to be transformed into one another—is shown to follow from a somewhat different starting-point (32\textsuperscript{a} 4—b 5).

(ii) It is proved that none of the 'simple bodies' can be an unchangeable origin (\alpha\rho\chi\gamma') of the others. None of them is a genuine element, none of them is—in that sense—the \upsilon\lambda\eta of the 'natural bodies'. All of them are on the same level of being—derivative and changeable.

Incidentally it is proved that the transformations of the 'elements' cannot proceed \textit{ad infinitum} in a straight line: and thus Aristotle's own doctrine, that their transformations are cyclical, is confirmed (32\textsuperscript{b} 5—33\textsuperscript{a} 15).

32\textsuperscript{a} 4—5. e\iota \ldots \tau\omicron\omega\upsilon\alpha\tau\alpha. Cf. \textsuperscript{28b} 32—29\textsuperscript{a} 5. τὰ φυσικὰ σώματα (\textsuperscript{a} 4) are, I think, equivalent here to αἱ φύσει συνεστῶσαι αὐτοῖαι, on which see \textsuperscript{28b} 32—33.

32\textsuperscript{a} 6—7. ἐν \ldots γῆν. Aristotle is arguing against the theory that some one or other of the so-called 'elements' is the ἵπποκειμένη \upsilon\lambda\eta, of which the remaining 'elements' (and therefore \textit{ultimately} all φυσικὰ σώματα) are derivative forms. πάντα (\textsuperscript{a} 6, \textsuperscript{a} 7), i.e. πάντα τὰ ἀπλὰ σώματα.

32\textsuperscript{a} 7—8. εἴπερ \ldots τάναντία. Here, as elsewhere (cf. e.g. 31\textsuperscript{a} 14, 32\textsuperscript{b} 21—22), Aristotle assumes this principle, which he had established in the \textit{Physics} (cf. \textsuperscript{19b} 6—20\textsuperscript{a} 7), as a fundamental law of nature.

32\textsuperscript{a} 8—9. εἰ μὲν \ldots γενεσίς. It will be ἀλλοίωσις, because \textit{ex hypothesi} the persisting ἵπποκείμενον (viz. Air) is a perceptible body: cf. e.g. \textsuperscript{19b} 10—12. The alternative—viz. εἰ μὴ ἵππομένει—is not stated, because, unless Air is supposed to 'persist', it clearly could not be the \upsilon\lambda\eta of the others as the theory maintains.

32\textsuperscript{a} 9—10. ἄμα \ldots ὅτιον. 'Moreover, nobody supposes a single "element" to persist as the basis of all in such a way that, besides being Air, it is \textit{simultaneously} Water or any other "element".'

Air (\textsuperscript{a} 8—9) is supposed to 'persist', and the other 'elements' to be derived from it. This means that Air \textit{alters} e.g. into
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Water, not that Water comes-to-be. 'Alteration', however, implies that the Air, which has altered e.g. into Water, exhibits some difference from simple Air: and this leads to difficulties which Aristotle will develop immediately (a 10-17). In the meantime, in the parenthesis ἀμα . . . ὀριον, he confirms his statement that the theory is bound to recognize an alteration of its supposed fundamental 'element'.

32a 10-12. ἔσται . . . θερμότητα. Since some change is necessarily implied, and since all change is from contrary to contrary, the persisting 'element' must possess a quality contrary to a quality possessed by the 'element' into which it 'alters'. Thus e.g., if Air is to alter into Fire, we must assume a contrariety hot-cold, and assign one contrary (e.g. hot) to Fire. The Air, which has altered into Fire, will then be distinguished from the Air, which is the ὑποκειμένη ὕλη, by being hot Air.

The antecedent of ης (a 11) is ἐναντίωσις, καὶ διαφορά being parenthetical and explanatory. The contrariety differentiates the ὑποκειμένον into its specific forms, each contrary characterizing a different form. It is tempting to transpose ὅλον and τὸ πῦρ, but in any case we must construe τι as the subject of ἡξεί.

32a 12-17. ἀλλα . . . ἔσται. Fire cannot be 'hot Air' for three reasons. For (i) the process thus implied is 'alteration' of Air, not transformation: (ii) Air is not observed to become Fire by being heated (a 13 οὐ φαίνεται): (iii) if Fire is 'hot Air', Air itself must be cold (for if we suppose Fire to revert again into its ὑποκειμένη ὕλη, Air, this will involve the conversion of the hot into its contrary); in other words, Fire will be both hot and cold, hot qua Fire and cold qua Air.

τὸ αὐτὸ (a 17), sc. τὸ πῦρ: but Aristotle's argument also proves that Air must be simultaneously both cold and hot.

32a 17-18. ἄλλα . . . κοινή. 'Both Fire and Air, therefore, will be something else which is the same; i.e. there will be some matter, other than either, common to both.' This 'other matter' is of course Aristotle's πρῶτη ὕλη.

32a 20-25. οὐ μὴν . . . περιέχον. Anaximander and his followers (a 25, πνεύς) thought that all things were made out of a single 'deathless' and 'indestructible' stuff, which they called 'the Boundless' and 'the Environing': cf. e.g. de Caelo 303b 12-13, Phys. 203b 10-15. As the origin of all things, and as itself not characterized by any of the contraries, it is clearly 'other' than the 'elements'. And since, as Aristotle rightly interprets the
theory, ‘the Boundless’ is a body, it is natural that he should describe it as an ‘intermediate’ between two of the ‘elements’. In several passages (cf. e.g. 28b 35) Aristotle speaks of it as intermediate between Fire and Air: in others (e.g. Phys. 203a 18, 205a 27) as intermediate between Water and Air: and in one (Phys. 189b 3) as intermediate between Water and Fire. Burnet (p. 55) rightly remarks that this variation shows we are dealing with an inference drawn by Aristotle, not with Anaximander’s own statement.

32a 20—22. οἶν . . . λεπτότερον, i.e. the ἀπειρον, if intermediate between Air and Water, is coarser than Air and finer than Water; if between Fire and Air, coarser than Fire and finer than Air (cf. Phys. 187a 14—15).

32a 22—25. ἐσται . . . περιέχον. The ἀπειρον is supposed to be a body existing apart from (i.e. unqualified by) the contraries which characterize the ‘elements’. Hence the moment any of these contraries is added to it, it becomes one or other of the ‘elements’. Now Aristotle maintains that it must always be qualified by one or the other of the contraries constituting each contrariety in question. For in the contrarieties which characterize the ‘elements’ (hot—cold, dry—moist) one contrary is related to the other as privative to positive, as στέρησις to ἔξις or to κατηγορία τις καὶ εἴδος (cf. * 18b 14—18). And though a middle is possible between two contrary judgements (for x may be neither hot nor cold, but insusceptible of temperature), under certain conditions the contrary is invested with the character of the contradictory, and the Law of Excluded Middle applies. Thus, if x is a subject which can accept the predicate ‘odd’, i.e. if x is a number, it must be either odd or even: for a number, which is not-odd, is eo ipso ‘even’. Within the sphere of number the negation of ‘odd’ is eo ipso the affirmation of ‘even’ (cf. Post. Anal. 73b 18—24).

So the ἀπειρον, which ex hypothesi can accept ‘hot’, must be either hot or cold. For it must be either hot or not-hot: and a subject which is by nature recipient of heat, in so far as it is not-hot, is eo ipso cold. For ‘cold’ is simply the στέρησις of heat in a subject by nature δεκτικόν of heat. The principle of Aristotle’s argument applies to ‘coarse—fine’, the contrariety here supposed to differentiate ‘the Boundless’ into Air and Water or into Air and Fire (cf. 32a 21—23). For coarse and fine are equivalent to dense and rare (cf. * 29b 34—30a 4), a contrariety which Anaxi-
mander regarded as primary (cf. de Caelo 303b 10–19): and rare is, relatively to dense, a στέρησις (cf. de Caelo 299b 8–9 ἐστὶ δὲ πυκνὸν μανόν διαφέρον τῷ ἐν ἰσοὶ ὤγκῳ πλείον ἐννπάρχειν). If, therefore, ‘the Boundless’ can be dense (coarse), it must be either dense or rare (fine): for the δεκτικῶν of the dense, in so far as it is not-dense, is εὐ ἰρσο rare.

32a 25–27. ὅμως... πάντα. ‘The Boundless’ cannot exist apart from all contraries: and, possessing a contrary, it will be one or other of the ‘elements’. Hence it is either nothing at all or any one of the ‘elements’ indifferently, according to the particular contrary which is at any time qualifying it. We have thus disposed of the theory that something perceptible—i.e. some body—exists, which is other than, and prior to, the four ‘elements’. Hence the four ‘elements’ are all the simple bodies there are—always excepting the Aether, which is not here in question, since we are considering only the matter of the γεννητά καὶ φθαρτά.

32a 29–30. ἂ... ἕγγραφεν: cf. * 25b 19–25 and Timaeus 54 b–d. Fire, Air, and Water all come-to-be out of one another, since they are all derived from the right-angled scalene. But Earth is derived from the isosceles and therefore does not come-to-be out of the other three nor pass into them.


32a 31–33. καὶ... βραδύτερον: cf. 31a 20–b 36.

In a 31 I have followed E (cf. also Γ ‘et quoniam’) in reading καὶ ὅτι, and have therefore ventured to bracket εἰρήται πρότερον in a 32 as clumsy and unnecessary. In a 32 ὅτι means ‘because’.

32a 34–b 1. εἰ... ἀχρόιστος. One contrariety produces two ‘elements’ only: for matter (πρόωτη ὅλη) is the ‘mean’ between the contraries, and matter has no separate subsistence. (Or perhaps: ‘for the “intermediate” is nothing but matter, and that is imperceptible’ &c.)

32b 5. πρότερον: above, B. 2 and 3. Cf. also Phys. 189b 16 ff.

32b 5–7. ὅτι... δῆλον. Aristotle is going to show that none of the ‘elements’ is an unchangeable originative source (ἀρχῆ) of the others: i.e. that all four are on the same derivative level of being. Assuming the natural series of the ‘elements’ (cf. * 31b 2–4), there are two ‘at the end’ (ἐπὶ τῷ ἀκρῷ, or ἐπὶ τοῖς ἀκροῖς), i.e. two ‘end-elements’, viz. Fire at the top and Earth at the bottom: and two in the middle, viz. Air and Water. Hence we have to prove that there can be no ἀρχῆ either ‘at the ends’ or ‘in the middle’.
32\textsuperscript{b} 7-9. \textit{ἐπὶ \textmu\epsilon\nu ... πάντα}. If there is an \(\dot{\alpha\rho\chi\nu\dot{i}}\) at one of the ends of the series, all the ‘elements’ (\textsuperscript{b} 8 and \textsuperscript{b} 9 πάντα) will be Fire or Earth. This is tantamount to saying that they all arise by alteration of Fire or Earth—a theory which has already been refuted (cf. 32\textsuperscript{a} 6-20).

It is not clear why Aristotle confines this argument to the ‘end-elements’. It would apply equally—if it applies at all—whatever ‘element’ is selected as the \(\dot{\alpha\rho\chi\nu\dot{i}}\) of the rest.

The argument remains equally obscure if we interpret πάντα (\textsuperscript{b} 8 and \textsuperscript{b} 9) as ‘all things’, with Philoponos.

32\textsuperscript{b} 10-12. \textit{δι... \textalpha\lambda\nu\gamma\nu\lambda\alpha}. We are to prove that no ‘middle-element’ can be an \(\dot{\alpha\rho\chi\nu\dot{i}}\) either. (δι ὅ δι’ ὀιδὲ μέσον, sc. \(\dot{\alpha\rho\chi\nu\dot{i}}\ τις ἐσταὶ αὐτῶν.) It is not true, as some thinkers suppose, that Air is transformed ‘upwards’ into Fire and ‘downwards’ into Water, and Water ‘upwards’ into Air and ‘downwards’ into Earth, whilst Earth and Fire are not further transformed into one another. In other words, we cannot maintain that the process of transformation starts from the ‘middle-elements’ and, proceeding upwards and downwards in a straight line, is terminated by the top and bottom ‘elements’ respectively.

We do not know to what thinkers Aristotle is referring. They denied the transformation of Fire into Earth and vice versa: i.e. they denied the \textit{cyclical} transformation of the ‘elements’. They must also have denied the transformation of Fire into Air, and of Earth into Water: otherwise (a) they could not have regarded the ‘middle-elements’ as \(\dot{\alpha\rho\chi\nu\dot{i}}\), and (b) they would have admitted an indirect transformation of Fire and Earth into one another.

I have marked a lacuna after \(\textalpha\lambda\nu\gamma\nu\lambda\alpha\) in \textsuperscript{b} 12. The sense requires \(\delta\epsilon\lambda\nu\nu\) or ἐκ τῶν ὁδὸν \(\delta\epsilon\lambda\nu\nu\) which can hardly be borrowed in thought from \textsuperscript{b} 7.

32\textsuperscript{b} 12-14. \textit{δεὶ ... ἐσονται}. Aristotle’s own theory is that the transformation of the ‘elements’ is cyclical. He has therefore to prove (a) that none of the ‘elements’ can be the \(\dot{\alpha\rho\chi\nu\dot{i}}\) of the rest, (b) that transformation cannot \textit{stop} at any of them, and (c) that transformation cannot start from any one and proceed \textit{ad infinitum} in a straight line upwards or downwards.

He sets out to prove the last thesis (c) first: cf. 32\textsuperscript{b} 30-32. But the actual proof is postponed to a refutation of the theory that the ‘middle-elements’ are \(\dot{\alpha\rho\chi\nu\dot{i}}\) and that transformation, starting from them, stops at the extremes. Aristotle argues (32\textsuperscript{b} 14-30) that the transformations which this theory accepts
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(e.g. from Air to Fire and Water) imply the possibility of the reverse transformations also, e.g. of Fire into Water (cf. b.24–25), and thus ultimately of all the 'elements' into one another.

32b 14–15. γῆ . . . Π. We need not attempt to reconstruct Aristotle's diagram, traces of which seem to be preserved in J. The argument is clear without the letters.

32b 15–16. εἰ . . . Α. Π. The words καὶ Υ (b.16) are not strictly relevant; for the consequence (viz. that there must be a contrariety belonging to ἀρετή and πικρία) follows from the transformation of Air into Fire alone. Air's transformation into Water (Υ) is dealt with below (b.17–19).

32b 20–24. οὐκόν . . . ἕρμητας. Air, we have supposed, quæ white changes into Fire quæ black: and Air quæ dry changes into Water quœ moist. Now, in this second transformation, what happens to Air's whiteness? It must either persist or change; and if it changes, it must be converted into its contrary, black. Hence Water, besides being moist, must also be either white or black. It does not matter which alternative we adopt: for Aristotle's conclusions would follow equally, mutatis mutandis, from either. For the sake of argument, he supposes (b.23) that Air's whiteness persists when it is transformed into Water. Water, therefore, will be moist and white. On the same principle (b.23–24) we must suppose that Fire, besides being black, is also dry, Air's dryness persisting when it is transformed into Fire.

32b 24–27. ἐσταὶ . . . λευκόν. We saw first that Fire was black (b.16–17) and Water moist (b.17–19). Next we saw that Water was also white (b.20–23) and Fire also dry (b.23–24). Hence Fire is black–dry, and Water is moist–white. Therefore, since Fire and Water possess contrary qualities, Fire can be transformed into Water.

32b 28–30. καὶ ἐπὶ γε . . . πω. In Aristotle's diagram, A (Air) has been taken as white–dry, Π (Fire) as black–dry, and Υ (Water) as white–moist. Hence it is clear that, in the instances we have taken, Π (Earth) also will contain the remaining two 'complementary factors', viz. the black and the moist: for these have not yet been coupled.'


32b 32–33a 1. εἰ . . . τῷ Ψ. We must bear in mind, as Philo-ponos rightly observes, that Aristotle throughout assumes the transformations to proceed in a straight line. Only on this
assumption is it true that each new transformation implies a new
contrariety, and that the preceding ‘elements’ must possess
counterparts corresponding to all the contrarieties. On
Aristotle’s own theory, the contrariety dry–moist (e.g.) is the basis
of two transformations, viz. of Fire into Air (or vice versa) and of
Water into Earth (or vice versa). But, according to the theory
which Aristotle has in mind in his present criticism, a ‘middle-
element’—e.g. Air—is transformed ‘upwards’ in virtue of one
contrariety into Fire and in virtue of another contrariety ‘down-
wards’ into Water. Fire, again, is supposed to be transformed
‘upwards’ into a totally new ‘element’ (33 els . . . ἀνακάμψις, i.e. the new ‘element’ cannot be reached either by cyclical trans-
formation or by reversion in a straight line): the basis of this
transformation, therefore, must be a totally new contrariety. And
since we cannot suppose that Fire suddenly develops the contrary
in question out of nothing, we must assume that this contrary
has been passed on to Fire from Air and from all preceding
‘elements’ (if there are any) in the straight line of ‘upward’
transformation.

33a 1-7. τὸ δὴ Κ . . . ὑπάρξουσιν. If II (Fire) is transformed
into a new ‘element’, Ψ, this implies a new contrariety, e.g. ΚΦ,
of which one contrary (e.g. Κ) belongs to Fire and the other (Φ)
to Ψ. Since Κ cannot have emerged from nowhere (see preceding
note), it must have been passed on to Fire from the ‘element’
out of which Fire itself came-to-be, i.e. Κ must belong to Air and
to the preceding members of the series (if any there be). The
same argument applies, if Ψ be further transformed into another
new ‘element’: hence if the transformation continues ad infinitum,
there must be an infinity of contrarieties (i.e. an infinity of
contrary qualities) in each single ‘element’.

In 33a 1-3 (τὸ δὴ Κ . . . ἀλληλα) Aristotle begins a different
argument, which is dropped because it assumes that all the
‘elements’ (Earth, Water, Air, Fire) are transformed into one
another. This assumption admits cyclical transformation and
is therefore incompatible with the theory which he is criticizing.
Hence, though Aristotle has in fact proved that his opponents are
bound to admit cyclical transformation (*32b 12-14, 32b 15-30),
he is ready, for the sake of argument, to suppose (33a 3) that the
transformation of all the ‘elements’ into one another has not yet
been proved.

33a 9-10. τοσαυτάς . . . πλείους. ‘It will have to pass through
such a vast number of contrarieties—and indeed even more than any determinate number." So Philoponos interprets, apparently rightly.

33\textsuperscript{a} 10–13. ὅστ' ... ἐναντιώτητες. (i) Some ‘elements’ will never come-to-be at all, viz. those which are separated from the ‘element’, with which the process of transformation starts, by an infinite number of intervening ‘elements’.

(ii) Even the transformation of e.g. Air into its next neighbour, Fire, will be impossible. For (cf. 33\textsuperscript{a} 3–7) Air and Fire will each contain an infinite number of qualities, corresponding to the infinite number of contrarieties demanded by the infinitely-extended line of transformations. But it is impossible for a thing \textit{with an infinite number of qualities} to come-to-be or (we might add) to pass-away. Hence Air will never pass-away and Fire will never come-to-be.

33\textsuperscript{a} 13–15. γίνεται ... ἔσται. Aristotle’s argument here appears to be unsound. He has proved (cf. *33\textsuperscript{a} 1–7) that each new ‘element’ \textit{above} Fire in the ‘upward’ line of transformation implies a new contrariety: and from this it follows that a contrary from each new contrariety must belong to all the ‘elements’ \textit{below} Fire. Similarly, if we suppose the line of transformation to be reversed, each new ‘element’ \textit{below} Fire in the ‘downward’ transformation implies a new contrariety, a contrary from which must belong to all the ‘elements’ \textit{above} Fire.

But it does not follow from this that the elements above and below Fire are identical, since they will not all have the same contraries (i.e. qualities). If e.g. Fire \textit{qua} K changes into \textit{Ψ} \textit{qua} Φ, all the ‘elements’ \textit{below} Fire will possess the contrary K: whilst \textit{Ψ}, and all the ‘elements’ \textit{above} it, will possess the contrary Φ.

What Aristotle says is that ‘all the contrarieties of the “elements” above Fire must belong to the “elements” below Fire, and \textit{vice versa}’: but we cannot infer from this that the ‘elements’ are identical. The contrarieties hot–cold and dry–moist belong to Earth, Air, Fire, and Water on Aristotle’s own theory: but these ‘elements’ are not on that account ‘all of them one’.

B. 6–7

33\textsuperscript{a} 16—34\textsuperscript{b} 30. Θαυμάσει ... τάλλα. On the connexion of these two chapters with B. 1–4, see *28\textsuperscript{b} 26—35\textsuperscript{a} 23. They may
be summarized as follows. (i) If the 'elements' are incapable of transformation—i.e. ultimately-distinct kinds of matter, 'eternal' (as e.g. Empedokles maintained)—they cannot be quantitatively compared. Hence Empedokles had no right to say they were all equal (33a16–34). (ii) There follows a general attack on the theory of Empedokles. (a) He cannot recognize growth, but only increase by addition or apposition (33a35–b3). (b) He cannot explain the γένεσις and the perpetuation of the various types of compound natural bodies. He recognizes, indeed, that if the consilience of the 'elements' is to form a definite compound (e.g. bone), it cannot be 'fortuitous', but must be governed by a certain 'proportion'. But he does not explain what causes this 'proportional consilience' (33b3–18). (c) Nor does he see that the 'excellence' and the 'good' of each compound natural body are not due to the 'mingling', but to the cause determining the proportion in which the 'elements' are 'mingled' (33b19–20). (d) His account of motion is abstract, inadequate, and inconsistent (33b22–34a9). (e) His theory leaves psychical phenomena and psychical changes inexplicable (34a9–15).

(iii) The formation of compounds (the ὑμοιομερή) out of the 'elements' presents a serious difficulty not only for theories like that of Empedokles, but even for theories which (like Aristotle's) admit transformation of the 'elements' and recognize the genuine emergence of a new product out of two or more constituents.

For (a) how are we to distinguish the coming-to-be of a compound out of two or more 'elements' from the coming-to-be of one 'element' out of another? And (b) what is combination? How can \( x \) and \( y \) combine to form a \( z \), which is neither \( x \) nor \( y \), nor the indeterminate substratum of both, but a compound in which \( x \) and \( y \) are modified and fused? (34a15–b7).

In solving these problems, Aristotle explains how he conceives the action—passion of contrary on contrary in the process of combination which issues in the formation of a ὑμοιομερῆ (34b8–30).

33a19–20. ταύτα . . . πάντα: Empedokles, fr. 17, l. 27 (Diels, p. 179). In the same fragment Strife is said to be ἀναλαμβάνω ἀπάντη, and Love ἵση μὴκός τε πλάτος τε (ll. 19, 20).

33a20–23. εἰ . . . αὐτῷ. If the 'elements' are comparable in amount or in bulk (a 20 κατὰ τὸ ποσὸν, sc. συμβλητά), there must be something common to them—an identical something which, e.g. as Air, has ten times the bulk that it has as Water. But if so,
the way is at once open for the transformation of Air into Water and vice versa.

33\textsuperscript{a} 23–27. \( \epsilon i \ \delta \epsilon \ldots \delta \varphi \alpha t a i \ \tau i \). Empedokles' 'elements', since they are incapable of transformation (cf. * 15\textsuperscript{a} 4–8), are not 'quantitatively comparable' in the sense e.g. that ten \( \kappa o t \acute{\iota} \lambda \alpha i \) of Air result from one \( \kappa o t \acute{\iota} \lambda \eta \) of Water. But can we compare them quantitatively in respect to their powers-of-action? Can we measure e.g. the cooling power of Air and Water, and equate one \( \kappa o t \acute{\iota} \lambda \eta \) of the latter with ten of the former in this respect? Aristotle answers this question in the negative; see the next note. For the meaning of \( \delta \varphi \alpha t a i \) (and \( \delta \varnu \acute{\alpha} \mu e i s \), \( \text{a} 28, 32 \)), cf. * 27\textsuperscript{b} 22–31.

33\textsuperscript{a} 27–34. \( \epsilon i \eta \ldots \lambda \acute{\o} \acute{\gamma} o v \). When \( A: B: C: D \), \( A \) and \( C \), even if they belong to entirely different 'kinds', are 'one' or 'the same' \( k a t \) \( \acute{\alpha} \nu \alpha l o g i a v \) (or \( \acute{\alpha} \nu \alpha l o g i a \)). Thus, if the spring is to the river as the heart is to the animal, the spring is \( \acute{\alpha} \nu \alpha l o g i a \) 'one' with the heart. They are comparable in so far as they fulfil corresponding functions in their respective spheres (cf. Alexander's commentary on \textit{Metaph.} 1016\textsuperscript{b} 34–35). So (\textit{Eth. Nic.} 1096\textsuperscript{b} 28–29) if vision is in the body what intelligence is in the soul, vision and intelligence are \( \acute{\alpha} \nu \alpha l o g i a \) 'the same' and may both be called 'good' in 'the same', i.e. in a corresponding, sense.

Now suppose that the heat of one 'element' corresponds to the whiteness of another, so that 'the first is hot as the second is white', the two \( \delta \varnu \acute{\alpha} \mu e i s \) (heat and whiteness) will be comparable \( k a t \) \( \acute{\alpha} \nu \alpha l o g i a v \), though they, and the 'elements', may remain irreducibly different. For the comparison is not quantitative and does not imply the presence of anything identical (any common unit of measurement) in the comparables. Empedokles, therefore, might consistently have said that the 'elements' were comparable as \textit{qualia} in respect to their 'powers'. This would mean that the qualities of the 'elements' corresponded to one another; e.g., that \( a s \) it is the function of Fire to burn, \( s o \) it is the function of Water to cool. And Empedokles would be entitled to say that the 'elements' were all \( \delta \mu o i a , \) 'analogous' or 'similar'. The four terms in such an \( \acute{\alpha} \nu \alpha l o g i a \) are treated simply as \textit{qualia}, not as \textit{quanta}: and the identity of the \( \lambda \acute{\o} \acute{\gamma} o s \) between each pair signifies therefore mere 'similarity', not 'equality' (cf. \( a \ 29–30 \) \( \tau \delta \delta \ldots \iota o v \)).

But Empedokles said that the 'elements' were all \textit{equal}. Now it is only when the terms in an \( \acute{\alpha} \nu \alpha l o g i a \) are \textit{quanta} that the
correspondence' signifies equality. If \(2:4:8:16\), then we may speak of the identity of the \(\lambda \gamma\) as an 'equality' (for \(\frac{2}{4} = \frac{8}{16}\)) or again of 2 and 8 being 'equally' related to their respective partners, for the relation is in each case a half. Empedokles, therefore, must be contending that the 'elements', although irreducibly different, are quantitatively comparable in respect to their powers-of-action (see preceding note: and cf. Meteor. 340a 13–17, where the unnamed thinker is rightly identified with Empedokles by Alexander).

But quantitative comparison in this sense (i.e. 'equating') is incompatible with the 'unchangeableness' of the 'elements'. For we cannot thus compare disparate \(\delta\nu\nu\alpha\mu\varepsilon\iota\)s, or irreducibly different qualities (e.g. hot with white, or hot with cold). The terms in the \(\dot{\alpha}v\alpha\lambda\omega\gamma\iota\alpha\), if they are to be thus compared, must be different amounts of the same. We shall be dealing simply with one \(\kappa\omicron\omicron\upsilon\lambda\eta\) and ten \(\kappa\omicron\omicron\iota\lambda\alpha\iota\) of cooling substance (cf. 33a 25), or with so-much and many-times-as-much hot substance (cf. 33a 32–33). The qualitative differences of Air and Water, or of Fire and 'Air, cannot come into the \(\dot{\alpha}v\alpha\lambda\omega\gamma\iota\alpha\) at all. What we really have is: — 'one pint exhibits \(x\) degrees of heat or cold: how many degrees will ten pints exhibit?' And the only possible answer is 'ten times \(x\)': i.e. the \(\lambda\gamma\) will not be equal, but greater (33a 34 \(\tau\omicron\omega\iota\omicron\upsilon\), sc. \(\pi\lambda\epsilon\iota\omega\ \omega\) or \(\mu\epsilon\iota\zeta\omega\).

33a 30–34. \(\dot{\alpha}t\upsilon\omicron\) ... \(\lambda\gamma\). 'Thus it is manifestly absurd that the simple bodies, though not transformable, are comparable not merely as "corresponding", but by a measure of their powers; i.e. that so-much Fire is comparable with many-times-that-amount of Air, as being "equally" or "similarly" hot. For the same thing, if it be greater in amount, will, since it belongs to the same kind as the thing of less amount with which it is being compared, have its \(\textit{ratio} \) correspondingly increased.'

33a 32–33. \(\iota\sigma\nu\) ... \(\delta\omicron\iota\iota\omicron\iota\sigma\). I have followed the reading of \(EJ\) (cf. \(\Phi\)): but I suspect that Aristotle wrote \(\iota\sigma\nu\ \theta\epsilon\rho\mu\omicron\ \hat{\eta}\ \delta\omicron\iota\iota\omicron\iota\sigma\ \iota\sigma\nu\ \delta\omicron\iota\iota\omicron\iota\sigma\).

33a 35–b 3. \(\delta\lambda\lambda\) ... \(\alpha\delta\xi\alpha\nu\omicron\omicron\varepsilon\nu\). On Aristotle’s conception of ‘growth’, see A. 5 and *20b 34–21a 29. Aristotle himself applies the term metaphorically to the spreading of fire, cf. *22a 15. The quotation from Empedokles is given as fr. 37 by Diels (p. 186: cf. p. 686) who quotes Lucretius, ii. 111.4 ff., in support of \(\delta\epsilon\mu\alpha\) (HJ) against \(\gamma\nu\omicron\) (EFL).

In Empedokles \(a\iota\theta\omicron\nu\) means ‘Air’, not ‘Fire’ (cf. Burnet,
pp. 228–229), as Aristotle is well aware: cf. * 34\(^a\) 3. That ‘Fire increases by Fire’, therefore, must be derived from a lost verse of Empedokles, unless it is merely an inference of Aristotle’s own.

The first \(a\varepsilon\iota\) (33\(^b\) 1) is probably intransitive, although the second is transitive. Aristotle would hardly have said ‘Empedokles increases Fire by Fire’.

33\(^b\) 4–9. τὰ ... ἀλαῖαν; The γένεσις of things which come-to-be by a natural process is uniform: and the uniformity is either absolute or highly regular. Breaches of the uniformity, when they occur, are not attributed to φύσις as their cause, but to chance. The problem therefore, which Empedokles ought to solve, is:—‘What determines this uniformity in the γένεσις of natural products?’

In \(b\) 5 ὁδεῖ (which EFL omit) is necessary: cf. the corresponding formula (Phys. 196\(^b\) 10–11) ὄρῳμεν τὰ μὲν ἄεὶ ὄσαντως γινόμενα τὰ δ’ ὡς ἐπὶ τολὺ.

The meaning of τὸ αὐτόματον and τῖτχη, and the distinction between them, are discussed in the Physics (195\(^b\) 31–197\(^b\) 37). The distinction is irrelevant here, and Aristotle mentions both only in order to cover all possible cases. Thus at 34\(^a\) 2 he employs the term τῖτχη, though (according to the distinction as drawn in the Physics) he ought to have spoken of τὸ αὐτόματον.

With 33\(^b\) 3–18, and again with 34\(^a\) 9–15, the reader should compare de Anima 408\(^a\) 18–23 and 409\(^b\) 23—410\(^a\) 22.

33\(^b\) 9–11. \(\eta\) ... τυί. The distinction between fortuitous and proportionally determinate ‘consilience of the elements’, and the explanation of the formation of bone by a mingling of the ‘elements’ in a certain proportion, are ascribed to Empedokles elsewhere; cf. Metaph. 993\(^a\) 17, and de Anima 410\(^a\) 1–6 where Aristotle quotes the first three lines of fr. 96 (Diels, p. 199).

We must therefore refer to Empedokles the suggestion that bone results \(\epsilon\lambdaν \omega\deltaι \sigmaυντεθη\) (\(b\) 9): and we must regard καθ’ \(\alpha\varepsilon\kappaε\iotaνοσ \phiη\σ\nu\) as covering the whole sentence \(ο\upsilon \ldots τυί\) (\(b\) 9–11).

33\(^b\) 11. τούτου, sc. τοῦ λόγῳ τυί \(\sigmaυνελθόντων \gammaίγνεσθαι\). The singular is required by the sense of the passage.

33\(^b\) 12–13. ἀλλὰ \ldots αὐτην. According to Empedokles, Love ‘associates’ and thus causes the union of all things in the ‘Sphere’; whilst Strife ‘dissociates’ and thus breaks up the ‘Sphere’. But Aristotle (cf. Metaph. 985\(^a\) 21–29, 1000\(^a\) 24—\(b\) 12, &c.) points out that Love, in bringing all things together, destroys
the individuality of each; and that Strife, in ‘dissociating’, brings into distinctive being the various constituents of the universe (cf. * 15a 8–11: Burnet, pp. 232–233).

The same criticism is clearly in Aristotle's mind at 33b 20–22 (καίτω ... ταῦτα): perhaps, therefore, we ought to read that sentence immediately after αἰτίων (b 13).

33b 13. τοῦτο, sc. the cause of the ‘proportional consilience’ to which Empedokles attributes the γένεσις e.g. of bone.


33b 15–16. τὸχν ... ἐπικεφ. According to Empedokles, fr. 8 (cf. the paraphrase in MXG. 957a 36–b 16), what is supposed to be coming-to-be or death is really ‘only a mingling and a divorce of what has been mingled: but it is called coming-to-be amongst men’. Aristotle is here parodying the last line of this fragment, φύσις δ' ἐπὶ τοῖς ὄνομαξεται ἀνθρώπωσιν. He reminds us of the original by the mere sound of the phrase (ἐπὶ τοῖς ὄνομαξεται), of which he has entirely altered the construction and the meaning.

‘And chance, not proportion, is the name given to these occurrences’, viz. to μίξεις and διάλλαξις μυγέντων.

For the idiom, ὄνομαξεσθαι ἐπὶ τιν, see Stallbaum’s note on Plato, Rpf. 470 b and the passages there quoted.

33b 15. ἐπὶ τοῖς ὄνομαξεται. I have restored τοῖς from J’s τὸ ἴσων (cf. Γ ‘ad equale nominatur’), which arose from the reduplication of the first syllable of ὄνομαξεται. Instead of τοῖς, FHL have τοῦτοις and DbΕ τοῦτον. But in Ε ὦν is corrected out of an earlier reading and ὦς is written above it.

33b 16–20. τῶν ... ἐπικεφ. Cf. 35b 6–7, where Aristotle says that the final cause of the things that come-to-be is ἡ μορφὴ καὶ τὸ ἔδος: τοῦτο δ' ἐστὶν ὁ λόγος ὁ τῆς ἐκάστου οὐσίας.

‘The formula expressing the essential nature’ of a δημοιομερές (like bone) is the λόγος τῆς μίξεως of its constituents (cf. * 14b 19), i.e. the scheme of proportions constituting the plan of the combination. This ‘combining-formula’ (a) adequately expresses the ‘form’ (and is therefore the scientific definition) of the δημοιομερές; and (b) states the normal or perfect development of the δημοιομερές, its φύσις in the sense of τὸ τέλος τῆς γενέσεως (cf. e.g. Metaph. 1015a 10–11), i.e. its ‘good’.

The basis of the doctrine is Plato’s Philebus, e.g. 25d–26d, 64c–65a.

33b 17. τὸ οὕτως ἔχειν, sc. being a compound such that the
consilience of its constituents has been governed by a certain proportion and not by chance.

33b 18. *οὖθεν... λέγει* : an allusion to the title of Empedokles’ poem. His work Περὶ φύσεως tells us nothing about Nature.

33b 19–20. ὅ ... ἐπαινεῖ. Cf. *Metaph.* 984b 32—985a 10, where Aristotle says that ‘Empedokles, though he expressed himself imperfectly, really regarded Love as the cause of all the goods in the universe, and Strife as the cause of all the evils’.

Since Love brings things together, the *μίξις*, to which alone Empedokles ascribed the formation of the ‘perfect’ or ‘normal’ compound, is no doubt the work of Love.


What then is the cause of the original separate being of the ‘elements’, before Love had ‘associated’ them to form the Sphere? They must, Aristotle argues (*de Caelo* 301a 15–20), have been ‘separated out’ of some prior unity, since Love formed the Cosmos ἐκ διακριμένων τῶν στοιχείων : yet this original διάκρισις cannot be the work of Strife, for Strife can ‘dissociate’ only the already-formed Sphere.

33b 22–26. ἕτ... τωσ. Aristotle proceeds (33b 22—34a 9) to criticize Empedokles’ account of motion. He finds fault with it firstly because it is vague, devoid of scientific precision (*b* 22 ἀπλῶς, i. q. ἀδιοριστῶς: cf. Bonitz, *Ind.* 76b 30 ff., 77b 5 ff.).

Thus, e. g., Empedokles (cf. fr. 20; Diels, p. 180) attributes the formation of organisms (plants, fish, sea-birds, beasts, man) to Love, and their dissolution to Strife. The separate limbs or organic parts come together because Love sets them moving: and the organism is disintegrated because Strife divides it.

But this is no explanation, unless indeed Empedokles means, by ‘Love’ and ‘Strife’, forces whose very nature it is to initiate respectively movements of integration and disintegration. And if that was his meaning, he ought to have adopted the recognized scientific procedure. For the man of science explicitly assumes
the ‘that’ and the ‘what’ (the ‘being’ and the ‘nature’) of the substances which he proves to contain certain essential properties: and he explicitly assumes the ‘what’ (i.e. the meaning) of the properties whose inherence he demonstrates. In other words, the man of science either defines or posits or demonstrates the constituents of his subject-matter. (For the doctrine of the Posterior Analytics, which Aristotle is here assuming, and for the functions assigned to ὐφισμός and ὑπόθεσις in the logical structure of a ‘science’, see Introd. §§ 7–9.) If, therefore, Empedokles’ account of motion had been precise, he would not have been content to say that ‘Love and Strife set things moving’ (b 23 διότι, i. q. οὕτως: cf. 37a 15; Bonitz, Ind. 200b 39 ff.). He would either (i) have stated explicitly ‘I assume that there is a force—viz. Love—whose nature it is to initiate such-and-such a movement, and another force—viz. Strife—whose nature it is to initiate such-and-such a movement’; or (ii) he would have demonstrated that ‘to bring together’ and ‘to force asunder’ are ‘properties’ which must characterize Love and Strife respectively.

33b 25–26. ἡ ἀκριβῶς . . . πως. These alternatives qualify ἀποδείκται. Perhaps we have no right to demand an exact demonstration, like that of the mathematician, in the sphere of φυσικῆ. But Empedokles ought to have attempted some kind of proof:—an inference from consequent to ground, or (e.g.) a dialectical proof.

Bekker’s conjecture (b 26 ἀμὸς for ἄλλως) is tempting at first sight: but it does not really solve the difficulty. For presumably we must identify (i) the exact demonstration with ἀποδείκτης τοῦ διότι, and (ii) the laxer demonstration with ἀποδείκτης τοῦ ὅτι (cf. Post. Anal. 78a 22 ff.). Besides these two ways of demonstrating no other way is left: for the probable reasoning of the dialectician, to which Aristotle appears to be referring, is not ἀποδείκτης at all. Hence Aristotle’s language remains inaccurate, whether we read ἄλλως γέ πως (‘in some other way’) or ἀμὸς γέ πως (‘in some way or other’).

33b 26–33. ἔτσι . . . μᾶλλον. I (b 26–30). There is natural, as opposed to compulsory or unnatural, movement. For (a) the ‘simple’ bodies appear to move in two different ways, viz. ‘by compulsion’ and ‘naturally’: (b) these two kinds of movement are contrary to one another, and (c) ‘compulsory’ movement actually occurs (i.e. according to Empedokles himself, as Aristotle infers from his statements: cf. Bonitz). Hence its contrary, ‘natural’ movement, must also occur in fact.
II (b 30-33). Is Love the cause of the natural movement (b 30 ταύτην, sc. τῆν κατὰ φύσιν) of the ‘simple’ bodies? From what Empedokles says (when e.g. he ascribes the formation of organisms to Love, fr. 20) we should expect an affirmative answer to this question. Yet in fact, it would seem, the answer must be ‘No’ (b 30 ἡ oὔ;). For Love brings all the ‘elements’ together, ‘associating’ them to form the Sphere: whilst Strife ‘dissociates’ the Sphere, moving all the ‘elements’ apart. Now the natural movement of Earth (e.g.) moves it downwards, i.e. away from the other ‘elements’, and thus resembles a movement of dissociation (b 31 τῆν γῆν κάτω, sc. κυνὲί ἡ κατὰ φύσιν κίνησις). Hence Strife—rather than Love—seems to cause the natural movements: and Love—rather than Strife—is contrary to nature. Empedokles ought to have given to Love the epithets he applies to Strife—e.g. ‘destructive’ (fr. 17, l. 19 ; Diels, p. 178), ‘evil’ (fr. 20, l. 4 ; Diels, p. 180).

Philoponos, to judge from his paraphrase, seems to have read b 26-33 very differently: but it is not possible to infer with certainty what he had before him.

33b 27. τὰ σώματα, i. q. τὰ ἀπλὰ σώματα: so also b 34 (αἱ ἐκ τῶν σωμάτων), 36a 1, 37a 8 and 10.

33b 33—34a 5. ἀπλῶς ... βίας. Since, according to Empedokles, Love and Strife are the sole causes of motion, the ‘elements’ have absolutely no inherent motion or rest (b 33 ἀπλῶς goes with οὐδεμία ἐστίν). Yet this is not only a paradox, but incompatible with his own statements. For though Strife initiated the disintegration of the Sphere, the ‘elements’ were borne asunder by movements of their own. Thus Empedokles himself attributes to Fire a natural tendency to move upwards; and to Air a downward movement, which he contrasts with its occasional fortuitous motion upwards and therefore clearly regards as natural.

In b 34 I follow EF and read κυνὲί, ‘unless Love or Strife are actually setting the simple bodies in motion’.

In b 35 Aristotle adds ουδὲ μονὴ: for, according to his own theory, the ‘rest’ of each ‘element’ at its proper place is the effect of that inherent tendency to movement which constitutes its ‘nature’ (cf. e.g. Introd. § 10).

34a 3. οὔτω ... ἄλλως. Empedokles, fr. 53 (Diels, p. 189). The same verse is quoted in the Physics (196a 22-23), where Aristotle substitutes δὴ for αἰθήρ in his explanatory paraphrase: cf. *33a 35—b 3.
34a 4–5. ἐνευκέναι... ἐρίας. Empedokles, fr. 51 and 54 (Diels, p. 189). The present passage is the only source of fr. 54.

34a 5–9. ἄμα... ἀρχή. According to Empedokles, the Order of the World is the same now, in the reign of Strife, as it was formerly in the reign of Love (cf. *15a 14). Hence neither Strife nor Love can be the force which first set the ‘elements’ moving and thus initiated the persistent Order. Strife and Love are reduced to secondary causes—causes of this and that particular kind of motion, which presuppose an originate source of motion in general. But Empedokles does not tell us what this unknown first cause of motion is.

In a 9 I have ventured to read εἰ γ’ ἐστὶν ἐκεῖνο ἀρχή, ‘if at least we assume that “first mover” to be an originate source of motion in general’.

34a 15. ἔτερα... θεωρίας. Cf. de Anima, Α. 4 and 5, especially 408a 18–23, 409b 23 ff., where Empedokles’ failure to account for the soul is exposed very forcibly and in more detail.

34a 15–b 7. περὶ δὲ... Ἀλη. Aristotle is about to discuss the formation of the δομομερὴ out of the simple bodies. As a preliminary, he divides all theories into (i) those which admit, and (ii) those which deny, that the ‘elements’ are transformed into one another. The theories of the Pythagoreans (cf. *34b 4) and of Aristotle himself belong to the first group: whilst the theory of Empedokles is typical of the second.

(i) Theories which admit transformation of the ‘elements’ into one another necessarily also regard the ‘elements’ as differentiations of a common substratum; and vice versa (34a 16–18). And (ii) the denial of the reciprocal transformation of the ‘elements’ is equivalent to the denial that any ‘element’ can come-to-be out of any ‘element’ taken singly, except in the sense in which bricks can come-to-be out of a wall. Fire, e.g., taken singly, is not transformed into any other ‘element’: all that Empedokles could admit, is that some other ‘element’ might be extracted out of Fire by a mechanical analysis (34a 18–20: the words ὁς... πλίνθους are an explanatory amplification of ἐν τοιούτῳ ἔκ ἄλλῃμιπ γένεσιν). Such a theory will find it difficult to explain how anything—e.g. any ὁμομερὲς—can come-to-be out of a plurality of ‘elements’ (34a 20–21: ἔκ ἐκλείπων is contrasted with ὡς ἔκ ἐκάλατον). The only explanation available for Empedokles is that flesh (e.g.) comes-to-be by a mechanical synthesis; i.e. that Earth, Air, Fire, and Water ‘compose’ the
\( \text{ὅμοιομερῆ} \) much as bricks and stones 'compose' a wall. But this is clearly inadequate (34\(^a\) 26 – b 2).

Even for the theories of the first group there is here a serious difficulty. Water comes-to-be out of Fire, and Fire out of Water, because Fire and Water are differentiations of a common substratum. But how are we to account for the \( \gammaένευοις \) of the \( \text{ὅμοιομερῆ} \) — e.g. of flesh and marrow — out of Earth, Air, Fire, and Water? (34\(^a\) 21–26). How can there be a resultant which is neither one of its constituents, nor a mosaic of them all, nor yet the common substratum of which they are the differentiations? (34\(^b\) 2–7).

34\(^a\) 23–24. \( \dot{e} \kappa \ldots \pi\partial\rho \). 'Water' and 'Fire' are selected merely for illustration (cf. also 34\(^a\) 32). According to Aristotle's own doctrine all four 'elements' are combined in every \( \text{ὅμοιομερῆς} \): cf. e.g. B. 8, *14\(^a\) 19, *27\(^a\) 33 – b 6.

34\(^a\) 26 – b 2. \( \epsilon\kappa\epsilonι\nuις \ldots \mu\epsilonρούς \): cf. *27\(^b\) 33 – 28\(^a\) 17. The conception of a compound, which is \( \text{ὁμοιομερῆς} \), is that of a whole formed by chemical combination and capable of chemical analysis. But theories like that of Empedokles can only offer us the conception of an aggregate, or mosaic, formed by mechanical synthesis and capable of mechanical analysis. The so-called \( \mu\gamma\muα \) or 'Sphere' of Empedokles is in fact a mere shuffle of the 'elements', in which they persist unchanged in quality, though divided into minute particles: and the same will apply to every compound, and therefore to every \( \text{ὁμοιομερῆς} \), within the 'Sphere'. But this is not only contrary to the true conception of the \( \text{ὁμοιομερῆ} \): it collides with the facts. Flesh, e.g., can in fact yield Fire and Water (and also, as Aristotle might have added, Earth and Air) from any and every part of itself. Any part of flesh can indifferently be converted into flame, into liquid, into the dry dust of putrefaction, and into 'air' or gas (cf. e.g. *29\(^b\) 24–26). But this would be impossible if flesh were a mere shuffle or mosaic. It would, indeed, be possible to extract e.g. Fire from one part of flesh and Water from another, as one can extract a stone here and a brick there from a wall: but we could not extract both Fire and Water indifferently from every part.

34\(^a\) 32–34. \( \dot{\omega}περ \ldots \gammaενέσθαι \). The purpose of this illustration is to explain the precise meaning of the chemical analysis which every \( \text{ὁμοιομερῆς} \) can undergo.

34\(^a\) 34–35. \( \tauούτο \ldots \dot{\alpha}μφω \). I insert \( \tauό \) in a 35 before \( \dot{e}\kappa \tau\dot{\eta}\epsilon \ldots \)
\( \alpha \mu \phi \omega \), and take the clause as expository of \( \tau \omega \tau \). Cf. Philoponos (p. 274) κατὰ τὸν αὐτὸν τρόπον, \( \phi \tau \sigma \iota \), τοῦτο δὲ τὸ \( \varepsilon \) ὀτονοῦν μορίου \( \alpha \mu \phi \omega \) γενέσθαι καὶ τὰς σαρκὸς συμβαίνει.

34b 4. οἶον ... γῆς. Aristotle selects ‘the cold and hot, or Fire and Earth’ as examples and is probably thinking of ‘Parmenides’, i.e. the Pythagoreans (cf. *30b 13–19): but the criticism applies, as he is well aware, to his own theory too.

34b 8–30. \( \alpha \rho \)’... τάλα. Aristotle now solves the problem and explains how the γένεσις of the ὀμοιομερή out of the ‘elements’ differs from the transformation of one ‘element’ into another. In the main this passage is a mere restatement of the doctrine already enunciated in A. io (cf. *27b 22–31, *28a 29–31, *29b 24–26), but two new features are briefly indicated. Thus, (i) \( b 14–16 \) give us a hint of the sense in which the ‘elements’, qua constituting a ὀμοιομερὲς, are συμβλητά: and (ii) \( b 27–28 \) indicate how Aristotle would have explained the emergence of different ὀμοιομερή from the combination of the same constituents.

Aristotle bases his solution (i) on the distinction between (a) the absolutely or ‘completely’ and (b) the relatively or ‘more or less’ hot, cold, dry, moist (\( b 8–16 \)): and (ii) on the reciprocal action-passage of contraries (\( b 20–24 \).

34b 8–16. \( \alpha \rho \)’... τοιοῦτον; (a) The ‘completely-hot’ is not in any sense actually cold: but it is δυνάμει cold, because its substratum is the substratum also of the cold. Hence that which is completely-hot may become cold, and there is always a tendency for the substratum to pass from one extreme to the contrary. (b) The ‘relatively-hot’, on the other hand, is an ‘intermediate’ which is actually both hot and cold, though neither completely-hot nor completely-cold. It is the compromise, resulting from the reciprocal action-passage of a completely-hot and a completely-cold which were present in amounts approximately balanced or equal. It actually possesses the ‘powers of action’ which characterize both the completely-hot and the completely-cold, but in a reduced degree. It is in fact a ‘tempered-hot’, which relatively to the completely-hot is cold and relatively to the completely-cold is hot. Thus it is δυνάμει both hot and cold, in the sense that the heat and cold, which it actually possesses, are present in it in a reduced degree (cf., for this sense of δυνάμει, *27b 22–31).

But the tempered-hot must not be confused with the \( \upsilon \lambda \eta \). The \( \upsilon \lambda \eta \) is neither hot nor cold, but capable of becoming either.
The ‘intermediate’, or the tempered-hot, is both hot and cold. It is a compromise, in which the completely-hot has reduced its contrary to a relatively-cold and been itself reduced to a relatively-hot. In this reciprocal attemperament of the contraries to a compromise participating in the characteristics of both, we already have in principle the process which Aristotle calls μίξις (cf. b 11–12 διὰ ... ἀλλήλων). But the γένεσις of a ὅμοιομερίς out of the elementary qualities requires in addition a temperament of the dry and the moist, which is in part effected by the ‘immanent’ action of the tempered-hot: cf. *29b 24–26.

In 34b 9–10 θάτερον is the subject: ἢ, ἐσται are to be taken in the existential sense.

34b 14–16. κατὰ ... τοιούτων; An ‘intermediate’ can result only if the active-passive extremes were present in approximately equal amounts (cf. b 23, 28a 28–31). But the ‘intermediate’ itself may exhibit its powers-of-heating-and-cooling in different proportions. Thus, e.g., in one ‘intermediate’ the power-of-heating will be twice as great as its power-of-cooling: in another, three times as great: in others, perhaps, one-half or one-third as great.

In other words, there is a sense in which the ‘elements’ ἡμοιομερή constituting the ὅμοιομερή are συμβλητά (cf. the criticism of Empedokles, 33a 16–34). The constituents of the ὅμοιομερή are the ‘simple’ bodies ἡμα hot, cold, dry, and moist: and these elementary qualities form, by reciprocal action—passion, a tempered-hot and a tempered-dry. These ‘intermediates’ differ in the different ὅμοιομερή: but, though different, they are nevertheless συμβλητά, because they are definable in terms of the ratio (positive or negative) of their power-of-heating to their power-of-cooling, or of their power-of-maintaining to their power-of-adapting their outlines.

In b 14 ἢ ψυχρὸν means ‘than cold’: similarly, b 15–16 διπλασίως ... ψυχρὸν means ‘potentially-hot twice as much as it is potentially-cold’. But ἢ τούναντίν (b 14) means ‘or contrariwise’, i.e. ἢ μᾶλλον εἶναι ψυχρὸν ἢ θερμόν. This possibility—viz. that the ‘intermediate’ may exhibit an excess of cooling-power over heating-power—is provided for at b 16 (ἡ κατ' ... τοιούτων). The ratio of the heating-power to the cooling-power in an ‘intermediate’ may be e.g. 2 : 1, or 3 : 1, or again 1 : 2 or 1 : 3.

34b 16–20. ἐσται ... γινόμενον. Aristotle here summarizes his view of the way in which the ὅμοιομερή (b 17 τάλλα, i.e. all bodies
other than the 'simple' bodies, viz. all σώνθετα: but Aristotle is thinking primarily of the ὀμοιομερή) result from the 'elements' or the elementary qualities. At the same time, he emphasizes the distinction between (a) the combination of contraries, which results in the ὀμοιομερή, and (b) the lapsing of both contraries into the undifferentiated matter which is the mere potentiality of both: and thus solves the problem formulated at 34b 2–7.

The contraries, or rather the 'elements' (b 17 ἑ τῶν στοιχείων), constitute the ὀμοιομερή in so far as they have been 'combined'. They are 'combined', when both contraries in each contrariety are preserved at a lower degree in a resultant 'intermediate'. Hence the 'elements', in so far as they are the constituents of a ὀμοιομερή, result from (and contain) all the contraries, these being preserved in them 'potentially'. But we must understand this 'potential being' of the contraries in a special sense (b 18 διναμεῖ πως ὑντιον), viz. in the sense which has been explained (cf. * 27b 22–31, * 34b 8–16). We must not suppose that the 'elements', qua constituting the ὀμοιομερή, are only 'potentially' hot, cold, dry, and moist in the sense in which the matter of these contraries is only 'potentially'—i.e. not actually—any of them.

This interpretation, which alone gives a satisfactory sense to the passage, forces us to take ἐκείνων (b 18) as equivalent to τῶν ἐναντίων, and to understand τὰ στοιχεῖα in the same line as Earth, Air, Fire, and Water, in so far as they are co-operating to form a ὀμοιομερή.

34b 19–20. καὶ... γινόμενον. ὑγίων, sc. in the manner described at b 10–12. ἐκείνως, sc. in the manner which alone was contemplated as possible in the formulation of the problem (b 6–7), viz. so that one contrary is destroyed by the other. For if the completely-hot 'passes-away', the only possible result—unless the completely-cold takes its place—is Ἠγη.

34b 20–30. ἐπεὶ... τὰλλα. Aristotle completes his account by appealing to the 'disjunctively-articulated definition' (διοριστυ: cf. 23a 22, 29a 14) or 'law' of the reciprocal action—passion of contraries, which was formulated in A. 7.

One consequence of this law is that a contrary is converted into its contrary, if the latter is present in an overwhelming or 'dominant' amount (b 23 ἕλαφοι μὴ ἐσάχθῃ, cf. e.g. * 28a 29–31, * 34b 14–16): and it is owing to a conversion of this kind that the reciprocal transformations of the 'elements' take place (cf. * 31a 7—32a 2).
But the formation of the ὥμωομερὴ is another consequence of the same law. For if any two contraries are present in approximately equal amounts, their reciprocal action-passion reduces both in degree equal to a 'mean', and the contraries are thus 'compromised' to form an 'intermediate' (cf. * 29b 24–26, * 34b 8–16).

34b 20–28. ἐπεὶ ὥμωομερὴν. The protasis extends to b 24 ἐναντίων. By that time Aristotle has forgotten that he began the sentence with ἐπεὶ, and the apodosis (καὶ πρῶτον κτλ.) is introduced as an independent sentence.

34b 24–26. καὶ πρῶτον τοιαῦτα. There is no expressed ἔτει, but it is implied. Aristotle is of course referring to two different consequences of the action-passion of contraries (cf. * 34b 20–30), not to two temporally successive stages in the γένεσις of the ὥμωομερῆ.

34b 27–28. ἔνταῦθα ὥμωομερὴν. ἔνταῦθα, sc. at the μέσον. The tempered-hot is neither completely-hot nor completely-cold (cf. * 34b 8–16).

34b 28. τὸ ὥμωομερὴν. The diversity in the 'intermediates' (cf. * 34b 14–16), on which the difference of the various ὥμωομερῆ depends, is due to the fact that 'the mean' is a 'stretch' or a 'scale', not 'punctual' or a 'point'. The contraries can be 'compromised', so as to form an 'intermediate', at various degrees along a scale, or anywhere along a certain stretch.

For this familiar Aristotelian conception of a μέσον which is capable of fluctuation within certain defined limits, cf. Eth. Nic. e. g. 1106a 26–32, 1106b 36—1107a 2, 1173a 23–28.

34b 29. καὶ τὰ τοιαῦτα. Since no contraries except the hot and the cold, and the dry and the moist, contribute to the formation of the ὥμωομερῆ, we must refer τὰ τοιαῦτα to the hot and the cold: 'as well as the contraries we have used as examples'.

B. 8

34b 31—35a 23. Ἀπαντά . . . εἰρηταί. All the ὥμωομερῆ must contain all four 'elements' as their constituents (34b 31—35a 9). This is confirmed by the fact that all living things—even plants—require at least two 'elements' as their food (35a 9–14). A note is added to explain why Fire, alone of the 'simple bodies', is said to 'be fed'; and the part played by Fire in the make-up of the ὥμωομερῆ is indicated (35a 14–21).

34b 31–32. Ἀπαντά . . . ἐστίν. Since there are no μικτὰ (i. q. μιχθέντα, cf. 28a 4) σώματα except in the sublunary sphere, we
must translate: 'All the compound bodies—all of which exist in the region belonging to the central body—are composed of' &c.

The central body (τὸ μέσον) is the earth, and its place (ὁ τοῦ μέσου τόπος) is the centre of the universe. Perhaps, however, the phrase means simply 'in the region about the centre' (i.e. of the universe): cf. 35a 25.

34b 32—34. γῆ...τόπῳ. The compounds must all contain earth because there is more earth than anything else in the region where they exist, that being Earth's 'proper place'.

34b 34—35a 3. ὄσωρ...διαπίπτοι ἄν. What defines the shape of the compound is Fire (cf. *35a 14—21): but Water is essential to every compound, if it is to possess a definite shape, for two reasons. For (i) Water, of all the four 'elements', is most characteristically ἤγρον (cf. *31a 3—6), and τὸ ἤγρον is par excellence readily adaptable in shape: and (ii) Water, qua ἤγρον, gives cohesion to the Earth in the compound. Cf. *29b 24—26, *29b 30—32.

35a 3—9. γῆ...ἐνέσται. Every compound must contain Earth and Water, as we have seen. But Earth (cold—dry) and Water (cold—moist) are contrary respectively to Air (hot—moist) and Fire (hot—dry), so far as one ὁσόλα can be contrary to another (cf. *31a 1—3). Now (cf. e.g. *29b 10—11) the constituents, out of which a compound comes-to-be, must be contrary to one another. Hence the compound, since it contains cold—dry, must also contain the contrasted extremes 'hot—moist' (Air): and since it contains cold—moist, it must also contain the contrasted extremes 'hot—dry' (Fire).

35a 9—14. μαρτυρεῖν...ἀρδεῖν. We can infer the constituents of the ὄμοιουμερές from the constituents of its food, because the food, in so far as it is food (i.e. actually nourishes) must have been 'assimilated': cf. *20b 34—21a 29, *21b 35—22a 4. Now the food of all living things consists of moist and dry (cf. e.g. de Part. Anim. 650a 3—4). It must therefore contain at least two of the 'simple bodies': for moist and dry cannot be coupled together to constitute a single 'element' (cf. 30a 31—33). And in fact all living things—plants as well as animals—require in their food Earth (cold—dry) and Water (cold—moist): cf. e.g. de Gen. Anim. 762b 12—13. Hence the ὄμοιουμερές in plants and animals are said to consist of Water and Earth (Meteor. 384b 30—31: cf. above, *31a 3—6).

Even plants (Aristotle here points out, 35a 11—14) do not live
by Water alone, as careless observers might suppose. They are nourished naturally by Water impregnated with Earth and artificially by Water mixed with manure, which is a kind of Earth.

In 35a 14 E reads ἀρδεύω. This is no doubt a mere note, but it gives the right sense. Philoponos says the γενεργοῖ mix with the Water τὴν κοπρώδη (sc. γην) ἡτίς καὶ πυρώδους καὶ ἀέρώδους μετέχει φύσις: but Aristotle is not here concerned with Fire and Air.

35a 14–21. ἐπεὶ ... ὁ ροῖς. The meaning of this obscure passage seems to be as follows:—

(a) The food, i.e. the dry and the moist, is par excellence the ῥήχη of the ὁμοιομέρες. It is the inner heat (the hot-cold or tempered-hot) which, by digesting the food, converts it into the substance of the ὁμοιομέρες, or 'forms' it (cf. * 29b 24–26).

(b) What 'is fed', and what 'grows', is (cf. * 21b 17–22a 33, * 21b 24–25, * 21b 25–28) the 'form' or 'figure' taken along with the matter. Now this 'form' or 'figure' is constituted by the Fire in the make-up of the ὁμοιομέρες. Fire alone of the four 'simple bodies'—or most of them all—is of the nature of 'form'. For the 'form' of anything lies in its continent limits or outline. And (i) Fire by nature moves towards the outermost sphere of the Lower Cosmos, thus circumscribing Air, Water, and Earth, as their containing outline (cf. * 22b 2–3): and (ii) within each ὁμοιομέρες, Fire may be said to constitute its outline. For Fire's movement towards 'the limit' will take it to the limit of the ὁμοιομέρες.

35a 16. η μορφή. In A. 5 (21b 27–28) σχῆμα is used instead of μορφή.


B. 9–10

35a 24—37a 33. ἐπεὶ ... χρόνον. In these chapters Aristotle (i) treats of the four causes of the γενετῆ καὶ φθαρτή, thus fulfilling his original plan (cf. 14a 1–6), and (ii) adds a note (37a 17–33) in confirmation of his theory of the efficient cause.

The account here given of the material cause (35a 32–b 5) is a restatement in somewhat modified terms of the doctrine implied in A. 3. As regards the formal cause Aristotle briefly repeats the doctrine assumed in his criticism of Empedokles (cf. * 33b
16–20). He defines it as the 'formula expressing the essential nature', and thus identifies it with the final cause, i.e. the normal (perfect) development of the type of thing in question (35b 6–7). Nothing more is said of these three causes. But it is incidentally shown (36b 26–34) that the continuity of coming-to-be contributes to the perfection of the scheme of things—an indication of the line which a teleological explanation of γένεσις would ultimately take for Aristotle. The rest of the treatise on the causes is devoted to the efficient cause. Aristotle shows (i) that a complete explanation of γένεσις is impossible without the recognition of its efficient cause (35b 7–36a 12); (ii) what the efficient cause of γένεσις and φθορά is (36a 14–b 10); and (iii) how his theory accords with observed facts and explains a well-known problem (36b 10–37a 15).

35a 24–28. Ἐπει ... πρῶτον. We have now established that there are γεννητὰ καὶ φθαρτά—that γένεσις ἀπλή and φθορά actually occur—in the region about the centre (cf. * 34b 31–32), i.e. in the Lower Cosmos. It remains for us to determine the number and the nature of the 'originative sources of all coming-to-be alike', i.e. of γένεσις considered as the universal of which the γενετές of the various types of γεννητά are specific forms (a 26 πάσης γενέσεως ὁμοίως: cf. * 14a 2, * 18a 25–27). This is the right procedure: for it is a principle of method that 'a grasp of the true theory of any universal facilitates the understanding of its specific forms' (a 27–28. οὐτω is merely the antecedent of ὤταν ... πρῶτον. The reading of ΕΗΙ, ἡ καθ ἐκαστα, is supported by Philoponos, p. 281, ll. 9–10).

35a 24. γεννητά. According to the manuscripts Aristotle uses both γεννητός and γεννητός (cf. Bonitz, Ind. 150a 37 ff. and 155b 12 ff.), though I confess to a suspicion that we ought always to read γενητός, even where γενητός is better attested. Above (27b 8) I read γεννητοῦ with EHL: but throughout the present passage I have retained the form with one ν, which is given by EFJ and sometimes also by H. The evidence for ἀγενητος (cf. 37a 20) and γεννητικός (cf. 36a 18) is overwhelming: cf. Bonitz, Ind. 5b 41 and 149a 37.

35a 28–29. εἷν ... πρῶτος. Though the bodies of the Upper Cosmos—the 'celestial bodies'—are eternal, they are perceptible and in movement. Hence they too require material, formal, efficient, and final causes: i.e. ἄρχαι the same in number, and generically the same, as the ἄρχαι of the γεννητὰ καὶ
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φθαρτά. For τὰ πρῶτα (i. q. τὰ οὐράνια σώματα) cf. e. g. de Caelo 288b 18–19. As contrasted with the γεννατα καὶ φθαρτά, they are sheerly actual substances, primary ‘reals’, the sources of the life and change in the sublunary sphere: cf. e. g. Introd. §§ 3, 10, * 36a 14–18.

35a 31–32. οὖ...πρῶτος. The ‘celestial bodies’ require an efficient cause for their movement, though not πρῶς τὸ γεννήσαι, since they are ἀγέννητα καὶ ἀφθαρτά (cf. * 28b 32–33).

35a 32—b 5. ώς...μὴ εἰναι. The celestial bodies (a) qua perceptible, involve matter as well as ‘form’; but their matter is the Aether and is itself eternal: and (b) qua moving, they involve ἥλιος πόθεν ποῖ (ἥλιος τοπική), i. e. a something δυνατόν, viz. a ἐνοχεί-μενον capable of occupying successively the different points on its orbit (cf. Introd. § 10).

But the bodies of the Lower Cosmos, inasmuch as they are continuously undergoing γένεσις and φθορά, involve a matter which is the subject of this dual process (35b 2–3 τὸ γεννητόν-καὶ-φθαρτόν). Their matter is something δυνάμει ὑπερ-εν, i. e. a something which at one time exists, but at another time does not exist. We may therefore define it as τὸ δυνατὸν εἰναι καὶ μὴ εἰναι (35a 33, b 4–5). It is something which per se is not actual, though capable of being actualized, i. e. formed. When it is formed, a σύνθετος οὐσία has ‘come-to-be’, and exists. And when that substance ‘passes-away’, the matter has been transformed, i. e. has passed from one of its actualizations to another.

The antecedent of ὅπερ (b 2) is τὸ δυνατόν εἰναι καὶ μὴ εἰναι (a 33), the intervening sentences forming a parenthesis. In a 35 τοῖτων includes (i) ‘the things which are of necessity’ and (ii) ‘the things which of necessity are not’. The antecedent of τοῦτο (b 3) is τὸ γεννητόν-καὶ-φθαρτόν.


35b 7—36a 12. δεῖ...ὀργανά. In order to establish the need for an investigation of the efficient cause, Aristotle divides all preceding theories into (i) those which (like the theory of ‘Sokrates in the Phaedo’) tried to explain γένεσις and φθορά by the formal cause, i. e. as effects of the ‘forms’: and (ii) those which (like the theories of the Atomists, the Pythagoreans, and Empedokles) tried to explain γένεσις and φθορά by the material cause, i. e. as effects of the movement originating in the matter. The inadequacy of both types of theory is to be ascribed, Aristotle urges, to the absence of a clear recognition of the efficient cause.
35\textsuperscript{b} 9. \textit{oi \ μέν.} There does not seem to be any evidence to
determine to what theories (if to any), besides that of 'Sokrates
in the \textit{Phaedo}', Aristotle is here referring.

35\textsuperscript{b} 12--15. \textit{ὑποτίθεται ... ἀποβολήν:} a rough paraphrase of
\textit{Phaedo} \textit{100b}--\textit{101c}.

35\textsuperscript{b} 15--16. \textit{ὡς ἔτ... \φθοράς.} Aristotle is still paraphrasing the
\textit{Phaedo}. Sokrates (cf. 99c--\textit{100b}, \textit{101d}--\textit{e}) thinks that 'provided
his \textit{ἐποθέσεις} are sound' ( \textit{b} 15 {\textit{ταῦτα}}, sc. the doctrines which
Aristotle has just summarized from the \textit{Phaedo}) it 'necessarily
follows that the Forms are causes of \textit{γένεσις} and \textit{φθορά}'.

35\textsuperscript{b} 16--17. \textit{οὶ 8' ... κίνησιν.} Philoponos (p. 282, ll. 3 and 4; 
p. 286, ll. 19, 28, and 29) interprets the 'movement' here in
question as the \textit{τροπή} in the matter, by which he appears to mean
the 'turning' of the atoms in the theory of Leukippos and
Demokritos (cf. *15\textsuperscript{b} 33--16\textsuperscript{a} 2; *16\textsuperscript{a} 1--2). But there is no
reason to suppose that Aristotle is thinking exclusively of the
Atomists. His description is wide enough to include e.g. Empedokles (cf. *15\textsuperscript{a} 22) and possibly Archelaos (cf. \textit{Phaedo} \textit{96b},
with Burnet's note \textit{ad loc.}). Moreover, part of Aristotle's criticism
(cf. *36\textsuperscript{a} 1--12) is directed against a doctrine which we have good
reason to attribute to the Pythagoreans (cf. *18\textsuperscript{b} 6--7, *30\textsuperscript{b}
13--19).

35\textsuperscript{b} 18--24. \textit{εἰ ... πράττομένων:} criticism of the theory of
'Sokrates in the \textit{Phaedo}'. (i) The Forms and the Participants
always \textit{are}—e.g. there always is a body which can come-to-be
healthy, and there always is Health—but \textit{γένεσις} is intermittent;
and (ii) at any rate in the products of \textit{τέχνη} ( \textit{b} 23 \textit{δύναμιν}, i.q.
\textit{τέχνη}: cf. Burnet, \textit{Ethics}, Introd. §12) we actually see a cause
other than the Forms at work. For patients or pupils do not come-to-be healthy or learned without the action of the doctor or
the teaching of the man of science.

35\textsuperscript{b} 24--36\textsuperscript{a} 12. \textit{εἰ ... ὅγγανα.} Aristotle's criticism of the
theories, which tried to explain \textit{γένεσις} by the material cause, is
based upon his own doctrine (cf. also *35\textsuperscript{b} 34--35). As the
reader will remember, \textit{ἀλήθεις} requires (a) an efficient cause,
\textit{viz.} the \textit{ἀλήθητικὴ ψυχή} or \textit{τὸ ἐνὸν ἀλήθητικὸν}, which (b) employs \textit{τὸ
θερμων} as an auxiliary active force for the digestion and assimila-
tion of the food, in order that (c) the living thing may grow to
its normal stature, i.e. to its \textit{μορφή} or \textit{εἶδος} which is its 'end' (cf.
*20\textsuperscript{a} 8, *20\textsuperscript{b} 34--21\textsuperscript{a} 29, *22\textsuperscript{a} 10--13). Similarly \textit{γένεσις} requires
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(a) an efficient cause, viz. the ‘basal’ soul, the soul \( \text{qua } \gamma\varepsilon\nu\nu\-\tau\iota\kappa\iota \), which (b) employs certain secondary or auxiliary forces, in order that (c) \( \tau\circ \gamma\nu\nu\omicron\omicron\epsilon\nu\nu\) may come-to-be. The auxiliary forces here in question are certain \( \delta\nu\varepsilon\mu\epsilon\) inherent in, and constitutive of, the matter—i.e. the elementary qualities, and specially the ‘active’ couple, viz. the hot and the cold (cf. * 29\(^b\) 24–26).

Aristotle begins (35\(^b\) 24–29) by praising the materialists. Their theory is more scientific (\( \phi\nu\sigma\iota\kappa\omega\tau\epsilon\rho\omicron\) than that of Sokrates, for at least they recognize that movement is required to account for \( \gamma\nu\nu\epsilon\omicron\omicron\). But (b 29–31) they were wrong in supposing that this movement originates in the matter. Matter is passive: it is a \( \delta\nu\varepsilon\mu\mu\) only in a passive sense. What initiates movement is a \( \delta\nu\varepsilon\mu\mu\) in a different sense, an active force. This objection is confirmed (b 31–33) by an appeal to the facts. Neither in natural \( \gamma\nu\nu\epsilon\omicron\omicron\), nor in artificial production, does the matter of itself make the result. Hence they are wrong (b 33–35) not only in ascribing the movement to the matter, but also in omitting the ‘more controlling cause’, viz. the ‘form’. Moreover (36\(^a\) 1–12), by eliminating the formal cause, they deprive themselves of the right to regard the ‘material forces’ (e.g. the hot and the cold) as causes of \( \gamma\nu\nu\epsilon\omicron\omicron\) in any sense, even as ‘instrumental’ or auxiliary forces.

35\(^b\) 26–29. \( \tau\circ \gamma\rho \ldots \kappa\iota\eta\tau\iota\kappa\iota\kappa\)•. ‘For what “alters” and transfigures plays a greater part’ (sc. than the Forms) ‘in bringing things into being; and we are everywhere accustomed, in the products of nature and of art alike, to look upon that which can initiate movement as the producing cause.’

Cf. * 21\(^b\) 6–10, * 24\(^a\) 24 – \( \tau\circ\nu\tau\omicron\) (b 27) is the antecedent of \( \delta \\alpha\nu \tilde{\gamma} \kappa\iota\eta\tau\iota\kappa\iota\)•. Failure to recognize this perhaps gave rise to the erroneous variant (b 28) \( \alpha\pi\circ \tau\varepsilon\chi\nu\sigma\), \( \alpha\pi\circ \tau\varepsilon\chi\nu\) \( \delta\epsilon \ldots \) .

35\(^b\) 29–31. \( \tau\iota\sigma \ldots \delta\nu\varepsilon\mu\epsilon\omicron\omicron\)•. We speak of ‘matter’ (a) in so far as there is a \( \delta\nu\varepsilon\mu\mu \) \( \tau\circ \nu\chi\epsilon\)\(\epsilon\), or (b) in so far as there is a \( \delta\nu\varepsilon\mu\mu\) in contrast to an \( \epsilon\nu\nu\epsilon\omicron\omicron\)•—a mere ‘potentiality’, or something ‘potentially existent’, in contrast to something realized and actual. But matter is not an \( \alpha\rho\chi\gamma \mu\eta\tau\beta\upsilon\theta\upsilon\) \( \epsilon\nu \\alpha\lambda\lambda\omega\)•—not a \( \delta\nu\varepsilon\mu\mu\) in the sense of an active or operative force. Cf. e.g. \( \text{Melaph. 1046a } 9–29, \text{1048a } 25– \( \text{b } 9) .

35\(^b\) 34–35. \( \kappa\iota \ldots \mu\omicron\rho\phi\iota\nu\)•. According to Aristotle’s own doctrine, \( \text{the form} \) (not \( \text{the matter} \), as the materialists supposed, cf. 35\(^b\) 17) initiates and controls the processes, by which a work
of τέχνη is made or a living thing in Nature brought into being. The architect, e.g., conceives the 'form' which the completed house is to exhibit—its structural plan, the scheme of synthesis which is to be realized in the materials (the bricks and beams). It is this 'form'—the 'form' as 'in the soul' of the architect, or as the τέχνη οἰκοδομική (cf. * 20b 18–21)—which initiates and controls the processes of building. Similarly in the γένεσις of a living thing—e.g. of an animal or a child—the 'form' is the 'controlling' cause. For the 'form', implanted by the efficient cause (i.e. by the generating parent) in the matter, initiates therein a determinate movement or change (κάρνησις), which in turn causes other succeeding changes until the matter has been developed into the offspring which is to come to birth (cf. de Gen. Anim. 733b 23 ff., with Professor Platt's notes in his translation; Metaph. 1033b 29—1034a 8, 1034a 33—b 4, &c.).

Formal, final, and efficient causes, it will be observed, come very close together in Aristotle's explanation of ποίησις and γένεσις. For the 'form' of the house is the ideal to be realized and the originative source of the processes which the architect (the so-called 'efficient cause') sets going. And the male parent is the efficient cause only qua communicating the 'form' (i.e. the soul, cf. * 20a 8, * 21b 16–17) to the embryonic matter: whilst the final cause of the γένεσις is the completed embodiment of that 'form', i.e. the new representative of the species. As we shall see (cf. * 36a 14–18), the ultimate formal, final, and efficient causes are one and the same, viz. God.

36a 1–12. ἔτι... ὑπάρχα. The special form of the materialist theory, which Aristotle here criticizes, is ascribed to Parmenides by Diels (p. 110): and Philoponos says that Alexander attributed it to 'the followers of Parmenides'. It appears in fact to be the doctrine—only more fully stated— which Aristotle elsewhere ascribes to 'Parmenides', i.e. to the Pythagoreans criticized in the 'Way of Opinion': cf. * 18b 6–7, * 29b 27, * 30b 13–19.

The Pythagorean materialists regard γένεσις and φθορά as the effects of certain forces—e.g. the hot and the cold—inherent in, and constitutive of, the matter of which bodies consist. It is the nature of each of these 'elementary qualities' or 'material forces' to act or to suffer action in certain definite ways. Hence the hot and the cold, and the like, are both the materials out of which (or into which), and the forces by means of which, all the other things come-to-be (or pass-away).
Now, according to Aristotle's own doctrine (cf. * 35b 24—36a 12), the hot and the cold are forces inherent in, and constitutive of, the matter of φυσικά φύματα: and they are employed by the efficient cause as instrumental to its purpose of bringing τὸ γεννώμενον into being. Hence (a) they are not genuine efficient causes of γένεσις and φθορά, but only secondary causes. The hot, e.g., does not originate the κίνησις which results in the coming-to-be of a new individual of the species; but it acts as a mediating link, communicating to the matter the κίνησις originated by τὸ γεννητικὸν. For the hot can be itself moved in a certain way and, being thus moved, it can set something else moving in the same way. And (b) they become instrumental to γένεσις, only so far as they are 'used' by the efficient cause in the service of the final cause.

The Pythagorean materialists, therefore, are open to the following criticisms:—(i) Since they abstract the formal cause, the hot and the cold can no longer be regarded as 'instrumental'. They assign too high a rank to such material forces in speaking of them as the 'instruments' of γένεσις and φθορά (cf. 36a 6 διὰ τούτων ἢ φθειρέσθαι); for—apart from the formal (i.e. the efficient and the final) cause—they are not ὑπανικαί. (ii) They forget that these material forces are passive as well as active. Thus even Fire (the hot par excellence, cf. * 30b 25—30) obviously 'is moved', i.e. suffers action. Hence these material forces cannot originate κίνησις: for τὸ πρῶτον κύμων is ἀκίνητον, and τὸ πρῶτον κύμων is ἀπαθῆς (cf. 24b 12—13). (iii) The part, which these material forces in fact play in γένεσις, is that of 'instruments' or 'tools' of the final (efficient and formal) cause. It is therefore as absurd to regard them as the causes of γένεσις as it would be to view the saw and plane as the causes of the things made by the carpenter. Finally (iv) even if we admit that (e.g.) Fire—unlike the carpenter's tools—does act or set things moving of itself, the movement, which it thus 'originates', is not instrumental to γένεσις: on the contrary, it is destructive. Fire therefore, if we consider it apart from the controlling cause, is actually less conducive to γένεσις, than are the tools to πολήσις.

36a 2. λαν ὑπανικᾶς, i.e. they make the material forces too instrumental in character. They treat mere natural forces as auxiliary to a purpose, though they have eliminated all notion of a formal cause, and therefore also all notion of a final cause.
36\textsuperscript{a} 12. ἀλλὰ ... ὁργάνα. This criticism is somewhat obscure owing to its brevity: I have followed Philoponos in my interpretation (cf. * 36\textsuperscript{a} 1–12).

36\textsuperscript{a} 13–14. ᾗ μέν ... μορφῆς. Aristotle's 'general account of the causes' is given in the *Physics* (B. 3–9), and his special account of the material and formal causes of γένεσις and φθορά is contained in the present chapter (35\textsuperscript{a} 32–b 7).

36\textsuperscript{a} 14–b 10. ἐτέ ... φύσιν. Aristotle's theory of the efficient cause of γένεσις and φθορά presupposes his astronomical system, which is based upon the system of Eudoxos as modified by Kallippos. The reader should consult *Metaph.* 1073\textsuperscript{b} 18–1074\textsuperscript{a} 17, and the excellent exposition in Heath, pp. 190 ff., from which I make the following extracts. 'Eudoxus adopted the view which prevailed from the earliest times to the time of Kepler, that circular motion was sufficient to account for the movements of all the heavenly bodies. With Eudoxus this circular motion took the form of the revolution of different spheres, each of which moves about a diameter as axis. All the spheres were concentric, the common centre being the centre of the earth; hence the name of "homocentric spheres" used in later times to describe the system. The spheres were of different sizes, one inside the other. Each planet was fixed at a point in the equator of the sphere which carried it, the sphere revolving at uniform speed about the diameter joining the corresponding poles; that is, the planet revolved uniformly in a great circle of the sphere perpendicular to the axis of rotation. But one such circular motion was not enough; in order to explain the changes in the speed of the planets' motion, their stations and retrogradations, as well as their deviations in latitude, Eudoxus had to assume a number of such circular motions working on each planet and producing by their combination that single apparently irregular motion which can be deduced from mere observation. He accordingly held that the poles of the sphere which carries the planet are not fixed, but themselves move on a greater sphere concentric with the carrying sphere and moving about two different poles with a speed of its own. As even this was not sufficient to explain the phenomena, Eudoxus placed the poles of the second sphere on a third, which again was concentric with and larger than the first and second and moved about separate poles of its own, and with a speed peculiar to itself. For the planets yet a fourth sphere was required similarly related to the
three others; for the sun and moon he found that, by a suitable choice of the positions of the poles and of speeds of rotation, he could make three spheres suffice. . . . The spheres which move each planet Eudoxus made quite separate from those which move the others. One sphere sufficed of course to produce the daily rotation of the heavens. Thus, with three spheres for the sun, three for the moon, four for each of the planets, and one for the daily rotation, there were 27 spheres in all. . . . It would appear that he did not give his spheres any substance or mechanical connexion; the whole system was a purely geometrical hypothesis, or a set of theoretical constructions calculated to represent the apparent paths of the planets and enable them to be computed.' Kallippos (cf. Arist. *Metaph.* 1073b 32–38) 'thought it necessary to add two more spheres . . . to the sun and moon respectively, if one wishes to account for the phenomena, and one more to each of the other planets'. Aristotle (cf. *Metaph.* 1073b 38–1074a 14) 'transformed the purely abstract and geometrical theory into a mechanical system of spheres, i.e. spherical shells, in actual contact with one another; this made it almost necessary, instead of assuming separate sets of spheres, one set for each planet, to make all the sets part of one continuous system of spheres. For this purpose yet other spheres had to be added which Aristotle calls "unrolling" or "back-rolling" (ανέλιπτουσαί), by which is meant "reacting" in the sense of counteracting the motion of certain of Eudoxus's and Callippos's spheres which, for the sake of distinction, we may with Schiaparelli call "deferent". Hence (Heath, p. 219), according to Aristotle, nine spheres (five 'deferent' and four 'back-rolling') combine their revolutions to produce the apparent motion of the sun.

In the present passage Aristotle begins by recalling two theses which he had established in the *Physics* (36a 15 δεδεκταί, α18–19 τὸ πρῶτον καλῶς εἴρηται: the reference is to *Phys.* Θ. 7–9), viz. that motion (a) is eternal and (b) is the primary form of change, of which all other forms, including γένεσις, are derivatives. Motion, therefore, causes coming-to-be (36a 25), and the eternity of motion causes the continuity of coming-to-be (36a 15–18). But we have still to determine precisely what motion is the efficient cause of γένεσις and φθορά. Since γένεσις and φθορά (i) occur continuously or uninterruptedly in the Lower Cosmos and (ii) are contrary to one another; the motion, which is their efficient cause, must be (i) eternal and continuous, and (ii) in
some sense dual or internally diverse, since it has to cause a pair of contrary effects (36a 23–31).

These two conditions, Aristotle maintains, are satisfied by 'the motion along the inclined circle' (36a 32), i.e. by the sun’s annual movement in the ecliptic or zodiac circle. For that movement is continuous (cf. *36b 2–3): and it brings τὸ γεννητικὸν, i.e. the sun, alternately nearer to, and further away from, any given point on the earth's surface (cf. *36b 3–6).

The alternation of γένεσις and φθορά is ascribed to the sun's movement in the zodiac circle in Meteor. 346b 16 ff. (cf. *36b 6–7): and the doctrine is implied e.g. in Metaph. 1071a 15–16, 1072a 10–18, Phys. 194b 13.

36a 14–18. ἐπὶ ... γεννητικὸν. Aristotle is only beginning the statement of his doctrine, and his language is not quite precise: The continuity of γένεσις is due to the eternity of motion. But the whole effect to be explained is the continuous alternation of γένεσις and φθορά. Possibly Aristotle uses the plural (a 16 τοῦτων ὀντων) because he is thinking not only of the eternity of motion (a 15–16), but also of the 'inclination of the circle' which he will specify (36b 3–10) as the cause of the sun's alternate approach and retreat.

There is a similar want of precision in 36a 16–18 (ἡ ... γεννητικὸν), which is not remedied by F's omission of καὶ ἀπάγευ (a 18). But we have no right to expect pedantic accuracy in the first rough statement of a theory.

Aristotle's doctrine of the efficient cause of γένεσις and φθορά has a certain 'metaphysical' or 'theological' background, which it will be convenient to sketch briefly here. Eternal circular motion, which the Physics (6. 7 and 8) had shown to be possible, is actually exhibited in the first instance by the revolution of the πρῶτον οὐρανός, i.e. the outermost of the concentric spheres, the sphere in which are set the fixed stars. Its revolution is eternal and uniform because it is the πρῶτον κυνούμενον, i.e. because it is immediately moved by the πρῶτον κυνόν which is ἀδίδων as well as ἀκανθον, i.e. by God (cf. e.g. Phys. 258b 12—260a 10). But the motion, which the outermost sphere derives immediately from God, is imparted to the whole system of concentric spheres, since they are in contact one with another. Hence, through the mediation of the πρῶτον κυνούμενον, the 'revolution of the whole heavens' (cf. 36b 3 ἡ τοῦ ὀλον φορά) is eternal too.

Now God is conceived by Aristotle as absolute 'form' or sheer
actuality, and as therefore also the ultimate final cause and the ultimate (or primary) efficient cause. For (i) God, as sheer actuality, is the fulfilment in which all effort must recognize its end—i.e. God is 'the Best', the supreme object of all desire. And Aristotle represents all things in the Cosmos as inspired by love of God, as striving, so far as in them lies, to attain to God; i.e. to imitate in their activities that perfect and eternal life, that self-dependent and self-fulfilling spiritual activity, which is God. But (ii) God, as sheer actuality, is the underived origin of all motion, i.e. the primary efficient cause. The eternal life, which is God, radiates through the whole system. It communicates itself immediately (as we have seen) to the πρῶτον κινούμενον in the form of eternal uniform revolution. In the subordinate spheres (in the lower regions of the heavens) the movements, though still continuous and eternal, are no longer uniform, since they are transmitted through more than one intermediary—i.e. the movements of the planets are irregular, since they are the resultants of many revolutions. And in 'the region about the centre'—i.e. in the sublunar sphere—there is no revolution at all. The divine life is manifested here, in this region furthest removed from the πρῶτον κινούμενον, in the enfeebled and imperfect processes of the perishable things, viz. in the movements and transformations of the four 'simple' bodies, in the movements of the animals and men, in γένεσις and φθορά, in ἀλλοκοτος, and in αἰτίας and φθίνως. (Cf. Introd. §§ 3 and 4, *36b 26—34, *36b 30—32; Philoconos, p. 288, ll. 24—26; Metaph. 1072a 19—1073a 13, Phys. 250b 11—15, de Caelo 279a 16—30, 288a 13—17, 292a 18—b 25.)

36a 18. τὸ γεννητικὸν. All movement is the movement of a body. The outermost sphere, e.g., is a spherical shell, i.e. a spherical body, whose substance is the Aether (cf. Introd. § 10): and it is this 'body' which revolves uniformly and eternally. Similarly the movement along the ecliptic, which is the efficient cause of γένεσις and φθορά, is the movement of a body, viz. of the sun (cf. 36b 1 ἄει μὲν τι κυκάβα, b 7 ταῦτα τοῦτο, b 17 τοῦ ἑλίου). Aristotle calls the sun 'the generator': but, strictly speaking, it is the alternately approaching and receding sun which causes, alternately, γένεσις and φθορά. The sun, γεια near, γεννά: and the sun, γεια remote, φθείρει (cf. *36b 6—7, *36b 8—10).

36a 19—20. τὸ . . . εἰπείν. This clause is in apposition to, and epexegetical of, τὸ πρῶτον (a 18). The thesis is established in Phys. 260a 26—261a 26.
36a 23–25. ἐπεί ... φθορά: cf. above, 17b 33 ff.
36a 26–31. φανερῶν ... τάννυία. The grammatical construction has become slightly deflected: but in effect Aristotle is saying 'It is clear that, in order to account for the occurrence of both γένεσις and φθορά, not one motion only (a 26–29 μοι ... φθορά), but more motions than one are required (a 29–31 δε ... τάννυία)'. At first sight Aristotle's words (δεί δὲ πλείους εἶναι τὰς κανήσεις) suggest that separate contrasted movements are required: but he makes it clear immediately (36a 32–b 2) that the two contrasted movements are constituents of the single 'motion along the inclined circle'.

36a 30. ἑννυίας ... ἀνωμαλία: 'contrasted with one another either by the sense of their motion or by its irregularity.'

(i) One movement is 'contrary' to another, only if the terminal points of the former are spatially contrary to those of the latter. If e.g. A is above and B below, or A right and B left, or A front and B back, then a movement from A to B is contrary to a movement from B to A. The two movements, from A to B and from B to A, are then ἑννυίας φοράι or ἑννυίαι τῆς φορᾶ. From this it follows that there is no movement contrary to circular motion. If a body is carried round in a circle, from whatever point in the circumference its motion starts, it must equally, in each revolution, reach all the contrasted positions in its circle: and its movement round its circle, whatever its sense, is (if we consider each complete revolution) 'from the same to the same', and not from contrary to contrary terminus. (Cf. de Cælo 270b 32–271a 33.)

From this conception of 'contrariety of motion' it follows that if the movements, which cause γένεσις and φθορά, are ἑννυίας τῆς φορᾶ they cannot be (either or both of them) complete revolutions. And in fact (see preceding note) they are contrasted portions of the sun's completed circle along the ecliptic.

(ii) Every form of process—'alteration', growth and diminution, motion—may be uniform (ὁμαλής) or irregular (ἀνωμαλός): and the term ἀνωμαλός is applied below to the matter of the γενητὰ καὶ φθαρτὰ (in so far as its temperament and texture are not everywhere the same) and also to certain γενέσις and φθοραὶ (cf. * 36b 20–24). It appears, however, that the terms, when applied to motion, express the contrast between a motion with unchanging, and a motion with changing, velocity. The characteristic of an irregular motion is that its velocity increases towards, and diminishes from, a maximum. Hence it contains
a plurality of different, and possibly contrary, part-motions: and
is 'one' only by 'continuity', i.e. only because the end of one
of its part-motions is the beginning of another. In a uniform
motion, on the other hand, there is the same velocity throughout.
It is absolutely 'one'; for all its constituent motions are similar,
i.e. any one of them could be substituted for any other. Hence
a body which moves uniformly and the path of its motion must
themselves be uniform—i.e. must be such that any part could
coincide with (could be substituted for) any other. From this
it follows that the path of a uniform motion must be either
a straight line or a circle. But a straight line (since Aristotle
does not admit an Infinite) contains an ἀρχή and a τέλος. Bodies,
therefore, which move along a straight line, cannot move uniformly.
For, if their motion is 'natural', its velocity will increase as they
get further from the point of rest (the ἀρχή) towards the τέλος
of their path: whilst if their motion is παρά φύσιν, its velocity
will diminish as they get further from the ἀρχή of their path, since
that means further from the force which impelled them to move
'against their nature'. A circle alone contains in itself neither ἀρχή
nor τέλος nor μέσον: i.e. a circular path has no natural terminus.

Hence revolution—the revolution of a body which is itself
uniform, viz. of a sphere—is the only motion which is absolutely
'uniform'. (Cf. e.g. de Caelo 288a 13-27; Phys. 228b 15—
229a 6, 265b 11-16.)

36a 34—b 1. ἀνάγκη ... φορά. συνεχίς is probably to be taken
as predicate: cf. 36b 25.

36b 1. τι.: cf. * 36a 18.

36b 2. δύο, sc. κυνήγεις κινεώσατι, cf. 36a 33.

36b 2-3. τῆς ... αἰτία. 'The first motion' (cf. 36a 31 ἦ πρῶτη
φορά) is that of the πρῶτος οὐρανός, which revolves once in every
twenty-four hours from East to West. Since it carries round with
it the whole system of concentric spheres, Aristotle here speaks
of it as ἦ τοῦ ὀλον (sc. οὐρανοῦ) φορά: cf. * 36a 14—b 10, * 36a 14—
18; Phys. 267b 8-9. It is absolutely single and uniform, for what
is revolving is a sphere (cf. * 36a 30): and its velocity is greater
than that of the proper revolution of any of the other celestial
spheres. Owing to its singleness, uniformity, and supreme velocity,
the astronomers use it as the unit or standard of all the celestial
motions: cf. de Caelo 287a 23-26, Metaph. 1053a 8-12.

Philoponos quotes this interpretation of ἦ τοῦ ὀλον φορά from
Alexander, but perversely rejects it.
\[36^b \text{3-6. τοῦ δὲ . . . κίνησις.} \] Aristotle, with a natural economy of his full astronomical theory (cf. *36^a \text{14 - b 10}), speaks as if \textit{two spheres} only were required to produce the sun's movements, viz. (i) the sphere of the fixed stars, and (ii) a sphere moving 'about an axis perpendicular to the plane of the zodiac' (Heath, p. 198: cf. also \textit{de Caelo} \text{285^b 28}, where Aristotle refers to 'the second revolution, viz. that of the planets'). The sun is carried in its annual movement by this second sphere along the ecliptic or zodiac circle; and the latter is inclined at an angle to the equator of the first sphere, which is the equator of the universe and is in the same plane as the terrestrial equator. Owing to this inclination, the sun, at different points of its annual path, 'will cross the celestial equator, be north of it, cross it again and be south of it' (cf. N. Lockyer, \textit{Elementary Lessons in Astronomy}, § 363). Hence the sun in its annual movement will alternately 'approach' and 'recede from' any given point on the earth's surface (e.g. Athens). Aristotle adds (36^b \text{5-6}) 'since the sun's distance' (viz. from any given point on the earth's surface) 'is thus unequal, its movement will be irregular'. This ought to mean (cf. *36^a \text{30}) that the sun's annual movement will alternately accelerate towards, and diminish from, a maximum velocity; and perhaps Aristotle is referring to the apparent arrest of the sun's motion at the solstices. For the sun appears to stand still at its extreme north and south declinations, i.e. at those points on the \textit{λόξος κύκλος} which are furthest removed from the equator of the outermost sphere. After each solstice the direction of the sun's movement is changed and it moves 'back' towards the points of intersection of the ecliptic and equator, which it reaches at the vernal and autumnal equinoxes. If the sun's movement is \textit{ἀνόμαλος} in the strict sense of that term, we must suppose that it accelerates from \textit{ἡρεμία} at each solstice till it reaches its \textit{ἀκμή} at the next equinox; and diminishes in velocity from each equinox till it reaches \textit{ἡρεμία} at the next solstice.

\[36^b \text{6-7. ὅτ' . . . φθείρει.} \] The sun's annual movement includes, as we have seen, part-motions which are contrary to one another in 'sense' and perhaps also contrasted in velocity. The whole movement, therefore, is the efficient cause of the alternation of \textit{γένεωσις} and \textit{φθορά}, one part-motion causing \textit{γένεωσις} and the other \textit{φθορά}. Aristotle maintains that certain 'facts of observation' (36^b \text{15-19}) confirm his view that \textit{γένεωσις} is the effect of the sun's \textit{approach} and \textit{φθορά} of its \textit{retreat}. What are these 'facts'?
Aristotle is thinking (i) of the growth of vegetation, &c., in spring and summer, and its decay in autumn and winter: (ii) of the birth and death of those insects (e. g.) which do not survive the winter: (iii) of the development and decay of the other animals and plants (cf. * 36b 8–10): and (iv) probably also of the annual cycle of the seasons, i. e. the annual alternation of drought and heat with cold and rain. For the increased heat, produced by the sun's annual 'approach', vaporizes and draws up the Water on and near the earth, so that it is converted into Air: whilst, when the sun 'retreats', the original heat in the vaporized Water is partly 'quenched' by the cold of its environment, and partly 'dissipated' by rising into still higher regions, so that the Air condenses into cloud, and descends again to earth in the form of Water. This seasonal cycle—Water streaming up as ἀτμίς and becoming Air, Air condensed into cloud and streaming down as rain—is the result, Aristotle thinks, of an 'imitation' of the sun's circular movement in the ecliptic. (Cf. Meteor. 346b 16—347a 12, and Alexander's commentary ad loc. Cf. also above, * 22b 2–3, * 30b 4, * 31a 24.)

The reader will have observed an obvious difficulty, which is noticed by Alexander and Philoponos. For (cf. * 18a 23–25) the γένεσις of one thing is εν ἑαυτῷ the φθορά of something else and vice versa. How, then, can the sun's approach be the cause of γένεσις only and its retreat be the cause of φθορά only? If the plant or the animal comes-to-be, the seed passes-away: and when the former pass-away, there is a γένεσις of certain simple (or relatively-simple) constituents. So, in the seasonal cycle, the γένεσις of Air is the φθορά of Water, the φθορά of Air the γένεσις of Water.

The solution of this difficulty depends, we must suppose, upon a difference of rank, or degree of reality, in the γεννητά (cf. * 18b 14–18 ; Philoponos, p. 289, ll. 27 ff.; Alexander, ἀπορίαι καὶ λύσεις, iii. 4). The plant and the animal are 'more real' than the seed: Air is 'more real' than Water, for it is nearer to the ἀρχή, i. e. the πρῶτον κινοῦν. Hence the 'approach' of the sun brings into being the 'more real' γεννητά: and the φθορά of the 'less real' things, which this γένεσις involves, is only a subordinate concomitant effect of the sun's action. Similarly the 'retreat' of the sun destroys the 'more real' things, and this φθορά is only incidentally accompanied by the γένεσις of things 'less real'.

36b 8–10. καὶ εἴ . . . φύσιν. Aristotle endeavours to bring within the scope of his theory the ripening to maturity and the
decay to extinction of the longer-lived organisms. He supposes that the sun 'generates' such organisms—i.e. brings them to their ἀκμῇ or full development—by a succession of its 'approaches', and causes their φθορά by a succession of its 'retreats'. And he enunciates it as a general law that the period of their natural development to their ἀκμῇ is equal in length to the period of their natural decay towards their φθορά. It is obvious, as Philoponos observes, that the phenomena here in question are αἰξίησις and φίλοςίς rather than γένεσις and φθορά in the proper sense: and the substitution of φίλος for φθορά (36 b 18) is perhaps significant as an indication of what was in Aristotle's mind.

Aristotle does not explain why, if a succession of the sun's 'approaches' (e.g. twenty successive summers) causes the full development of an oak or a man, the successive 'retreats' during the same period (i.e. the corresponding winters) do not counteract this effect: nor conversely, why the successive summers, during the period of the organism's decline, do not neutralize the destructive power of the winters. We must suppose that he would have met this difficulty by his theory of the σύμφωνον θερμῶν, though there is no evidence to show the precise form which his answer would have taken. The development of a living thing, as we know from other works, is due to the co-operation of (a) the heat in the environment (i.e. in the Air or Water in which the thing lives), which is derived principally from the sun, and (b) the 'connate vital heat', which is contained in the heart of sanguineous animals and in the analogous organ of bloodless animals. This 'vital heat' (σύμφωνον θερμώτης φυσική, θερμώτης ψυχική, ζωτική θερμώτης, φυσικῶν θερμῶν, κτλ.) plays a very important part in Aristotle's physiological and biological theories: cf. e.g. * 29 b 24–26; de Gen. Anim. 736 b 33 ff., 762 a 18–21, 784 a 34 ff.; Parva Naturalia 469 b 6 ff., 473 a 9–12; Meteor. 379 a 3 ff.

36 b 10–15. διὸ . . . μέτρον. The Order controlling all things in the Cosmos assigns a determinate period of life to each species of living thing. Within this period, so many years, e.g., are required for the process of development to maturity and an equal number of years for the decline to extinction. The individual members of the species conform, as a general rule, to their specific period. And the period of each species is distinctive, i.e. the various species are distinguished from one another (b 12 διορίζονται) by the various numbers which express the differing lengths of their periods. There are constant references in Aristotle's works to

In 36b 15 the grammatical subject is ὑ periódos, with which τὸ μέτρον is in apposition.

36b 20–24. ἀλλὰ ... φθοράν. The vital period of the species, assigned by the Order, demands equal duration for the process of development and for the process of decline: but to this, as to every general rule, there are exceptions. It often happens that individuals of a given species die prematurely:—i.e. that their decline occupies a shorter time than their development, or a shorter time than the Order prescribes (b 20 ἐν ἑλάττωνι φθείρεσθαι: either interpretation is possible, and both come to the same thing). This, like all exceptions to the general rules in nature, is due to the matter. For the matter, of which the living things are composed, is 'irregular', i.e. not the same in texture throughout (cf. * 36a 30). Hence the γένεσις of some individuals in a species will be 'irregular', i.e. will exhibit a velocity varying from the normal or specific rate; so that some of them will develop too quickly and others too slowly. Now, since the γένεσις of one thing is εὐ ἰπσο the φθορά of another, each abnormally rapid γένεσις will εὐ ἰπσο involve an abnormally rapid φθορά. Premature death, therefore, or abnormally rapid decline in some individuals is only the inevitable obverse of premature or abnormally rapid development on the part of other living things, whether of the same or of a different species.

This interpretation, by which alone a tolerable meaning can be extracted from the passage, involves the placing of a comma after συμβαίνει and the insertion of τὸ after διὰ in b 24. συμβαίνει, sc. πολλάκις ἐν ἑλάττωνι φθείρεσθαι (cf. b 20). In the same line τούτων refers to the things whose γένεσις is ἀνώμαλος, i.e. in this case 'too rapid'.

36b 20–21. ὑδιὰ ... σύγκρασιν. All the manuscripts read σύγκρασιν. Philoponos quotes σύγκρονων as a variant. Neither word, so far as I can discover, occurs elsewhere in Aristotle, though both are to be found once in the spurious *de Plantis*.

It is difficult to extract a satisfactory meaning from these words whether we read σύγκρασιν or σύγκρονων. Pacius, who reads σύγκρασιν, interprets 'ob mutuam invicem conspirationem'. By this he appears to mean 'because of the way in which the γενητὰ καὶ φθιοτὰ are implicated with one another', i.e. (cf. b 21–24) because every γένεσις is intertwined with a φθορά and
vice versa. But (a) σύγκρασις is a very inappropriate word, and 
(b) the phrase would then only anticipate obscurely what the 
following lines state clearly.

Philoponos wishes to interpret τὴν πρὸς ἀλληλα σύγκρασις as 
'the reciprocal attemperament of the στοιχεῖα'. This would give 
an excellent sense, since the matter of living things is a blend or 
attemperament of the four elementary qualities. But there is 
nothing in the context to justify us in supposing that the things 
which are 'reciprocally attempered' are the στοιχεῖα.

If we read σύγκρουσις, we might suppose Aristotle to mean 
that premature death is due to 'collision'—i.e. to life being 
crushed out βίω, instead of vanishing by the process of natural 
decline. But this interpretation is impossible, since it would 
leave the next sentence (ἀνωμάλου γὰρ ... φθοράν) disconnected 
and pointless. Philoponos himself suggests two very uncon-
vincing interpretations of σύγκρουσις, viz. (i) 'the reciprocal 
consilience of the causes, i.e. the material cause and the 
proximate and primary efficient causes'; but—not to mention 
other objections—there is nothing in the context to suggest that 
the σύγκρουσις is a σύγκρουσις τῶν αἰτίων: and (ii) 'the συνδορμή τῶν 
σχήματων of the sun, the other planets, and the stars' (i.e. their 
'conjunction' in an astrological sense), to which he ascribes 
a certain influence in determining the span of life. Here again 
it is a sufficient objection that nothing in the context justifies 
us in identifying ἀλληλα with τὰ οὐράνια or with their σχήματα.

On the whole I have thought it best to obelize the words as 
probably spurious.

36b 25–26. ἄελ ... αἰτίαν. Aristotle has explained (i) how the 
material cause renders it possible for γένεσις and φθορά to occur 
continuously, without ever failing in nature (26 ἦν ἄπομεν αἰτίαν, 
sc. the material cause, cf. 18a 9–10, * 18a 23–25), and (ii) how the 
sun's annual movement in the ecliptic acts as the efficient cause 
of the continuous alternation of these processes.

36b 26–34. τούτο ... γένεσιν. Aristotle briefly indicates the 
final cause of the continuity of γένεσις, i.e. shows how it con-
tributes to fulfil the perfection of the universe. The continuity of 
γένεσις is a logical consequence of the fundamental teleological 
principle for the explanation of natural phenomena, viz. that 
'Nature in all things always strives after the better'.

Since 'being' is better than 'not-being', every thing, if nature's 
purpose could be fully attained, would always 'be', i.e. would be
individually eternal. But the eternity of the individual is impossible in the Lower Cosmos: for the things in that sphere are too remote from the ἄρχη (i.e. from God) to share in the ‘eternal life’, except in a very feeble degree and in a very imperfect form (cf. *36a 14–18). They are στοιβετα, and their matter (unlike that of the stars and planets) is τὸ δύνατον-εἶναι-καὶ-μὴ-εἶναι (cf. *35a 32–b 5). It is in constant process of transformation; hence individually they cannot ‘be’ except for a limited time, and in a sense which presupposes ‘not-being’ and necessarily involves a future φθορά or cessation of ‘being’. But nature secures ‘eternity’ for them in another sense. For although each individual comes-to-be and passes-away, each species always ‘is’ owing to the continuity of γένεσις—i.e. each species is always actual, embodied in an unbroken succession of individual representatives. Hence every individual thing in the Lower Cosmos shares in eternity in virtue of its ‘form’. For its ‘form’ is the species, the specific character of all the individual embodiments; and this neither comes-to-be nor passes-away, but exists for ever—i.e. there is no gap between, and no end to, its ‘recurrences’ in its representatives.

Thus the continuity of γένεσις contributes to the perfection of the universe. For by it, and by it alone, the sublunary sphere is linked up with the celestial spheres, since even the γεννητα καὶ φθαρτα, in virtue of this continuity, contribute to, and share in, the divine life which is ‘the best’ or the τέλος of the whole system.

Aristotle touches below (cf. *38b 6–19) on the distinction between the individual eternity of e.g. the stars and planets and the specific eternity of the γεννητα καὶ φθαρτα, and explains it by the difference in their matter.

The reader may be reminded in this connexion that Aristotle, as well as Plato, regarded the impulse of the individual living thing to ‘propagate its kind’ as the expression of its striving after eternity. The perishable things attain to immortality and eternal life, so far as in them lies, in the perpetuation of their species (cf. e.g. Plato, Symp. 207 d ff.; Arist. de Anima 415a 25–b 7).

36b 29. τὸ . . . εἰρηνα. The different meanings of εἶναι and τὸ ὅν are constantly set forth in Aristotle’s works, and specially in the Metaph. (cf. e.g. 1017a 7 ff., 1026a 33 ff., 1028a 10 ff., 1045b 32 ff., 1051a 34 ff. : and above, Introd. § 3). It is ‘being’ in the primary and superlative sense—the substance which is pure ‘form’ or sheer actuality—that Aristotle here seems to have in
mind. But the principle that 'being is better than not-being' no doubt involves also the superiority of τὸ ὑπὸ ὃς ἄληθες to τὸ μὴ ὑπὸ ὃς ψεύδος, and again of the adjectival 'reals' to τὸ μὴ δύνατα, and even of the 'potentially-real' to that which is ἀπλῶς μὴ ὑπὸ.

36b 30–32. τοῦτο . . . γένεσιν. All things in the universe are animated by desire or love for 'the best', i.e. for God; and God is eternal life (cf. * 36a 14–18). But the divine life is reflected in the actions and activities of the derivative things with decreasing intensity and diminishing adequacy in proportion to their increasing distance from God. Thus even the heavenly bodies, though they are free from γένεσις and φθορά and though they are individually eternal, only approximate in their activities to the divine actuality. Their life is not 'the good'. They live in 'actions' or 'series of actions' (πρᾶξεις) by which they approximate to 'the good' more or less closely, and by less or more indirect paths (cf. de Caelo 292a 18–b 25). The things of the Lower Cosmos, as we have seen (* 36b 26–34), are incapable of individual eternity. They cannot 'be', but only 'come-to-be'. Yet, by the continuity of their coming-to-be, they share in the eternity of their species.

In view of Chapter 11, it is important to notice that the uninterrupted linear succession of individuals, which embodies the eternity of a species, is in fact an unbroken repetition of cycles. As Philoponos expresses it, the perishable things attain to specific eternity only 'by imitating the circular movement of the heavenly bodies'. Thus, in order that the human species may be eternally actual, the cycle 'man-seed-embryo-child-youth-man' must be endlessly repeated.

36b 32–34. οὖν . . . γένεσιν. συνέπερν was used intransitively above, 16a 8, 18a 13. Here it is passive. We must understand τὸ εἶναι (b 33) in its widest sense, so as to include the 'being' of all forms and kinds of ὑπὸτα. In b 34 τὴν γένεσιν is, I think, the subject of the verb γίνεσθαι, the words τὸ γ. ἀ. κ. τ. γένεσιν forming a single phrase—'that coming-to-be should itself (καὶ) come-to-be perpetually'.

36b 34. τούτου, sc. τοῦ γίνεσθαι ἀεὶ καὶ τὴν γένεσιν.

37a 1. ἦ . . . συνεχής. The same thing (cf. Phys. 261b 31 ff.) cannot come-to-be and pass-away, increase and diminish in magnitude, alter from hot to cold and vice versa, or move from A to B and back again, without a break in its change at the point where reversal takes place. In that sense, no μεταβολή except
circular motion is 'continuous' (for the meaning of \(συνεχής\), cf. *16\(^b\) 4).

The 'continuity' of \(γένεσις\) and \(φθορά\) in nature, upon which Aristotle insists, is not the continuity of a single \(μεταβολή\), i.e. not continuity in the change of a single thing. What he maintains is that (a) there always are things coming-to-be in nature and \(εο \ iψο\) there always are things passing-away: (b) everything which comes-to-be is thereby committed to a 'vital cycle' which it is bound to complete by passing-away: (c) the endless linear succession of the individuals of a species is the endless repetition of a cycle (cf. *36\(^b\) 30–32): and (d) the course of nature as a whole is a cycle, in which the dominance of \(γένεσις\) as the sun approaches alternates with the dominance of \(φθορά\) as it retreats.

37\(^a\) 1–7. \(διδ . . . ἐστίν\). The reciprocal transformations of Earth, Air, Fire, and Water are due to the conversion of one, or both, of their constitutive elementary qualities into the contrary quality or qualities (cf. B. 4). Of these elementary qualities, the dry and the moist are \(παρ \ excellence\) passive \(\piάθη\) and the hot and the cold are \(παρ \ excellence\) active \(δυνάμεις\): cf. *29\(^b\) 24–26. Hence 'the things which are reciprocally transformed in virtue of their passions and their powers of action' are \(in \ the \ first \ instance\) the 'simple bodies', which Aristotle here adduces in illustration; though the description is no doubt intended to cover the \(σύνθετα\) also, in so far as their \(γενέσεις\) and \(φθοραί\) are ultimately due to the transformations of the \(ἀπλὰ \ σώματα\) of which they all consist (cf. *28\(^b\) 32–33; 34\(^b\) 31 ff.).

Now there are in nature reciprocal transformations of the 'simple bodies' which go on endlessly and continuously. One instance is the transformation of Water into Air and Air into Water, to which we owe the succession of the seasons (cf. *36\(^b\) 6–7). But Aristotle's words here (37\(^a\) 4–6 and *7–15) suggest that he is thinking of a still more comprehensive cycle of transformations, in which Fire is included as well as Water and Air. (Perhaps, indeed, the reciprocal transformation of Water and Air is to be regarded as simply a part of the more comprehensive cycle.) And in fact there is, as we saw (*22\(^b\) 2–3), a never-ending cycle of transformations of the Water, Air, and Fire, which envelop the Earth. Water is always ascending and becoming Air, Air always ascending and becoming Fire: and conversely, Fire is always descending and becoming Air, and Air descending and becoming Water.
In all such transformations there is motion in a straight line, upwards and downwards: but since the motion is reversed—the terminus of the ascent becoming the ἀρχή of a complementary descent and vice versa—it 'returns upon itself', and thus 'imitates circular motion' and is continuous. The upward and downward motions together form a cycle of transformations which inevitably repeats itself endlessly.

37ᵃ 5. πάλιν ... ὄδωρ. Aristotle abbreviates his description of the downward transformation, omitting the intermediate stage, viz. Air.

37ᵃ 7. ἕ ... ἐστίν. The principle is of universal application, though it is here inferred from the εἴθεια φορά upwards and downwards of Water, Air, and Fire. Hence L's reading (εἴθεια τούτων φορά) must be rejected as a blundering correction.

37ᵃ 7-15. ἃρα ... τεταγμένη. The sun's annual movement, by which it alternately approaches and retreats, causes the alternate ascent and descent of Water, Air, and Fire. They are thus brought into contact, Water with Air, Air with Fire, Fire with Air, and Air with Water: and the effect of this contact is the action-passion, and the reaction and re-passion, of the contrary constitutive elementary qualities, from which the transformations of these 'simple bodies' result (cf. e.g. *23ᵇ 12-22, *34ᵇ 20-30).

Apart from this continuous reciprocal transformation of the 'simple bodies', which is thus due to the 'dual motion', the Lower Cosmos would long ago have suffered disruption. For each of the 'simple bodies' would long ago, in the infinite lapse of time, have reached its 'proper place'—the place allotted to it by the Order (ὡς 15 τεταγμένη, cf. *36ᵇ 10-15)—and have remained there quiescent and isolated. Hence, if it were not for the sun's 'dual motion', all interaction between the 'simple bodies', all chemical process, all formation and dissolution of compounds—in short, all energy and life whatever—would have vanished from nature.

37ᵃ 8. τινές. It is not known who these people were.

37ᵃ 9. ἐν ... χρόνῳ. The physical universe 'contains and comprehends within itself infinite time' (de Caeo 28ᵃ 29: and cf. below, *37ᵃ 22-25). Hence whatever is true of the 'simple bodies' as they exist in the Lower Cosmos now, must be compatible with their having existed through an infinite antecedent time.
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37α 10. ὡ ... σῶματα. The problem is to explain why the simple bodies have not long ago got entirely separated from one another. Hence, though such an isolation of the simple bodies would entail also the disruption of the compound bodies, we must reject J's tà σύνθετα σῶματα as a correction due to misunderstanding.

37α 15–17. διότι ... εἰρημένων. This little epilogue marks the completion of the treatise on the causes: cf. * 35α 24—37α 33.


37α 17–33. ἐπει ... χρόνον: a note to confirm Aristotle's theory that the revolution of the outermost sphere is the efficient cause of the continuity of the sun's annual movement, and therefore (mediately) of the continuity of the alternation of γέωργιος and φθορά.

The note takes the form of (i) a gigantic protasis (37α 17–31), breathless indeed and rather loose in syntax, but concentrating into a number of distinct praemissa the results of Aristotle’s discussions in Phys. Θ, so far as they are relevant to his present purpose: and (ii) an apodosis (37α 32–33) which (a) reaffirms in a more precise form the thesis asserted at 36b 2–3 (τῆς μὲν οὖν συνεχείας ἡ τοῦ διόν φορὰ αἰτία), leaving us to infer that the revolution of the ‘body’ which constitutes the outermost sphere is mediate the cause of the continuity of the alternation of γέωργιος and φθορά, and (b) answers a question, which was suggested by one of the praemissa (37α 22–25), but is not otherwise connected with the present inquiry.

The praemissa may be summarized thus:—

(i) If there is to be continuous eternal movement, there must be a single, unmoved, ungenerated, and unalterable initiating cause (a 17–22): (ii) there must be continuous circular movement because of the continuity of time (a 22–25): (iii) the continuity of the movement depends upon the continuity of the body which is moved (and not primarily upon the continuity of the ‘path’ of its movement); but the continuous moving body must move in a circle if it is always to remain continuous with itself throughout its movement (a 25–31).

37α 17–22. ἐπει ... ἄρχην. Cf. Phys. Θ. 255b 31—260a 10: Metaph. 1072a 19—1074b 14. The reference here and below (cf. a 18 πρῶτερον, a 25 ἐν τοῖς ἐν ἄρχην λόγοις) is to the Physics, the first in the series of Aristotle’s works on natural philosophy: cf. Introd. § 10.
37\(^a\) 22-25. συνεχόσ ... διωρίσθη. On Aristotle's conception of time, cf. *Phys. 217\(^b\) 29—224\(^a\) 17, 251\(^b\) 10 ff.; *Metaph. 1071\(^b\) 6-11.

Time and change reciprocally imply one another. There can be no change which is not in time, no time without change, and no perception of time without the perception of change.

'Continuity' and 'succession' are primarily spatial and characterize magnitudes (cf. \(*\) 16\(^b\) 4). But the change of a continuous magnitude, so far as the latter preserves its continuity, is itself 'continuous': and exhibits 'succession' ('before' and 'after') in a sense analogous to the 'succession' (order of position) in the parts of the magnitude. From this continuity and succession in change, the continuity of time and its order of 'before' and 'after' are derived.

We recognize time when we perceive 'before' and 'after' in a change: i.e. when we perceive a change now, and again now, and recognize that the 'nows' are two and separated from one another by an interval different from both. Time, in fact, is that which is limited by the 'now': and that which is limited is change qua numerable or measurable. Hence time may be defined as ἀριθμός κατά τὸ πρῶτον καὶ ὄστερον: but by ἀριθμός in this definition we must understand τὸ ἄριθμούμενον or τὸ ἄριθμητὸν, and not τὸ ἄριθμούμενον (cf. *Phys. 219\(^b\) 1-8).

Time is one, continuous, uniform in its flow, and without beginning or end. Ultimately, therefore, the change of which it is a πᾶθος—i.e. of which it is the ἀριθμός or the μέτρον in the sense explained—must itself be one, continuous, uniform, and without beginning or end. But the only kind of change, which can satisfy these conditions, is circular motion: and the only change, which in fact satisfies them, is the revolution of the outermost sphere (cf. \(*\) 36\(^a\) 30). Time therefore implies, and is implied by, the eternal uniform revolution of the πρῶτος οὐρανός. It is that in it which is 'numerable' or 'counted'. It 'measures' it, and is 'measured' by it.

37\(^a\) 23. χωρίς. FHVJ read ἄνευ, which E recognizes as a variant. But it is difficult to see why ἄνευ should have been corrected into χωρίς, whereas χωρίς may have been altered into ἄνευ owing to the scribe's reminiscence of *Phys. 218\(^b\) 33 and 219\(^a\) 1.

37\(^a\) 25-31. σωσικα ... ἂεί σωσικές. Continuity is predicable primarily of magnitude (cf. \(*\) 37\(^a\) 22-25): and μέγεθος, in its fullest and most proper sense, is three-dimensional, i.e. σῶμα (cf.
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e.g. *de Caelo* 268a 20—24). Hence the continuity of a movement is determined primarily by the continuity of the moving body. But 'amongst continuous bodies which are moved, only that which is moved in a circle is "continuous" in such a way that it preserves its continuity with itself throughout the movement' (*a* 30—31 τούτου . . . δεί συνεχές). Hence 'that in which the movement occurs'—i.e. the path of the movement—contributes, by its continuity, to the continuity of the movement.

37a 26—27. πότερον . . . πάθος; Aristotle is here concerned only with ἕφα. But the general doctrine, which he is applying, was based in the *Physics* on discussions covering all forms of μεταβολή. Hence he illustrates the 'sphere' (τὸ ἐν ἑ) of ἁίνησις by πάθος (which is the 'sphere' of ἀλλοίωσις: cf. e.g. *Phys.* 262a 2—5) as well as by τότος.


37a 28—30. πῶς . . . ἐξει. The result of this parenthesis—viz. that the continuity of the 'sphere' of ἕφα (though not of any other kind of ἁίνησις) contributes, as a secondary condition, to the continuity of the movement—is utilized in the continuation of the main sentence. For it is only a circular 'path' which is continuous: hence continuous movement implies a continuous body moving in a circle.

37a 30—31. τούτου . . . δεί συνεχές. τούτου (sc. τοῦ κυκλικόν η συνεχούς) is a partitive genitive. For a similar instance of the partitive genitive in the singular, cf. *Eth. Nic.* 1127a 7 and Bywater, l.c., note on 1149a 16.

τὸ κύκλῳ, sc. κυκλικόν: cf. e.g. *de Caelo* 270a 33 (τὸ κύκλῳ σώμα), 289a 30 (τοῦ κυκλικοῦ σώματος). Philoponos wrongly supposes the phrase to mean τὸ κυκλοτερὲς σῶμα. When Aristotle refers to the shape of the revolving body (i.e. of the ὀψανός), he speaks of it as σφαιροειδές: cf. e.g. *de Caelo* 286b 10—287b 21.

37a 33. ἡ . . . χρόνον, sc. συνεχῆ τοιεῖ.

B. 11

37a 34—38b 19. Ἑπεὶ . . . εἶναι. With the treatise on the causes Aristotle has completed the task which he originally proposed to himself (cf. *35a 24—37a 33*). The present chapter, therefore, is to be regarded as an appendix. The bulk of the
chapter (37a 34—38b 6) explains in what sense, and under what conditions, the things which come-to-be are 'necessary'. Aristotle establishes that any continuous coming-to-be, which is cyclical, exhibits 'absolute' as well as 'hypothetical' necessity. The remainder of the chapter (38b 6–19) briefly explains why γένεσις in some instances is cyclical, whilst in other instances it proceeds (or appears to proceed) in a straight line onwards without reversion.

There is a good exposition of 37b 14—38b 19 in Alexander, ἀπορίας καὶ λύσεως, iii. 5.

37a 34—b 3. Ἐπεὶ ... γενέσθαι: formulation of the main problem of the chapter. Wherever there is continuous change of any kind, there must be consecutiveness. For a continuum (τὸ συνεχὲς) is that kind of consecutive series (τὸ ἐφεξῆς), whose terms are (a) immediately next to one another (ἐξόμενα) and moreover (b) so closely connected that their limits are not merely ἄμα, but coalesce into one: cf. *16b 4. Hence the continuity of γένεσις implies a succession of γεγομένα such that γεγομένον follows 'consecutively', and without any interval, upon γεγομένον. The problem then arises:—Is the coming-to-be of every member of this succession contingent, so that every one of them might fail to come-to-be? Or is the coming-to-be of any of them necessary in the sense that some member (or members) will be of necessity?

37b 3—9. δὴ ... ἐσται. The question is whether any of the γεγομένα will be of necessity. For that the coming-to-be of some of them at any rate is 'contingent', is evident (a) from the different meaning assigned by common usage to the terms μέλλει and ἐσται (b 3–7: cf. also Parva Naturalia 463b 28–31) and (b) from the fact that the being of some things is contingent, which implies a corresponding contingency in their coming-to-be (b 7–9).

The argument in b 3–7 is an appeal to linguistic usage; and therefore I prefer to alter μέλλον into μέλλει with Φe, instead of adopting Bywater's neat emendation (τὸ δ ἐσται) of the reading in the manuscripts (τὸ ἐσται).

37b 7—9. ὅλως ... ἐσται. Aristotle is appealing to a general distinction (ὁλως) within τὰ ὅντα, which is a fundamental principle of his philosophy. The omission of τὰ (b 9) makes the argument slightly more cogent. οὖτως ἔστι, sc. ἐνδέχεσθαι καὶ μὴ γενέσθαι. τοῦτ', sc. τὸ γίνεσθαι.

37b 12—13. οἶον ... ἐνδέχεσθαι; The problem is:—Are all γεγομένα contingent (i.e. at most conditionally or hypothetically necessary), or are some—e.g. the occurrence of the solstices—
unconditionally or absolutely necessary? If the solstices are absolutely necessary occurrences, they correspond to the necessary δύνατα which are δύνατα μή εἶναι (b 11–12): they will therefore be δύνατα μή γενέσθαι, i.e. it will be impossible for them to be μή δύνατα γενέσθαι or μή ἐνδεχόμενα γενέσθαι. They cannot ‘fail to be able to occur’: for, if so, their occurrence might not even be actual, and a fortiori it would not be necessary.

This interpretation of b 13 (οὖχ οὖν τε μὴ ἐνδεχόμενα γενέσθαι, sc. τροπὰς γενέσθαι) is consistent with the doctrine of de Interpr., chapters 12 and 13. It is false, we must remember (l. c. 22b 29–33), to say of ‘the necessary’ that it is μή δυνατῶν εἶναι, as well as to say of it that it is δυνατῶν μὴ εἶναι.

Bonitz, perhaps rightly, places a mark of interrogation after γένεσθαι (b 12), and reads ἀρα for ἄρα in b 13.


If, in a temporal sequence, A is the cause of an effect B, B’s occurrence implies the prior occurrence of A. Hence from the being of B we can infer that A must have occurred: and unless A occurs, B will not occur. But we cannot, from the occurrence of A, infer that B will occur. The nexus, therefore, so far is not reciprocal. B is not necessary at all, and A is only εἰ ὑποδείγμενος ἀναγκαῖον—i.e. necessary, if B is to occur, or presupposed in the being of B.

Suppose, however, that B’s occurrence is unconditionally or absolutely necessary, whilst, whenever B occurs, its being will presuppose the occurrence of A. Under these conditions, the nexus is in a sense reciprocal. For (as before) B’s occurrence implies the prior occurrence of A. And, if A occurs, B will occur—because B in any case must occur and, when it occurs, its occurrence will follow upon the prior occurrence of A. Here, therefore, the absolute necessity of B extends itself, as it were, over A, since A’s occurrence is presupposed in that of B.

The validity of the latter part of this argument clearly depends upon the meaning which Aristotle gives to ‘absolute necessity of occurrence’; and that is explained below, 37b 29—38a 5. The effect of that explanation is to restrict ‘absolute necessity of occurrence’, and the reciprocal necessary nexus, to the members of eternally-repeated cycles of γενέσθαι. Moreover, even in such cycles (cf. * 38b 6–19), ‘absolute necessity of occur-
rence' attaches to the members of the cycle only qua embodying an identical type or species, not to them qua individuals severally excluding one another.

37\textsuperscript{b} 25—38\textsuperscript{a} 17. \(e\iota\ldots \kappa\upsilon\kappa\lambda\omega\). No member of a rectilinear succession of \(\gamma\epsilon\gamma\nu\omicron\omicron\alpha\nu\), whether infinite (\(25-29\)) or finite (\(29-33\)), can exhibit 'absolute necessity of occurrence'. If a thing is to come-to-be with 'absolute necessity', it must come-to-be always and invariably: and that is possible only if it is a member of an eternally-repeated cycle of \(\gamma\epsilon\gamma\nu\omicron\omicron\alpha\nu\) (37\textsuperscript{b} 33—38\textsuperscript{a} 5). Hence 'absolute necessity of occurrence' and 'reciprocal necessary nexus' (which depends upon it) are to be found only in cyclical \(\kappa\upsilon\eta\sigma\rho\upsilon\sigma\iota\varsigma\) and cyclical \(\gamma\epsilon\nu\epsilon\sigma\tau\varsigma\iota\varsigma\) (38\textsuperscript{a} 5—17).

37\textsuperscript{b} 25—29. \(e\iota\ldots \gamma\epsilon\nu\epsilon\sigma\theta\alpha\iota\). The reading of \( \varepsilon\iota\gamma\omicron\iota\varsigma\) in \(26\), which I have adopted (except that I have substituted \(\tau\delta\epsilon\) for \(\tau\delta\epsilon\)), is given as a variant by Alexander (\(\acute{\alpha}\pi\omicron\iota\acute{\iota} \alpha\kappa\alpha\omicron \lambda\upsilon\sigma\epsilon\iota\varsigma\), ii. 22, pp. 71, 72) whose interpretation I have followed.

In a causal succession of events, proceeding from the present onwards in a straight line \textit{ad infinitum} (\(25 \epsilon\iota\varsigma \acute{\alpha}\pi\epsilon\iota\rho\omicron\ldots \epsilon\pi\iota \tau\delta \kappa\alpha\tau\theta\omega\)), there can be no member whose occurrence is absolutely necessary. For take any one of the events subsequent to the present, e.g. \(P\) (\(26 \tau\omicron\nu \omicron\iota\epsilon\omicron\tau\omicron\rho\omicron \tau\delta\epsilon\)). \(P\)'s future occurrence is necessarily \textit{presupposed} by (i.e. is contingent upon) the future occurrence of the still later next event, \(R\); that is contingent upon the future occurrence of the still later next event, \(S\); and so on \textit{ad infinitum} (\(27-28 \acute{\alpha}\delta\iota\ldots \gamma\epsilon\nu\epsilon\sigma\theta\alpha\iota\)). Hence the occurrence of \(P\), and of every subsequent member of the infinite succession, is \textit{contingent} (\(\epsilon\iota \omicron\nu\theta\omicron\beta\omicron\omicron\omicron\omicron\omicron\omicron \acute{\alpha}\acute{\alpha}\gamma\kappa\alpha\acute{\alpha} \alpha\omicron\)) and not \textit{absolutely necessary} (\(\acute{\alpha}\pi\lambda\omega\acute{\alpha} \acute{\alpha}\gamma\kappa\alpha\acute{\alpha} \alpha\omicron\)).

If \(P\)'s occurrence were absolutely necessary, \(P\) would be an originary source (an \(\acute{\alpha}\rho\chi\iota\)) of the whole succession and would invest all the preceding events with absolute necessity (cf. \(37\textsuperscript{b} 14-25\)). But the succession is \textit{ex hypothesi} \(\acute{\alpha}\pi\epsilon\iota\rho\omicron\), and there can be no \(\acute{\alpha}\rho\chi\iota\) in what is \(\acute{\alpha}\pi\epsilon\iota\rho\omicron\).

The \(\acute{\alpha}\rho\chi\iota\), which Aristotle denies to this succession proceeding \textit{ad infinitum} in the future (cf. \(28-29\)), is in fact, as Alexander rightly insists, a \(\tau\epsilon\lambda\omicron\). It would be the genuine 'first' or 'primary determinant' of the temporally-preceding events, as the 'end' in which they culminate, or the final cause to which they are the necessary means.

37\textsuperscript{b} 29—38\textsuperscript{a} 3. \(\acute{\alpha}\lambda\lambda\alpha\ldots \acute{\alpha}\nu\acute{\alpha}\gamma\kappa\eta\varsigma\). Even in a \textit{finite} rectilinear
causal succession, we cannot attribute absolute necessity to the occurrence of the last member; and therefore none of the members is absolutely necessary, but all are contingent (cf. *37b 14–25). Thus, e.g., in the building of a house, the succession begins with the preparation of the clay or the shaping of the stones, proceeds through the laying of the foundations, and terminates in the coming-to-be of the house (37b 31–33; cf. b 14–18 and Post. Anal. 95b 32–37). But the coming-to-be of the house is not ἀπλῶς ἀναγκαῖον. For, if it were, it would have to be ἄει. What is ἐς ἀνάγκης ἀπλῶς, cannot possibly not-be: i.e. its being is eternal. Similarly, if the γένεσις of anything is ἐς ἀνάγκης ἀπλῶς, the γένεσις cannot possibly fail: i.e. the γένεσις is eternal, or the thing is ἄει τῇ γενέσει (37b 33–38a 3: cf. e.g. Eth. Nic. 1139b 23–24, de Part. Anim. 630b 21–640a 9). But it would be absurd to contend that 'house' is ἄει τῇ γενέσει. When the foundations have been laid, the succession may nevertheless remain uncompleted, since on any given occasion a house ἐνδέχεται μὴ γίνεσθαι (37b 32–33. ὅταν γὰρ γένηται, sc. θεμέλιοι. τοῦτο, sc. τὴν οἰκίαν).

In b 33 I have retained τό, although it rests only upon ΛΦ, because the argument gains in clearness and force by its retention.

38a 5–17. ἀνάγκη...κύκλῳ. The argument is in substance clear, though the text seems to have got disturbed at a 10.

Coming-to-be must either go on ad infinitum, or come to a stop, i.e. be finite. If infinite, it cannot be eternal. Since, therefore, it is to be eternal (as was shown in B. 10), it must go on ad infinitum. If so, there are two alternatives. It must either (i) proceed ad infinitum in a straight line or (ii) return upon itself in a circle, i.e. form endlessly-repeated cycles. Now the first of these alternatives (a 6 τοῦτων refers to the immediately preceding words, viz. καὶ εἶναι τῇ ζῇ τῇ κύκλῳ) is impossible. For (cf. *37b 25–29) in an infinite rectilinear succession of γενόμενα there can be no ἀρχή, and therefore no absolute necessity, and therefore (cf. preceding note) no eternity.

Hence the second alternative alone remains.

38a 8. λαμβανομένων. The genitive depends on ἀρχήν. 'There can be no ἀρχή of the members of an infinite rectilinear succession, whether they be taken "downwards", i.e. as if they were future events, or "upwards", i.e. as if they were past events.'

38a 9–10. ἀνάγκη...εἶναι. The meaning appears to be:
'Yet coming-to-be must have an originative source if it is to be necessary and therefore eternal, nor can it be eternal if it is limited.' But the text at a 10 is hopelessly corrupt. It seems probable that the corrupt words μήτε πεπερασμένης οὐσίας conceal μήτε ἐπὶ πέρας ἔχουσις (cf. E), or μήτε ἐπὶ πεπερασμένης εἰδήσεως (cf. Φε, p. 312, l. 1): but a clause must have dropped out between ἄρχῃν and μήτε.

38a 10–17. διὸ . . κύκλῳ. The only remaining alternative (* 38a 5–17) is that the γένεσις should be cyclical.

In a cyclical succession with e.g. four members (we can take any number we like, for the principle is not affected: cf. a 13–14 οὕδεν . . . πολλὰν) we shall have A necessarily succeeded by B, B by C, C by D, and D by A: and, conversely, D necessarily presupposing C, C necessarily presupposing B, B A, and A D. Whichever way we look at this cyclical succession, it must repeat itself endlessly and continuously (* 13 καὶ . . . συνεχῶς). If e.g. the earth be moistened, vapour must rise: if vapour rises, cloud must form: if cloud forms, rain must fall: and if rain falls, the earth must be moistened, and the cycle has recommenced. And, conversely, if rain falls, cloud must have formed: if cloud has formed, vapour must have risen: if so, the earth must have been moistened: if so, rain must have fallen:—and so on continuously and ad infinitum (cf. Post. Anal. 96a 2–7).

38a 17–b 5. ταῦτα . . ὀπὸ τοῦτων. The conclusion just established (ταῦτα, cf. a 14–17) is logically concordant with the eternity of the revolution of the ὀψανός which Aristotle had proved on other grounds in Phys. Θ. 7–9. For since that is circular and eternal, it is also necessary: and the movements which are parts of it (e.g. the movements of the inner concentric spheres), or dependent upon it, will be necessary, eternal, and circular also. Thus the outermost sphere, which is eternally being moved in a circle, eternally sets the inner spheres moving in circles (b 1–3 εἰ . . . κύκλων). Hence the sun is eternally moved in a circle in a determinate manner (b 3 κύκλῳ ὀδί, sc. in the ecliptic) and this solar motion causes the eternal cyclical change of the seasons. Finally, on the latter depend the eternally-repeated cyclical vital periods of the living things on and about the earth: cf. * 36a 14–18, * 36b 6–7, * b 8–10, * b 10–15.

In b 3 I read κύκλῳ after ἥλιος with EHJL. The 'being of the upper φορά' is of course equivalent to 'the being of the movement of the outermost sphere'—a movement which is circular,
as Aristotle had just reminded his readers \((38^a \text{18}-\text{19})\). ὁδὲ in
the same line, I take to refer to the special nature of the circular
path of the sun's annual movement, viz. its inclination to the
equator, on which the alternation of the seasons depends. Bonitz
reads κύκλῳ, ὁ ἔλαιος ὁδὲ (sc. κύκλῳ) with F: and in \(b\) 4 he proposes
\(ὦττος) ὀττως (cf. J). Neither of these readings appears to be
necessary, though both are tempting.

\(38^b \text{6-19}. \) τι . . . ἐνα. Aristotle here formulates \((b \text{6-11})\) and
solves \((b \text{11-19})\) a subsidiary problem: cf. \(37^a \text{34}-38^b \text{19}.
Why do some γενντὰ καὶ φθαρτὰ form cyclical successions, whilst
others apparently do not? Why e. g. is there obviously a cycle in
which rain \((b \text{6 ἀθανα, 'showers'})\) produces cloud, cloud rain, and
rain cloud once more \((cf. * 38^a \text{10-17})\): whereas the succession
of the γενντεῖς of men and animals appears \((b \text{11 ἐκουκεν})\) to be
rectilinear?

The solution depends on the recognition of a difference in the
sense in which 'the same' member recurs. For (i) in some cycles
the same individual eternally recurs: whilst (ii) in others no
member recurs individually the same, but the same species, or
specific form, is eternally represented in the succession of its
perishing individual embodiments. Thus (i) the heavenly bodies—
e. g. the sun and the planets—have a 'being' or 'substance'
\((b \text{14}, \text{19 ὀνόσω})\) which is free from all forms of change except
motion. Each of them is the unique singular representative of
a species \((cf. \text{Introd. § 10})\) and persists as an eternally-identical
individual, returning in eternally-repeated revolutions to the same
point on its orbit. But (ii) the γενντὰ καὶ φθαρτὰ (e. g. the
individual animals and men, and the individual clouds and
showers of rain) have a 'being' or 'substance' which is subject
to φθορά. As individuals, therefore, they come-to-be and pass-
away once and for ever. Nevertheless rain and cloud eternally
recur in a cycle: though the cloud, from which this shower falls,
is only specifically (not individually) identical with the cloud
to which this shower gives rise. Similarly there is a cycle in
the endless rectilinear succession of the individuals of an animal
species. The individual animals, indeed, like the individual
clouds and showers, occur once and vanish for ever: but their
'form' or species exists eternally in the sense that it 'recurs'
without interruption and without end in its individual embodiments
\((cf. * 36^b \text{26-34}, * b \text{30-32}, * 37^a \text{1}, * 37^b \text{14-25})\).

\(38^b \text{15}. \) ἦ . . . κινωμένω. For κινησις is an adjetival and
depends—like a πάθος—upon the substance, or subject, of which it is predicated: cf. e. g. Metaph. 1070b 36—1071a 2.

38b 18-19. εἶ...εἶναι. As Philoponos rightly explains, this is intended to meet a criticism which might be made by a follower of Empedokles. For Empedokles (cf. *15a 4-8) insisted that Earth, Air, Fire, and Water were eternal and indestructible. According to him, therefore, their οὐσία is ἄφθαρτος: so that, even if they recur as individually-identical members of a cycle, this does not conflict with the solution which Aristotle has just given.
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+ = recurrit non semel in contextu

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'Eμεδεδόκησ, Λευκίππος, Δημόκριτος 14*12 sqq.—νὴν οἴκειαν φωνὴν ἠγνώρισεν 14*13 —τὸ δομομηρί

τοιούτῳ τίθητον 14*19 οἷον περὶ 'Αναγαγόραν ορρ., τοῦ περὶ Ἐμεδεδο-

κέλα 14*25

ἀναπληρωτικὸς 29*34, 30*1 + ἀνεπιστήμων 19*17 ἄνθρωπος 19*25; 20*20; 22*17; 24*16 +; 33*7 + ἄρρητοι καὶ

ξα οὐκ ἀνακαλμένους εἰς αὐτοὺς 38*8 ἄνυσος 36*5 τὰ ἀνωμομερή ορρ. τὸ ὄμοιορρ.

21*17 + ἄνυμοι 22*4; 24*4 + τὸ ὄμωμα καὶ τὸ διάφορα 23*6 ἀντικεῖθαι 30*16 + τὰ ἀντικεῖμενα 23*8; 24*7 ἀντιστρέψεις 28*19; 37*24; 38*11 ἀντιτίθεναι 23*18; 30*21 ἀνῶν φέρεται 34*1 + ἀνὰ ορρ. κάτω (μενεσθα) 33*28 + — ὁς ἐπὶ τῶν γενομένων ορρ. κάτω ὡς ἐπὶ τῶν ἐσομένων 38*9 ἢ ἄνω φορά

38*3 τὸ ἄνω καὶ τὸ κάτω καὶ τὰ τοιαῦτα τῶν ἀντικειμένων = τόσον διαφορά πρότερ 23*7 τὸ ἄνωθεν ορρ. τὸ κάτω, τὰ κάτωθεν (τοῦ Π) 33*14 ἀναμαλα 36*30 ἀνάμολος κινήσις 36*5 — ὑλή 36*21 ἀνώμαλοι γενεσίς 36*22 ἄδορας 16*33; 24*30; 25*30 ἄδορας 20*30 ἀπάγεις 36*18 ἀπαθής 24*33; 24*13; 26*1; 27*1 ἀπάθη ορρ. παθητικά (σκ. τὰ ποιη-

τικὰ) 24*5 + ὥσα μὴ ἔχει τὴν αὐτήν ὑλή, ποτε ἀπάθη ὑντα 24*34, cf. 28*21 ἀπαντοῦς 18*25 ἀπειρία 16*6 ἀπειροι 14*18 +; 15*20 +; 25*15; 32*14; 33*7 +; 37*9 — ὅρρ. πεπερασμένοις 18*19 — ὅρρ. μέχρι του (σκ. ἡ ὑρφι) 16*30 ἀπειροι κατ' ἐνέργειαν ορρ. δυνάμει ἐπὶ τῆν διαίρεσιν 18*21 τέ ἀπειρον 37*28 — καὶ τὸ περιέχον 33*25 τὸ ἀπειρον τούτο, δ λέγουσι τινὲς εἶναι τῆν ἀρχήν 20*12 ἀπειροι ἔδοξα 20*10 — ἐναποτίθεται 33*14; 33*7 + ἀπειροι ὁρίσθαι σχήματι (ορρ. ὄφισινοι) 25*27 εἰς ἀπειροι οὐκ οὖν τε λέναι 32*30
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ārχαί 14b 16 (cf. 14a 11 et b. 4); 30b
11; 35a 26; (coni. στοιχεῖα) 29a 5
āρχη = initium disputations 15b 24;
22b 26; 25a 1; 26b 30; 38a 11 ē
ārχη 16b 18; 21b 1; 27b 32 ēn
ārχη 27b 7; 37b 25
h āρχη πρώτη tōn aithion 24b 27 ār-
χai kai aitai tōn συμβαίνων 26b
35 aithetho σαυματω ārχai 20b 7
(cf. b. 4); (coni. ἐβη) 29b 9 ē
ārχη τῆς κινήσεως 21b 6 + 24b 27;
34b 14, cf. 34a 9 et 37b 22 aitia
δεν tōn ἀρχην εἶναι φαινέ τῆς
κινήσεως 18a 1 ēτι δεī h μὲ
iatrapē kai ērχη (sc. poiōn)
opp. tō αἰτοῦ tō ἀν ἑξαθάντων 24b
h ēκινητηro ārχη 18b 5, cf. διά τὸ πόρρω
tās āρχης ἀρίσταται 36b 31
aσάματος coni. āμεγήθη 20a 30 ēs
aσάματον ἐφαρμὸν tō sūma
26b 16 aσωμάτων āμεγήθατα 21b 5 +; 21b 16
aτίμε 30b 4.
aτομα μεγήθη 16a 11; 16b 32; 17a 1
eis aτoμα kai ἐς ατόμων 17a 13
aυξὸs 22b 28 + meiōs aυξὸs 22a 21
aυξάνει intrans. 21b 31; cf. fortasse
πιερ γάρ aυξέ τῷ πῦρ 33b 2 aυξέ
trans. 22b 22; (apud Empedoclem)
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35 — kai āμήθαι 14a 15 +; 27b 23 —
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περί μεγέθος (metatable) 20a 14 περί
aμήθαι 20b 8 — 32b 33 aμήθαι
dist. γένεσι 20b 10 sqq.; 22a 4—16
— dist. τροφῆ (= nutritio) 22b 20—28
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aμήθεσικον 22b 12
ἀπό ταὐτοματον καὶ ἀπὸ τόχης 35b 6
ἀπαρέτος 15b 12
ἀφαρη 18b 21
ἀφανέται 28b 13
ἀφή = contactus 23b 22 +; 28b 26
— coni. διάρεισ et stigmē 16b 7
— deī mia dōan tōn 16b 6 — h ἐν
τῶν φυσικῶν 3a 34, kατά τῆν ἀρήν
25b 32; 26b 32 diὰ tōν κενοῦ kai
diὰ tēn ἀρήν 25b 31 περὶ ἀρήν
22b 29 — 23b 34 ἀφαί coni. stigmā
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Empedocles sex ponit στοιχεῖα, h.e. quatuor elementa et duas motrices causas 14*16, 17 — quatuor ponit στοιχεῖα 14*26; 29*3; 30*20 — negat generationem elementorum 15*4, generat tamen e Sphaero 15*7 sqq. examinantur Emp, sententia de generatione et alteratione 14*4 sqq.; de poris 24*33 sqq. (comp. cum Lecipici doctrina 25*5 sqq.); de motu 33*22 sqq. tota eius doctrina examinatur et reprehenditur 33*16 sqq.

τὰ ἐμποδον 23*27
ἐμποσθεὶ 35*21
ἐμποσθεὶς 32*31 τὸ ἐμποσθεῖν 33*6

τὸ ἐν (καίεται) 37*26 +

ἐναντιολογία 23*7

τὸ ἑναντίον 14*26; 19*20 +; 19*22; 24*2 +; 29*31; 30*31; 31*22—32*21; 34*13 +; 35*8 τῶν ἑναντίων αἰτία τάνων 36*31; 36*9 τὸ ἑναντίον καί τὰ μεταξὺ 24*8, cf. 10*12 εἰς τούαντον (ἡ γένεσις) 24*12 +, (μεταβάλλειν) 32*14 τούαντον (ε καταρισμό) 33*30; 34*14 ἑναντίος λέγειν 14*24

ἐναντίοτης 32*34—33*6 μετ' ἑναντίοτητος 32*23 ἑναντίοτηται ἄψευσι 32*14; 33*7 +

ἐναντίοις 19*21; 20*51; 23*9; 29*9 +; 31*15 — αἰσθητή 29*10, ἀπῆς 29*11 — coni. διαφοράς 32*10, cf. 29*17 ἡ μεταβολὴ τῆς ἑναντίωσις 19*21 ἑναντίωσιν ἔχειν 28*32; (dist. ἑναντίον εἶλαι) 23*30 κατ' ἑναντίον διαφέρειν 29*10 μετ' ἑναντίωσιν 29*26

ὅτι ἑναντίους ὑπερείραι τὸ δύναμεν σῶμα αἰσθητῶν 29*34 — ὑπὲρ μεταβαλλοντος 29*12 αἰ ἀναπέδιλτον ἑναντίωσις 29*13 ἑναντίωσις κατὰ τὴν ἀφρὶν enumerantur 29*18 sqq. ἐνδελεχίας 36*32 ἐνδελεχίας 36*17

τὸ ὅτι ἐνεκα λοιπῶν ἐπικαλεῖται 24*14 ὡς δὲ τὸ ὅτι ἐνεκα (αἰτίων ἔστιν) ἡ μορφὴ καὶ τὸ ἐδός 35*6 ἐνεγειρέει 27*29 — opp. δύναμει 27*23 + κατ' ἐνεργείαν opp. δύναμει 18*20

ἐναντίος 36*14

ἐνοικεί 16*6

ἐντελεχεία 20*15 — μεγέθους opp. ἐνεγειρέει ὅλη 20*33 ἐντελεχείας 16*24; 17*26; 20*11 +; 34*13 — opp. δύναμει 16*21; 17*17 +; 20*13 +; 20*26; 22*6 +; 26*31; 34*9 ὅπ' ἐντελεχείας 20*21

ἐννάρχεις 16*32; 20*34; 27*20; 31*4 +; 34*33; 35*4 + ἐνώσις 28*22

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ἐξαιρεθη 35*2

ἐξάναι 20*13

(ἐξίς) ἔξει 24*17 + αἱ ἔξεις coni. τὰ πάθη 27*10

ἐξιστάναι αὐτῷ τῆς φύσεως 23*28

ἐξιστάναι τούτου ὁμοία... 25*20

ἐξω Δημηκρίτου 15*34

ἐπαίνει 33*20

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ἐπίσεις (Platonis in Timaeo) 15*30 +; 25*26; 29*22 + ὁ δύαστερα 25*33; 26*22 εἰς ἐπίσεις διαμερίσθηκεν 16*2 μέχρι ἐπιπέδων διάσημος 15*31 — πολείοισιν τὴν ἀνάλυσιν 29*22

ἐπιπλογῆς opp. εἰς βάθος 30*17 παρὰ τὸ ἐπίπολον 15*34

ἐπιστήμη 18*24; 27*18; 35*21 + ἐπιστήμων 18*35; 19*10 + ὁ ἐπιστήμων 35*22
tὸ ἐπιστήμων opp. τὸ ἀνωτῶν 18*23 ἐπιτίθεται 22*15

ἐπιστήμων 35*11

ἐπιχείρει 22*9

ἐργον 18*6; 21*1 ἐτέρας ἐργον ἐστὶν διήρθης 34*15 φόσας (σ. δ. Πλάτων). ἐιλαὶ ὑποκείμενοι τι... οἷον ἡ ἐργοῦ τοῦ ἐργοῦ τοῦ χορεύου 29*17 τὸ ἐσχάτον πρὸς τὸ κινοῦμεν καὶ τὴν γένεσιν opp. τὸ πρῶτον κινοῦν 24*28 τὸ ἐσχάτον αὐτῷ κινοῦμεν 24*28 τὸ ως ἐσχάτον καὶ ἀποτέμον τὸ ως ἐργοῦ (ποιοῦν) 24*4, cf. b. 27 et al. 24*33 ἑκέναι δὲ ὅτι ταύτα (sc. στιγματι καὶ γραμμαῖ) ἐσχάτα ἡ ὑπὸ 20*16 τὸ ἐσχάτα 23*4 + εἰς τὸ ἐσχάτα διαλύεται opp. ἐνω ὧν πρῶτον υἱοῖν εἶχεν 25*19 τὰ ἐσχάτα (in serie elementorum) 32*12

ἐν ἐνέπιροι 16*18; 20*28; 29*27; 37*18 τὸ παντελῶς ἐτέρων καὶ τὸ μηδέμη ταύτων 23*24 τὸ ἐτέρα καὶ διαφέροντα 23*12 τὸ εῦ καὶ τὸ ἄγαθον 33*19
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ēdlogon 23b19; 24a9; 35a16 μαλ-
λων ἑδλόγον 15b32 πολύ ἑδλογώ-
teron 36a20 ἑδλόγον 26a26; 30b6; 36b27; 38d17 εὑρήμοστος 28a35; 28b3 + 29b31 + 34b35 τὸ εὑρήματι εἶναι 28b2 εὑρήσω 15b21 εὑρεῖν 21b12 εὑρήσατο 17a9; 23b1 ὤρῳ μὲν τὸ ἑὑρήσῃ ὦν καὶ γινόμενον τὸ τέλειον τὸ τέλειον ὡς μὲν διαλείπεται 37b35 τὰ ἑὑρήσῃ (Ῥ. τῶν ἅπαλων σωμάτων) 31b 4 + ἑὑρησάμην περὶ τῶν ἑὑρησάμην ϑεωρήτην 15b18 περὶ οὖδεὶς οὐδεὶς ἑὑρησάμην 15a34 ἑὑρησάμην στιγμὴν στιγμής 17b3 κατ’ ἑὑρησάμην στιγμὴν διαρεῖτων 17b10 ἑὑρησάμην στιγμὴν σημεῖον 17b11 ζησὶς 30b27 + ἐν 15b25 ἐγείρον 21b2; 27b7 — λόγον 18a31 τὸν τρόπον γιγνόμενον ἀλλ’ οὐ τὸ ἑὑποκείμενον 18b9 τὸ γιγνόμενον 18b2 ἐγείρον 21a1 ἐγγορ 22a17; 35b32 ἐγά 38b8 ἥλιον μὲν λευκῶν ὄραν κτλ. (citatur ex Emped.) ἐν 14b20 ἡλίος 15a10; 36b17; 38b3 τὸ ἥλιον θερμὸν 26b12 πάμπαν ἥλιον ὑπ’ ὑπ’ ὑπ’ ἡμέρα ὑπ’ ὑπ’ ἡμέρα οἰκ. ὑποδά 28b7 μικτὰ ἡμέρα 28b10 ἡμείσθητίς τοῦ 9νάκας 14b13 ϑαυμαζεῖν 33b16 ϑαυμαζότοι 17b18 ὑμεῖς 37b15 + ὁ θεός 36b32 τα στοιχεῖα διακρίνει ... ἡ φιλία τὰ φίλητε πρότερον τοῦ θεοῦ—θεοὶ δὲ καὶ ταύτα (Emped. ϑρονικ. respicitur) 33b21 τιμαίεισθαι 24b9 +; 27b4 + τιμαίεισθαι 22b16; 24b17 +; 24b20 + τὸ τιμητικὸν 24b8 θερμὸν—ψυχρὸν ετ’ ἐγρόν—ἐγρόν = πρῶ-
tαι ἐναντιώσεις κατὰ τὴν ἀφήν 29b 18 sqq. θερμῶν def. 20b26 — χωρίστον 27b19 τὸ θερμῶν ὑπ’ ἐγρόν; θερμὸς ὑπ’ ἐγρόν τῷ θερμῷ ὑπ’ ἐγρόν τῷ θερμῷ ὑπ’ ἐγρόν τῷ θερμῷ 29b31 μᾶλλον καὶ ἡττὸν θερμῶν καὶ ψυχρῶν 34b8 sqq. θερμῶν—ψυχρῶν enumenatur inter qualitates quibus Empedoclis elementa inter se differentur 14b18 + λέγει (Ἑμι.) τῶν μὲν ἥλιον λευκῶν καὶ θερμῶν 15b10 ἄτομον τὸ μόνον ἀναζωοῦν τῷ περιφέρει σχήματι τὸ θερμῶν (reprehendiur Democritus) 26b5 τὸ περιφέρει τὸ μόνον τὸ μόνον θερμῶν 26b12 πέρευκε, ὡς φαίνετο, τὸ μὲν θερμῶν διακρίνειν τῇ δὲ ψυχρῶν συνιστᾶναι 36a3 θερμῶτης 26b7; 29b34; 30b26 +; 33a12 οὐ γὰρ ἡ θερμῶτης μετα-
βάλλει καὶ ἡ ψυχρῶτης ἑλ ἄλληλα 22b16 ἄλληλα 22b16 θέσις 22b33 +; 23b5 + — opp. τάξις (τῶν σχήματων, τῶν ἀδιαρέτων σωμάτων) 14b24; 15b9 αἱ θέσις 25b14 θεωρεῖ 32b3; 35b7; 35b20 θεω-
ρήσατο 25b35; 27b30; 28b31 — ὅλον τι 23b18 θεωρήτην 15b19; 17b32 θεωρεῖ 34b15 κυρίανει 26b33; 26b22; 27b22 (υἱῆσκευ) τενέωτος 21b31 θραίασθαι 26b26 θρόφις 16b30 ιατρικὴ 24b35; 24b3; 28b22 ιατρός 24b30; 35b21 ἰδίος 20b29 Δημόκριτος παρὰ τοὺς ἄλλους ἰδίος ἐλέξει μόνος 23b10 ἱεράν εἰς ἰατρὸν ὑπόθεται 32b13 + έρει ἱεράν εἰς ἱεράν τοῦ κάτω 37b25 ἱερανός 18b13 +; 33b22; 35b31; 35b9 διηρώταται ἱερανός 21b11 ἱσάζει 28b29; 34b23 ἱσός 16b10; 20b23; 33b32; 35b28; 36b10 + παντὶ σωματί ἐκ οὗ ἱσόν ἔσται κανόν 26b20 ταύτα γὰρ ἴσα τ’ ἰσότα (cit. ex Emped.) 33b20 τὸ ἴσον διστ. τὸ ῥόμιον 33b30 (ἱσόταν) ἱσόταν 32b12 (καταστάσας) ταύτον καθέστηκε 14b14 καθάλοιμ 17b12; 23b22; 36b13 — opp. καθ’ ἐκκατοντος 31b20 τὸ καθάλοιμ 22b16 + — καὶ τὸ πάντα περιέχον 17b7 τὰ καθάλοιμ ὑπ’ τα καθ’ ἐκκατοντα 35b28 καίεσθαι 27b11; 31b26 (καλείσθαι) ἡ καλομενή ἀπλὴ γένεσις 14b7 μεταβολῇ κατὰ μέγεθος, ἡ καλομενή αὐξήθαι καὶ φθάσις 1a14, 1a14 τὰ καλομενά στοιχεῖα 22b1; 28b 31; 29b16 ἐκ μὴ καλοῦ 17b5 τὰ καλὰ ὑπ’ τα
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def. 25*26
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I1vrjfffis
34*32
rcL 25*1
19*11
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Leucippi doctrina exponitur 25 43 sqq.; comp. cum Emped. doctrina 25 6 sqq.; dist. a Platonis doctrina 25 25 sqq. vide etiam s. v. Δη-μοκρίτος

Lexus, 15 10; 17 4; 23 27; 32 20 + ; 33 29

Lōgos, 4 14; 17 14. ὁ Lōgos, 4 ὁ τῆς ἑκάστου οὐδείς 35 7 κατά τὸν λόγον οππ. κατὰ τὴν ύλην 17 24, τῷ λόγῳ οππ. τῷ ἄρισμῳ (eis) 20 14. — οππ. τὸ πέρα (χωρίστη) ὕλη. 20 24 — διαφέρειν 22 24,

Lūgos = ratio mathematica 28 9,

Lūdos 34 11, 34 28

O Lōgiques (opp., φυσικοῖς) σκοποῦντες 14 11

Lōgos = definitio 14 3; 17 14. ὁ Lōgos τῆς ἑκάστος οὐδείς 35 7 κατὰ τὸν λόγον οππ. κατὰ τὴν ύλην 17 24, τῷ λόγῳ οππ. τῷ ἄρισμῳ (eis) 20 14. — οππ. τὸ πέρα (χωρίστη) ὕλη. 20 24 — διαφέρειν 22 24,

Lōgos = ratio mathematica 28 9,

33 34; 33 11; 34 15

Lōgos = argumentum, ratiocinatio 25 13; 27 16; 27 7. ὁ Lōgos δι- πορεί 27 27. ὁ ἄγανάκτης δωκόν λόγον 17 1. λόγοι ἀναγκαστικοὶ καὶ οὐκ εἴποροι διαλέκτων 15 21 οἰκεῖοι καὶ ψυκοῖοι λόγοι πεπεσθαί 14 13. ὁ τῶν πολλῶν λόγων ἀδιέφορον τῶν ὑπαρχόντων ὑπερείς 16 8. τῷ λόγῳ (οππ. τῇ αἰσθήσει) ἀςόλυθεν 25 14. ὁ τῶν λόγων οππ. ἐπὶ τῶν πραγμάτων 25 18,

ὁ αὐτὸς λόγος 14 25; 15 2; 24 24; 32 19; 32 9


λογίν 16 24; 16 25; 20 8; 28 31 τὸ λοιπᾷ καὶ δύο σύμβολα 32 29

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τὸ ἦλυ νικεῖ δ' οὐδέν μεγιγάνεν 28 15

λόις 16 18 λεύσει 27 10 λέεται τὸ εἴδος 28 27

ὁ λυπών 23 23

λύσιν εὑρεῖν 21 12

τὰ μαθηματικὰ 23 1
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μεταβάλλειν εκ τούτου είς τούτε ὅλον 17 a 21, cf. 19 b 14 — κατά τόπον, κατ’ αὐτόν καὶ φίλον, κατ’ ἄλλους 14 a 27 — τοις πάθεσι 15 a 14, cf. 15 b 18 et 19 b 11 — κατά τά πάθη καὶ τά δυνάμεις 37 a 2 — διὰ τήν κίνησιν 15 a 22 — τά μεταβάλλοντα κατά φύσιν 28 b 27

μετάβασις 31 b 24; 31 b 13; + 32 a 2 ἢ εἰς ἄλλα μετάβασις 38 a 11

μεταβλητικός 19 a 20

μεταβολή 15 a 2; 17 a 23; + 18 a 25; 18 b 30; 19 b 7; + 20 a 4; + 29 b 8; 31 a 11; 31 b 3; + 32 b 22; + 33 a 10; 36 a 19; 36 b 2 — κατά γένεσιν ἢ ἀλλοιώσειν ἢ διόλου 37 a 35; — κατά μέγεθος 14 b 14 — ἢ εἰς τούτου εἰς τὸν (ὁπρ. ἢ περὶ μέγεθος ἢ περὶ πάθος) 20 b 12 ἢ εἰς τῷ συνεχεῖς μεταβολή 17 a 19 ἢ μεταβολή ἣν ἐναντίον 10 b 31 — μεταβολή εἰς τάναντας 32 b 7; + 32 b 22 — αὐτοὶ μεταβολάζον τού συνεκμενὸν 15 b 11 μετακινήθη 15 b 35 μετακινεῖσθαι 15 b 13 μετάληψις ὑποβολή (σχ. τῶν εἰδών) 35 a 14

τά μεταλλευόμενα 26 b 35

μετάφυσις κοινών 28 a 13 — opp. τῶν ἐναντίων ἐκατέρων 34 b 13 τά μεταφύσις 30 b 14; 33 a 11 — τά ἐναντία 24 a 8, cf. 19 b 12 — μεταφύσις τῶν (σχ. τῶν Ἐμπεδοκλείους στρεφέων) κανά 25 b 10 — τιθέντες ἢ πόρ ἢ τι μεταφύσις τούτων 28 b 35

μεταχρηματίζειν 35 b 26

μεταταχθεῖν 24 a 19

μετατεθεῖ 27 a 19

κατά μεταφοράν 24 b 15

μετρεῖν 21 b 24 μετρείσθαι 33 a 21; +

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μέτρον 21 b 24; 36 b 15 το τοῦ ποσοῦ μέτρον opp κατ’ ἀναλογίαν (συμπληράσσει) 33 a 27

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μεγάναι οὖν διατη 21 a 33 (cf. 22 a 9) μεγάναι ἄρθρα 35 b 14 μεγάναι, μεγάναι (absolute) 22 b 24; 24 b 34; 33 b 16 μεγάναιν τῶν ἡμερῶν καθ’ αὐτό μεταβάλλοντο 27 b 25 με- μεγάλεα ὑποπλάται 30 b 34 διάλλαξ τοῦ μεγάνον (cit. ex Ἐμπε- pedoclis) 14 b 8; 33 b 14 διὰ τή μεγάλην φθειραὶ τάς ὑπεροχὰς ἀλλή- λών 34 b 11

τά μεγάναι 27 b 5; τά μεγάνιτα 27 b 11; + 28 b 2 το μεγάνιτο 22 b 10; 28 b 7

εἰς μικρὰ καὶ ἐλάττῳ (διάκρισιν) 17 a 16 μικρὰ μικροὶ παρατιθέμενα 28 a 33 κατὰ μικρὰ 28 b 7; + 34 b 29 μικροὶ ἢ μέγαλον (γίνεσθαι) 17 b 35 μι- κροὶ ἢ μεγάλων 15 b 13

τῷ μικρομερεῖ 30 b 2
dia μικρόττα (ἄνοιατο τόροι) 24 b 31, cf. 25 a 30

μικτῶν opp. ἀπλοῦσ 30 b 22 μικτῶν = mistum 28 a 4; 34 b 14 = miscible 27 b 21; 28 a 31; 28 b 1 + — def. 28 b 20 τῶν μικτῶν = miscible 27 a 32; 27 b 8; 28 b 22 τά μικτά σώματα = corporausta 34 b 31

μίξις 15 b 4; 21 b 1; 22 b 8; + 27 b 30— 28 b 26; 33 b 19; 34 b 19 — coni. κράσις 28 b 9, dist. σύνθεσις 28 b 6 μίξις τε διάλλαξ τοῦ μεγάνον (cit. ex Ἐμπεδ. ) 14 b 8; 33 b 14 ἢ μίξις = τῶν μικρῶν ἢ ἀλλοκατόρθων ἔνσισ 28 b 22 perί μίξεως 27 a 30 sqq.

μιμεῖται 37 a 3 +

μιμήμα 34 b 12

μοιή opp. κινήσις 33 b 35

μονιστά 32 b 24

μονός 20 a 11

μόρον 20 b 21; 21 b 20 +; 28 a 1 + 

θάτερον μόρον (ἐναντίωσε) 32 b 11 τά μόρια 27 b 12

μορφή coni. πάθος 20 b 17 ἀπείρα τοῖς πληθοῖς καὶ ταῖς μορφαῖς 14 a 23 ἢ μορφή coni. το εἴδος 35 a 16; 35 b 6 — coni. το τί ἐνείαν 35 b 35 — opp. ἢ ἔλης 36 a 14 ὡς μορφή (σχ. ἀρχή) opp. ὡς ἔλης 5 a 30 ἢ ἔλης ἐξεῖν τὴν μορφὴν 24 b 5 perί τῆς ὑπῆς καὶ τῆς μορφῆς τῶν γενετῶν καὶ φθαρτῶν exponitur 35 a 28 sqq.

μοσχική 19 b 27

μοσχικός opp. ἀμοινος 19 b 25; + 34 a 11

μυκέλος 14 a 20; 34 b 25

μυρίας 16 a 22

tο ύλες (Ἐμπεδοκλίς) 15 a 7 — opp. ἢ φυλα 15 a 17; 33 b 12; + 34 b 1 + ἐπί τῶν ύλων opp. προτέρου ἐπί τῆς φυλας 34 a 6, cf. 15 a 6 sqq.

νέφος 38 b 7 +

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