

ARISTOTLE  
ON THE SOUL  
PARVA NATURALIA  
ON BREATH

WITH AN ENGLISH TRANSLATION BY

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LONDON  
WILLIAM HEINEMANN LTD  
CAMBRIDGE, MASSACHUSETTS  
HARVARD UNIVERSITY PRESS

MCMXXXV

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*Printed in Great Britain*

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## INTRODUCTION

ARISTOTLE, the man, we know ; the works of Aristotle, the philosopher, present almost insuperable problems. We know as much of the life of Aristotle as of most of Hellas' great men, but we find it difficult, if not impossible, to regard his work as his contemporaries regarded it. His writing was considered a model of Greek prose style at its best, but no one who reads his works as they have come down to us could subscribe to this view. In the treatises comprised in this volume, the philosopher is sometimes lucid and bald, sometimes involved and obscure, and sometimes even unintelligible, but very rarely brilliant in style.

Yet we need not necessarily blame Aristotle for this. In days when there was no copyright corruption of the text was fatally easy, and if we are to believe Strabo, the works of Aristotle were peculiarly unfortunate in this respect. According to that author, Aristotle left his library to Theophrastus, who handed it on to others. It passed through a good many hands, including those of one Apellicon, who is delightfully described by Strabo as " a book-worm, rather than a philosopher," by whom the gaps in the manuscript caused by damp and moth were filled in " not well." Later on still, when Sulla captured Athens, they were transferred to Rome, and edited by inferior clerks under the direction of

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booksellers who made no attempt to collate the different copies. Small wonder if we find them often obscure and lacking in style. There is, however, another view of the works which have come down to us bearing the name of Aristotle. Cicero refers to them as *commentarii*, and it is quite possible that the present volume contains nothing but lecture notes compiled either by Aristotle himself or his pupils. This would account for the unevenness of exposition. Some points are argued in full, some are only briefly outlined. It might also account for the numerous cross-references to other treatises, some of which cannot be traced.

Yet, in spite of obscurity and baldness of style, it would be quite wrong to suppose that these treatises are valueless. An attempt has been made in the introductions to the separate treatises to show where this value lies for us to-day.

The modern reader studying Greek philosophy is confronted at the outset by a difficulty which must be boldly faced. Aristotle received his training in the school of Plato, and from him inherited many of his fundamental beliefs. Plato had come to regard the world of sense as unreal, and only the world as apprehended by the mind, detached as far as possible from sense impressions, as real. Aristotle repeatedly shows this Platonic influence in his handling of philosophical questions. He pursues an argument in the direction in which Logic leads him, quite unmoved by any apparent absurdity in the conclusions at which he arrives. Thus in this volume Aristotle will often be found to reach conclusions, which at first sight seem only fantastic; but such are always worth careful and unbiased consideration.

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This collection of treatises belongs to subjects on the borderline between bodily and mental. Aristotle was the son of a doctor, and himself a biologist, who believed in experiment and dissection as a means of collecting evidence. Thus his views on the soul are influenced by his physiology. Yet he never falls into the meshes of materialism, and appears quite certain that the body cannot possibly explain the mind. His method is analytical, his logic, within the limitations imposed by his age and personal character, is ruthless, and his knowledge is encyclopaedic. His arguments and conclusions should assuredly serve to stimulate, even where they fail to satisfy.

Finally, without any monotheistic conception of God, Aristotle believes implicitly in design and purpose in the universe, and lays it down as axiomatic that no account of any part of the body or function of the mind can be considered adequate, unless it shows the purpose which it serves in the scheme of creation.

## THE TEXT

The present text is that of Bekker. It is based in the main upon two mss. known as Codex Parisiensis and Codex Vaticanus. Bekker also collated six other mss., which seem to have come from one original. Since the publication of Bekker's recension a considerable amount of research has been devoted to the mss. This has suggested a number of alterations, some of which have cleared up doubtful points or

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have made unintelligible passages comparatively clear. Where such an alteration has seemed important it has been incorporated in the text, and the original "Bekker" reading printed as a footnote followed by the letter B. In most cases it has not seemed worth while to print other mss. variations.

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I have found it impossible to express in detail my indebtedness to those many scholars who have edited or revised the text of Aristotle's *De Anima* and *Parva Naturalia*, but all who have worked in this field must be conscious how great that debt inevitably is. In the translation it has been my aim to make Aristotle's meaning as clear as possible, even if this has involved contraction or (more commonly) expansion of the Greek. I have one other debt to acknowledge : my thanks are due to Messrs. R. & R. Clark's reader, who has dealt so ably with the German text (in spite of the comparative poor ness of the type and the irritating contractions) that my own task of proof correction has been reduced to a minimum.

It may assist the general reader to add an explanation of some of the technical terms used by Aristotle in this work.

*δυνάμει* ("potential"). A man is "potentially" (e.g.) a thinking being, but he is not always thinking. When this capacity is actually operating, Aristotle calls him *ἐνεργείᾳ* ("actually") a thinking being.

*ἐντελεχείᾳ* ("actuality" or "actualization"). This term frequently overlaps *ἐνέργεια*, but in its

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most exact sense it means more. It is the perfect realization of all that any creature or power is capable of becoming.

*εἶδος* ("form"), often contrasted with *ὕλη* ("matter"). Matter in itself is formless; *e.g.* the marble from which a statue is carved. When it has received *εἶδος*, it becomes *τόδε τι* ("particular thing").

*κατὰ συμβεβηκός* ("accidentally"), *τὰ συμβεβηκότα* ("contingent attributes"). A table may be green, but its greenness is only "accidental"; that is to say, if it were (*e.g.*) brown, it would be just as much a table as before. But there are some qualities which belong to its *οὐσία* ("essence," "essential quality"). We assume this to be true of all objects of sense, and although it is always difficult and usually impossible to determine exactly what these qualities are their sum total constitutes the *τὸ τι ἢν εἴραι* ("that which makes it what it is").

*νοῦς* ("mind"); the most general word, including frequently both the percipient and the intellectual faculties. It is sometimes subdivided by Aristotle into *νοῦς πρακτικός* (the mind as applied to producing results) and the *νοῦς θεωρητικός* (the mind regarded as purely contemplative).

*πάσχω* ("be acted upon" or "affected"). Both in the physical and intellectual worlds influences of different kinds are at work. If such an influence operates the object of it is said *πάσχειν*. The noun *πάθος* ("affection") is to be interpreted in this sense.

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*phantasia* ("imagination"). The word is used by Aristotle in two senses: (1) sometimes it operates in the presence of the sensible object and thus "interprets" the object to the mind; (2) sometimes it operates in the absence of the sensible object, and then is either a form of memory or what we call "pure imagination."

# ON THE SOUL

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It seems impossible to avoid the word "soul" as a translation of the Greek  $\psi \chi \acute{\eta}$ ; indeed it would be entirely suitable were it not for the religious connotation with which the word is invariably associated in the language of to-day.

This treatise has more interest for us as the foundation of the modern science of psychology than for its actual conclusions. It is not to be supposed that Aristotle was the first to inquire into the nature of the soul; far from it. Indeed he builds on the foundations laid by his predecessors, particularly Plato. But he was the first to grasp the importance of the application of scientific method to the inquiry. The present treatise was not Aristotle's only work on the subject; but we have only fragments of his dialogue—the *Eudemus*—and these for the most part only repeat the arguments of the *De Anima*.

A precise definition of the soul is hard to come by, though we shall find one in this work, which Aristotle ultimately accepts, but we may premise that the author means by the word that in virtue of which the term living is applied to plants, animals, and above all to men; but we are not to understand from this that each of these three classes has a soul of the same kind.

## ON THE SOUL

### ARGUMENT

#### *Book I*

A reader who wishes to know nothing beyond what Aristotle himself can contribute to psychology could afford to omit nearly the whole of Book I.; for the author has devoted it in the main to clearing the ground for a statement of his own views in Books II. and III. Yet this first book has a value of its own, in that it shows that Aristotle did not consider himself a pioneer in this field, though he clearly regards his predecessors' conclusions as always inadequate, and often quite erroneous.

The first chapter raises some preliminary questions as to the right method of approach to this important subject, and as to the category to which the soul properly belongs. The philosopher then passes on to consider how body and soul are related. We ourselves are quite familiar with this problem. We find ourselves continually baffled in an attempt to draw an accurate line of demarcation between the "physical" (as we call it) and the "mental." Aristotle's conclusion (which is further developed later in the treatise) is that the soul itself is without question incorporeal, but that it has no possibility of action apart from the body to which it belongs. In his own language it is only separable from the body in thought, in just the way that a geometrical truth is only separable in thought from the figure to which it relates.

The rest of the book is mainly devoted to those characteristics of the soul which are acknowledged by earlier thinkers. It is the cause of movement, and it is composed of the elements. To neither of these

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propositions does Aristotle give unqualified assent, nor on the other hand does he explicitly deny them. He, however, points out with a good deal of closely reasoned argument, that many difficulties arise if these two characteristics are accepted without qualification.

He denies the doctrine that the soul moves itself. This erroneous theory was based on the belief that the soul is the cause of movement and that nothing can produce movement, which does not itself move. At the same time he admits that there must be some connexion between movement and the soul, but he leaves its precise nature undetermined. He suggests in chapter 4 that the soul may only move "indirectly," that is, that it may be in something which moves (the body), and only moves in this sense.

The second supposed characteristic of the soul—that it is composed of the elements—seems to Aristotle equally unconvincing as it stands. If the soul is composed of the elements it cannot escape from being corporeal; and, even if this conclusion were not inevitable, it would be impossible on this hypothesis to account for many of the admitted functions of the soul.

The rest of Book I. is occupied with other earlier theories, particularly with the question whether the soul has parts, or is one and indivisible. Aristotle seems to conclude that the soul has parts, but that these parts are not qualitatively different.

## *Book II*

This book begins with a tentative definition of the soul; it is found to be "the first actuality of a natural body possessing life." These difficult words will

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repay careful consideration. A block of marble is the "matter" out of which the statue of Hermes is made. The marble may then be said to be potentially a statue of Hermes. But when it receives "form"—given to it by the sculptor—it becomes "actually" a statue of Hermes. Similarly the body being the "matter" the soul gives it form, and the living being is now actualized. So the soul is the actuality of the body. It is called the first actuality as opposed to the second, which is the soul when performing its functions.

Chapter 2 begins with an explanation of true definition. Aristotle decides that his present definition is too abstract, and that a much closer investigation of the functions of the soul is essential to a true understanding of it. They are found to be nutrition, sensation, thinking and movement. After some argument these functions are found to constitute a series, the later terms of the series implying the earlier ones, so that as we ascend from the lower to the higher forms of life we find more and higher functions.

The most elementary and essential faculty of the soul is the nutritive. In this is included both feeding, which preserves the life of the individual, and reproduction, which preserves the life of the species.

The remainder of Book II. (chs. 5-12) is concerned with sensation. Aristotle deals first with sensation in general and then with the senses in particular. Vision and the objects of vision first come under review. It is found that light is an essential condition of vision, and Aristotle offers us a physical explanation of light, which is largely inaccurate. He then outlines a theory, which he discusses later

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on, that in between the sensible object and the sense organ which perceives it there must exist a medium, without which no sensation will be felt.

Chapter 8 deals with sound on similar lines, chapter 9 with smell, chapter 10 with taste, chapter 11 with touch, while the last chapter attempts a definition of sensation in general.

### *Book III*

This book begins with a complicated and somewhat unnecessary argument to prove that there are only five senses, and that therefore anything which is perceived, and yet appears not to be the object of any one of the five, must be perceived by a combination of two or more senses. After the discussion of some further difficulties in the operation of the sensitive faculties Aristotle proceeds (ch. 3) to consider the relation between sensation and thinking. He finds (ch. 4) that though they have obvious superficial analogies they are not really analogous. From this point up to the end of chapter 8 he deals with the mind, its method of operation, and how far its power of abstract thinking is illusory. In chapter 8 he attempts to summarize his views on the relations between the sensitive and thinking faculties of the soul, and decides that although they can be conceived as separate they are really interdependent and inseparable. In chapter 9 Aristotle reaches the question how movement is associated with the soul. On the commonly accepted view that there are definite and separate parts of the soul he cannot account for movement as due to any one of these, though he thinks (ch. 10) that it may be due to

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“appetence and mind.” In chapter 11 mind is dismissed as being a real cause of movement, and appetence seems to be left to account for it. The last two chapters attempt to explain why the various forms of life occur in an ascending scale, graduated by the possession of more and more faculties of the soul. Touch is the one indispensable faculty, without which the living creature must die ; the other (and presumably higher) faculties exist in the higher animals, not that they may live but that they may “live well.”

# ΑΡΙΣΤΟΤΕΛΟΥΣ ΠΕΡΙ ΨΥΧΗΣ

## Α

402 a Ι. Τῶν καλῶν καὶ τιμίων τὴν εἰδησιν ὑπολαμ-  
βάνοντες, μᾶλλον δ' ἔτέραν ἔτέρας ἢ κατ' ἀκρίβειαν  
ἢ τῷ βελτιόνων τε καὶ θαυμασιωτέρων εἶναι, δι'  
ἀμφότερα ταῦτα τὴν τῆς ψυχῆς ἱστορίαν εὐλόγως  
5 ἀν ἐν πρώτοις τιθείημεν. δοκεῖ δὲ καὶ πρὸς  
ἀλήθειαν ἅπασαν ἢ γνῶσις αὐτῆς μεγάλα συμβάλ-  
λεσθαι, μάλιστα δὲ πρὸς τὴν φύσιν· ἔστι γὰρ οἶν  
ἀρχὴ τῶν ζώων. ἐπιζητοῦμεν δὲ θεωρῆσαι καὶ  
γνῶναι τὴν τε φύσιν αὐτῆς καὶ τὴν οὐσίαν, εἴθ'  
10 ὅσα συμβέβηκε περὶ αὐτῆν· ὅν τὰ μὲν ἴδια πάθη  
τῆς ψυχῆς εἶναι δοκεῖ, τὰ δὲ δι' ἐκείνην καὶ τοῖς  
ζώοις ὑπάρχειν. πάντη δὲ πάντως ἔστι τῶν χαλε-  
πωτάτων λαβεῖν τινὰ πίστιν περὶ αὐτῆς. καὶ γὰρ  
15 ὅντος κοινοῦ τοῦ ζητήματος πολλοῖς ἔτέροις, λέγω  
δὲ τοῦ περὶ τὴν οὐσίαν καὶ τοῦ τί ἔστι, τάχ' ἄν  
τῷ δόξειε μία τις εἶναι μέθοδος κατὰ πάντων περὶ  
20 ὅν βουλόμεθα γνῶναι τὴν οὐσίαν, ὥσπερ καὶ τῶν  
κατὰ συμβεβηκός ἴδιων ἀπόδειξις,<sup>1</sup> ὥστε ζητητέον

<sup>1</sup> ἀπόδειξιν Β.

# ARISTOTLE : ON THE SOUL

## BOOK I

I. We regard all knowledge as beautiful and valuable, but one kind more so than another, either in virtue of its accuracy, or because it relates to higher and more wonderful things. On both these counts it is reasonable to put an inquiry into the soul among subjects of the foremost rank. Moreover this investigation seems likely to make a substantial contribution to the whole body of truth, and particularly to the study of nature ; for the soul is in a sense the basis of animal life. So we seek to examine and investigate first the nature and essential quality of the soul, and then its contingent attributes. Of the latter some seem to be affections peculiar to the soul, and others seem to belong to all living things by virtue of the soul. But to attain any sure belief on the subject is hedged with difficulties on every side. This inquiry has the same characteristics as many others, such as that concerned with essential quality and real existence, and one might suppose that there was one method applicable to all the things whose real nature we wish to understand ; just as syllogistic demonstration applies to all their contingent attributes. If so, this method must be discovered ;

The object  
and method  
of the  
inquiry.

402 a

ἀν εἴη τὴν μέθοδον ταύτην. εἰ δὲ μή ἐστι μία τις καὶ κοινὴ μέθοδος περὶ τὸ τί ἐστιν, ἔτι χαλεπώτερον γίνεται τὸ πραγματεύθηναι· δεήσει γὰρ λαβεῖν περὶ ἕκαστον τις ὁ τρόπος, ἐὰν δὲ φαινερὸν 20 ἦ, πότερον ἀπόδειξίς τις ἐστιν ἢ διαιρεσίς ἢ καὶ τις ἄλλη μέθοδος, ἔτι<sup>1</sup> πολλὰς ἀπορίας ἔχει καὶ πλάνας, ἐκ τίνων δεῦ ζητεῖν· ἄλλαι γὰρ ἄλλων ἀρχαί, καθάπερ ἀριθμῶν καὶ ἐπιπέδων.

Πρῶτον δ' ἵσως ἀναγκαῖον διελεῖν ἐν τίνι τῷ γενῶν καὶ τί ἐστι, λέγω δὲ πότεροι τόδε τι καὶ 25 οὐσία ἢ ποιὸν ἢ ποσὸν ἢ καὶ τις ἄλλη τῶν διαιρεθεισῶν κατηγοριῶν, ἔτι δὲ πότερον τῶν ἐν δυνάμει ὅντων ἢ μᾶλλον ἐντελέχειά τις· διαφέρει γὰρ οὐ τι 402 b σμικρόν. σκεπτέον δὲ καὶ εἰ μεριστὴ ἢ ἀμερής, καὶ πότερον ὅμοειδῆς ἅπασα ψυχὴ ἢ οὐ· εἰ δὲ μὴ ὅμοειδής, πότερον εἴδει διαφέρουσαν ἢ γένει. νῦν μὲν γὰρ οἱ λέγοντες καὶ ζητοῦντες περὶ ψυχῆς 5 περὶ τῆς ἀνθρωπίνης μόνης ἐοίκασιν ἐπισκοπέν. εὐλαβητέον δ' ὅπως μὴ λανθάνῃ πότερον εἰς ὁ λόγος αὐτῆς ἐστί, καθάπερ ζώου, ἢ καθ' ἕκαστον ἔτερος, οἷον ἵππου, κυνός, ἀνθρώπου, θεοῦ· τὸ δὲ ζῶον τὸ καθόλου ἦτοι οὐθέν ἐστιν ἢ ὕστερον. ὅμοίως δὲ κανεὶς τι κοινὸν ἄλλο κατηγοροῦτο. ἔτι δ' εἰ μὴ πολλαὶ ψυχαὶ ἄλλα μόρια, πότερον δεῖ<sup>1</sup> μέθοδος. ἔτι δὲ B.

<sup>a</sup> *Division.* Plato used and perhaps invented this method of forming a concept. If, for instance, you divide the term "living creature" into "footed" and "footless," and "footed" again into "biped" and "quadruped," and so on, you will after many such divisions and subdivisions form a clear concept of the meaning of "living creature." A. objects (*Post. An.* 11, c. 7, 92 b 5) to the method on several grounds, one being that such division presupposes the existence of the concept.

## ON THE SOUL, I. 1.

but if there is no one common method of inquiry into real existence, our handling of the subject becomes still more difficult. For we shall be obliged to establish the proper method in each individual case ; and, even if this is patent, whether syllogistic demonstration, or division,<sup>a</sup> or some other method is the right one, there is still room for confusion and error as to the premisses from which we must start the inquiry ; for the premisses of all subjects are not the same ; for instance those of arithmetic and those of plane geometry are different.

Perhaps our first business is to determine to what genus the soul belongs, and what it is ; I mean whether it is some particular thing and has real existence or whether it is a quality, or quantity, or belongs to any other of our pre-established categories, and furthermore, whether it has potential or actual existence. For this makes no small difference. In the second place we must inquire whether it has parts or not, and whether every soul is of the same kind or not ; and if not, whether the difference is one of species or of genus. For speakers and inquirers about the soul seem to-day to confine their inquiries to the soul of man. But one must be careful not to evade the question whether one definition of "soul" is enough, as we can give one definition of "living creature," or whether there must be a different one for each soul ; that is, one of the horse, one of the dog, one of man, and one of God, and whether the words "living creature" as a common term have no meaning, or logically come later. This question can of course be raised about any common term. Further, supposing that there are not many kinds of soul, but only parts, are we to inquire first

To what category does the soul belong?

402 b

10 ζητεῦν πρότερον τὴν ὅλην ψυχὴν ἢ τὰ μόρια.  
 χαλεπὸν δὲ καὶ τούτων διορίσαι ποῖα πέφυκεν  
 ἔτερα ἀλλήλων, καὶ πότερον τὰ μόρια χρὴ ζητεῦν  
 πρότερον ἢ τὰ ἔργα αὐτῶν, οἷον τὸ νοεῖν ἢ τὸν  
 νοῦν καὶ τὸ αἰσθάνεσθαι ἢ τὸ αἰσθητικόν· δύοιντα  
 δὲ καὶ ἐπὶ τῶν ἄλλων. εἰ δὲ τὰ ἔργα πρότερον,  
 15 πάλιν ἀν τις ἀπορήσειν εἰ τὰ ἀντικείμενα πρότερον  
 τούτων ζητητέον, οἷον τὸ αἰσθητὸν τοῦ αἰσθητικοῦ  
 καὶ τὸ νοητὸν τοῦ νοητικοῦ. ἔοικε δὲ οὐ μόνον  
 τὸ τί ἐστι γνῶναι χρήσιμον εἶναι πρὸς τὸ θεωρῆσαι  
 τὰς αἰτίας τῶν συμβεβηκότων ταῖς οὐσίαις, ὥσπερ  
 ἐν τοῖς μαθήμασι τί τὸ εὐθὺν καὶ καμπύλον ἢ τὸ  
 20 γραμμὴν καὶ ἐπίπεδον πρὸς τὸ κατιδεῖν πόσαις  
 δρθαῖς αἱ τοῦ τριγώνου γωνίαι ἔσαι, ἀλλὰ καὶ  
 ἀνάπταντα τὰ συμβεβηκότα συμβάλλεται μέγα μέρος  
 πρὸς τὸ εἰδέναι τὸ τί ἐστιν· ἐπειδὴν γάρ ἔχωμεν  
 ἀποδιδόναι κατὰ τὴν φαιτασίαν περὶ τῶν συμ-  
 βεβηκότων, ἢ πάντων ἢ τῶν πλείστων, τότε καὶ  
 25 περὶ τῆς οὐσίας ἔξομεν λέγειν κάλλιστα· πάσης  
 γάρ ἀποδείξεως ἀρχὴ τὸ τί ἐστιν, ὥστε καθ' ὅσους  
 403 a τῶν δρισμῶν μὴ συμβαίνει τὰ συμβεβηκότα γνωρί-  
 ζειν, ἀλλὰ μηδὲ εἰκάσαι περὶ αὐτῶν εὔμαρές, δῆλον  
 δτι διαλεκτικῶς εἴρηνται καὶ κενῶς ἀπαντεῖς.

‘Απορίαν δὲ ἔχει καὶ τὰ πάθη τῆς ψυχῆς, πότερόν  
 ἐστι πάντα κοινὰ καὶ τοῦ ἔχοντος ἢ ἐστί τι καὶ

## ON THE SOUL, I. 1.

into the soul as a whole or the several parts? Here again it is difficult to determine the nature of the differences, one from the other, and whether we should inquire first into the parts of the soul, or their functions; for example, into the thinking or into that which thinks, into sensation or into that which feels; and a similar difficulty arises with all the other parts. If we are to take the functions first, a further problem may arise; whether we should consider the objects corresponding to them before the parts themselves—I mean, the thing felt before the part of the soul which feels it, and the thing thought before the mind which thinks it. A knowledge of what a thing is is of course a valuable assistance towards the examination of the causes of the attributes contingent upon its essence; for instance, in mathematics, to know the meaning of "straight," "curved," "line," and "plane figure" helps to determine the number of right-angles to which the angles of a triangle are equal. But the converse is also true; the accidental properties contribute materially to the knowledge of what a thing is. For when we are in a position to expound all or most of the accidental properties as presented to us, we shall also be best qualified to speak about the essence. For the essential quality of a thing is the starting-point for a demonstration, and definitions which do not enable us to know the accidental properties, nor even to make a tolerable guess about them, are clearly laid down merely for argument's sake and are utterly valueless.

The affections of the soul present a further difficulty—Are they all associated with that which contains the soul, or is any of them peculiar to the soul

and how  
shall we  
approach  
the analysis?

Relations  
of soul and  
body.

ARISTOTLE

403 a

τῆς ψυχῆς ἴδιον αὐτῆς· τοῦτο γάρ λαβεῖν μὲν ἀναγκαῖον, οὐ ράδιον δέ. φαίνεται δὲ τῶν πλείστων οὐθὲν ἄνευ σώματος πάσχειν οὐδὲ ποιεῖν, οἷον ὀργίζεσθαι, θαρρεῖν, ἐπιθυμεῖν, ὅλως αἰσθάνεσθαι. μάλιστα δ' ἔοικεν ἴδιον τὸ τοεῖν· εἰ δ' ἐστὶ καὶ τοῦτο φαντασία τις ἡ μὴ ἄνευ φαντασίας, οὐκ 10 ἐνδέχοιτ' ἄν οὐδὲ τοῦτ' ἄνευ σώματος εἶναι. εἰ, μὲν οὖν ἐστί τι τῶν τῆς ψυχῆς ἔργων ἡ παθημάτων ἴδιον, ἐνδέχοιτ' ἄν αὐτὴν χωρίζεσθαι· εἰ δὲ μηθέν ἐστιν ἴδιον αὐτῆς, οὐκ ἄν εἴη χωριστή, ἀλλὰ καθάπερ τῷ εὐθεῖ, ἢ εὐθύ, πολλὰ συμβαίνει, οἷον ἄπτεσθαι τῆς χαλκῆς σφαίρας κατὰ στιγμήν, οὐ 15 μέντοι γ' ἄφεται τούτου χωρισθὲν τὸ εὐθύ· ἀχώριστον γάρ, εἴπερ ἀεὶ μετὰ σώματός τινός ἐστιν. ἔοικε δὲ καὶ τὰ τῆς ψυχῆς πάθη πάντα εἶναι μετὰ σώματος, θυμός, πραότης, φόβος, ἔλεος, θάρσος, ἔτι χαρὰ καὶ τὸ φιλεῖν τε καὶ μισεῖν· ἅμα γάρ τούτοις πάσχει τι τὸ σῶμα. μηνύει δὲ τὸ ποτὲ 20 μὲν ἴσχυρῶν καὶ ἐναργῶν παθημάτων συμβαινόντων μηδὲν παροξύνεσθαι ἡ φοβεῖσθαι, ἐνίοτε δ' ὑπὸ μικρῶν καὶ ἀμαυρῶν κινεῖσθαι, ὅταν ὀργῇ τὸ σῶμα καὶ οὕτως ἔχῃ ὥσπερ ὅταν ὀργίζηται. ἔτι δὲ τοῦτο μᾶλλον φανερόν· μηθενὸς γάρ φοβεροῦ συμβαίνοντος ἐν τοῖς πάθεσι γίνονται τοῖς τοῦ φοβου- 25 μένου. εἰ δ' οὕτως ἔχει, δῆλον ὅτι τὰ πάθη λόγοι ἔνυλοι εἰσιν. ὥστε οἱ ὄροι τοιοῦτοι. οἷον τὸ ὀργίζεσθαι κίνησίς τις τοῦ τοιουδὶ σώματος ἡ μέρους

## ON THE SOUL, I. I.

itself? This question must be faced, but its solution is not easy. In most cases it seems that none of the affections, whether active or passive, can exist apart from the body. This applies to anger, enthusiasm, desire and sensation generally, though possibly thinking is an exception. But if this is also some form of activity stimulated by sense impression, or at least cannot exist without such activity, it cannot exist apart from the body. If then any function or affection of the soul is peculiar to it, it can be separated from the body ; but if there is nothing peculiar to the soul it cannot be separated. In the same way there are many accidental properties belonging to straight, *qua* straight, as, for instance, that a straight line touches a bronze sphere at a point, yet if separated, the straight line will not so touch. It is in fact inseparable, if it is always associated with some body. Probably all the affections of the soul are associated with the body—anger, gentleness, fear, pity, courage and joy, as well as loving and hating ; for when they appear the body is also affected. There is good evidence for this. Sometimes no irritation or fear is expressed, though the provocations are strong and obvious ; and conversely, small and obscure causes produce movement, when the body is disposed to anger, and when it is in an angry mood. And here is a still more obvious proof. There are times when men show all the symptoms of fear without any cause of fear being present. If this is the case, then clearly the affections of the soul are ideas expressed in matter. Their definitions therefore must be in harmony with this ; for instance, anger must be defined as a movement made by a body in a particular state, or by a part, or by a capacity of

ARISTOTLE

408 a ἢ δυνάμεως ὑπὸ τοῦδε ἔνεκα τοῦδε. καὶ διὰ ταῦτα  
 ἥδη φυσικοῦ τὸ θεωρῆσαι περὶ ψυχῆς, ἢ πάσης ἢ  
 τῆς τοιαύτης. διαφερόντως δ' ἀν ὄρισαντο φυσικός  
 30 τε καὶ διαλεκτικὸς ἔκαστον αὐτῶν, οἷον ὄργὴ τί<sup>1</sup>  
 ἔστιν· ὁ μὲν γὰρ ὅρεξιν ἀντιλυπήσεως ἢ τι τοιοῦτον,  
 408 b ὁ δὲ ζέσιν τοῦ περὶ καρδίαν αἴματος καὶ θερμοῦ.  
 τούτων δὲ ὁ μὲν τὴν ὕλην ἀποδίδωσιν, ὁ δὲ τὸ  
 εἶδος καὶ τὸν λόγον. ὁ μὲν γὰρ λόγος εἶδος τοῦ  
 πράγματος, ἀνάγκη δ' εἶναι τοῦτον ἐν ὕλῃ τοιᾳδί,  
 εἰ ἔσται, ὥσπερ οἰκίας ὁ μὲν λόγος τοιοῦτος, ὅτι  
 5 σκέπασμα κωλυτικὸν φθορᾶς ὑπ' ἀνέμων καὶ  
 ὅμβρων καὶ καυμάτων, ὁ δὲ φήσει λίθους καὶ  
 πλίνθους καὶ ξύλα, ἔτερος δ' ἐν τούτοις τὸ εἶδος,  
 ἔνεκα τωνδί. τίς οὖν ὁ φυσικὸς τούτων; πότερον  
 10 διὰ τὴν ὕλην, τὸν δὲ λόγον ἀγνοῶν, ἢ διὰ περὶ  
 τὸν λόγον μόνον; ἢ μᾶλλον ὁ ἐξ ἀμφοῦ; ἐκείνων  
 δὲ δὴ τίς ἐκάτερος; ἢ οὐκ ἔστι τις ὁ περὶ τὰ  
 πάθη τῆς ὕλης τὰ μὴ χωριστά, μηδ' ἢ χωριστά,  
 ἀλλ' ὁ φυσικὸς περὶ ἀπαιθ' ὅσα τοῦ τοιουδὶ<sup>1</sup>  
 σώματος καὶ τῆς τοιαύτης ὕλης ἔργα καὶ πάθη·  
 ὅσα<sup>1</sup> δὲ μὴ ἢ τοιαῦτα, ἄλλος, καὶ περὶ τινῶν  
 μὲν τεχνίτης, ἐὰν τύχῃ, οἷον τέκτων ἢ ἱατρός,  
 τῶν δὲ μὴ χωριστῶν μέν, ἢ δὲ μὴ τοιούτου

<sup>1</sup> ὀπόσα B.

## ON THE SOUL, I. I.

such a body roused by such a cause, with such an end in view. For this reason it immediately becomes the business of the philosopher to inquire into the soul, either every soul, or at least a soul from this point of view. But the natural philosopher and the logician will offer different definitions in answer to the question what is anger. The latter will call it a craving for retaliation, or something of the sort, while the former will describe it as a surging of the blood round the heart and a form of heat. The one is describing the matter, the other the form, that is the idea implied. For this implied idea is the form of the thing, and if it is to exist, it must appear in matter of such a kind. To illustrate this : the idea of a house is a covering to protect from damage by wind, rain and heat. But another will mean by a house stones, bricks and timber ; and another again will mean the form expressed in these materials to achieve these objects. Now which of these is really the natural philosopher ? The man who ignores the form and is only concerned with the matter, or the man who is only concerned with the idea implied ? Probably the man who bases his concept on both. What then are we to say of the other two ? Perhaps there is no one who treats of the affections of the soul which are inseparable, or in so far as they are inseparable <sup>a</sup> ; but the natural philosopher's concern is with all the functions and affections of the body, and of matter in such a state ; whatever is not in such a state is the business of another ; in some subjects it is the business of the craftsman, the carpenter, it may be, or the physician ; but inseparables in so far as they are not affections of the body in such a state,

<sup>a</sup> *i.e.* from the body.

403 b

15 σώματος πάθη καὶ ἐξ ἀφαιρέσεως, ὁ μαθηματικός,  
ἢ δὲ κεχωρισμένα, ὁ πρῶτος φιλόσοφος.

’Αλλ’ ἐπανιτέον ὅθεν ὁ λόγος. ἐλέγομεν δ’ ὅτι  
τὰ πάθη τῆς ψυχῆς ἀχώριστα τῆς φυσικῆς ὕλης  
τῶν ζώων, ἢ δὴ τοιαῦθ’ ὑπάρχει, θυμὸς καὶ φόβος,  
καὶ οὐχ ὥσπερ γραμμὴ καὶ ἐπίπεδον.

20 II. Ἐπισκοποῦντας δὲ περὶ ψυχῆς ἀναγκαῖον ἄμα  
διαποροῦντας περὶ ὧν εὐπορεῦν δεῖ, προελθόντας  
τὰς τῶν προτέρων δόξας συμπαραλαμβάνειν ὅσοι  
τι περὶ αὐτῆς ἀπεφήναντο, ὅπως τὰ. μὲν καλῶς  
εἰρημένα λάβωμεν, εἰ δέ τι μὴ καλῶς, τοῦτ’ εὐ-  
25 λαβηθῶμεν. ἀρχὴ δὲ τῆς ζητήσεως προθέσθαι τὰ  
μάλιστα δοκοῦνθ’ ὑπάρχειν αὐτῇ κατὰ φύσιν. τὸ  
ἔμψυχον δὴ τοῦ ἀψύχου δυοῦ μάλιστα διαφέρειν  
δοκεῖ, κινήσει τε καὶ τῷ αἰσθάνεσθαι. παρειλή-  
φαμεν δὲ καὶ παρὰ τῶν προγενεστέρων σχεδὸν  
δύο ταῦτα περὶ ψυχῆς φασὶ γὰρ ἔνιοι καὶ μάλιστα  
καὶ πρώτως ψυχὴν εἶναι τὸ κινοῦν. οἱ θέντες δὲ  
30 τὸ μὴ κινούμενον αὐτὸ μὴ ἐνδέχεσθαι κινεῖν ἔτερον,  
τῶν κινουμένων τι τὴν ψυχὴν ὑπέλιμβον εἶναι.

404 a ὅθεν Δημόκριτος μὲν πῦρ τι καὶ θερμόν φησιν  
αὐτὴν εἶναι. ἀπείρων γὰρ ὄντων σχημάτων καὶ  
ἀτόμων τὰ σφαιροειδῆ πῦρ καὶ ψυχὴν λέγει, οἷον  
ἐν τῷ ἀέρι τὰ καλούμενα ξύσματα, ἀ φαίνεται ἐν  
ταῖς διὰ τῶν θυρίδων ἀκτῖσιν, ὃν τὴν πανσπερμίαν

<sup>a</sup> i.e. the Metaphysician.

## ON THE SOUL, I. 1.—II.

that is, in the abstract, are the province of the mathematician, and in so far as they are separable are the sphere of the First Philosopher.<sup>a</sup>

But we must now return to the point from which our digression started. We were saying that the affections of the soul, such as anger and fear, are inseparable from the matter of living things in which their nature is manifested, and are not separable like a line and a plane figure.

II. In our inquiry about the soul we shall have to raise problems for which we must find a solution, and in our progress we must take with us for comparison the theories expounded by our predecessors, in order that we may adopt those which are well stated, and be on our guard against any which are unsatisfactory. But our inquiry must begin by laying down in advance those things which seem most certainly to belong to the soul by nature. There are two qualities in which that which has a soul seems to differ radically from that which has not ; these are movement and sensibility. We have practically accepted these two distinguishing characteristics of the soul from our predecessors. Some say that capacity to produce movement is first and foremost the characteristic of the soul. But because they believe that nothing can produce movement which does not itself move, they have supposed that the soul is one of the things which move. On this supposition Democritus argues that the soul is fire in some sense and heat. For forms and atoms being countless, he calls the spherical ones fire and soul, like what are called particles in the air, which can be seen when the sunbeams pass through our windows ; the whole collection of which he calls the elements of which all nature is composed.

Previous theories as to the nature of the soul.

## ARISTOTLE

404 a

5 στοιχεῖα λέγει τῆς ὅλης φύσεως. ὁμοίως δὲ καὶ Λεύκιππος. τούτων δὲ τὰ σφαιροειδῆ ψυχήν, διὰ τὸ μάλιστα διὰ παιντὸς δύνασθαι διαδύνειν τοὺς τοιούτους ῥυσμούς, καὶ κινεῖν τὰ λοιπὰ κινούμενα καὶ αὐτά, ὑπολαμβάνοντες τὴν ψυχὴν εἶναι τὸ παρέχον τοῖς ζῷοις τὴν κύνησιν. διὸ καὶ τοῦ ζῆν 10 ὅρον εἶναι τὴν ἀναπνοήν· συνάγοντος γὰρ τοῦ περιέχοντος τὰ σώματα, καὶ ἐκθλίβοντος τῶν σχημάτων τὰ παρέχοντα τοῖς ζῷοις τὴν κύνησιν διὰ τὸ μηδ' αὐτὰ ἡρεμεῖν μηδέποτε, βοήθειαν γίγνεσθαι θύραθεν ἐπεισιόντων ἄλλων τοιούτων ἐν τῷ ἀναπνεῖν· καλούειν γὰρ αὐτὰ καὶ τὰ ἐνυπάρ- 15 χοντα ἐν τοῖς ζῷοις ἐκκρίνεσθαι, συνανείργοντα τὸ συνάγον καὶ πηγγύνον· καὶ ζῆν δὲ ἔως ἂν δύνωνται τοῦτο ποιεῖν. ἔοικε δὲ καὶ τὸ παρὰ τῶν Πυθ- αγορείων λεγόμενον τὴν αὐτὴν ἔχειν διάνοιαν· ἔφασαν γάρ τινες αὐτῶν ψυχὴν εἶναι τὰ ἐν τῷ ἀέρι ἔνσματα, οἵ δὲ τὸ ταῦτα κινοῦν. περὶ δὲ τούτων 20 εἴρηται, διότι συνεχῶς φαίνεται κινούμενα, κανὸν ἢ νηνεμία παντελής. ἐπὶ ταῦτὸ δὲ φέρονται καὶ ὅσοι λέγουσι τὴν ψυχὴν τὸ αὐτὸ κινοῦν· ἐοίκασι γὰρ οὗτοι πάντες ὑπειληφέναι τὴν κύνησιν οἰκειότατον εἶναι τῇ ψυχῇ, καὶ τὰ μὲν ἄλλα πάντα κινεῖσθαι διὰ τὴν ψυχὴν, ταύτην δ' ὑφ' ἔαυτῆς, διὰ τὸ μηθὲν 25 ὄρδαν κινοῦν δὲ μὴ καὶ αὐτὸ κινεῖται.

‘Ομοίως δὲ καὶ Ἀναξαγόρας ψυχὴν εἶναι λέγει τὴν κινοῦσαν, καὶ εἴ τις ἄλλος εἴρηκεν ὡς τὸ πᾶν

## ON THE SOUL, I. II.

And Leucippus adopts a similar position. It is the spherical atoms which they call the soul, because such shapes can most readily pass through anything, and can move other things by virtue of their own motion, supposing, as they do, that the soul is that which imparts motion to living things. They consider that this is why respiration is the essential condition of life ; for the surrounding atmosphere exerts pressure upon bodies and thus forces out the atoms which produce movement in living things, because they themselves are never at rest. The resulting shortage is reinforced from outside, when other similar atoms enter in the act of breathing ; for they prevent the atoms which are in the bodies at the time from escaping by checking the compression and the hardening (caused by the surrounding atmosphere) ; and animals can live just so long as they are competent to do this. The theory handed down from the Pythagoreans seems to mean the same thing ; for some of them have declared that the soul is identical with the particles in the air, and others with what makes these particles move. The identity of these particles with the soul has been alleged because they can be seen perpetually in motion even when the air is completely calm. Those who say that the soul is that which moves itself tend towards the same view. For they all seem to assume that movement is the distinguishing characteristic of the soul, and that everything else owes its movement to the soul, which they suppose to be self-moved, because they see nothing producing movement which does not itself move.

In the same way Anaxagoras says that the soul is *Anaxagoras.* the producer of movement, and any other who has

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404 a

ἐκίνησε νοῦς, οὐ μὴν παντελῶς γ' ὥσπερ Δημόκριτος. ἐκεῖνος μὲν γάρ ἀπλῶς ταῦτὸν ψυχὴν καὶ νοῦν· τὸ γάρ ἀληθές εἶναι τὸ φαινόμενον· διὸ 30 καλῶς ποιῆσαι τὸν "Ομηροι ὡς""Εκτωρ κεῦτ" ἀλλοφρονέων." οὐ δὴ χρῆται τῷ νῷ ὡς δυνάμει τινὶ περὶ τὴν ἀληθειαν, ἀλλὰ ταῦτὸν λέγει ψυχὴν καὶ νοῦν.

404 b

Λαναξαγόρας δ' ἡττον διασαφεῖ περὶ αὐτῶν· πολλαχοῦ μὲν γάρ τὸ αἴτιον τοῦ καλῶς καὶ ὀρθῶς τὸν νοῦν λέγει, ἐτέρωθι δὲ τοῦτον εἶναι τὴν ψυχὴν· ἐν ἄπασι γάρ ὑπάρχειν αὐτὸν τοῖς ζῷοις, καὶ 5 μεγάλοις καὶ μικροῖς, καὶ τιμίοις καὶ ἀτιμοτέροις. οὐ φαίνεται δ' ὅ γε κατὰ φρόνησιν λεγόμενος νοῦς πᾶσιν ὅμοιως ὑπάρχειν τοῖς ζῷοις, ἀλλ' οὐδὲ τοῖς ἀνθρώποις πᾶσιν.

"Οσοι μὲν οὖν ἐπὶ τὸ κινεῖσθαι τὸ ἔμψυχον ἀπέβλεφαν, οὗτοι τὸ κινητικώτατον ὑπέλαβον τὴν ψυχὴν· ὅσοι δ' ἐπὶ τὸ γινώσκειν καὶ τὸ αἰσθάνεσθαι 10 τῶν ὄντων, οὗτοι δὲ λέγουσι τὴν ψυχὴν τὰς ἀρχάς, οἵ μὲν πλείους ποιοῦντες, οἵ δὲ μίαν ταύτην, ὥσπερ Ἐμπεδοκλῆς μὲν ἐκ τῶν στοιχείων πάντων, εἶναι δὲ καὶ ἔκαστον ψυχὴν τούτων, λέγων οὕτω

γαίη μὲν γάρ γαῖαν δπώπαμεν, ὕδατι δ' ὕδωρ,  
αἰθέρι δ' αἰθέρα δῖαν, ἀτὰρ πυρὶ πῦρ ἀτῆλον,  
15 στοργῇ δὲ στοργήν, νεῦκος δέ τε νείκει λυγρῷ.

τὸν αὐτὸν δὲ τρόπον καὶ Πλάτων ἐν τῷ Τιμαίῳ τὴν ψυχὴν ἐκ τῶν στοιχείων ποιεῖ· γινώσκεσθαι γάρ τῷ ὅμοιῷ τὸ ὅμοιον, τὰ δὲ πράγματα ἐκ τῶν ἀρχῶν εἶναι. ὅμοιως δὲ καὶ ἐν τοῖς περὶ φιλοσοφίας

<sup>a</sup> Because on D.'s theory the dying Hector's delusions are true.

## ON THE SOUL, I. II.

laid it down that the mind is responsible for all movement, though not in every case, as Democritus said ; for he actually identified the soul and the mind ; for he believes that what appears to one is the truth. Hence he regards Homer's description of Hector in his swooning as " lying thinking other thoughts " as accurate.<sup>a</sup> He does not then employ the term mind as a faculty concerned with the truth, but identifies the soul and the mind.

Anaxagoras is less precise in his dealing with the subject ; for on many occasions he speaks of the mind as responsible for what is right and correct, but at others he says that this is the soul : for the mind he regards as existing in all living things, great and small, noble and base ; but the mind in the sense of intelligence does not appear to belong to all living things alike, and not even to all men.

Those then who have interpreted the soul in terms of motion have regarded the soul as most capable of producing movement. But those who have referred it to cognition and perception regard the soul as the first beginning of all things—some regarding this first beginning as plural and some as singular. Empedocles, for instance, thought that the soul was composed of all the elements, and yet considered each of these to be a soul. He says :

By Earth we see Earth, by Water Water,  
By Air the divine Air, by Fire destroying Fire,  
Love by Love, and Strife by bitter Strife.

In the same way, in the *Timaeus*, Plato constructs the soul out of the elements. For he maintains that " like " can only be known by " like," and that from these first beginnings grow the things which we perceive. A similar definition is laid down in his

404 b  
 20 λεγομένοις διωρίσθη, αὐτὸ μὲν τὸ ζῷον ἐξ αὐτῆς  
 τῆς τοῦ ἐνὸς ὑδέας καὶ τοῦ πρώτου μήκους καὶ  
 πλάτους καὶ βάθους, τὰ δ' ἄλλα ὄμοιοτρόπως.  
 ἔτι δὲ καὶ ἄλλως, νοῦν μὲν τὸ ἔν, ἐπιστήμην δὲ  
 τὰ δύο· μοναχῶς γάρ ἐφ' ἔν· τὸν δὲ τοῦ ἐπιπέδου  
 ἀριθμὸν δόξαν, αἰσθησιν δὲ τὸν τοῦ στερεοῦ· οἱ  
 25 μὲν γάρ ἀριθμοὶ τὰ εἴδη αὐτὰ καὶ αἱ ἀρχαὶ ἐλέγοντο,  
 εἰσὶ δ' ἐκ τῶν στοιχείων. κρίνεται δὲ τὰ πράγματα  
 τὰ μὲν ἥπα, τὰ δ' ἐπιστήμη, τὰ δὲ δόξη, τὰ δ'  
 αἰσθήσει· εἴδη δ' οἱ ἀριθμοὶ οὗτοι τῶν πραγμάτων.

405 a 'Ἐπειδὴ δὲ καὶ κινητικὸι ἐδόκει ἡ ψυχὴ εἶναι καὶ  
 γνωριστικόν, οὕτως ἔνιοι συνέπλεξαν. ἐξ ἀμφοῖν,  
 τὸ ἀποφηνάμενοι τὴν ψυχὴν ἀριθμὸν κινοῦνθ' ἔαυτόν.  
 διαφέρονται δὲ περὶ τῶν ἀρχῶν, τίνες καὶ πόσαι,  
 μάλιστα μὲν οἱ σωματικὰς ποιοῦντες τοῖς ἀσω-  
 μάτους,<sup>1</sup> τούτοις δ' οἱ μίξαντες καὶ ἀπ' ἀμφοῖν τὰς  
 ἀρχὰς ἀποφηνάμενοι. διαφέρονται δὲ καὶ περὶ τὸ  
 πλῆθος· οἱ μὲν γάρ μίαν οἱ δὲ πλείους λέγουσιν.  
 ἐπομένως δὲ τούτοις καὶ τὴν ψυχὴν ἀποδιδόσιν.

<sup>1</sup> ἀσωμάτως B.

<sup>a</sup> This difficult passage gives Aristotle's interpretation of Plato's theory of Ideas, as applied to the origin of the universe. We know of no treatise of Plato *About Philosophy*, but tradition ascribes the reference to some lecture notes of Plato to which Aristotle had access. According to this theory Pure Knowledge has some object corresponding to it; this object is not the world of Sense, but the world of Ideas. All the sensible world is thus but an imperfect copy of this world of Ideas. There is, for instance, in the world of Ideas an Idea Beauty. Objects in the world of Sense are beautiful only in so far as they are copies of this. But the world of Ideas includes the Ideas of numbers and, according to the theory Aristotle is discussing, from these are derived some

## ON THE SOUL, I. II.

comments *About Philosophy*, where he maintains that the living universe is derived from the idea of the One, primary length from the ideal number Two, primary breadth from the ideal number Three, and primary depth from the ideal number Four, and all the rest in the same way. But there is a further explanation that mind is One and knowledge Two. For there is only one straight line from one point to another. So the number of the plane figure (Three) is opinion, and the number of the cube (Four) is perception. For numbers are alleged to be their forms and ultimate principles, but they are composed of the elements.<sup>a</sup> The sensible world is apprehended in some cases by mind, in others by knowledge, in others again by opinion, and in others by perception ; but these numbers are the forms of things.

But since the soul appears to contain an element which produces movement and one which produces knowledge, so some thinkers have constructed it from both, explaining the soul as a number moving itself. But men differ about the first beginnings of things, both as to their nature and quantity, especially those who make them corporeal from those who make them incorporeal, and from both these differ those who combine the two and explain the ultimate principles as compounded of both. They differ again about the number, some alleging that there is one, and others more than one. The account they give of the soul in each case follows their conclusions ;

of our concepts. One was not considered by the Greeks as a number, but only as the fountain of all numbers. So the three dimensions are derived from the numbers 2, 3, and 4 respectively. As "like" is known by "like," there are similarly in the soul faculties corresponding to these. So mind corresponds to One, Knowledge to Two, and so on.

5 τό τε γάρ κινητικὸν τὴν φύσιν τῶν πρώτων ὑπειλήφασιν, οὐκ ἀλόγως. ὅθεν ἔδοξέ τισι πῦρ εἶναι· καὶ γάρ τοῦτο λεπτομερέστατόν τε καὶ μάλιστα τῶν στοιχείων ἀσώματον, ἔτι δὲ κινεῖται τε καὶ κινεῖ τὰ ἄλλα πρώτως. Δημόκριτος δὲ καὶ γλαφυρωτέρως εἴρηκεν ἀποφηνάμενος διὰ τί τούτων ἔκάτερον· ψυχὴν μὲν γάρ εἶναι ταῦτο καὶ νοῦν,  
10 τοῦτο δ' εἶναι τῶν πρώτων καὶ ἀδιαιρέτων σωμάτων, κινητικὸν δὲ διὰ μικρομέρειαν καὶ τὸ σχῆμα· τῶν δὲ σχημάτων εὐκινητότατον τὸ σφαιροειδές λέγει· τοιοῦτον δ' εἶναι τόν τε νοῦν καὶ τὸ πῦρ.

15 'Αναξαγόρας δ' ἔοικε μὲν ἔτερον λέγειν ψυχὴν τε καὶ νοῦν, ὥσπερ εἴπομεν καὶ πρότερον, χρῆται δ' ἀμφοῖν ὡς μιᾶ φύσει, πλὴν ἀρχῆν γε τὸν νοῦν τίθεται μάλιστα πάντων· μόνον γοῦν φῆσιν αὐτὸν τῶν ὄντων ἀπλοῦν εἶναι καὶ ἀμιγῆ τε καὶ καθαρόν. ἀποδίδωσι δ' ἀμφω τῇ αὐτῇ ἀρχῇ, τό τε γινώσκειν καὶ τὸ κινεῖν, λέγων νοῦν κινῆσαι τὸ πᾶν. ἔοικε  
20 δὲ καὶ Θαλῆς ἐξ ὧν ἀπομνημονεύουσι κινητικόν τι τὴν ψυχὴν ὑπολαβεῖν, εἴπερ τὸν λίθον ἔφη ψυχὴν ἔχειν, ὅτι τὸν σίδηρον κινεῖ. Διογένης δ' ὥσπερ καὶ ἔτεροί τινες, ἀέρα τοῦτον οἰηθεὶς πάντων λεπτομερέστατον εἶναι καὶ ἀρχῆν· καὶ διὰ τοῦτο γινώσκειν τε καὶ κινεῖν τὴν ψυχὴν, οὐ μὲν πρῶτόν ἔστι, καὶ ἐκ τοῦτου τὰ λοιπά, γινώσκειν, οὐ δὲ  
25 λεπτότατον, κινητικὸν εἶναι. καὶ Ἡράκλειτος δὲ τὴν ἀρχὴν εἶναι φῆσι ψυχὴν, εἴπερ τὴν ἀναθυμίασιν,

<sup>a</sup> i.e. "the Magnesian stone," or, as we call it, the magnet.

## ON THE SOUL, I. II.

for they consider the soul to be that first cause, which by its own nature produces movement ; and this is not unreasonable. And so some have thought the soul to be fire ; for this is composed of the lightest constituents, and of all the elements is the nearest to incorporeal, but it also moves and is a primary cause of movement in other things. Democritus has explained with greater precision why each of these two things is so ; for he identifies the soul and the mind. This, he says, consists of primary and indivisible bodies, and its power of producing movement is due to the smallness of its parts and its shape ; for he calls the spherical the most easily moved of all shapes ; and this characteristic is shared by mind and fire.

Democritus.

Anaxagoras indeed seems to regard soul and mind as different, as we have said before, but he treats them both as of one nature, except that he regards mind as above all things the ultimate principle ; at any rate, he speaks of it as the only existing thing which is simple, unmixed, and pure. But he assigns both the power of knowing and of moving to the same principle when he says that the mind moves everything. Thales too, judging from what men recall of his work, seems to suppose that the soul is in a sense the cause of movement, since he says that a stone<sup>a</sup> has a soul because it causes movement to iron. Diogenes and some others think that the soul is air, regarding this as having the lightest parts of all things, and as an ultimate principle ; for this reason he believes that the soul both knows and causes movement ; it knows because it is primary and from it all else comes ; it causes movement because of its extreme lightness. Heracleitus also calls the soul the first beginning, as the emanation from which

Anaxagoras.

Thales.

Diogenes.

Heracleitus.

405 <sup>a</sup> ἔξ οὐ τάλλα συνίστησιν· καὶ ἀσωματώτατον δὴ καὶ ῥέον ἀεὶ τὸ δὲ κινούμενον κινούμενῷ γινώσκεσθαι. ἐν κινήσει δ' εἶναι τὰ ὅντα κάκεῦνος φῆτο καὶ οἱ πολλοί. παραπλησίως δὲ τούτοις πο καὶ Ἀλκμαίων ἔοικεν ὑπολαβεῖν περὶ ψυχῆς· φησὶ γὰρ αὐτὴν ἀθάνατον εἶναι διὰ τὸ ἔοικέναι τοῖς ἀθανάτοις, τοῦτο δ' ὑπάρχειν αὐτῇ ὡς ἀεὶ κινούμενη· κινεῖσθαι γὰρ καὶ τὰ θεῖα πάντα συνεχῶς 405 <sup>b</sup> ἀεὶ, σελήνην, ἥλιον, τοὺς ἀστέρας καὶ τὸν οὐρανὸν ὅλον. τῶν δὲ φορτικωτέρων καὶ ὕδωρ τινὲς ἀπεφήναντο, καθάπερ "Ιππων. πεισθῆναι δ' ἔοίκασιν ἐκ τῆς γονῆς, ὅτι πάντων ὑγρά· καὶ γὰρ ἐλέγχει τοὺς αἷμα φάσκοντας τὴν ψυχήν, ὅτι ή γονὴ οὐχ αἷμα· ταύτην δ' εἶναι τὴν πρώτην ψυχήν. ἔτεροι δ' αἷμα, καθάπερ Κριτίας, τὸ αἰσθάνεσθαι ψυχῆς οἰκειότατον ὑπολαμβάνοντες, τοῦτο δ' ὑπάρχειν διὰ τὴν τοῦ αἵματος φύσιν. πάντα γὰρ τὰ στοιχεῖα κριτὴν εἴληφε, πλὴν τῆς γῆς· ταύτην δ' οὐθεὶς 10 ἀποπέφανται, πλὴν εἴ τις αὐτὴν εἴρηκεν ἐκ πάντων εἶναι τῶν στοιχείων ή πάντα.

'Ορίζονται δέ πάντες τὴν ψυχὴν τρισὶν ὡς εἰπεῖν, κινήσει, αἰσθήσει, τῷ ἀσωμάτῳ· τούτων δ' ἔκαστον ἀνάγεται πρὸς τὰς ἀρχάς. διὸ καὶ οἱ τῷ γινώσκειν ὅριζόμενοι αὐτὴν ή στοιχεῖον ή ἐκ τῶν στοιχείων ποιοῦσι, λέγοντες παραπλησίως ἀλλήλοις, πλὴν 15 ἐνός· φασὶ γὰρ γινώσκεσθαι τὸ ὅμοιον τῷ ὅμοιῷ· ἐπειδὴ γὰρ ή ψυχὴ πάντα γιγνώσκει, συνιστᾶσιν αὐτὴν ἐκ πασῶν τῶν ἀρχῶν. ὅσοι μὲν οὖν μίαν τινὰ λέγουσιν αἰτίαν καὶ στοιχεῖον ἔν, καὶ τὴν

<sup>a</sup> Empedocles.

<sup>b</sup> Anaxagoras.

## ON THE SOUL, I. II.

he constructs all other things : it is incorporeal and always in a state of flux : he and many others supposed that a thing moving can only be known by something which moves, and all that exists is in motion. Alcmaeon's suppositions about the soul are somewhat similar to these ; for he says it is immortal, because it resembles the immortals, and that this characteristic is due to its perpetual motion ; for things divine are in a state of perpetual motion, the moon, the sun, the stars, and the whole heavens. Some of the less exact thinkers like Hippon have declared the soul to be water. This belief seems to arise from the fact that the seed of all things is moist. For he rebuts those who say that the soul is blood, on the ground that the seed is not blood ; but he says that the first soul is seed. Others like Critias have imagined the soul to be blood, because they have supposed perceptiveness to be the peculiar characteristic of the soul, and that this is due to the nature of blood. In fact each of the elements in turn has found a supporter, except earth ; but this no one has suggested except in so far as one<sup>a</sup> has said that the soul is composed of, or is identical with, all the elements.

But all, or almost all, distinguish the soul by three of its attributes, movement, perception, and incorporeality ; and each of these leads to the first beginnings. So those who define it by the power of knowing describe it as an element, or as derived from the elements, all arguing with one<sup>b</sup> exception on similar lines ; for they say that "like" is known by "like" ; for since everything is known by the soul, they construct it of all the elements. Those, then, who allege that there is only one cause, and but one

## ARISTOTLE

405 b

ψυχὴν ἐν τιθέασιν, οἷον πῦρ ἢ ἀέρα· οἱ δὲ πλείους λέγοντες τὰς ἀρχὰς καὶ τὴν ψυχὴν πλείω ποιοῦσιν. 20 Ἀναξαγόρας δὲ μόνος ἀπαθῆ φησὶν εἶναι τὸν νοῦν, καὶ κοινὸν οὐθὲν οὐθὲνὶ τῶν ἀλλων ἔχειν. τοιοῦτος δ' ὁν πῶς γνωριεῖ καὶ διὰ τίν' αἰτίαν, οὗτ' ἐκεῖνος εἰρηκεν οὗτ' ἐκ τῶν εἰρημένων συμφαινέσ· ἔστιν. ὅσοι δ' ἐναντιώσεις ποιοῦσιν ἐν ταῖς ἀρχαῖς, καὶ τὴν ψυχὴν ἐκ τῶν ἐναντίων συνιστᾶσιν· οἱ δὲ 26 θάτερον τῶν ἐναντίων, οἷον θερμὸν ἢ ψυχρὸν ἢ τι τοιοῦτον ἄλλο, καὶ τὴν ψυχὴν ὁμοίως ἐν τι τούτων τιθέασιν. διὸ καὶ τοῖς ὀνόμασιν ἀκολουθοῦσιν, οἱ μὲν τὸ θερμὸν λέγοντες, ὅτι διὰ τοῦτο καὶ τὸ ζῆν ὡνόμασται, οἱ δὲ τὸ ψυχρὸν διὰ τὴν ἀναπνοὴν καὶ τὴν κατάψυξιν καλεῖσθαι ψυχῆν. τὰ μὲν οὖν παρα- 30 δεδομένα περὶ ψυχῆς, καὶ δι' ἀστιλας λέγονται οὕτω, ταῦτ' ἔστιν.

III. Ἐπισκεπτέον δὲ πρῶτον μὲν περὶ κινήσεως· 406 a ἵσως γὰρ οὐ μόνον ψεῦδός ἔστι τὸ τὴν οὐσίαν αὐτῆς τοιαύτην εἶναι οἷαν φασὶν οἱ λέγοντες ψυχὴν εἶναι τὸ κινοῦν ἔαυτὸν ἢ δυνάμενον κινεῖν, ἀλλ' ἐν τι τῶν ἀδυνάτων τὸ ὑπάρχειν αὐτῇ κίνησιν. ὅτι μὲν οὖν οὐκ ἀναγκαῖον τὸ κινοῦν καὶ αὐτὸν κινεῖσθαι, πρότερον εἴρηται. διχῶς δὲ κινουμένου παντός (ἢ δ γὰρ καθ' ἔτερον ἢ καθ' αὐτό· καθ' ἔτερον δὲ λέγομεν, ὅσα κινεῖται τῷ ἐν κινουμένῳ εἶναι, οἷον πλωτῆρες· οὐ γὰρ ὁμοίως κινοῦνται τῷ πλοίῳ· τὸ μὲν γὰρ καθ' αὐτὸν κινεῖται, οἱ δὲ τῷ ἐν κινουμένῳ

## ON THE SOUL, I. II.—III.

element, also make the soul one element, such as fire or air ; but those who believe in more than one first beginning make the soul also plural. Anaxagoras is alone in his belief that the mind cannot be acted upon, and that it has nothing in common with anything else. But how the mind being thus constructed can ever recognize anything, and by what agency, he does not explain, nor is it clear from his expressed views. But those who assume pairs of opposites to exist in the first beginnings also construct the soul from opposites. Those who suppose the first beginning to be one of a pair of opposites such as hot and cold or the like, similarly also suppose the soul to be one of these. They have an etymological argument also ; those who say it is heat connect *ζῆν* (to live) with *ζεῖν* (to boil), but those who call it cold think that it is due to breathing and chilling or *κατάψυξις* (connecting this with *ψυχή*). These, then, are the traditional views about the soul and the causes to which it is attributed.

III. In the first place we must investigate the question of movement. For perhaps it is not merely untrue that the nature of the soul is of such a kind as those describe it to be who say that the soul moves itself or can do so, but it may be quite impossible that movement should be characteristic of the soul at all. We have said before that it is not necessary that that which produces movement should itself move. But everything may be moved in two senses (directly and indirectly. We call movement indirect, when a thing moves because it is in something which moves ; for instance the passengers in a ship. For they do not move in the same sense as the ship moves ; for the ship moves directly, but they move only by being in

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408 a

εἶναι. δῆλον δ' ἐπὶ τῶν μορίων· οἰκεία μὲν γάρ  
ἐστι κίνησις ποδῶν βάδισις, αὕτη δὲ καὶ ἀνθρώπων·  
10 οὐχ ὑπάρχει δὲ τοῖς πλωτήρσι τότε), διχῶς δὲ  
λεγομένου τοῦ κινεῖσθαι, νῦν ἐπισκοποῦμεν περὶ  
τῆς ψυχῆς εἰ̄ καθ' αὐτὴν κινεῖται καὶ μετέχει  
κινήσεως.

Τεσσάρων δὲ κινήσεων οὐσῶν, φορᾶς ἀλλοιώσεως  
φθίσεως αὐξήσεως, ἢ μίαν τούτων κινοῖτ' ἀν ἢ  
πλείους ἢ πάσας. εἰ̄ δὲ κινεῖται μὴ κατὰ συμ-  
15 βεβηκός, φύσει ἀν ὑπάρχοι κίνησις αὐτῇ· εἰ̄ δὲ  
τοῦτο, καὶ τόπος· πᾶσαι γὰρ αἱ λεχθεῖσαι κινήσεις  
ἐν τόπῳ. εἰ̄ δ' ἐστὶν ἡ οὐσία τῆς ψυχῆς τὸ κινεῖν  
έαυτὴν, οὐ κατὰ συμβεβηκός αὐτῇ τὸ κινεῖσθαι  
ὑπάρξει, ὥσπερ τῷ λευκῷ ἢ τῷ τριπήχει· κινεῖται  
20 γὰρ καὶ ταῦτα, ἀλλὰ κατὰ συμβεβηκός· ὡς γὰρ  
ὑπάρχουσιν, ἐκεῖνο κινεῖται, τὸ σῶμα. διὸ καὶ οὐκ  
ἐστι τόπος αὐτῶν· τῆς δὲ ψυχῆς ἐσται, εἴπερ φύσει  
κινήσεως μετέχει.

"Επι δ' εἰ̄ φύσει κινεῖται, καὶν βίᾳ κινηθείη· καὶν  
εἰ̄ βίᾳ, καὶ φύσει. τὸν αὐτὸν δὲ τρόπον ἔχει καὶ  
περὶ ἡρεμίας· εἰ̄ς ὁ γὰρ κινεῖται φύσει, καὶ ἡρεμεῖ  
25 ἐν τούτῳ φύσει· ὅμοίως δὲ καὶ εἰ̄ς ὁ κινεῖται βίᾳ,  
καὶ ἡρεμεῖ ἐν τούτῳ βίᾳ. ποῖαι δὲ βίαιοι τῆς  
ψυχῆς κινήσεις ἔσονται καὶ ἡρεμίαι, οὐδὲ πλάττειν  
32

## ON THE SOUL, I. III.

something which moves. And this becomes obvious if we consider the parts of the body. For the movement proper to the feet is walking, that is the movement natural to human beings ; and at the moment the passengers are not exhibiting this kind of motion). Movement then having two different senses, we are at present inquiring whether the soul moves and has a share in direct movement.

Now there are four kinds of movement : (1) change of position, (2) change of state, (3) decay and (4) growth ; if then the soul moves, it has one of these kinds of movement, or more than one of them, or all of them. But if the movement of the soul is not accidental, then movement must belong to it by nature ; if this is so, its movement is in space, for all the kinds of movement mentioned are in space. But if it is the essence of the soul to move itself, then movement will not belong to it by accident, as it does for instance to the quality of whiteness, or to a length of three cubits ; these are liable to be moved, but only accidentally, and merely because the body to which they belong is moved. For this reason they have no position in space. But the soul must have a position in space, if it shares in movement by its own nature.

Again, if it moves by its own nature, it must be moved by some force ; and conversely if by force, then its movement is natural to it. And the same thing is true about its rest ; for it comes to rest by nature at the point to which it is moved by nature ; and similarly it rests by force in the place to which it is moved by force. But how these enforced movements of the soul and enforced rests occur is not easy to explain, even if we are prepared to allow our

Four kinds  
of move-  
ment.

Difficulties  
of attribut-  
ing move-  
ment to the  
soul.

408 a βουλομένοις ράδιον ἀποδοῦναι. ἔτι δ' εἰ μὲν ἄνω κινήσεται, πῦρ ἔσται, εἰ δὲ κάτω, γῆ· τούτων γὰρ τῶν σωμάτων αἱ κινήσεις αὗται. ὁ δ' αὐτὸς λόγος 30) καὶ περὶ τῶν μεταξύ.

"Ετι δ' ἐπεὶ φαίνεται κινοῦσα τὸ σῶμα, ταύτας εὖλογον κινεῖν τὰς κινήσεις ἃς καὶ αὐτὴ κινεῖται. εἰ δὲ τοῦτο, καὶ ἀντιστρέψασιν εἰπεῖν ἀληθὲς ὅτι 408 b ἦν τὸ σῶμα κινεῖται, ταύτην καὶ αὐτή. τὸ δὲ σῶμα κινεῖται φορᾷ· ὥστε καὶ ἡ ψυχὴ μεταβάλλοι· ἀν κατὰ τὸ σῶμα ἢ ὅλη ἢ κατὰ μόρια μεθισταμένη. εἰ δὲ τοῦτ' ἐνδέχεται, καὶ ἐξελθοῦσαν εἰσιέναι πάλιν ἐνδέχοιτ' ἄν· τούτῳ δ' ἔποιτ' ἄν τὸ ἀνίστασθαι τὰ τεθνεῶτα τῶν ζώων.

Τὴν δὲ κατὰ συμβεβηκὸς κίνησιν καὶ ὑφ' ἔτέρου κινοῦτο· ὡσθείη γὰρ ἄν βίᾳ τὸ ζῶον. οὐδὲν δὲ φ' τὸ ὑφ' ἑαυτοῦ κινεῖσθαι ἐν τῇ οὐσίᾳ, τοῦθ' ὑπ' ἄλλου κινεῖσθαι, πλὴν εἰ μὴ κατὰ συμβεβηκός, ὥσπερ οὐδὲ τὸ καθ' αὐτὸν ἀγαθὸν ἢ δι' αὐτό, τὸ 10 μὲν δι' ἄλλο εἶναι, τὸ δ' ἔτέρου ἔνεκεν. τὴν δὲ ψυχὴν μάλιστα φαίη τις ἄν ὑπὸ τῶν αἰσθητῶν κινεῖσθαι, εἴπερ κινεῖται.

"Αλλὰ μὴν καὶ εἰ κινεῖ γε αὐτὴ αὐτήν, καὶ αὐτὴ κινοῖτ' ἄν, ὥστ' εἰ πᾶσα κίνησις ἔκστασίς ἐστι τοῦ κινουμένου ἢ κινεῖται, καὶ ἡ ψυχὴ ἐξίσταιτ' ἄν ἐκ τῆς οὐσίας, εἰ μὴ κατὰ συμβεβηκὸς αὐτὴν

<sup>a</sup> Many of the things we want we want for the sake of something else; e.g. we may want money for the sake of health, health for the sake of our work in the world, and so on. But ultimately we must reach a "good" which we want

## ON THE SOUL, I. III.

fancies free play. If the soul moves upwards it will be fire, and if downwards earth ; for these two movements belong respectively to these two bodies ; and the same argument will apply to movements intermediate between "up" and "down."

Moreover, since the soul seems to move the body, it is reasonable to suppose that it imparts to it the same movements that it has itself ; and if this is so, we are entitled to declare the converse proposition true—namely, that the soul has the same movements as the body. But the body moves by change of position ; so that the soul must change position in the same way as the body, either as a complete whole or in parts. But, if this is possible, it would also be possible for the soul to go out of the body and enter in again ; and upon this would follow the possibility of resurrection for those living beings which are dead.

But if the soul's movement is accidental, it must be moved by something else ; the living creature might be pushed by force. But that which has the capacity for self-caused movement cannot be moved by anything else except accidentally : in the same way that which is good in itself is not good for anything else, and that which is good for its own sake is not good for the sake of anything else.<sup>a</sup> But one would be inclined to assert that the soul, if it is moved at all, is moved by sensible objects.

Moreover, even if the soul moves itself, it still moves, so that, if every kind of movement is a displacement of that which moves in so far as it moves, then the soul is moved out of its essential nature, if

for its own sake, one, that is, which is not a subordinate end but the *summum bonum*, for which the Greek philosophers were always seeking.

408 b

15 κινεῖ. ἀλλ' ἔστιν ἡ κύησις τῆς οὐσίας αὐτῆς καθ' αὐτήν.

"Εινοι δὲ καὶ κινεῖν φασὶ τὴν ψυχὴν τὸ σῶμα ἐν ᾧ ἔστιν, ὡς αὐτὴ κινεῖται, οἶον Δημόκριτος, παραπλησίως λέγων Φιλίππω τῷ κωμῳδοδιδασκάλῳ. φησὶ γάρ τὸν Δαιδαλον κινουμένην ποιῆσαι τὴν ἔνδιλλην Ἀφροδίτην, ἐγχέαντ' ἄργυρον χυτοῖν.

20 ὄμοιώς δὲ καὶ Δημόκριτος λέγει· κινουμένας γάρ φησι τὰς ἀδιαιρέτους σφαίρας διὰ τὸ πεφυκέναι μηδέποτε μένειν, συνεφέλκειν καὶ κινεῖν τὸ σῶμα πᾶν. ἡμεῖς δ' ἐρωτήσομεν εἰ καὶ ἡρέμησιν ποιεῖ ταῦτα ταῦτα. πῶς δὲ ποιήσει, χαλεπὸν ἦ καὶ ἀδύνατον εἰπεῖν. ὅλως δ' οὐχ οὕτω φαίνεται 25 κινεῖν ἡ ψυχὴ τὸ ζῶον, ἀλλὰ διὰ προαιρέσεώς τυος καὶ νοήσεως.

Τὸν αὐτὸν δὲ τρόπον καὶ ὁ Τίμαιος φυσιολογεῖ τὴν ψυχὴν κινεῖν τὸ σῶμα· τῷ γάρ κινεῖσθαι αὐτὴν καὶ τὸ σῶμα κινεῖν διὰ τὸ συμπεπλέχθαι πρὸς αὐτό. συνεστηκοῦνται γάρ ἐκ τῶν στοιχείων, καὶ μεμερισμένην κατὰ τοὺς ἀρμονικοὺς ἀριθμούς, 30 ὅπως αἴσθησίν τε σύμφυτοι ἀρμονίας ἔχῃ καὶ τὸ πᾶν φέρηται συμφώνους φοράς, τὴν εὐθυωρίαν εἰς κύκλον κατέκαμψεν· καὶ διελών ἐκ τοῦ ἕιδος δύο 407 a κύκλους δισσαχῆ συνημμένους πάλιν τὸν ἔνα διεῖλεν εἰς ἑπτὰ κύκλους, ὡς οὕσας τὰς τοῦ οὐρανοῦ φορὰς τὰς τῆς ψυχῆς κινήσεις.

Πρῶτον μὲν οὖν οὐ καλῶς τὸ λέγειν τὴν ψυχὴν μέγεθος εἶναι· τὴν γάρ τοῦ παντὸς δῆλον ὅτι τοιαύτην εἶναι βούλεται οἶον ποτ' ἔστιν ὁ καλού-

<sup>a</sup> The point of the comparison is that both offer a purely external and mechanical explanation of movement.

## ON THE SOUL, I. III.

it does not move itself accidentally, but movement is part of its essential nature.

Some say that the soul moves the body in which it resides, just as it moves itself. Such is the view of Democritus, arguing in the vein of Philip, the master of comedy ; for he tells us that Daedalus made the wooden Aphrodite move by pouring in quicksilver.<sup>a</sup> Democritus speaks in a similar strain ; for he says that the indivisible spheres (atoms), because it is their nature never to remain still, draw the whole body with them and move it. But we want to ask whether these same atoms also produce rest. How they can do so, it is difficult, if not impossible, to say. In general the living creature does not seem to be moved by the soul in this way, but by exerting preference and by thought.

In the same way Timaeus <sup>b</sup> in Plato's dialogue also argues by physical science that the soul moves the body ; he thinks that the soul moves the body by its own movement, owing to its being intimately interwoven with it. For first the Creator fashioned the soul out of all the elements, and divided it according to harmonic ratios, in order that it might have perception of harmony and might move entirely by harmonic movements ; then he bent the straight line into the form of a circle, and, having divided the one circle into two, meeting at two points, he again divided one of these into seven, so that the movements of the heavenly bodies are the movements of the soul.

(1) Now in the first place, to say that the soul is a magnitude is unsound ; for "the soul of the world" must clearly be some such thing as what is called

Plato's view  
that the  
soul causes  
movement  
of the body.

<sup>a</sup> Plato, *Timaeus*, pp. 33 *sqq.*

407 a

μενος νοῦς· οὐ γάρ δὴ οἰόν γ' ἡ αἰσθητική, οὐδὲ  
οἰον ἡ ἐπιθυμητική· τούτων γάρ ἡ κίνησις οὐ  
κυκλοφορία. ὁ δὲ νοῦς εἰς καὶ συνεχής, ὥσπερ  
καὶ ἡ νόησις· ἡ δὲ νόησις τὰ νοήματα· ταῦτα δὲ  
τῷ ἐφεξῆς ἔν, ὡς ἀριθμός, ἀλλ' οὐχ ὡς τὸ μέγεθος.  
διόπερ οὐδὲ ὁ νοῦς οὕτω συνεχής, ἀλλ' ἥτοι ἀμερής  
10 ἡ οὐχ ὡς μέγεθός τι συνεχής· πῶς γάρ δὴ καὶ  
νοήσει μέγεθος ἀν δτῷοῦν τῶν μορίων τῶν αὐτοῦ;  
μορίων δ' ἥτοι κατὰ μέγεθος ἡ κατὰ στιγμήν, εἰ  
δεῖ καὶ τοῦτο μόριον εἰπεῖν. εἰ μὲν οὖν κατὰ  
στιγμήν, αὐται δ' ἄπειροι, δῆλον ὡς οὐδέποτε  
διέξεισιν, εἰ δὲ κατὰ μέγεθος, πολλάκις ἡ ἄπειράκις  
15 νοήσει τὸ αὐτό. φαίνεται δὲ καὶ ἄπαξ ἐνδεχόμενον.  
εἰ δ' ἵκανὸν θιγεῖν δτῷοῦν τῶν μορίων, τί δεῖ  
κύκλῳ κινεῖσθαι ἡ καὶ ὅλως μέγεθος ἔχειν; εἰ δ'  
ἀναγκαῖον νοῆσαι τῷ ὅλῳ κύκλῳ θιγόντα, τίς ἐστιν  
ἡ τοῖς μορίοις θίξις; ἔτι δὲ πῶς νοήσει τὸ μεριστὸν  
ἀμερεῖ καὶ τὸ ἀμερὲς μεριστῷ; ἀναγκαῖον δὲ τὸν  
20 νοῦν εἶναι τὸν κύκλον τοῦτον. νοῦ μὲν γάρ κίνησις  
νόησις, κύκλου δὲ περιφορά. εἰ οὖν ἡ νόησις περι-  
φορά, καὶ νοῦς ἀν εἴη ὁ κύκλος, οὐδὲ ἡ τοιαύτη περι-  
φορὰ νόησις. ἀεὶ δὲ δή τι νοήσει· δεῖ γάρ, εἰπερ  
ἀῖδιος ἡ περιφορά· τῶν μὲν γάρ πρακτικῶν νοήσεων  
25 ἐστι πέρατα (πᾶσαι γάρ ἔτέρου χάριν), αἱ δὲ θεωρη-  
τικαὶ τοῖς λόγοις ὁμοίως ὀρίζονται. λόγος δὲ πᾶς

## ON THE SOUL, I. III.

mind ; it is nothing like either the perceptive or appetitive faculty ; for their movements are not circular. But the mind is one, and continuous like the process of thinking ; and the process of thinking implies thoughts. But these are continuous in the same sense as numbers and not as magnitudes. So also the mind is not continuous in this sense, but it is either indivisible, or at any rate is not continuous as a magnitude. For, if it is a magnitude, how will it think with any one of its parts ? With a part then considered as a magnitude, or as a point, if one can call a point a part. If then with a point, seeing that these are infinite, the mind can obviously never reach any end. If as a magnitude, it will think the same thoughts very many or an infinite number of times. But it is clear that it is capable of thinking a thought once only. (2) But if it is sufficient for it to touch with any one of the parts, why should it move in a circle, or generally have magnitude ? But if it can only think when in contact with the whole circle, what is its contact with the parts ? (3) Again, how will the divisible part think the indivisible thought, or the indivisible the divisible ? The mind must therefore be identical with this circle ; for the movement of the mind is the act of thinking, and the movement of a circle is circular. If then the act of thinking travels in a circle, then that circle would be the mind, of which the act of thinking is the circumference. Then there is some one thing which it will always think. It must behave in this way, for the circumference of a circle has no end. But all practical thinking has an end (for all thoughts have an object in view), and theoretical speculations are defined by their terms ; every term is a definition or

407 a ὁρισμὸς ἡ ἀπόδειξις. αἱ δὲ ἀποδείξεις καὶ ἀπὸ ἀρχῆς, καὶ ἔχουσι πως τέλος τὸν συλλογισμὸν ἡ τὸ συμπέρασμα· εἰ δὲ μὴ περατοῦνται, ἀλλ’ οὐκ ἀνακάμπτουσι γε πάλιν ἐπ’ ἀρχήν, προσλαμβάνουσαι δὲ ἀεὶ μέσον καὶ ἄκρον εὐθυποροῦσιν. ἡ 30 δὲ περιφορὰ πάλιν ἐπ’ ἀρχὴν ἀνακάμπτει. οἱ δὲ ὁρισμοὶ πάντες πεπερασμένοι. ἔτι εἰ ἡ αὐτὴ περιφορὰ πολλάκις, δεήσει πολλάκις νοεῖν τὸ αὐτό. ἔτι δὲ ἡ νόησις ἔοικεν ἡρεμήσει τινὶ καὶ ἐπιστάσει μᾶλλον ἡ κινήσει τὸν αὐτὸν δὲ τρόπον καὶ δὲ συλλογισμός. ἀλλὰ μὴν οὐδὲ μακάριόν γε τὸ μὴ 407 b ῥάδιον ἀλλὰ βίαιον· εἰ δὲ ἐστὶν ἡ κίνησις αὐτῆς μὴ οὐσία, παρὰ φύσιν ἀν κινοῦτο. ἐπίπονον δὲ καὶ τὸ μεμῖχθαι τῷ σώματι μὴ δυνάμενον ἀπολυθῆναι, καὶ προσέτι φευκτόν, εἴπερ βέλτιον τῷ νῷ μὴ μετὰ σώματος εἶναι, καθάπερ εἴωθε τε λέγεσθαι καὶ πολλοῖς συνδοκεῖ. ἀδηλος δὲ καὶ τοῦ κύκλῳ φέρεσθαι τὸν οὐρανὸν ἡ αἰτία· οὕτε γὰρ τῆς ψυχῆς ἡ οὐσία αἰτία τοῦ κύκλῳ φέρεσθαι, ἀλλὰ κατὰ συμβεβηκὸς οὕτω κινεῖται, οὕτε τὸ σῶμα αἴτιον, ἀλλ’ ἡ ψυχὴ μᾶλλον ἐκείνω. ἀλλὰ μὴν οὐδὲ ὅτι 10 βέλτιον λέγεται· καίτοι γ’ ἔχρην διὰ τοῦτο τὸν θεὸν κύκλῳ ποιεῖν φέρεσθαι τὴν ψυχήν, ὅτι βέλτιον αὐτῇ τὸ κινεῖσθαι τοῦ μένειν, κινεῖσθαι δὲ οὕτως ἡ ἀλλως. ἐπεὶ δὲ ἐστὶν ἡ τοιαύτη σκέψις ἐτέρων λόγων οἰκειοτέρα, ταύτην μὲν ἀφῶμεν τὸ νῦν.

'Εκεῖνο δὲ ἄποπον συμβαίνει καὶ τούτῳ τῷ λόγῳ 15 καὶ τοῖς πλείστοις τῶν περὶ ψυχῆς· συνάπτουσι γὰρ καὶ τιθέασιν εἰς σῶμα τὴν ψυχήν, οὐθὲν προσ-

## ON THE SOUL, I. III.

a demonstration. A demonstration must start from some beginning, and has an end in a sense in an inference or conclusion. Even if they do not arrive at a conclusion, they do not at any rate return again to the beginning, but they advance in a straight line by means of the middle and extreme terms. But the circle is for ever returning to its starting-point, whereas all definitions are finite. Again, if the same circle recurs frequently, the mind will frequently think the same thing. (4) Again, the mind seems more like a state of rest or a halting than a movement; and the same thing is true of the syllogism. (5) Furthermore, that which moves not easily but only by force cannot be happy. If its movement is not an essential quality, it will be contrary to nature. (6) Again, the idea of the soul being involved with the body without the possibility of escape is painful, and must be avoided, if it is true that it is better for the mind to be without the body, as is usually said and as most men believe. (7) Again, the reason why the heavenly bodies move in a circle is obscure. For the essence of the soul suggests no reason for its circular movement, but it only moves in this way by accident, nor is the body responsible for the soul but rather the converse. Nor is there any suggestion that this circular movement is better, and yet God must surely have made the soul move in a circle for this very reason, that movement is a better condition for it than rest, and this movement better than any other. But since this inquiry belongs more properly to another subject let us leave it now.

But there is one absurd feature both in this argument, and in most of those about the soul. Men associate the soul with and place it in the body, with-

Relation of  
soul and  
body.

διορίσαντες διὰ τίν' αἰτίαν καὶ πῶς ἔχοντος τοῦ σώματος. καίτοι δόξειεν ἀν τοῦτ' ἀναγκαῖοι εἶναι· διὰ γὰρ τὴν κοινωνίαν τὸ μὲν ποιεῖ τὸ δὲ πάσχει καὶ τὸ μὲν κινεῖται τὸ δὲ κινεῖ, τούτωι δ' οὐθὲν 20 ὑπάρχει πρὸς ἄλληλα τοῖς τυχοῦσιν. οἱ δὲ μόνον ἐπιχειροῦσι λέγειν ποιόν τι ἡ ψυχή, περὶ δὲ τοῦ δεξιού σώματος οὐθὲν ἔτι προσδιορίζουσιν, ὥσπερ ἐνδεχόμενον κατὰ τοὺς Πυθαγορικοὺς μύθους τὴν τυχοῦσαι ψυχὴν εἰς τὸ τυχὸν ἐνδύεσθαι σῶμα· δοκεῖ γὰρ ἔκαστον ἔδιον ἔχειν εἶδος καὶ μορφήν. παραπλήσιον δὲ λέγουσιν ὥσπερ εἴ τις 25 φαίη τὴν τεκτονικὴν εἰς αὐλοὺς ἐνδύεσθαι· δεῖ γὰρ τὴν μὲν τέχνην χρῆσθαι τοῖς ὄργανοις, τὴν δὲ ψυχὴν τῷ σώματι.

IV. Καὶ ἄλλη δέ τις δόξα παραδέδοται περὶ ψυχῆς, πιθανὴ μὲν πολλοῖς οὐδεμιᾶς ἥττον τῶν λεγομένων, λόγους δ' ὥσπερ εὐθύνας δεδωκυῖα καὶ τοῖς ἐν 30 κοινῷ γνωμένοις λόγοις· ἀρμονίαν γάρ τινα αὐτὴν λέγουσι· καὶ γὰρ τὴν ἀρμονίαν κρᾶσιν καὶ σύνθεσιν ἐναντίων εἶναι, καὶ τὸ σῶμα συγκεῖσθαι ἐξ ἐναντίων.

Καίτοι γε ἡ μὲν ἀρμονία λόγος τίς ἔστι τῶν μιχθέντων ἡ σύνθεσις, τὴν δὲ ψυχὴν οὐδέτερον οἶντας εἶναι τούτων. ἔτι δὲ τὸ κινεῖν οὐκ ἔστιν ἀρμονίας, ψυχῆς δὲ πάντες ἀπονέμουσι τοῦτο μάλισθ' ὡς εἰπεῖν. ἀρμόζει δὲ μᾶλλον καθ' ὑγιείας λέγειν ἀρμονίαν, καὶ ὅλως τῶν σωματικῶν ἀρετῶν, ἡ κατὰ ψυχῆς. φανερώτατον δ' εἴ τις ἀποδιδόναι 5 πειραθείη τὰ πάθη καὶ τὰ ἔργα τῆς ψυχῆς ἀρμονία τινί· χαλεπὸν γὰρ ἐφαρμόζειν. ἔτι δ' εἰ λέγομεν<sup>1</sup> τὴν ἀρμονίαν εἰς δύο ἀποβλέποντες, κυριώτατα μὲν

<sup>1</sup> λέγοιμεν Β.

## ON THE SOUL, I. III.—IV.

out laying down why this is so, and in what condition the body is ; and yet this would seem to be essential. For it is by this association that the soul acts and is acted upon, that it moves and causes movement, and none of these qualities belong to each other by chance. But they only undertake to explain what is the nature of the soul, without postulating anything about the body which is to receive it, as though it were possible, as the Pythagorean stories suggest, that any soul can find its way into any body : but each body seems to have its own peculiar shape and form.. But they talk as if one could suppose that carpentry can find its way into flute-playing; each craft must employ its own tools, and each soul its own body.

IV. There is another traditional theory about the soul, which many find the most credible of all current theories, although it has, as it were, been called to account in general discussions. It is said that the soul is a harmony of some kind ; for, they argue, a harmony is a mixture or composition of opposites, and the body is composed of opposites.

But (1) a harmony is either a proportion or a composition of the ingredients mixed, and the soul cannot be either of these things. (2) Again, movement is not a characteristic of harmony, and yet almost everyone ascribes this to the soul as an essential. (3) It seems more in accord with the facts to ascribe harmony to bodily health and to bodily qualities generally than to the soul. This will become quite obvious if one tries to ascribe the soul's experiences and actions to some sort of harmony ; for it is difficult to make a harmony of them. (4) Again, we use the word harmony in two different senses : primarily

Is the soul  
a harmony  
or propor-  
tion?

Objections  
to this  
theory.

408 a

τῶν μεγεθῶν ἐν τοῖς ἔχουσι κίνησιν καὶ θέσιν τὴν  
σύνθεσιν αὐτῶν, ἐπειδὴν οὕτω συναρμόζωσι· ὥστε  
μηδὲν συγγενὲς παραδέχεσθαι, ἐγτεῦθειν δὲ καὶ τὸν  
τῶν μεμιγμένων λόγον.

10 Οὐδετέρως μὲν οὖν εὔλογοι, ή δὲ σύνθεσις τῶν  
τοῦ σώματος μερῶν λέγει εὐεξέταστος· πολλαί τε  
γάρ αἱ συνθέσεις τῶν μερῶν καὶ πολλαχῶς· τίνος  
οὖν ἡ πᾶς ὑπολαβεῖν τὸν νοῦν χρὴ σύνθεσιν εἶναι,  
ἢ καὶ τὸ αἰσθητικὸν ἡ ὄρεκτικόν; δροίως δὲ  
ἄτοπον καὶ τὸν λόγον τῆς μίξεως εἶναι τὴν ψυχήν·  
15 οὐ γάρ τὸν αὐτὸν ἔχει λόγοι ή μίξις τῶν στοιχείων  
καθ' ἥν σὰρξ καὶ καθ' ἥν ὁστοῦν. συμβήσεται οὖν  
πολλάς τε ψυχὰς ἔχειν καὶ κατὰ πᾶν τὸ σῶμα,  
εἴπερ πάντα μὲν ἐκ τῶν στοιχείων μεμιγμένων, δέ  
δὲ τῆς μίξεως λόγος ἀρμογία καὶ ψυχή. ἀπαιτή-  
σειε δ' ἄν τις τοῦτο γε καὶ παρ' Ἐμπεδοκλέους·  
20 ἔκαστον γάρ αὐτῶν λόγω τινί φησιν εἶναι· πότερον  
οὖν δὲ λόγος ἐστὶν ή ψυχή, ἡ μᾶλλον ἔτερόν τι  
οὖσα ἐγγίνεται τοῖς μέλεσιν; ἔτι δὲ πότερον ή  
φιλία τῆς τυχούσης αἰτία μίξεως ἡ τῆς κατὰ τὸν  
λόγον; καὶ αὕτη πότερον δὲ λόγος ἐστὶν η παρὰ  
τὸν λόγον ἔτερόν τι; ταῦτα μὲν οὖν ἔχει τοιαύτας  
25 ἀπορίας· εἰ δὲ ἐστὶν ἔτερον ή ψυχὴ τῆς μίξεως, τί·  
δή ποτε ἀμα τῷ σαρκὶ εἶναι ἀναιρεῖται καὶ τῷ  
τοῖς ἄλλοις μορίοις τοῦ ζώου; πρὸς δὲ τούτοις

<sup>a</sup> Love is Empedocles' personification of the force of attraction which accounts for the combination of elements into a whole, as its opposite repulsion (Strife) accounts for the separation of things into separate wholes.

## ON THE SOUL, I. iv.

of magnitude, to mean putting together in the case of those things, which have movement and position, when they fit in such a way that there is no room for anything of the same kind between them ; but in another sense we use the word harmony to mean the proportion in which the components are mixed.

Neither of these meanings offers a reasonable explanation of the soul, but, in the sense of composition of parts of the body, the theory is easily refuted. For the compositions of parts are many, and take place in many ways. Of which of the parts, then, are we to suppose that the mind or the perceptive or appetitive faculty is a composition, and how is such a composition effected ? But the view that the soul is a harmony in the sense of a proportion of components is equally absurd. For the mixing of the elements which go to make the flesh has not the same proportions as that which makes the bone. It will follow, then, that there are many souls distributed all over the body, if all is made up of elements in different combinations, and the proportion of the mixture is a harmony which is the soul. One would like to question Empedocles ; for he says that each of these parts is determined by a certain proportion. Now is this proportion the soul, or is the soul something distinct, which develops in the limbs ? Again, is his principle of Love " responsible for a chance mixture, or for a mixture in a fixed proportion ? And is the soul this proportion, or is it some other thing distinct from the proportion ? Such are the difficulties which these theories present. If the soul is a different thing from the mixture in proportion, why does it die at the same time as the flesh and the other parts of the living animal ? Besides this, unless each of the

## ARISTOTLE

408 a εἴπερ μὴ ἔκαστον τῶν μορίων ψυχὴν ἔχει, εἰ μὴ ἔστιν ἡ ψυχὴ ὁ λόγος τῆς μίξεως, τί ἔστιν ὁ φθείρεται τῆς ψυχῆς ἀπολειπούσης;

“Οτι μὲν οὖν οὕθ’ ἀρμονίαν οἴον τ’ εἶναι τὴν 810 ψυχὴν οὔτε κύκλῳ περιφέρεσθαι, δῆλοι ἐκ τῶν εἰρημένων. κατὰ συμβεβηκὸς δὲ κινεῖσθαι, καθ- ἀπερ εἴπομεν, ἔστι καὶ κινεῖν ἔαυτήν, οἷον κινεῖσθαι μὲν ἐν ᾧ ἔστι, τοῦτο δὲ κινεῖσθαι ὑπὸ τῆς ψυχῆς· ἄλλως δ’ οὐχ οἴον τε κινεῖσθαι κατὰ τόπον αὐτήν.

Εὐλογώτερον δ’ ἀπορήσειν ἄν τις περὶ αὐτῆς ὡς 408 b κινουμένης, εἰς τὰ τοιαῦτα ἀποβλέψας: φαμὲι γάρ τὴν ψυχὴν λυπεῖσθαι χαίρειν θαρρεῶν φοβεῖσθαι, ἔτι δὲ ὅργιζεσθαι τε καὶ αἰσθάνεσθαι καὶ διανοεῖ- σθαι· ταῦτα δὲ πάντα κινήσεις εἶναι δοκοῦσιν.

δ ὅθεν οἰηθείη τις ἀν αὐτὴν κινεῖσθαι· τὸ δ’ οὐκ ἔστιν ἀναγκαῖον· εἰ γάρ καὶ ὅτι μάλιστα τὸ λυπεῖσθαι ἡ χαίρειν ἡ διανοεῖσθαι κινήσεις εἰσί, καὶ ἔκαστον κινεῖσθαι τούτων, τὸ δὲ κινεῖσθαι ἔστιν ὑπὸ τῆς ψυχῆς, οἷον τὸ ὅργιζεσθαι ἡ φοβεῖσθαι τῷ τὴν καρδίαν ὧδι κινεῖσθαι, τὸ δὲ διανοεῖσθαι ἡ τοιοῦτον 10 ἵσως ἡ ἔτερόν τι (τούτων δὲ συμβαίνει τὰ μὲν κατὰ φορὰν τινῶν κινουμένων, τὰ δὲ κατ’ ἄλ- λοισιν. ποῖα δὲ καὶ πῶς, ἔτερός ἔστι λόγος).

τὸ δὲ λέγειν ὅργιζεσθαι τὴν ψυχὴν ὅμοιον καν εἰ τις λέγοι τὴν ψυχὴν ὑφαίνειν ἡ οἰκοδομεῖν· βέλτιον γάρ ἵσως μὴ λέγειν τὴν ψυχὴν ἐλεεῖν ἡ μανθάνειν ἡ 15 διανοεῖσθαι, ἀλλὰ τὸν ἄνθρωπον τῇ ψυχῇ. τοῦτο δὲ μὴ ὡς ἐν ἐκείνῃ τῆς κινήσεως οὖσης, ἀλλ’ ὅτε μὲν μέχρι ἐκείνης, δὲ δ’ ἀπ’ ἐκείνης, οἷον ἡ μὲν

## ON THE SOUL, I. iv.

parts has a separate soul of its own, and if in consequence the soul is not the proportion of the mixture, what is it which is destroyed when the soul leaves it?

It is clear from what has been said that the soul Summary. cannot be a harmony, nor can it move in a circle. It is, however, possible, as we have said, that it has movement as an accidental quality, and that it can move itself in the sense of moving within that in which it resides, and that this is moved by the soul ; but in no other sense can it move in space.

The following considerations suggest even more Further difficulties about the soul's movement. reasonable difficulties in the theory that the soul moves. We say that the soul grieves, is courageous, or afraid, and also grows angry, perceives and thinks ; all these seem to be movements ; from which one might suppose that the soul is moved ; but this is not a necessary consequence. Let us grant that grief, joy and thinking are all movements, and that each of these may be called a movement ; let us further admit that movement is caused by the soul—for instance that anger and fear are particular movements of the heart, and that thinking is the movement of the heart or of something else (recognizing of course that some of these movements are in position, and some qualitative : of what kind and in what way is another question). Even if we admit both these propositions, to say that the soul gets angry is as if one were to say that the soul weaves or builds a house. Probably it is wiser not to say that the soul pities, or learns, or thinks, but to say rather that the soul is the instrument whereby man does these things ; that is to say, that the movement does not take place in the soul, but sometimes penetrates to it, and sometimes starts from it. For instance perception starts from

## ARISTOTLE

408 b

αἰσθησις ἀπὸ τωνδί, ἡ δ' ἀνάμυησις ἀπ' ἐκείνης  
ἐπὶ τὰς ἐν τοῖς αἰσθητηρίοις κινήσεις ἡ μονάς.

Ο δὲ νοῦς ἔοικεν ἐγγίνεσθαι οὐσίᾳ τις οὖσα,  
20 καὶ οὐ φθείρεσθαι. μάλιστα γὰρ ἐφθείρετ' ἀν ύπὸ<sup>της</sup> ἐν τῷ γήρᾳ ἀμαυρώσεως, οὐν δ' ἵσως ὅπερ  
ἐπὶ τῶν αἰσθητηρίων συμβαίνει· εἰ γὰρ λάβοι ὁ  
πρεσβύτης ὅμιλα τοιωνδί, βλέποι ἀν ὥσπερ κινήσεις.  
25 καὶ τὸ νοεῖν δὴ καὶ τὸ θεωρεῖν μαραίνεται ἄλλου  
τινὸς ἔσω φθειρομένου, αὐτὸ δὲ ἀπαθές ἐστιν. τὸ  
δὲ διανοεῖσθαι καὶ φιλεῖν ἡ μισεῖν οὐκ ἔστιν ἐκείνου  
πάθη, ἀλλὰ τουδὶ τοῦ ἔχοντος ἐκεῖνο, ἡ ἐκεῖνο  
ἔχει. διὸ καὶ τούτου φθειρομένου οὔτε μνημονεύει  
οὔτε φιλεῖ· οὐ γὰρ ἐκείνου ἦν, ἀλλὰ τοῦ κοινοῦ, ὁ  
ἀπόλωλεν· ὁ δὲ νοῦς ἵσως θειότερόν τι καὶ ἀπαθές  
30 ἐστιν. ὅτι μὲν οὖν οὐχ οἶδιν τε κινεῖσθαι τὴν  
ψυχήν, φανερὸν ἐκ τούτων· εἰ δ' ὅλως μὴ κινεῖται,  
δῆλον ὡς οὐδὲ ὑφ' ἔαυτῆς.

Πολὺ δὲ τῶν εἰρημένων ἀλογώτατον τὸ λέγειν  
ἀριθμὸν εἶναι τὴν ψυχὴν κινοῦνθ' ἔαυτόν· ὑπάρχει  
γὰρ αὐτοῖς ἀδύνατα· πρῶτα μὲν τὰ ἐκ τοῦ κινεῖσθαι  
409 a συμβαίνοντα, ιδίᾳ δ' ἐκ τοῦ λέγειν αὐτὴν ἀριθμόν·  
πῶς γὰρ χρὴ νοῆσαι μονάδα κινουμένην, καὶ ύπὸ<sup>τίνος</sup>, καὶ πῶς, ἀμερῆ καὶ ἀδιάφορον οὖσαν; εἰ  
γάρ ἐστι κινητική καὶ κινητή, διαφέρειν δεῖ. ἔτι

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<sup>a</sup> This is the theory of Xenocrates, a contemporary of Aristotle, who succeeded Speusippus as head of the "Academy."

## ON THE SOUL, I. iv.

particular objects and reaches the soul ; recollection starts from the soul and reaches to movements in the sense organs, or to remains of such movements.

But the mind seems to have an independent existence and not to suffer decay. If it could be destroyed the most probable cause would be the feebleness of old age, but, as it cannot, probably the same thing occurs as in the sense organs ; for if an old man could acquire the eye of a young man, he would see as a young man sees. So that old age is not due to any affection of the soul, but only of that in which the soul resides, as is the case in drunkenness and disease. Thus the power of thought and speculation decays because something else within decays, but the power of thought is not itself affected. Thinking, loving and hating are not then qualities of the mind, but rather of the individual man who possesses the mind, in so far as he does so. Memory and love then fail because he fails ; for they were never part of the mind, but of the whole entity which has perished. Possibly the mind is too divine, and is therefore unaffected. It is then obvious from these considerations that the soul cannot move ; and, if it is generally incapable of movement, it is obviously not moved by itself.

But of all the unreasonable theories about the soul the most unreasonable is that which calls the soul a number which moves itself.<sup>a</sup> In this theory there are inherent impossibilities, first those which arise from the idea of movement and in particular from calling the soul a number. For how can one conceive (1) a unit moving, and by what is it moved, and in what way, being as it is without parts and indivisible ? For if it is movable and moved it must have divisions.

Does the soul decay ?

The soul as a self-moving number.

## ARISTOTLE

409 a

δ' ἐπεί φασι κινηθεῖσαν γραμμὴν ἐπίπεδον ποιεῖν,  
 5 στιγμὴν δὲ γραμμὴν, καὶ αἱ τῶν μονάδων κινήσεις  
 γραμμαὶ ἔσονται· ἡ γὰρ στιγμὴ μονάς ἐστι θέσιν  
 ἔχουσα· ὁ δ' ἀριθμὸς τῆς ψυχῆς ἥδη πού ἐστι καὶ  
 θέσιν ἔχει. ἔτι δ' ἀριθμοῦ μὲν ἐὰν ἀφέλη τις  
 ἀριθμὸν ἡ μονάδα, λείπεται ἄλλος ἀριθμός· τὰ δὲ  
 φυτὰ καὶ τῶν ζώων πολλὰ διαιρούμενα ζῆ, καὶ  
 10 δοκεῖ τὴν αὐτὴν ψυχὴν ἔχειν τῷ εἰδει. δόξειε δ'  
 ἂν οὐθὲν διαφέρειν μονάδας λέγειν ἡ σωμάτια  
 μικρά· καὶ γὰρ ἐκ τῶν Δημοκρίτου σφαιρίων ἐὰν  
 γένωνται στιγμαί, μόνον δὲ μένη τὸ ποσόν, ἔσται  
 τι ἐν αὐτῷ τὸ μὲν κινοῦν τὸ δὲ κινούμενον, ὥσπερ  
 ἐν τῷ συνεχεῖ· οὐ γὰρ διὰ τὸ μεγέθει διαφέρειν ἡ  
 15 μικρότητι συμβαίνει τὸ λεχθέν, ἀλλ' ὅτι ποσόν.  
 διὸ ἀναγκαῖον εἶναι τι τὸ κινῆσον τὰς μονάδας.  
 εἰ δ' ἐν τῷ ζῷῳ τὸ κινοῦν ἡ ψυχή, καὶ ἐν τῷ  
 ἀριθμῷ, ὥστε οὐ τὸ κινοῦν καὶ τὸ κινούμενον ἡ  
 ψυχή, ἀλλὰ τὸ κινοῦν μόνον. ἐνδέχεται δὲ ὁ δῆ  
 πῶς μονάδα ταύτην εἶναι;<sup>1</sup> δεῖ γὰρ ὑπάρχειν τινὰ  
 20 αὐτῇ διαφορὰν πρὸς τὰς ἄλλας· στιγμῆς δὲ μονα-  
 δικῆς τίς ἂν εἴη διαφορὰ πλὴν θέσις; εἰ μὲν οὖν  
 εἰσὶν ἔτεραι αἱ ἐν τῷ σώματι μονάδες καὶ αἱ  
 στιγμαί, ἐν τῷ αὐτῷ ἔσονται αἱ μονάδες· καθέξει  
 γὰρ χώραν στιγμῆς. καίτοι τί κωλύει ἐν τῷ  
 αὐτῷ εἶναι, εἰ δύο, καὶ ἀπείρους; ὅν γὰρ ὁ τόπος  
 25 ἀδιαιρετος, καὶ αὐτά. εἰ δ' αἱ ἐν τῷ σώματι  
 στιγμαὶ ὁ ἀριθμὸς ὁ τῆς ψυχῆς, ἡ εἰ δὲ ἐκ τῶν ἐν  
 τῷ σώματι στιγμῶν ἀριθμὸς ἡ ψυχή, διὰ τί οὐ

<sup>1</sup> B. δῆ πως and no question mark.

## ON THE SOUL, I. iv.

(2) Again, since they say that a straight line in motion describes a plane figure, and a moving point a line, the movement of units will be straight lines. For a point is a unit having position ; but the number of the soul is already somewhere, and has position.

(3) Now, if one subtracts a number or unit from a number, another number is left. But plants and many animals continue to live even when divided, and seem to have the same soul in these fragments as in their original form. It would seem to make no difference whether we speak of units or of minute bodies. For if points are developed from Democritus's spheres, and if magnitude is their only permanent quality, there will be something which moves and something which is moved, as in a continuous succession. For what we have mentioned does not occur through any difference of size (either great or small), but because it is a quantity. There must, then, be something which will give movement to the units. But if that which produces movement in the animal is the soul, then it is also so in the number, so that the soul is not both that which produces movement and that which is moved, but only that which produces movement. But how can this possibly be a unit ? For it must have differences from other units. But what difference can there be between one point and another except in position ? If then the bodily units and points are different, the units will be in the same place, for each will occupy the place of a point. And yet what prevents them, if there are two or an infinite number, from coinciding in the same place ? For where space is indivisible so are they. But if the bodily points are identical with the soul number, or if the number of bodily points is the soul, why do not

# ARISTOTLE

400 a

πάντα ψυχὴν ἔχουσι τὰ σώματα; στιγμαὶ γάρ εἰ  
ἄπασι δοκοῦσιν εἶναι καὶ ἀπειροι. ἔτι δὲ πῶς οἵν  
τε χωρίζεσθαι τὰς στιγμὰς<sup>1</sup> καὶ ἀπολύεσθαι τῶν  
30 σωμάτων, εἴ γε μὴ διαιροῦνται αἱ γραμμαὶ εἰς  
στιγμάς;

V. Συμβαίνει δέ, καθάπερ εἴπομεν, τῇ μὲν ταύτῃ  
λέγειν τοῖς σῶμά τι λεπτομερὲς αὐτὴν τιθεῖσι, τῇ  
400 b δ', ὥσπερ Δημόκριτος κινεῖσθαι φησιν ὑπὸ τῆς  
ψυχῆς, ἵδιον τὸ ἀτοπον· εἴπερ γάρ ἐστιν ἡ ψυχὴ  
ἐν παντὶ τῷ αἰσθανομένῳ σώματι, ἀναγκαῖον ἐν  
τῷ αὐτῷ δύο εἶναι σώματα, εἰ σῶμά τι ἡ ψυχὴ·  
τοῖς δ' ἀριθμὸν λέγουσιν, ἐν τῇ μιᾷ στιγμῇ πολ-  
λὰς στιγμὰς ἡ πᾶν σῶμα ψυχὴν ἔχειν, εἰ μὴ  
διαφέρων τις ἀριθμὸς ἐγγίνεται καὶ ἄλλος τις τῶν  
ὑπαρχουσῶν ἐν τῷ σώματι στιγμῶν. συμβαίνει  
τε κινεῖσθαι τὸ ζῷον ὑπὸ τοῦ ἀριθμοῦ, κινθάπερ  
καὶ Δημόκριτον ἔφαμεν αὐτὸν κινεῖν· τί γὰρ  
διαφέρει σφαίρας λέγειν σμικρὰς ἡ μονάδας μεγά-  
10 λας, ἡ ὅλως μονάδας φερομένας; ἀμφοτέρως γὰρ  
ἀναγκαῖον κινεῖν τὸ ζῷον τῷ κινεῖσθαι ταύτας.

Toῖς δὴ συμπλέξασιν εἰς τὸ αὐτὸν κύνησιν καὶ  
ἀριθμὸν ταῦτα τε συμβαίνει καὶ πολλὰ ἔτερα  
τοιαῦτα· οὐ γὰρ μόνον δρισμὸν ψυχῆς ἀδύνατον  
τοιοῦτον εἶναι, ἄλλα καὶ συμβεβηκός. δῆλον δ'  
15 εἴ τις ἐπιχειρήσειεν ἐκ τοῦ λόγου τούτου τὰ πάθη,  
καὶ τὰ ἔργα τῆς ψυχῆς ἀποδιδόναι, οἷον λογισμούς,  
αἰσθήσεις, ἥδονάς, λύπας, ὅσα ἄλλα τοιαῦτα·  
ὥσπερ γὰρ εἴπομεν πρότερον, οὐδὲ μαντεύσασθαι  
ράδιον ἔξι αὐτῶν.

<sup>1</sup> ψυχὰς B.

## ON THE SOUL, I. iv.—v.

all bodies have a soul? For there appear to be an infinite number of points in all of them. And again how is it possible to separate the points and free them from the bodies, unless the lines are divided into points?

V. As we have said, this theory in one direction says the same thing as those who suppose the soul to be a body of light parts, and in another direction, just as when Democritus states that the body is moved by the soul, it has an absurdity of its own. For if the soul exists in every part of the sentient body then there must be two bodies in the same place, if the soul is a body. But those who say that the soul is a number must believe that there are many points in one point, or else that every body has a soul, unless the number existing in the soul is a different thing from the points which reside in bodies. And it follows that the living creature is moved by the number, just as we have already said that Democritus accounted for its movement; for what difference does it make whether we call them small spheres, or large units, or generally moving units? For in either case they can only move the living creature by moving themselves.

Xenocrates' theory further criticized.

These are the difficulties in the way of those who combine movement and number together, and there are many other problems of a like nature; for not only is this unable to serve as a definition of the soul; it is not even one of its accidental attributes. And this will become clear to anyone, if he tries to give an explanation based on this theory of the affections and functions of the soul, such as calculations, sensations, pleasures, sorrows, and so on; for, as we have said before, on these lines it is not easy even to conjecture an explanation.

## ARISTOTLE

409 b

Τριῶν δὲ τρόπων παραδεδομένων καθ' οὓς  
 20 δρίζονται τὴν ψυχὴν, οἱ μὲν τὸ κινητικώτατον  
 ἀπεφήναντο τῷ κινεῖν ἔαντό, οἱ δὲ σῶμα τὸ λε-  
 πτομερέστατον ἢ τὸ ἀσωματώτατον τῶν ἄλλων.  
 ταῦτα δὲ τίνας ἀπορίας τε καὶ ὑπεναντιώσεις ἔχει,  
 διεληλύθαμεν σχεδόν. λείπεται δ' ἐπισκέψασθαι  
 πῶς λέγεται τὸ ἐκ τῶν στοιχείων αὐτὴν εἶναι.  
 25 λέγουσι μὲν γάρ, ἵν' αἰσθάνηται τε τῶν ὄντων  
 καὶ ἔκαστον γνωρίζῃ, ἀναγκαῖον δὲ συμβαίνειν  
 πολλὰ καὶ ἀδύνατα τῷ λόγῳ· τίθενται γὰρ γνωρίζειν  
 τῷ ὅμοιῷ τὸ ὅμοιον, ὥσπερ ἀν εἰ τὴν ψυχὴν τὰ  
 πράγματα τιθέντες. οὐκ ἔστι δὲ μόνα ταῦτα,  
 πολλὰ δὲ καὶ ἔτερα, μᾶλλον δ' ἵσως ἀπειρα τὸν  
 30 ἀριθμόν, τὰ ἐκ τούτων. ἐξ ὧν μὲν οὖν ἔστιν  
 ἔκαστον τούτων, ἔστω γινώσκειν τὴν ψυχὴν καὶ  
 αἰσθάνεσθαι· ἀλλὰ τὸ σύνολον τίνι γνωριεῖ ἢ  
 αἰσθήσεται, οἷον τί θεὸς ἢ ἄνθρωπος ἢ σάρξ ἢ  
 410 a ὁστοῦν; ὅμοιως δὲ καὶ ἄλλο ὅτιοῦν τῶν συνθέτων.  
 οὐ γὰρ ὅπωσδυν ἔχοντα τὰ στοιχεῖα τούτων ἔκα-  
 στον, ἀλλὰ λόγῳ τινὶ καὶ συνθέσει, καθάπερ φησὶ  
 καὶ Ἐμπεδοκλῆς τὸ ὁστοῦν.

ἡ δὲ χθῶν ἐπίγρος ἐν εὐστέρνοις χοάνοισιν  
 5 τῷ<sup>1</sup> δύο τῶν ὀκτὼ μερέων λάχει νήστιδος αἴγλης,  
 τέσσαρα δ' Ἡφαίστοιο· τὰ δ' ὁστέα λεύκ'·  
 ἐγένοντο.

οὐδὲν οὖν ὄφελος εἶναι τὰ στοιχεῖα ἐν τῇ ψυχῇ, εἰ  
 μὴ καὶ οἱ λόγοι ἐνέσονται καὶ ἡ σύνθεσις· γνωριεῖ  
 γὰρ ἔκαστον τὸ ὅμοιον, τὸ δ' ὁστοῦν ἢ τὸν ἄνθρω-

<sup>1</sup> τὰ B.

## ON THE SOUL, I. v.

Three methods of defining the soul have come down to us ; some have regarded it as the greatest cause of movement, because it moves itself ; others again have explained the soul as composed of very light parts, or as corporeal but less so than any other body. We have pretty well exhausted the difficulties and contradictions which these two definitions involve. But it remains to examine the third definition, and see what is meant by saying that the soul is composed of the elements. This theory is intended to explain how the soul apprehends and recognizes each existing thing, but the theory involves many impossibilities ; its supporters assume that like is recognized by like, and thus they identify the soul with the things it knows. But these elements are not the only things existing ; there are many other things compounded of the elements, in fact these are almost infinite. Granted that the soul might know and perceive the elements from which each of these things is compounded ; yet by what part will it perceive and know a composite whole such as god, man, flesh, or bone ? And similarly any other compound whole ? For such wholes do not consist of the elements arranged at random, but in a certain proportion and with some principle of composition, as Empedocles says in his description of bone :

“ The pleasant earth in full-breasted crucibles took two of the eight parts from the gleam of moisture, and four from Hephaestus ; and bones came into being all white.”

It is then no use for the elements to exist in the soul, unless the proportion and principle of composition also exist in it ; for each thing will recognize the like, but there will be nothing in the soul to recognize

The soul as  
a compound  
of the  
elements.

ARISTOTLE

410 a

10 πον οὐθέν, εὶ μὴ καὶ ταῦτ’ ἐνέσται. τοῦτο δ’ ὅτι ἀδύνατον, οὐθὲν δεῖ λέγειν· τίς γὰρ ἀν ἀπορήσειεν εἰ ἔνεστιν ἐν τῇ ψυχῇ λίθος ἢ ἄνθρωπος; ὅμοίως δὲ καὶ τὸ ἀγαθὸν καὶ τὸ μὴ ἀγαθόν. τὸν αὐτὸν δὲ τρόπον καὶ περὶ τῶν ἄλλων.

15 "Ετι δὲ πολλαχῶς λεγομένου τοῦ ὄντος (σημαίνει γὰρ τὸ μὲν τόδε τι, τὸ δὲ ποσὸν ἢ ποιὸν ἢ καὶ τίνα ἄλλην τῶν διαιρεθεισῶν κατηγοριῶν) πότερον ἔξ ἀπάντων ἔσται ἡ ψυχὴ ἢ οὐ; ἀλλ’ οὐ δοκεῖ κοινὰ πάντων εἶναι στοιχεῖα. ἀρ’ οὖν ὅσα τῶν οὐσιῶν ἐκ τούτων μόνον; πῶς οὖν γινώσκει καὶ τῶν ἄλλων ἔκαστον; ἢ φήσουσιν ἔκάστου γένους εἶναι στοιχεῖα καὶ ἀρχὰς ἴδιας, ἔξ ὧν τὴν ψυχὴν 20 συνεστάναι; ἔσται ἄρα ποσὸν καὶ ποιὸν καὶ οὐσία. ἀλλ’ ἀδύνατον ἐκ τῶν τοῦ ποσοῦ στοιχείων οὐσίαν εἶναι καὶ μὴ ποσόν. τοῖς δὴ λέγουσιν ἐκ πάντων ταῦτά τε καὶ τοιαῦθ’ ἔτερα συμβαίνει. ἄτοπον δὲ καὶ τὸ φάναι μὲν ἀπαθὲς εἶναι τὸ ὅμοιον ὑπὸ τοῦ ὅμοίου, αἰσθάνεσθαι δὲ τὸ ὅμοιον τοῦ ὅμοίου καὶ 25 γινώσκειν τῷ ὅμοίῳ τὸ ὅμοιον. τὸ δ’ αἰσθάνεσθαι πάσχειν τι καὶ κινεῖσθαι τιθέασιν. ὅμοίως δὲ καὶ τὸ νοεῖν τε καὶ γινώσκειν.

Πολλὰς δ’ ἀπορίας καὶ δυσχερείας ἔχοντος τοῦ λέγειν, καθάπερ Ἐμπεδοκλῆς, ὡς τοῖς σωματικοῖς στοιχείοις ἔκαστα γνωρίζεται καὶ πρὸς τὸ ὅμοιον, 30 μαρτυρεῖ τὸ νῦν λεχθέν· ὅσα γὰρ ἔνεστιν ἐν τοῖς 410 b τῶν ζώων σώμασιν ἀπλῶς γῆς, οἶνον ὀστᾶ νεῦρα τρίχες, οὐθενὸς αἰσθάνεσθαι δοκεῖ, ὥστ’ οὐδὲ τῶν ὅμοίων. καίτοι προσῆκεν. ἔτι δ’ ἔκάστη τῶν

<sup>a</sup> So that the soul can know other categories besides that of substance.

## ON THE SOUL, I. v.

bone, for instance, or man, unless they exist in it. But it is unnecessary to prove that this is impossible. For who could speculate as to whether there is a stone or a man in the soul? The same argument applies to good and not-good; and so with many other things.

Again, the word "existing" is used in many <sup>Dificulties in the theory.</sup> senses (it means substance, quantity, quality, or any other of the different categories). Is the soul then composed of all these or not? The elements cannot surely be common to all the categories. Is the soul composed only of those which belong to the category of substance? How then is it to know each of the others? Will they maintain that the elements have each their own genus and special principles, and that the soul is composed of each of these? In that case it will be quantity, quality, and substance. But nothing can be derived from the elements of quantity without its being quantity. Those who say that the soul is composed of all the elements are confronted with these and similar difficulties. It is unreasonable to say on the one hand that like is not acted on by like, and on the other that like has perception of like, and that one recognizes like by like; but they describe perception as a form of being acted upon and as movement. And similarly with thinking and knowing.

There are many obscurities and difficulties in saying, as Empedocles does, that each thing is known by corporeal elements, as what has been already said shows. For all the elements in living creatures which are composed simply of earth, such as bone, sinews, and hair, seem to have no perception at all, even of like things; and yet on this theory they should have.

410 b

ἀρχῶν ἄγνοια πλείων ἢ σύνεσις ὑπάρξει· γνώσεται  
 μὲν γὰρ ἐν ἔκαστον, πολλὰ δ' ἄγνοήσει· πάντα  
 δ γὰρ τάλλα. συμβαίνει δ' Ἐμπεδοκλεῖ γε καὶ  
 ἀφρονέστατον εἶναι τὸν θεόν· μόνος γὰρ τῶν στοι-  
 χείων ἐν οὐ γνωριεῖ, τὸ νεῦκος, τὰ δὲ θυητὰ πάντα·  
 ἐκ πάντων γὰρ ἔκαστον. ὅλως τε διὰ τίν' αἰτίαν  
 οὐχ ἅπαντα ψυχὴν ἔχει τὰ ὄντα, ἐπειδὴ πᾶν ἢ  
 στοιχεῖον ἢ ἐκ στοιχείου ἐνὸς ἢ πλειόνων ἢ πάντων;  
 10 ἀναγκαῖον γάρ ἔστιν ἐν τι γνώσκειν ἢ τινὰ ἢ  
 πάντα. ἀπορήσειε δ' ἂν τις καὶ τί ποτ' ἔστὶ τὸ  
 ἐνυποιοῦν αὐτά· ὑλῇ γὰρ ἔοικε τά γε στοιχεῖα·  
 κυριώτατον γὰρ ἐκεῖνο τὸ συνέχον ὅ τι ποτ' ἔστιν·  
 τῆς δὲ ψυχῆς εἶναι τι κρείττον καὶ ἄρχον ἀδύνατον·  
 ἀδυνατώτερον δ' ἔτι τοῦ νοῦ· εὑλογον γὰρ τοῦτον  
 15 εἶναι προγενέστατον καὶ κύριον κατὰ φύσιν, τὰ δὲ  
 στοιχεῖά φασι πρῶτα τῶν ὄντων εἶναι.

Πάντες δὲ καὶ οἱ διὰ τὸ γνωρίζειν καὶ αἰσθάνε-  
 σθαι τὰ ὄντα τὴν ψυχὴν ἐκ τῶν στοιχείων λέγοντες  
 αὐτήν, καὶ οἱ τὸ κινητικώτατον, οὐ περὶ πάσης  
 λέγουσι ψυχῆς· οὕτε γὰρ τὰ αἰσθανόμενα πάντα  
 20 κινητικά· φαίνεται γὰρ εἶναι τινα μόνιμα τῶν ζώων  
 κατὰ τόπον. καίτοι δοκεῖ γε ταῦτην μόνην τῶν  
 κινήσεων κινεῖν ἡ ψυχὴ τὸ ζῶον. ὅμοίως δὲ καὶ  
 ὅσοι τὸν νοῦν καὶ τὸ αἰσθητικὸν ἐκ τῶν στοιχείων  
 ποιοῦσιν· φαίνεται γὰρ τά τε φυτὰ ζῆν οὐ μετ-  
 ἔχοντα φορᾶς οὐδ' αἰσθήσεως, καὶ τῶν ζώων πολλὰ

## ON THE SOUL, I. v.

Again, in each of these first principles there will be more ignorance than understanding ; for each will know one thing, but will be ignorant of many, in fact of everything else. Thus Empedocles' god must be most unintelligent ; for he alone will be ignorant of one of these elements, namely strife, whereas man will know them all ; for each individual is composed of them all ; in general also why have not all existing things a soul, since everything is an element, or composed of an element, or of more than one, or of all ? For they must all know one thing, or some things, or all things. There would be a further difficulty in deciding what is the combining principle, for the elements correspond to matter ; and the combining force, whatever it is, is complete master ; but it is impossible that anything should be superior to and master of the soul, and still more impossible that it should be superior to the mind ; for it is reasonable to suppose that the mind is by nature prior and master, but they say that the elements are the first of all existing things.

Those who say that the soul is composed of the elements, because it knows and perceives existing things, and equally those who call it the chief cause of motion, do not offer an explanation which will cover every soul. For not everything which has perception has movement also ; for instance some living things seem to be stationary in space ; and yet this seems the only kind of movement which the soul imparts to the living creature. The same difficulty arises for those who construct the mind and the perceptive faculty out of the elements ; for plants seem to live without sharing in movement in space, nor in perception, and many living animals have no power

The definition will not cover all the facts.

410 b

25 διάνοιαν οὐκ ἔχειν. εἰ δέ τις καὶ ταῦτα παραχωρήσειε, καὶ θεέη τὸν νοῦν μέρος τι τῆς ψυχῆς, δόμοίως δὲ καὶ τὸ αἰσθητικόν, οὐδέν ἀντίτιτο λέγοιεν καθόλου περὶ πάσης ψυχῆς οὐδὲ περὶ ὅλης οὐδὲ μιᾶς. τοῦτο δὲ πέπονθε καὶ ὁ ἐν τοῖς Ὀρφικοῖς ἔπεσι καλούμενοις λόγος· φησὶ γὰρ τὴν ψυχὴν ἐκ τοῦ ὅλου εἰσιέναι ἀναπνεόντων, φερομένην ὑπὸ τῶν ἀνέμων. οὐχ οἶδόν τε δὴ τοῖς φυτοῖς τοῦτο συμβαίνειν οὐδὲ τῶν ζώων ἐνίοις, εἴπερ μὴ πάντα ἀναπνέοντα. τοῦτο δὲ λέληθε τοὺς οὕτως ὑπειληφότας. εἴ τε δεῖ τὴν ψυχὴν ἐκ τῶν στοιχείων ποιεῖν, οὐθὲν δεῖ ἐξ ἀπάντων· ἵκανὸν γὰρ θάτερον μέρος τῆς ἐναντιώσεως ἔαυτό τε κρίνειν καὶ τὸ ἀντικείμενον. καὶ γὰρ τῷ εὐθεῖ καὶ αὐτὸ καὶ τὸ καμπύλον γινώσκομεν· κριτής γὰρ ἀμφοῦν ὁ καιών, τὸ δὲ καμπύλον οὕθ' ἔαυτοῦ οὕτε τοῦ εὐθέος. καὶ ἐν τῷ ὅλῳ δέ τινες αὐτὴν μεμῖχθαι φασιν, ὅθεν ἵσως καὶ Θαλῆς ὡήθη πάντα πλήρη θεῶν εἶναι. τοῦτο δ' ἔχει τινὰς ἀπορίας· διὰ τίνα γὰρ αἰτίαν ἐν μὲν τῷ ἀέρι ἡ τῷ πυρὶ οὖσα ἡ ψυχὴ οὐ ποιεῖ ζῶον, ἐν δὲ τοῖς μικτοῖς, καὶ ταῦτα βελτίων ἐν τούτοις εἶναι δοκοῦσα; ἐπιζητήσειε γὰρ ἄν τις καὶ διὰ τίν' αἰτίαν ἡ ἐν τῷ ἀέρι ψυχὴ τῆς ἐν τοῖς ζῷοις βελτίων ἔστι καὶ ἀθανατωτέρα. συμβαίνει δὲ ἀμφοτέρως ἀτοπον καὶ παράλογον· καὶ γὰρ τὸ λέγειν ζῶον τὸ πῦρ ἡ τὸν ἀέρα τῶν παραλογωτέρων ἔστι, καὶ τὸ μὴ λέγειν ζῶα ψυχῆς ἐνούσης ἀτοπον. ὑπολαβεῖν δὲ ἐοίκασιν εἶναι τὴν ψυχὴν

## ON THE SOUL, I. v.

of thinking. But supposing one were to let this question pass, and to admit that the mind is part of the soul, and similarly the perceptive faculty, yet one could not speak generally in this way about every soul, nor about the whole of any one soul. The theory in the so-called poems of Orpheus presents the same difficulty ; for this theory alleges that the soul enters from the universe into animals when they breathe, borne by the winds. But this cannot happen to plants, nor to some animals, since they do not all breathe : a point which has escaped those who support this theory. And if we are to construct the soul out of the elements, it is quite unnecessary that it should be composed of all the elements ; for only one of a pair of opposites is needed to understand both it and its opposite. For instance, by knowing the meaning of "straight" we also know the meaning of "crooked" ; for the carpenter's rule is the test of both, but the crooked tests neither itself nor the straight. Some think that the soul pervades the whole universe, whence perhaps came Thales' view that everything is full of gods. But this theory contains certain difficulties ; for why does not the soul, when it is in the air and in fire, make an animal, but only when the elements are mixed, and that too though it seems to be in a purer form in the first case ? For one might ask why the soul in the air is better and less liable to death than the soul in living creatures. But in any case the conclusion is extraordinary and unreasonable ; for to describe fire or air as living creatures is too improbable, and yet to refuse to call them living creatures, if there is a soul in them, is illogical. They appear to suppose that the soul resides in these elements, because the whole

# ARISTOTLE

411 a

ἐν τούτοις, ὅτι τὸ ὄλον τοῖς μορίοις ὁμοειδές. ὥστ' ἀναγκαῖον αὐτοῖς λέγειν καὶ τὴν ψυχὴν ὁμοειδῆ τοῖς μορίοις εἶναι, εἰ τῷ ἀπολαμβάνεσθαι τι τοῦ 20 περιέχοντος ἐν τοῖς ζῷοις ἔμψυχα τὰ ζῷα γίνεται. εἰ δ' ὁ μὲν ἀὴρ διασπώμενος ὁμοειδῆς, ἡ δὲ ψυχὴ ἀνομοιομερῆς, τὸ μέν τι αὐτῆς ὑπάρξει δῆλον ὅτι, τὸ δ' οὐχ ὑπάρξει. ἀναγκαῖον οὖν αὐτὴν ἡ ὁμοιομερῆς εἶναι ἡ μὴ ἐνυπάρχειν ἐν δτῷοῦν μορίῳ τοῦ παντός.

Φανερὸν οὖν ἐκ τῶν εἰρημένων ὡς οὕτε τὸ 25 γινώσκειν ὑπάρχει τῇ ψυχῇ διὰ τὸ ἐκ τῶν στοιχείων εἶναι, οὕτε τὸ κινεῖσθαι αὐτὴν καλῶς οὐδὲ ἀληθῶς λέγεται. ἐπεὶ δὲ τὸ γινώσκειν τῆς ψυχῆς ἐστὶ καὶ τὸ αἰσθάνεσθαι τε καὶ τὸ δοξάζειν, ἔτι δὲ τὸ ἐπιθυμεῖν καὶ βούλεσθαι καὶ ὅλως αἱ ὀρέξεις, γίνεται δὲ καὶ ἡ κατὰ τόπον κίνησις τοῖς ζῷοις 30 ὑπὸ τῆς ψυχῆς, ἔτι δ' αὐξῆται τε καὶ ἀκμὴ καὶ 411 b φθίσις, πότερον ὅλη τῇ ψυχῇ τούτων ἔκαστον ὑπάρχει, καὶ πάση ονομάτην τε καὶ αἰσθανόμεθα καὶ τῶν ἄλλων ἔκαστον ποιοῦμέν τε καὶ πάσχομεν, ἡ μορίοις ἐτέροις ἐτερα; καὶ τὸ ζῆν δὴ πότερον ἐν τινι τούτων ἐστὶν ἐνὶ ἡ καὶ ἐν πλείοσιν 5 ἡ πᾶσιν, ἡ καὶ ἄλλο τι αἴτιον; λέγουσι δή τινες μεριστὴν αὐτήν, καὶ ἄλλω μὲν ονεῖν ἄλλω δὲ ἐπιθυμεῖν. τί οὖν δή ποτε συνέχει τὴν ψυχὴν, εἰ μεριστὴ πέφυκεν; οὐ γὰρ δὴ τὸ γε σῶμα· δοκεῖ γὰρ τούναντίον μᾶλλον ἡ ψυχὴ τὸ σῶμα συνέχειν. ἐξελθούσης γοῦν διαπνέεται καὶ σήπεται. εἰ οὖν 10 ἐτερόν τι μίαν αὐτὴν ποιεῖ, ἐκεῖνο μάλιστ' ἀν εἴη ψυχὴ. δεήσει δὲ καὶ πάλιν κάκενο ζητεῖν, πότερον

## ON THE SOUL, I. v.

is homogeneous with its parts ; so they are compelled to say that the soul is homogeneous with its parts, if living creatures become possessed of soul by some part of the surrounding air being cut off and enclosed in them. But if the air detached is homogeneous, while the soul has parts of different kinds, then evidently one part of the soul exists in the air, while another does not. So that either the soul must be of similar parts, or else it does not exist in any part of the universe taken at random.

From what has been said it is obvious that the faculty of knowing does not belong to the soul because it is composed of the elements, nor is it well and truly said that it moves. But since knowing, perceiving, and the forming of opinions are operations of the soul, besides desiring, wishing, and the appetites in general, and again since movement in space belongs to living creatures by reason of the soul, besides growth, the prime of life, and decay, does each of these things belong to the soul as a whole ? Do we think, perceive, and do and suffer everything else with the whole soul, or do some functions belong to one part and others to another ? Does living depend upon one of these, or upon more, or upon all, or is something else the cause ? Some say that the soul has parts, and thinks with one part, and desires with another. In this case what is it which combines the soul into a whole, if it naturally consists of parts ? Certainly not the body : on the contrary the soul seems rather to combine the body into a whole ; for when the soul is gone the body dissolves into air and decays. If then some other thing gives the soul unity, this would really be the soul. But we shall have to inquire again, whether this is a

Can the soul  
be divided  
into parts  
according  
to its  
functions?

ARISTOTLE

411 b

ένι ή πολυμερές. εἰ μὲν γὰρ ἔν, διὰ τί οὐκ εὐθέως καὶ ή ψυχὴ ἔν; εἰ δὲ μεριστόν, πάλιν ὁ λόγος ζητήσει τί τὸ συνέχον ἐκεῖνο, καὶ οὕτω δὴ πρόεισιν ἐπὶ τὸ ἄπειρον. ἀπορήσειε δ' ἄν τις καὶ περὶ τῶν 15 μορίων αὐτῆς, τίν' ἔχει δύναμιν ἔκαστον ἐν τῷ σώματι. εἰ γὰρ ή ὅλη ψυχὴ πάντα τὸ σῶμα συνέχει, προσήκει καὶ τῶν μορίων ἔκαστον συνέχειν τι τοῦ σώματος. τοῦτο δ' ἔοικεν ἀδυνάτῳ ποῖον γὰρ μόριον ή πᾶς ὁ νοῦς συνέξει, χαλεπὸν καὶ πλάσαι. φαίνεται δὲ καὶ τὰ φυτὰ διαιρούμενα ζῆν 20 καὶ τῶν ζώων ἔνια τῶν ἐντόμων, ὡς τὴν αὐτὴν ἔχοντα ψυχὴν τῷ εἴδει, εἰ καὶ μὴ ἀριθμῷ. ἐκάτεροι γοῦν τῶν μορίων αἰσθησιν ἔχει καὶ κινεῖται κατὰ τόπον ἐπὶ τινα χρόνον. εἰ δὲ μὴ διατελοῦσιν, οὐθὲν ἄτοπον· ὅργανα γὰρ οὐκ ἔχουσιν ὥστε σώζειν τὴν φύσιν. ἀλλ' οὐδὲν ἥττον ἐν ἐκατέρῳ τῶν μορίων 25 ἄπαντ' ἐνυπάρχει τὰ μόρια τῆς ψυχῆς, καὶ ὅμοειδῆ εἰσιν ἀλλήλοις καὶ τῇ ὅλῃ, ἀλλήλων μὲν ὡς οὐ χωριστὰ ὄντα, τῆς δ' ὅλης ψυχῆς ὡς διαιρετῆς οὖσης. ἔοικε δὲ καὶ ή ἐν τοῖς φυτοῖς ἀρχὴ ψυχῆς τις εἶναι· μόνης γὰρ ταύτης κοινωνεῖ καὶ ζῶα καὶ 30 φυτά. καὶ αὕτη μὲν χωρίζεται τῆς αἰσθητικῆς ἀρχῆς, αἰσθησιν δ' οὐθὲν ἄνευ ταύτης ἔχει.

<sup>a</sup> The ms. reading is doubtful. With the present text Λ: must mean that supposing an animal to be divided and to continue to live there must be a soul in each segment. The

## ON THE SOUL, I. v.

unit or has many parts. For if it is a unit, why should not the soul be straightway described as a unit ? And if it has parts, the progress of the argument will again demand to know what is its combining principle, and thus we shall proceed *ad infinitum*. There may also be some doubt about the parts of the soul, as to what is the function of each in the body. For if the soul as a whole combines the whole body, it is natural that each of the parts should combine some part of the body. But this seems impossible ; for it is hard even to imagine what part the mind will combine, or how it will do it. Moreover plants seem to live even when divided, and some of the insects also, and the parts have a soul the same in kind if not in number ; for each of the parts has perception and moves in space at any rate for a short time. It is not at all surprising that they do not continue to do so ; for they have not the organs necessary to maintain life. But none the less all the parts of the soul exist in each of the divided portions, and these are homogeneous <sup>a</sup> both with each other and with the whole, not in the sense that they are separated from each other, but because the whole soul is divided. The first principle in plants, then, seems to be a kind of soul ; for this alone is shared by animals and plants ; and this is separate from the perceptive first principle, but no being has perception without it.

different parts of the soul in one segment will be of the same kind as the corresponding parts in another segment, *e.g.* each segment will contain an appetitive part, and so on.

## B

412 a I. Τὰ μὲν δὴ ὑπὸ τῶν πρότεροι παραδεδομένα περὶ ψυχῆς εἰρήσθω· πάλιν δ’ ὥσπερ ἐξ ὑπαρχῆς ἐπ-  
5 αὐτῶμεν, πειρώμενοι διορίσαι τί ἔστι ψυχὴ καὶ τίς  
ἄν εἴη κοινότατος λόγος αὐτῆς. λέγομεν δὴ γένος  
én τι τῶν ὄντων τὴν οὐσίαν, ταύτης δὲ τὸ μὲν ὡς  
ὑλην, ὃ καθ’ αὐτὸν μὲν οὐκ ἔστι τόδε τι, ἔτερον δὲ  
μορφὴν καὶ εἶδος, καθ’ ἣν ἥδη λέγεται τόδε τι,  
καὶ τρίτον τὸ ἐκ τούτων. ἔστι δ’ ἡ μὲν ὕλη  
10 δύναμις, τὸ δ’ εἶδος ἐντελέχεια, καὶ τοῦτο διχῶς,  
τὸ μὲν ὡς ἐπιστήμη, τὸ δ’ ὡς τὸ θεωρεῖν. οὐσίαι  
δὲ μάλιστ’ εἶναι δοκοῦντι τὰ σώματα, καὶ τούτων  
τὰ φυσικά· ταῦτα γὰρ τῶν ἄλλων ἀρχαί. τῶν δὲ  
φυσικῶν τὰ μὲν ἔχει ζωὴν, τὰ δ’ οὐκ ἔχει· ζωὴν  
δὲ λέγομεν τὴν δι’ αὐτοῦ τροφήν τε καὶ αὔξησιν  
15 καὶ φθίσιν. ὥστε πᾶν σῶμα φυσικὸν μετέχον  
ζωῆς οὐσία ἄν εἴη, οὐσία δ’ οὕτως ὡς συνθέτη.  
ἐπεὶ δ’ ἔστι σῶμα τοιόνδε, ζωὴν γὰρ ἔχον, οὐκ  
ἄν εἴη τὸ σῶμα ψυχὴ· οὐ γάρ ἔστι τῶν καθ’  
ὑποκειμένου τὸ σῶμα, μᾶλλον δ’ ὡς ὑποκείμενον

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<sup>a</sup> If you have the capacity to acquire knowledge of a subject, you may be said to have potential knowledge of it, which will become actual by study. In another sense, if

## BOOK II

I. The theories of the soul handed down by our predecessors have been sufficiently discussed ; now we must return to our starting-point, and try to define what the soul is, and what account of it can be given which will be the most comprehensive. We describe one class of existing things as substance ; and this we subdivide into three : (1) matter, which is in itself not any particular thing ; (2) shape or form, in virtue of which it is called some particular thing, and (3) a compound of the two. Matter is then potentiality, while form is realization or actuality, but the word actuality is used in two senses, as is illustrated by the possession of knowledge and the exercise of it.<sup>a</sup> Bodies seem to be pre-eminently substances, and most particularly those which are of natural origin ; for these are the sources from which the rest are derived. But of natural bodies some have life and some have not ; by life we mean the capacity for self-sustenance, growth, and decay. Every natural body, then, which possesses life must be substance, and substance of the class which is a compound. Since this—having life—is predicated of a body, the body cannot be the soul, for the body is not predicated of anything else, but rather has things you possess knowledge which you are not using, it may be called potential, actual only when you are using it.

## ARISTOTLE

412 a

20 καὶ ὅλη. ἀναγκαῖον ἄρα τὴν<sup>1</sup> ψυχὴν οὐσίαν εἶναι  
 ὡς εἶδος σώματος φυσικοῦ δυνάμει ζωὴν ἔχοντος.  
 ἡ δὲ οὐσία ἐντελέχεια. τοιούτου ἄρα σώματος  
 ἐντελέχεια. αὕτη δὲ λέγεται διχῶς, ἡ μὲν ὡς  
 ἐπιστήμη, ἡ δὲ ὡς τὸ θεωρεῖν. φανερὸν οὖν ὅτι  
 ὡς ἐπιστήμη· ἐν γὰρ τῷ ὑπάρχειν τὴν ψυχὴν καὶ  
 25 ὑπνος καὶ ἐγρήγορσίς ἐστιν, ἀνάλογον δὲ ἡ μὲν  
 ἐγρήγορσις τῷ θεωρεῖν, δὲ δὲ ὑπνος τῷ ἔχειν καὶ  
 μὴ ἐνεργεῖν. προτέρα δὲ τῇ γενέσει ἐπὶ τοῦ αὐτοῦ  
 ἡ ἐπιστήμη. διὸ ψυχὴ ἐστιν ἐντελέχεια ἡ πρώτη  
 σώματος φυσικοῦ δυνάμει ζωὴν ἔχοντος. τοιοῦτο  
 412 b δέ, δὲ ἀνὴρ ὁ ὄργανικόν. (ὄργανα δὲ καὶ τὰ  
 φυτῶν μέρη, ἀλλὰ παντελῶς ἀπλά, οἷον τὸ φύλλον  
 περικαρπίου σκέπασμα, τὸ δὲ περικάρπιον καρποῦ.  
 αἱ δὲ ρίζαι τῷ στόματι ἀνάλογον· ἀμφο γὰρ ἔλκει  
 τὴν τροφήν.) εἰ δή τι κοινὸν ἐπὶ πάσης ψυχῆς  
 5 δεῖ λέγειν, εἴη ἀνὴρ ἐντελέχεια ἡ πρώτη σώματος  
 φυσικοῦ ὄργανικοῦ. διὸ καὶ οὐ δεῖ ζητεῖν εἰ ἐν ἡ  
 ψυχὴ καὶ τὸ σῶμα, ὥσπερ οὐδὲ τὸν κηρὸν καὶ τὸ  
 σχῆμα, οὐδὲ ὅλως τὴν ἐκάστου ὅλην καὶ τὸ οὖ  
 ὅλη· τὸ γὰρ ἐν καὶ τὸ εἶναι ἐπεὶ πλεοναχῶς  
 λέγεται, τὸ κυρίως ἡ ἐντελέχειά ἐστιν.

10 Καθόλου μὲν οὖν εἴρηται τί ἐστιν ἡ ψυχὴ· οὐσία

<sup>1</sup> τὰν Β.

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<sup>a</sup> Every " substance " is composed of two factors—matter

## ON THE SOUL, II. 1.

predicated of it, and is therefore matter.<sup>a</sup> So the soul must be substance in the sense of being the form of a natural body, which potentially has life. And substance in the sense of form is actuality. The soul, then, is the actuality of the kind of body we have described. But actuality has two senses, analogous to the possession of knowledge and the exercise of it. Clearly actuality in our present sense is analogous to the possession of knowledge ; for, where there is a soul, there is both sleep and wakefulness, and wakefulness is analogous to the exercise of knowledge, sleep to its possession but not its exercise. Now in any one person the possession of knowledge precedes its use. The soul may therefore be defined as the first actuality of a natural body potentially possessing life, and the body must be of a kind which possesses organs. (In plants also the parts are their organs, very simple ones, such as the leaf which covers the pod, and the pod which covers the seed ; but the roots are analogous to the mouth, for both these absorb food.) If then one is to find a comprehensive definition which will apply to every soul, it is the first actuality of a natural body possessed of organs. So one can no more ask if the body and the soul are one than if the wax and the impression it receives are one, or speaking generally the matter of each thing and the form of which it is the matter ; for admitting that the terms unity and existence are used in many senses, the paramount sense is that of actuality.

We have, then, given a general definition of what and form ; *e.g.* a billiard ball. Its matter is ivory, its form spherical. An animate body, then, as it is a substance, consists of matter and form. The body must be matter, for it is not itself an attribute, but has attributes. Therefore the soul is form.

## ARISTOTLE

412 b

γὰρ ἡ κατὰ τὸν λόγον. τοῦτο δὲ τὸ τί ἦν εἶναι τῷ τοιωδὶ σώματι, καθάπερ εἴ τι τῶν ὄργάνων φυσικὸν ἦν σῶμα, οἷον πέλεκυς· ἦν γὰρ ἂν τὸ πελέκει εἶναι ἡ οὐσία αὐτοῦ, καὶ ἡ ψυχὴ τοῦτο· χωρισθείσης γὰρ ταύτης οὐκ ἂν ἔτι πέλεκυς ἦν,  
 15 ἀλλ’ ἡ ὄμωνύμως. νῦν δ’ ἔστι πέλεκυς· οὐ γὰρ τοιούτου σώματος τὸ τί ἦν εἶναι καὶ ὁ λόγος ἡ ψυχὴ, ἀλλὰ φυσικοῦ τοιωδὶ ἔχοντος ἀρχὴν κυήσεως καὶ στάσεως ἐν ἑαυτῷ. θεωρεῖν δὲ καὶ ἐπὶ τῶν μερῶν δεῖ τὸ λεχθέν. εἰ γὰρ ἦν ὁ ὄφθαλμὸς ζῶον, ψυχὴ ἂν ἦν αὐτοῦ ἡ ὄψις· αὕτη γὰρ οὐσία 20 ὄφθαλμοῦ ἡ κατὰ τὸν λόγον. ὁ δ’ ἀφθαλμὸς ὅλη ὄψεως, ἡς ἀπολειπούσης οὐκ ἔστιν ὄφθαλμός, πλὴν ὄμωνύμως, καθάπερ ὁ λίθινος καὶ ὁ γεγραμμένος.  
 25 δεῖ δὴ λαβεῖν τὸ ἐπὶ μέρους ἐφ’ ὅλου τοῦ ζῶντος σώματος· ἀνάλογον γὰρ ἔχει ὡς τὸ μέρος πρὸς τὸ μέρος, οὕτως ἡ ὄλη αἰσθησις πρὸς τὸ ὄλον σῶμα τὸ αἰσθητικόν, ἡ τοιοῦτο. ἔστι δὲ οὐ τὸ ἀποβεβληκός τὴν ψυχὴν τὸ δυνάμει ὃν ὥστε ζῆν, ἀλλὰ τὸ ἔχον. τὸ δὲ σπέρμα καὶ ὁ καρπὸς τὸ δυνάμει τοιωδὶ σῶμα. ὡς μὲν οὖν ἡ τμῆσις καὶ  
 418 a ἡ ὄρασις, οὕτω καὶ ἡ ἐγρήγορσις ἐντελέχεια, ὡς δ’ ἡ ὄψις καὶ ἡ δύναμις τοῦ ὄργάνου, ἡ ψυχὴ· τὸ δὲ σῶμα τὸ δυνάμει ὃν· ἀλλ’ ὥσπερ ὁ ὄφθαλμὸς ἡ

<sup>a</sup> A.'s argument in the rest of this chapter is not quite easy to follow. The introduction of the axe seems at first irrelevant, because, as A. afterwards explains, being inanimate, it is not really parallel to the living creature. But his point is clear, the axe consists of the matter (wood and metal) of which it is composed, and its form (*i.e.* what makes it an axe—cutting edge, weight, and so forth). If you take away (*e.g.*) its edge, what remains? Still an axe, although one that will not cut. But this is not true of the living creature. It has a body which is its matter, and a soul

## ON THE SOUL, II. 1.

the soul is : it is substance expressed as form.<sup>a</sup> It is this which makes a body what it is ; supposing that instruments had a natural body, for instance an axe ; the substance of the axe would be that which makes it an axe, and this would be its soul ; suppose this removed, and it would no longer be an axe in the ordinary sense of the term. As it is, it remains an axe, because the soul is not the form of a body of this kind, but only of a natural body, which has in itself the power of movement and rest. We must therefore investigate the application of our definition to the parts of the body. If the eye were a living creature, its soul would be its power of seeing ; for this is the substance of the eye expressed as form. But the eye is the matter of seeing, and if seeing were absent, there would be no eye, except in an equivocal sense, as for instance a stone or painted eye. Now we must apply what we have found true of the part to the whole living body. For the same relationship must hold good of the part to the part, and the whole of sensation to the whole body which feels, in so far as it does so. But it is not the body which has lost its soul, which has the capacity to live, but that which possesses its soul ; so the seed and the fruit are potentially bodies of such a kind. Just as the cutting of the axe or the seeing of the eye is an actuality, so also is the waking state, and the soul is actuality in the same sense as the capacity of the eye for seeing, or of the instrument for doing its work. But the body is that which has a capacity for life ; but just as the pupil and the power of seeing make an eye, so

which is its form. Take away the latter and the body perishes, so that the whole is no longer a living creature ; by removing the form of a living creature we destroy its identity.

## ARISTOTLE

418 a

κόρη καὶ ἡ ὄψις, κάκεῖ ἡ ψυχὴ καὶ τὸ σῶμα τὸ  
ζῶον. ὅτι μὲν οὖν οὐκ ἔστιν ἡ ψυχὴ χωριστὴ τοῦ  
σώματος, ἡ μέρη τινὰ αὐτῆς, εἰ μεριστὴ πέφυκεν,  
οὐκ ἄδηλον· ἐνίων γὰρ ἡ ἐντελέχεια τῶν μερῶν  
ἔστιν αὐτῶν. οὐ μὴν ἀλλ’ ἔνιά γε οὐθὲν κωλύει,  
διὰ τὸ μηθενὸς εἶναι σώματος ἐντελεχείας. ἔτι  
δὲ ἄδηλον εἰ οὕτως ἐντελέχεια τοῦ σώματος ἡ  
ψυχὴ ὥσπερ πλωτὴρ πλοιόου. τύπῳ μὲν οὖν ταύτη  
ιο διωρίσθω καὶ ὑπογεγράφθω περὶ ψυχῆς.

II. 'Επεὶ δ' ἐκ τῶν ἀσαφῶν μὲν φανερωτέρων δὲ  
γίγνεται τὸ σαφὲς καὶ κατὰ τὸν λόγον γνωριμώ-  
τερον, πειρατέον πάλιν οὕτως ἐπελθεῖν περὶ αὐτῆς·  
οὐ γὰρ μόνον τὸ ὅτι δεῖ τὸν δριστικὸν λόγον δηλοῦν,  
15 ὥσπερ οἱ πλεῖστοι τῶν ὄρων λέγουσιν, ἀλλὰ καὶ  
τὴν αἰτίαν ἐνυπάρχειν καὶ ἐμφαίνεσθαι. νῦν δ'  
ώσπερ συμπεράσμαθ' οἱ λόγοι τῶν ὄρων εἰσὶν·  
οἷον τί ἔστι τετραγωνισμός; τὸ ἵσον ἐτερομῆκει  
ἀρθογώνιον εἶναι ἴσοπλευρον. ὁ δὲ τοιοῦτος ὄρος  
λόγος τοῦ συμπεράσματος. ὁ δὲ λέγων ὅτι ἔστιν  
20 ὁ τετραγωνισμὸς μέσης εὔρεσις, τοῦ πράγματος  
λέγει τὸ αἴτιον.

<sup>a</sup> Cf. Bk. I. ch. iii.

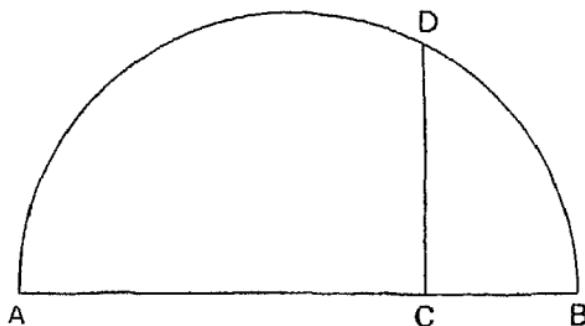
<sup>b</sup> Note.—The reference is to the figure opposite.

AB is a straight line divided into two parts at C. On AB a semicircle ADB is described. CD is drawn at right angles to AB to meet the circumference in D. Two conclusions can be proved. (1) The square on CD is equal to the rectangle AC.CB. (2) CD is the mean proportional between AC and CB, or in other words AC:CD::CD:CB. For the proofs of these two propositions cf. Euclid ii. 14 and vi. 18.

## ON THE SOUL, II. I.—II.

in the other case the soul and body make a living creature. It is quite clear, then, that neither the soul nor any parts of it, if it has parts, can be separated from the body, for the actuality of some animals belongs to the parts themselves. Not but what there is nothing to prevent some parts being separated, because they are not actualities of any body. It is also uncertain whether the soul as an actuality bears the same relation to the body as the sailor to the ship.<sup>a</sup> This then in outline is a sufficient definition and sketch of the soul.

II. But since the clear and theoretically better known conception arises from the obscure but more obvious data of sense, we must try to revise our views on the soul in this way ; for the words of a definition ought not merely to show the fact, as most definitions do, but to present the underlying cause. But so far the words of our definitions are only conclusions ; for instance, what is the definition of squaring a rectangle ? It is the construction of a square equal in area to a rectangle. Such a definition is merely a conclusion. But if a man says that squaring a rectangle is the finding of a mean proportional, he is giving the underlying cause of the fact.<sup>b</sup>



## ARISTOTLE

413 a

Λέγομεν οὖν ἀρχὴν λαβόντες τῆς σκέψεως,  
διωρίσθαι τὸ ἔμψυχον τοῦ ἀψύχου τῷ ζῆν. πλεο-  
ναχῶς δὲ τοῦ ζῆν λεγομένου, κανὸν ἐν τι τούτων  
ἐννυπάρχη μόνον, ζῆν αὐτό φαμεν, οἷον νοῦς,  
αἴσθησις, κίνησις καὶ στάσις ἡ κατὰ τόπον, ἔτι  
25 κίνησις ἡ κατὰ τροφὴν καὶ φθίσις τε καὶ αὔξησις.  
διὸ καὶ τὰ φυόμενα πάντα δοκεῖ ζῆν· φαίνεται γὰρ  
ἐν αὐτοῖς ἔχοντα δύναμιν καὶ ἀρχὴν τοιαύτην, δι’  
ἥς αὔξησίν τε καὶ φθίσιν λαμβάνουσι κατὰ τοὺς  
ἐναντίους τόπους· οὐ γὰρ ἄνω μὲν αὔξεται, κάτω  
δ’ οὐ, ἀλλ’ ὅμοιῶς ἐπ’ ἄμφω καὶ πάντοσε καὶ  
50 τρέφεται καὶ ζῆ διὰ τέλους, ἔως ἂν δύνηται λαμ-  
βάνειν τροφὴν. χωρίζεσθαι δὲ τοῦτο μὲν τῶν  
ἄλλων δυνατόν, τὰ δ’ ἄλλα τούτου ἀδύνατον ἐν  
τοῖς θυητοῖς. φανερὸν δ’ ἐπὶ τῶν φυομένων.  
418 b οὐδεμία γὰρ αὐτοῖς ὑπάρχει δύναμις ἄλλη ψυχῆς.

Τὸ μὲν οὖν ζῆν διὰ τὴν ἀρχὴν ταύτην ὑπάρχει  
τοῖς ζῶσι, τὸ δὲ ζῶον διὰ τὴν αἴσθησιν πρώτως·  
καὶ γὰρ τὰ μὴ κινούμενα μηδ’ ἄλλαττοντα τόπον,  
ἔχοντα δ’ αἴσθησιν ζῶα λέγομεν καὶ οὐ ζῆν μόνον.  
5 αἰσθήσεως δὲ πρῶτον ὑπάρχει πάσιν ἀφή. ὥσπερ  
δὲ τὸ θρεπτικὸν δύναται χωρίζεσθαι τῆς ἀφῆς καὶ  
πάσης αἰσθήσεως, οὕτως ἡ ἀφή τῶν ἄλλων  
αἰσθήσεων. θρεπτικὸν δὲ λέγομεν τὸ τοιοῦτον  
μόριον τῆς ψυχῆς οὐ καὶ τὰ φυτὰ μετέχει· τὰ δὲ  
ζῶα πάντα φαίνεται τὴν ἀπτικὴν αἴσθησιν ἔχοντα.  
10 δι’ ἣν δ’ αἰτίαν ἔκάτερον τούτων συμβέβηκεν,  
ὕστερον ἐροῦμεν.

Νῦν δ’ ἐπὶ τοσοῦτον εἰρήσθω μόνον, ὅτι ἐστὶν ἡ

## ON THE SOUL, II. II.

We say then, reverting to the starting-point of our inquiry, that that which has soul is distinguished from that which has not by living. But the word living is used in many senses, and if any one of the following is present we say that the creature lives—mind, sensation, movement or position in space, besides the movement implied in getting food, decay, and growth. Consequently all plants are considered to live, for they evidently have in themselves a capacity and first principle of such a kind that they show both growth and decay, and these in opposite directions ; for they do not grow up and not down, but equally in both directions, and in every direction, and they are nourished and continue to live, as long as they are able to absorb food. This capacity to absorb food may exist apart from all other powers, but the others cannot exist apart from this, as we see in human beings. This is evident, too, in the case of plants ; for they have no other capacity of the soul.

Because of this fundamental power all living things <sup>Sensation</sup> have life, but the living animal first and foremost <sup>a first essential</sup> lives because it can feel ; for even those which do not of life. move or change their place, but have sensation, we call living creatures, and do not merely say that they live. The first essential factor of sensation, which we all share, is a sense of touch. Just as the merely nutritive faculty may exist apart from touch and from all sensation, so touch may exist apart from all other senses. We call the nutritive faculty that part of the soul which even the plants share. But all living animals seem to possess the sense of touch. Why each of these things has happened so, we shall explain later on.

But for the moment let us be satisfied with saying

## ARISTOTLE

413 b

ψυχὴ τῶν εἰρημένων τούτων ἀρχὴ καὶ τούτοις ὥρισται, θρεπτικῷ, αἰσθητικῷ, διανοητικῷ, κινήσει. πότερον δὲ τούτων ἔκαστον ἔστι ψυχὴ η̄ μόριον ψυχῆς, καὶ εἰ μόριον, πότερον οὕτως ὥστ' εἶναι 15 χωριστὸν λόγω μόνον η̄ καὶ τόπῳ, περὶ μὲν τινῶν τούτων οὐ χαλεπὸν ἴδειν, ἔνia δὲ ἀπορίαν ἔχει. ὥσπερ γὰρ ἐπὶ τῶν φυτῶν ἔνia διαιρούμενα φαίνεται ζῶντα καὶ χωριζόμενα ἀπ' ἀλλήλων, ὡς οὐσῆς τῆς ἐν τούτοις ψυχῆς ἐντελεχείᾳ μὲν μιᾶς ἐν ἕκαστῳ φυτῷ, δυνάμει δὲ πλειόνων, οὕτως 20 ὅρωμεν καὶ περὶ ἑτέρας διαφορὰς τῆς ψυχῆς συμβαῖνον ἐπὶ τῶν ἐντόμων ἐν τοῖς διατεμομένοις· καὶ γὰρ αἰσθησιν ἕκάτερον τῶν μερῶν ἔχει καὶ κίνησιν τὴν κατὰ τόπον, εἰ δ' αἰσθησιν, καὶ φαντασίαν καὶ ὅρεξιν· ὅπου μὲν γὰρ αἰσθησις, καὶ λύπη τε καὶ ἡδονή, ὅπου δὲ ταῦτα, ἐξ ἀνάγκης 25 καὶ ἐπιθυμία. περὶ δὲ τοῦ νοῦ καὶ τῆς θεωρητικῆς δυνάμεως οὐδέν πω φανερόν, ἀλλ' ἔοικε ψυχῆς γένος ἑτερον εἶναι, καὶ τοῦτο μόνον ἐνδέχεται χωρίζεσθαι, καθάπερ τὸ ἀΐδιον τοῦ φθαρτοῦ. τὰ δὲ λοιπὰ μόρια τῆς ψυχῆς φανερὸν ἐκ τούτων ὅτι οὐκ ἔστι χωριστά, καθάπερ τινές φασιν· τῷ δὲ 30 λόγῳ ὅτι ἑτερα, φανερόν· αἰσθητικῷ γὰρ εἶναι καὶ δοξαστικῷ ἑτερον, εἴπερ καὶ τὸ αἰσθάνεσθαι τοῦ δοξάζειν. ὅμοιώς δὲ καὶ τῶν ἀλλων ἔκαστον τῶν εἰρημένων. ἔτι δ' ἐνίοις μὲν τῶν ζώων ἀπανθύνπάρχει ταῦτα, τισὶ δέ τινα τούτων, ἑτέροις δὲ ἐν 414 a μόνον. τοῦτο δὲ ποιεῖ διαφορὰν τῶν ζώων· διὰ τίνα δ' αἰτίαν, ὕστερον ἐπισκεπτέον. παραπλήσιον δὲ καὶ περὶ τὰς αἰσθήσεις συμβέβηκεν· τὰ μὲν γὰρ

<sup>a</sup> Cf. Introduction.

## ON THE SOUL, II. II.

that the soul is the origin of the characteristics we have mentioned, and is defined by them, that is by the faculties of nutrition, sensation, thought and movement. The further questions, whether each of these faculties is a soul, or part of a soul, and, if a part, whether a part in the sense that it is only separable in thought or also in fact, are in some cases easy of solution, but in some they involve difficulty. For just as in the case of plants some parts clearly live when divided and separated from each other, so that the soul in them appears to be one in actuality in each whole plant, but potentially more than one, so we can see that in other characteristics of the soul the same thing happens among insects in the divided pieces ; for each of the parts has sensation and movement in space ; and, if it has sensation, it must also have imagination <sup>a</sup> and appetite ; for, where sensation is, there is also pain and pleasure, and where these are there must also be desire. But in the case of the mind and the thinking faculty nothing is yet clear, but it seems to be a distinct species of soul, and it alone admits of being separated, as the immortal from the perishable. But it is quite clear from what we have said that the other parts of the soul are not separable, as some say ; though it is obvious that they are theoretically different ; for there is a difference between the faculties of sensation and thought, just as feeling is different from thinking. And the same thing is true of all the other faculties we have mentioned. Again, some animals have all these capacities, some only some of them, and others again only one. It is this which will constitute the differences in animals. The reason for this must be considered later. But a similar thing is true about sensations ;

ARISTOTLE

414 a

έχει πάσας, τὰ δὲ τινάς, τὰ δὲ μίαν τὴν ἀναγκαιοτάτην, ἀφήν.

ε<sup>5</sup> Ἐπεὶ δὲ ὁ ζῶμεν καὶ αἰσθανόμεθα διχῶς λέγεται, καθάπερ ὁ ἐπιστάμεθα (λέγομεν δὲ τὸ μὲν ἐπιστήμην τὸ δὲ ψυχήν· ἔκατέρῳ γὰρ τούτων φαμὲν ἐπίστασθαι). δμοίως δὲ καὶ ὁ ὑγιαίνομεν, τὸ μὲν ὑγίεια, τὸ δὲ μορίω τινὶ τοῦ σώματος ἡ καὶ ὅλω τούτων δ' ἡ μὲν ἐπιστήμη τε καὶ ὑγίεια μορφὴ<sup>10</sup> καὶ εἶδος τι καὶ λόγος καὶ οἶνον ἐνέργεια τοῦ δεκτικοῦ, ἡ μὲν τοῦ ἐπιστημονικοῦ, ἡ δὲ τοῦ ὑγιαστικοῦ (δοκεῖ γὰρ ἐν τῷ πάσχοντι καὶ διατιθεμένῳ ἡ τῶν ποιητικῶν ὑπάρχειν ἐνέργεια), ἡ ψυχὴ δὲ τοῦτο ὁ ζῶμεν καὶ αἰσθανόμεθα καὶ διανοούμεθα πρῶτως, ὥστε λόγος τις ἀν εἴη καὶ εἶδος, ἀλλ' οὐχ ὕλη καὶ τὸ ὑποκείμενον. τριχῶς γὰρ λεγομένης τῆς οὐσίας, καθάπερ εἴπομεν, ὡν τὸ μὲν εἶδος, τὸ δὲ ὕλη, τὸ δὲ ἐξ ἀμφοῦν τούτων δ' ἡ μὲν ὕλη δύναμις, τὸ δὲ εἶδος ἐντελέχεια. ἐπεὶ δὲ τὸ ἐξ ἀμφοῦν ἔμψυχον, οὐ τὸ σῶμά ἐστιν ἐντελέχεια ψυχῆς, ἀλλ' αὕτη σώματός τινος. καὶ διὰ τοῦτο<sup>20</sup> καλῶς ὑπολαμβάνουσιν οἱς δοκεῖ μήτ' ἄνευ σώματος εἶναι μήτε σῶμά τι ἡ ψυχή· σῶμα μὲν γὰρ οὐκ ἐστι, σώματος δέ τι, καὶ διὰ τοῦτο ἐν σώματι ὑπάρχει, καὶ ἐν σώματι τοιούτῳ, καὶ οὐχ ὥσπερ οἱ πρότερον εἰς σῶμα ἐνήρμοζον αὐτήν, οὐθὲν προσδιορίζοντες ἐν τίνι καὶ ποίῳ, καίπερ οὐδὲ<sup>25</sup> φανομένου τοῦ τυχόντος δέχεσθαι τὸ τυχόν. οὕτω

## ON THE SOUL, II. II.

for some animals have all, some only some, and some again one only—the most indispensable—touch.

The phrase “whereby we live and feel” is used in two senses, just as the phrase “whereby we know” (in the one sense we mean knowledge and in the other the soul; for we can say that we know by each of these); similarly the phrase “whereby we are healthy” may mean health, or it may mean some part or the whole of the body. Now of these, knowledge in the one case and health in the other are the shape and in a sense the form or notion, and the actuality of the recipient of knowledge in the one case, and health in the other. (For it is upon that which is affected and in a given condition that the activity of what is producing an effect seems to operate,) but the soul is that whereby we live and feel and think in the most fundamental sense, so that the soul would be the notion or form, and not the matter and underlying material. As we have already said,<sup>a</sup> substance is used in three senses, form, matter, and a compound of the two. Of these matter is potentiality, and form actuality; and since what has soul is a compound of the two, the body cannot be the actuality of a soul, but the soul is the actuality of some body. For this reason those are right in their view who maintain that the soul cannot exist without the body, but the soul is not in any sense a body. It is not a body, but it is something connected with a body, and exists in a body, and in a body of a particular kind, not at all as our predecessors supposed, who fitted it to any body, without adding any limitations as to what body or what kind of body, although it must be evident that no chance thing can admit any other chance thing. But it happens in this way

## ARISTOTLE

414 a

δὲ γίνεται καὶ κατὰ λόγον· ἔκάστου γὰρ ή ἐντελέχεια ἐν τῷ δυνάμει ὑπάρχοντι καὶ τῇ οἰκείᾳ ὥλῃ πέφυκεν ἐγγίνεσθαι. ὅτι μὲν οὖν ἐντελέχειά τις ἔστι καὶ λόγος τοῦ δύναμιν ἔχοντος εἶναι τοιούτου, φανερὸν ἐκ τούτων.

III. Τῶν δὲ δυνάμεων τῆς ψυχῆς αἱ λεχθεῖσαι τοῖς 80 μὲν ὑπάρχουσι πᾶσαι, καθάπερ εἴπομεν, τοῖς δὲ τινὲς αὐτῶν, ἐνίοις δὲ μία μόνη. δυνάμεις δὲ εἴπομεν θρεπτικόν, ὀρεκτικόν, αἰσθητικόν, κινητικὸν κατὰ τόπον, διανοητικόν. ὑπάρχει δὲ τοῖς 414 b μὲν φυτοῖς τὸ θρεπτικὸν μόνον, ἐτέροις δὲ τοῦτο τε καὶ τὸ αἰσθητικόν. εἰ δὲ τὸ αἰσθητικόν, καὶ τὸ ὀρεκτικόν· ὅρεξις μὲν γὰρ ἐπιθυμία καὶ θυμὸς καὶ βούλησις, τὰ δὲ ζῶα πάντ' ἔχουσι μίαν γε τῶν αἰσθήσεων, τὴν ἀφήν· ὡς δὲ αἰσθησις ὑπάρχει, τούτῳ ἡδονή τε καὶ λύπη καὶ τὸ ἡδύ τε καὶ λυπηρόν, οἷς δὲ ταῦτα, καὶ ή ἐπιθυμία· τοῦ γὰρ ἡδέος ὅρεξις αὐτη. ἔτι δὲ τῆς τροφῆς αἰσθησιν ἔχουσιν· ή γὰρ ἀφή τῆς τροφῆς αἰσθησις· ξηροῖς γὰρ καὶ ύγροῖς καὶ θερμοῖς καὶ ψυχροῖς τρέφεται τὰ ζῶα πάντα, τούτων δὲ αἰσθησις ἀφή· τῶν δὲ ἄλλων αἰσθητῶν κατὰ συμβεβηκός· οὐθὲν γὰρ εἰς τροφὴν συμβάλλεται ψόφος οὐδὲ χρῶμα οὐδὲ ὀσμή· ὁ δὲ χυμὸς ἐν τι τῶν ἀπτῶν ἔστιν. πεῦνα δὲ καὶ δίψα ἐπιθυμία, καὶ ή μὲν πεῦνα ξηροῦ καὶ θερμοῦ, ή δὲ δίψα ψυχροῦ καὶ ύγρου· ὁ δὲ χυμὸς οἷον ἡδυσμά τι τούτων ἔστιν. διασαφητέον δὲ 10 περὶ αὐτῶν ὕστερον, οὐδὲν δὲ ἐπὶ τοσοῦτον εἰρήσθω, ὅτι τῶν ζώων τοῖς ἔχουσιν ἀφήν καὶ ὅρεξις ὑπάρχει. περὶ δὲ φαντασίας ἄδηλον, ὕστερον δὲ ἐπι-

<sup>a</sup> i.e. on general grounds we should expect a particular soul to belong to a particular body.

## ON THE SOUL, II. II.—III.

quite reasonably<sup>a</sup> ; for the actuality of each thing is naturally inherent in its potentiality, that is in its own proper matter. From all this it is clear that the soul is the actuality and form of that which has the capacity of having a soul.

III. But of the faculties of the soul which we have mentioned, some living things have all, others only some, and others again only one. Those we have mentioned are the faculty for nourishment, for appetite,<sup>b</sup> for sensation, for movement in space, and for thought. Plants have the nutritive faculty only, but other living things have this and the faculty for sensation. But if for sensation then also for appetite ; for appetite consists of desire, anger, and wish, and all animals have one of the senses, that of touch ; but that which has sensation knows pleasure and pain, the pleasant and the painful, and that which knows these has also desire ; for desire is an appetite for what is pleasant. They have also a sensation in feeding ; for touch is the sense which apprehends food. All animals, again, are nourished by food, which is dry or wet, hot or cold, and touch is the sense which apprehends these ; the other objects of sense are only indirectly apprehended by touch ; for neither sound, nor colour, nor smell contribute anything to nourishment. But flavour is one of the things apprehended by touch. Hunger and thirst are desire, the former for what is dry and hot, the latter for what is cold and wet ; and flavour is a kind of sweetening of these things. We must be precise about these subjects later, but for the moment it is enough to say, that those animals which have a sense of touch have also appetite. As for imagination it is

All living creatures have not all faculties.

<sup>a</sup> Appetite is not included in the list in 413 b 13.

## ARISTOTLE

414 <sup>b</sup>

σκεπτέον. ἐνίοις δὲ πρὸς τούτους ὑπάρχει καὶ τὸ κατὰ τόπον κινητικόν, ἔτεροις δὲ καὶ τὸ διανοητικόν τε καὶ νοῦς, οἷον ἀνθρώποις καὶ εἴ τι τοιοῦτον ἔτερόν ἔστιν ἢ καὶ τιμιώτερον.

20 Δῆλον οὖν ὅτι τὸν αὐτὸν τρόπον εἴς ἄν εἴη λόγος ψυχῆς τε καὶ σχήματος· οὔτε γὰρ ἐκεῖ σχῆμα παρὰ τὸ τρίγωνόν ἔστι καὶ τὰ ἐφεξῆς, οὔτ' ἐνταῦθα ψυχὴ παρὰ τὰς εἰρημένας. γένοιτο δ' ἄν καὶ ἐπὶ τῶν σχημάτων λόγος κοινός, ὃς ἐφαρμόσει μὲν πᾶσιν, ἴδιος δ' οὐδενὸς ἔσται σχήματος. ὅμοίως 25 δὲ καὶ ἐπὶ ταῖς εἰρημέναις ψυχαῖς. διὸ γελοῖον ζητεῖν τὸν κοινὸν λόγον καὶ ἐπὶ τούτων καὶ ἐφ' ἔτέρων, ὃς οὐδενὸς ἔσται τῶν ὄντων ἴδιος λόγος, οὐδὲ κατὰ τὸ οἰκεῖον καὶ ἄτομον εἶδος, ἀφέντας τὸν τοιοῦτον.

Παραπλησίως δ' ἔχει τῷ περὶ τῶν σχημάτων καὶ τὰ κατὰ ψυχὴν· ἀεὶ γὰρ ἐν τῷ ἐφεξῆς 30 ὑπάρχει δυνάμει τὸ πρότερον ἐπὶ τε τῶν σχημάτων καὶ ἐπὶ τῶν ἐμψύχων, οἷον ἐν τετραγώνῳ μὲν τρίγωνον, ἐν αἰσθητικῷ δὲ τὸ θρεπτικόν. ὥστε καθ' ἔκαστον ζητητέον, τίς ἔκαστου ψυχή, οἷον τίς φυτοῦ καὶ τίς ἀνθρώπου ἢ θηρίου. διὰ τίνα 415 <sup>a</sup> δ' αἰτίαν τῷ ἐφεξῆς οὔτως ἔχουσι, σκεπτέον. ἀνευ μὲν γὰρ τοῦ θρεπτικοῦ τὸ αἰσθητικὸν οὐκ ἔστιν· τοῦ δ' αἰσθητικοῦ χωρίζεται τὸ θρεπτικὸν ἐν τοῖς φυτοῖς. πάλιν δ' ἀνευ μὲν τοῦ ἀπτικοῦ τῶν ἄλλων αἰσθήσεων οὐδεμίᾳ ὑπάρχει, ἀφὴ δ'

<sup>a</sup> The argument of this paragraph is as follows: Just as figure has a definition applicable to all varieties of figures, so soul has a similar "common" definition; but this can only be discovered by a patient study of individual souls, e.g. of man, animal, and plant.

## ON THE SOUL, II. III.

a matter of doubt, and must be considered later. In addition to these senses some also possess the power of movement in space, and others again the power of thinking and mind, namely, man, and any other being which may be superior to him.

So it is clear that in the same way there should be <sup>Definition of soul</sup> one definition of soul as there is of rectilinear figure ; for in the latter case there is no figure besides the triangle and those that follow from it (*i.e.* quadrilateral, pentagon, etc.), nor is there any soul besides those we have mentioned. It would be possible in the case of figures also to frame a common definition, which would fit them all, but would be descriptive of no particular figure. And similarly in the case of the kinds of soul we have mentioned. So that it would be ridiculous to look for the common definition in this case as in others, which is the particular definition of no existing thing, and has no reference to any particular or individual species, while we neglect such a particular definition.<sup>a</sup>

The facts regarding the soul are in the same position as those concerned with figures ; for in any series the first term has always a potential existence, both in the case of figures and of what possesses soul ; for instance the triangle is implied by the quadrilateral, and the nutritive faculty by the sensitive. We must then inquire in each several case, what is the soul of each individual, for instance of the plant, the man, and the beast. But we must also consider why they are thus arranged in a series. For without the nutritive faculty the sensitive does not exist, and in plants the nutritive is divorced from the sensitive faculty. Again, without the sense of touch none of the other senses exist, but touch may exist without

similar to  
mathematical  
definition.

## ARISTOTLE

415 a

δ ἄνευ τῶν ἄλλων ὑπάρχει· πολλὰ γὰρ τῶν ζώων  
οὗτ' ὅψιν οὕτ' ἀκοὴν ἔχουσιν οὗτ' δσμῆς ὅλως  
αἰσθησιν. καὶ τῶν αἰσθητικῶν δὲ τὰ μὲν ἔχει τὸ  
κατὰ τόπον κινητικόν, τὰ δὲ οὐκ ἔχει. τελευταῖον  
δὲ καὶ ἐλάχιστα λογισμὸν καὶ διάνοιαν· οἷς μὲν  
γὰρ ὑπάρχει λογισμὸς τῶν φθαρτῶν, τούτοις καὶ  
10 τὰ λοιπὰ πάντα, οἷς δὲ ἐκείνων ἔκαστον, οὐ πᾶσι  
λογισμός, ἀλλὰ τοῖς μὲν οὐδὲ φαντασίᾳ, τὰ δὲ  
ταύτη μόνη ζῶσιν. περὶ δὲ τοῦ θεωρητικοῦ νοῦ  
ἔτερος λόγος. ὅτι μὲν οὖν ὁ περὶ τούτων ἔκαστον  
λόγος οὗτος οἰκειότατος καὶ περὶ ψυχῆς, δῆλον.

IV. Ἀναγκαῖον δὲ τὸν μέλλοντα· περὶ τούτων  
15 σκέψιν ποιεῖσθαι λαβεῖν ἔκαστον αὐτῶν τί ἔστιν,  
εἴθ' οὕτως περὶ τῶν ἔχομένων ἢ καὶ περὶ τῶν ἄλ-  
λων ἐπιζητεῖν. εἰ δὲ χρὴ λέγειν τί ἔκαστον αὐτῶν,  
οἷον τί τὸ νοητικὸν ἢ τὸ αἰσθητικὸν ἢ τὸ θρεπτι-  
κόν, πρότερον ἔτι λεκτέον τί τὸ νοεῖν καὶ τί τὸ  
αἰσθάνεσθαι· πρότερον γάρ εἰσι τῶν δυνάμεων αἱ  
20 ἐνέργειαι καὶ αἱ πράξεις κατὰ τὸν λόγον. εἰ δὲ  
οὕτως, τούτων δὲ ἔτι πρότερα τὰ ἀντικείμενα δεῖ  
τεθεωρηκέναι, περὶ ἐκείνων πρῶτον ἀν δέοι δι-  
ορίσαι διὰ τὴν αὐτὴν αἰτίαν, οἷον περὶ τροφῆς καὶ  
αἰσθητοῦ καὶ νοητοῦ. ὥστε πρῶτον περὶ τροφῆς  
καὶ γεννήσεως λεκτέον· ἢ γὰρ θρεπτικὴ ψυχὴ καὶ  
τοῖς ἄλλοις ὑπάρχει, καὶ πρώτη καὶ κοινοτάτη  
25 δύναμίς ἔστι ψυχῆς, καθ' ἣν ὑπάρχει τὸ ζῆν  
ἄπασιν. ἡς ἔστιν ἔργα γεννῆσαι καὶ τροφῆ  
χρῆσθαι· φυσικώτατον γὰρ τῶν ἔργων τοῖς ζῶσιν,

<sup>a</sup> We proceed from the exercise of the functions, which we know and see, to assume the existence of the faculty: nature proceeds in the opposite order.

<sup>b</sup> A. identifies the origin of growth and reproduction,

## ON THE SOUL, II. III.—IV.

any others ; for many of the animals have neither vision nor hearing nor, generally speaking, any sense of smell. Again, of those possessing feeling, some have movement in space, and some have not. And lastly, and most rarely, living creatures have power of reasoning and thought. For those perishable creatures which have reasoning power have all the other powers as well, but those who have any one of them have not all reasoning power, but some have not even imagination, while others can be called living in virtue of this alone. The consideration of the speculative faculty is another question. But it is clear that the account of each of these faculties is also the most relevant account that can be given of the soul.

IV. If one intends to investigate these faculties, <sup>The method of inquiry.</sup> one must first inquire what each of them is, and then proceed to inquire about the next and other questions. But if one is to ask what each of them is, such as the thinking, sensitive, or nutritive faculty, one must first examine the meaning of acts of thinking or feeling ; for in our reasoning<sup>a</sup> the exercise of their functions comes before the faculties themselves. And if this is so, and if one should first of all examine the objects upon which the faculties are exercised, then for the same reason one must first of all lay down definitions of food, the thing felt, or the thing thought. First, then, we must speak of food and reproduction ; for the nutritive soul belongs to all other living creatures besides man, and is the first and most widely shared faculty of the soul, in virtue of which they all have life. The functions of the nutritive faculty are to reproduce and to use food.<sup>b</sup> For this is the most

because food is needed both for the survival of the individual and for the reproduction of the species.

## ARISTOTLE

415 a

ὅσα τέλεια καὶ μὴ πηρώματα, ἢ τὴν γένεσιν αὐτομάτην ἔχει, τὸ ποιῆσαι ἔτερον οἶνον αὐτό, ζῶον μὲν ζῶον, φυτὸν δὲ φυτόν, ἵνα τοῦ ἀεὶ καὶ τοῦ 415 b θείου μετέχωσιν ἢ δύνανται πάντα γὰρ ἐκείνου ὄρεγεται, κακείνου ἐνεκα πράττει ὅσα πράττει κατὰ φύσιν. τὸ δὲ οὖν ἐνεκα, διττόν, τὸ μὲν οὖν, τὸ δὲ ὡς. ἐπεὶ οὖν κοινωνεῖν ἀδυνατεῖ τοῦ ἀεὶ καὶ τοῦ θείου τῇ συνεχείᾳ, διὰ τὸ μηδὲν ἐνδέχεσθαι τῶν 5 φθαρτῶν ταῦτο καὶ ἐν ἀριθμῷ διαμένειν, ἢ δύνανται μετέχειν ἔκαστον, κοινωνεῖν ταῦτη, τὸ μὲν μᾶλλον τὸ δὲ ἥπτον· καὶ διαμένει οὐκ αὐτὸν ἀλλ' οἶνον αὐτό, ἀριθμῷ μὲν οὐχ ἐν, εἴδει δὲ δὲν.

"Εστι δὲ ἡ ψυχὴ τοῦ ζῶντος σώματος αἰτία καὶ 10 ἀρχή. ταῦτα δὲ πολλαχῶς λέγεται. ὅμοιώς δ' ἡ ψυχὴ κατὰ τοὺς διωρισμένους τρόπους τρεῖς αἰτία· καὶ γὰρ ὅθεν ἡ κίνησις αὐτή, καὶ οὖν ἐνεκα, καὶ ὡς ἡ οὐσία τῶν ἐμψύχων σωμάτων ἡ ψυχὴ αἰτία. ὅτι μὲν οὖν ὡς οὐσία, δῆλον· τὸ γὰρ αἴτιον τοῦ εἶναι πᾶσιν ἡ οὐσία, τὸ δὲ ζῆν τοῖς ζῶσι τὸ εἶναι ἐστιν, αἰτία δὲ καὶ ἀρχὴ τούτων ἡ ψυχὴ. ἔτι τοῦ 15 δυνάμει ὄντος λόγος ἡ ἐντελέχεια. φανερὸν δὲ ὡς καὶ οὖν ἐνεκεν ἡ ψυχὴ αἰτία· ὥσπερ γὰρ δὲν νοῦς

<sup>a</sup> Cf. *Metaph.* 983 a 26 "the word cause is used . . . (1) as the essential nature, (2) as the source of movement, (3) as the final cause."

<sup>b</sup> The word form here can best be understood by reference to A.'s own analogy. The wax is the "matter" of the seal, but it is only potentially a seal. When the die is impressed on the wax, the matter receives "form" and becomes "actualized" as a seal.

## ON THE SOUL, II. iv.

natural of all functions among living creatures, provided that they are perfect and not maimed, and do not have spontaneous generation. Each produces another creature like itself; an animal produces an animal, and a plant a plant, in order that they may have a share in the immortal and divine in the only way they can; for every creature strives for this, and this is the final cause of all its natural functions. But final cause has two meanings, the person for whose sake and the object for the sake of which an action is done. Since, then, they cannot share in the immortal and divine by continuity of existence, because no perishable thing can remain numerically one and the same, they share in these in the only way they can, some to a greater and some to a less extent; what persists is not the individual itself, but something in its image, not identical as a unit, but identical in form.

But the soul is the cause and first principle of the living body. The words cause and first principle are used in several separate senses. But the soul is equally the cause in each of the three senses to which we have referred <sup>a</sup>; for it is the cause in the sense of being that from which motion is derived, in the sense of the purpose or final cause, and as being the substance of all bodies that have souls. (1) That the soul is the cause in the sense of substance is obvious; for substance is the cause of existence in all things, and in living creatures life is their existence, and of these the soul is the cause and first principle. Also actuality is the form of that which exists potentially.<sup>b</sup> (2) And it is clear that the soul is the cause in the sense of the final cause. For just as the mind acts

The nature  
of the soul.

## ARISTOTLE

415 b

ἔνεκά του ποιεῖ, τὸν αὐτὸν τρόπον καὶ ἡ φύσις,  
καὶ τοῦτ' ἔστιν αὐτῇ τέλος. τοιοῦτον δὲ ἐν τοῖς  
ζῷοις ἡ ψυχὴ καὶ κατὰ φύσιν πάντα γὰρ τὰ  
φυσικὰ σώματα τῆς ψυχῆς ὅργανα, καὶ καθάπερ  
τὰ τῶν ζώων, οὕτω καὶ τὰ τῶν φυτῶν, ὡς ἔνεκα  
τῆς ψυχῆς ὄντα. διττῶς δὲ τὸ οὐ ἔνεκα, τό τε  
οὐ καὶ τὸ ω. ἀλλὰ μὴν καὶ ὅθεν πρῶτον ἡ κατὰ  
τόπον κίνησις, ψυχή· οὐ πᾶσι δὲ ὑπάρχει τοῖς  
ζῷοις ἡ δύναμις αὕτη. ἔστι δὲ καὶ ἀλλοίωσις καὶ  
αὔξησις κατὰ ψυχήν· ἡ μὲν γὰρ αἴσθησις ἀλλοίωσίς  
τις εἶναι δοκεῖ, αἰσθάνεται δὲ οὐθὲν ὅ μὴ ἔχει  
ψυχήν. ὅμοίως δὲ καὶ περὶ αὔξησεώς τε καὶ  
φθίσεως ἔχει· οὐδὲν γὰρ φθίνει οὐδὲν αὔξεται  
φυσικῶς μὴ τρεφόμενον, τρέφεται δὲ οὐθὲν ὅ μὴ  
κοινωνεῖ ζωῆς.

Ἐμπεδοκλῆς δὲ οὐ καλῶς εἴρηκε τοῦτο, προσ-  
τιθεὶς τὴν αὔξησιν συμβαίνειν τοῖς φυτοῖς κάτω.  
μὲν συρριζουμένοις διὰ τὸ τὴν γῆν οὕτω φέρεσθαι  
κατὰ φύσιν, ἄνω δὲ διὰ τὸ πῦρ ὡσαύτως. οὕτε  
γὰρ τὸ ἄνω καὶ κάτω καλῶς λαμβάνει· οὐ γὰρ  
ταῦτὸ πᾶσι τὸ ἄνω καὶ κάτω καὶ τῷ παντὶ, ἀλλ'  
ῶς ἡ κεφαλὴ τῶν ζώων, οὕτως αἱ ρίζαι τῶν φυτῶν,  
εἰ χρὴ τὰ ὅργανα λέγειν ἔτερα καὶ ταῦτὰ τοῖς  
ἔργοις. πρὸς δὲ τούτοις τί τὸ συνέχον εἰς τάναντία  
φερόμενα τὸ πῦρ καὶ τὴν γῆν; διασπασθήσεται  
γάρ, εἰ μή τι ἔσται τὸ κωλύσον· εἰ δὲ ἔσται, τοῦτ  
ἔστιν ἡ ψυχὴ καὶ τὸ αἴτιον τοῦ αὔξανεσθαι καὶ  
τρέφεσθαι.

## ON THE SOUL, II. iv.

with some end in view, so in the same way does nature, and this is its end. This, then, is the nature of the soul among living creatures, and this is in accordance with nature ; for all natural bodies are the instruments of the soul, and just as is the case with the bodies of animals, so with those of plants, in the sense that they exist for the sake of the soul. But the phrase "for the sake of" has two meanings—"for whom ?" and "for what ?" (3) Lastly, the soul is the cause whence movement is derived in the first place ; but this capacity does not belong to all living creatures. Change of state and growth are also due to the soul ; for sensation is in a sense change of state, and nothing feels which has not a soul. The same is true about growth and decay ; for nothing dies nor grows in nature, unless it is fed, and nothing is fed which does not share in life.

Empedocles is mistaken in his account of this, when he adds that the growth in plants, when their roots spread downwards, is due to the fact that earth naturally tends in this direction, and that when they grow upwards, it is due to the natural movement of fire. Nor is his theory of "upwards" and "downwards" correct ; for upwards and downwards are not the same for every thing in every case, but the function performed by the head in animals is performed by the roots in plants, if we are to identify and distinguish organs by their functions. But in addition to this, what is it which connects the fire and the earth tending in opposite directions ? For they will be violently separated, unless there is something to prevent this ; but if there is anything of the sort this will be the soul, and therefore the cause of growth and nourishment.

## ARISTOTLE

416 a

10 Δοκεῖ δέ τισιν ἡ τοῦ πυρὸς φύσις ἀπλῶς αἰτία τῆς τροφῆς καὶ τῆς αὐξήσεως εἶναι· καὶ γὰρ αὐτὸς φαίνεται μόνον τῶν σωμάτων ἡ τῶν στοιχείων τρεφόμενον καὶ αὐξόμενον. διὸ καὶ ἐν τοῖς φυτοῖς καὶ ἐν τοῖς ζῷοις ὑπολάβοι τις ἀν τοῦτο εἶναι τὸ ἔργα ζόμενον. τὸ δὲ συναίτιον μέν πώς 15 ἔστιν, οὐ μὴν ἀπλῶς γε αἴτιον, ἀλλὰ μᾶλλον ἡ ψυχή· ἡ μὲν γὰρ τοῦ πυρὸς αὐξῆσις εἰς ἄπειρον, ἔως ἀν ἣ τὸ καυστόν, τῶν δὲ φύσει συνισταμένων πάντων ἔστι πέρας καὶ λόγος μεγέθους τε καὶ αὐξήσεως· ταῦτα δὲ ψυχῆς, ἀλλ' οὐ πυρός, καὶ λόγου μᾶλλον ἡ ὕλης.

19 'Επεὶ δ' ἡ αὐτὴ δύναμις τῆς ψυχῆς θρεπτικὴ καὶ γεννητική, περὶ τροφῆς ἀναγκαῖον διωρίσθαι πρῶτον· ἀφορίζεται γὰρ πρὸς τὰς ἄλλας δυνάμεις τῷ ἔργῳ τούτῳ. δοκεῖ δ' εἶναι ἡ τροφὴ τὸ ἐναντίον τῷ ἐναντίῳ, οὐ πᾶν δὲ παντί, ἀλλ' ὅσα τῶν ἐναντίων μὴ μόνον γένεσιν ἔξ ἀλλήλων ἔχουσιν ἀλλὰ καὶ αὐξῆσιν· γίνεται γὰρ πολλὰ ἔξ ἀλλήλων, 25 ἀλλ' οὐ πάντα ποσά, οἷον ὑγιὲς ἐκ κάμνοντος. φαίνεται δ' οὐδὲ ἐκεῖνα τὸν αὐτὸν τρόπον ἀλλήλοις εἶναι τροφή, ἀλλὰ τὸ μὲν ὕδωρ τῷ πυρὶ τροφή, τὸ δὲ πῦρ οὐ τρέφει τὸ ὕδωρ. ἐν μὲν οὖν τοῖς ἀπλοῖς σώμασι ταῦτ' εἶναι δοκεῖ μάλιστα τὸ μὲν τροφὴ τὸ δὲ τρεφόμενον. ἀπορίαν δ' ἔχει· φασὶ γὰρ οἱ 30 μὲν τὸ ὄμοιον τῷ ὄμοιῷ τρέφεσθαι, καθάπερ καὶ αὐξάνεσθαι, τοῖς δ' ὕσπερ εἴπομεν τοῦμπαλιν δοκεῖ, τὸ ἐναντίον τῷ ἐναντίῳ, ὡς ἀπαθοῦσι ὅντος τοῦ ὄμοιον ὑπὸ τοῦ ὄμοιού, τὴν δὲ τροφὴν μεταβάλλειν καὶ πέττεσθαι· ἡ δὲ μεταβολὴ πᾶσιν εἰς τὸ ἀντι-

## ON THE SOUL, II. iv.

To some the nature of fire seems by itself to be the cause of nutrition and growth ; for it alone of all bodies and elements seems to be nourished and grow of itself. So that one might suppose that it was the operating principle in plants and animals. It may perhaps be a contributory cause, but it is not the primary cause, which is much more properly the soul ; for the growth of fire is without limit, so long as there is something to be burned, but of all things existing in nature there is a limit and a principle of size and growth ; this is due to the soul, not to fire, and to form rather than to matter.

But since nutrition and generation are the same faculty of the soul, we must first define nutriment carefully ; the nutritive faculty is separated from the other faculties by its function of feeding. There is a general opinion that opposites are nutriment to opposites ; not of course in every case, but among such opposites as have not merely their birth from each other, but their growth as well ; for many things arise from each other, but they are not all quantities ; for instance, health from illness. But not even the things mentioned seem to be food for each other in the same way ; water feeds fire,<sup>a</sup> but fire does not feed water. It is true that in simple bodies the food and what is fed do seem opposite. But this presents a difficulty ; for some say that like is fed by like, just as like grows by like, but others, as we have said, hold the opposite view, that opposites are fed by their opposites, on the ground that like is unaffected by like, but that food changes and is digested. But all change is to an opposite, or to an

<sup>a</sup> It was supposed that wood, when perfectly dry, would not keep a fire alight.

## ARISTOTLE

416 a

35 κείμενον ἢ τὸ μεταξύ. ἔτι πάσχει τι ἡ τροφὴ ὑπὸ<sup>416 b</sup> τοῦ τρεφομένου, ἀλλ’ οὐ τοῦτο ὑπὸ τῆς τροφῆς,  
ῶσπερ οὐδ’ ὁ τέκτων ὑπὸ τῆς ὕλης, ἀλλ’ ὑπ’ ἐκεί-  
νου αὗτη· ὁ δὲ τέκτων μεταβάλλει μόνον εἰς  
ἐνέργειαν ἐξ ἀργίας.

Πότερον δ’ ἔστιν ἡ τροφὴ τὸ τελευταῖον προσ-  
γινόμενον ἢ τὸ πρῶτον, ἔχει διαφοράν. εἰ δ’  
ἢ ἄμφω, ἀλλ’ ἡ μὲν ἀπεπτος ἡ δὲ πεπεμμένη,  
ἀμφοτέρως ἀν ἐνδέχοιτο τὴν τροφὴν λέγειν· ἢ μὲν  
γὰρ ἀπεπτος, τὸ ἐναντίον τῷ ἐναντίῳ τρέφεται,  
ἢ δὲ πεπεμμένη, τὸ ὅμοιον τῷ ὅμοιῳ. ὥστε  
φανερὸν ὅτι λέγουσί τινα τρόπον ἀμφότεροι καὶ  
όρθως καὶ οὐκ ὀρθῶς. ἐπεὶ δ’ οὐθὲν τρέφεται  
10 μὴ μετέχον ζωῆς, τὸ ἔμψυχον ἀν εἴη σῶμα  
τὸ τρεφόμενον, ἢ ἔμψυχον, ὥστε καὶ ἡ τροφὴ<sup>11</sup>  
πρὸς ἔμψυχόν ἔστι καὶ οὐ κατὰ συμβεβηκός.  
ἔστι δ’ ἔτερον τροφῆ καὶ αὐξητικῷ εἶναι· ἢ μὲν  
γὰρ ποσόν τι τὸ ἔμψυχον, αὐξητικόν, ἢ δὲ τόδε τι  
καὶ οὐσία, τροφή· σώζει γὰρ τὴν οὐσίαν, καὶ  
15 μέχρι τούτου ἔστιν ἔως ἀν καὶ τρέφηται· καὶ  
γενέσεως ποιητικὸν οὐ τοῦ τρεφομένου, ἀλλ’ οἶνον  
τὸ τρεφόμενον· ηδη γάρ ἔστιν αὐτὴ ἡ οὐσία, γεννᾷ  
δ’ οὐθὲν αὐτὸ ἔαυτό, ἀλλὰ σώζει. ὥσθ’ ἡ μὲν  
τοιαύτη τῆς ψυχῆς ἀρχὴ δύναμίς ἔστιν οἷα σώζειν  
τὸ ἔχον αὐτὴν ἢ τοιοῦτον, ἡ δὲ τροφὴ παρασκευάζει  
20 ἐνεργεῖν. διὸ στερηθὲν τροφῆς οὐ δύναται εἶναι.  
ἐπεὶ δ’ ἔστι τρία, τὸ τρεφόμενον καὶ ὃ τρέφεται  
καὶ τὸ τρέφον, τὸ μὲν τρέφον ἔστιν ἡ πρώτη

## ON THE SOUL, II. iv.

intermediate state. Again, the food is affected by the fed, and not *vice versa*, just as the carpenter is not affected by his material, but the material by the carpenter ; the carpenter merely changes from idleness to work.

Now it makes a difference whether the food is referred to in its last state or in its first. If in both states, that is both undigested and digested, it would be possible to speak of food in both the ways referred to above ; for when it is undigested, opposite feeds on opposite, but when digested like feeds on like. So that it is clear that both sides argue correctly in one sense and incorrectly in another. But since nothing is nourished which does not share in life, that which has a soul would be the nourished body, in virtue of its having a soul, so that food belongs to that which has a soul and is not an accidental property of it. But nutrition and growth are two different things ; for in so far as that which lives is a quantity, it is a matter of growth, but in so far as it is a particular thing and substance, it is a matter of nourishment ; for that which lives preserves its substance and continues to exist, so long as it is nourished, and it produces the birth not of that which is nourished, but of another like it ; for it is already itself substance, and it does not produce itself in any way, but only preserves itself. So that the first principle of the soul in this respect is its power of preserving what possesses it as an individual, while food prepares it for work. For this reason it cannot continue to exist when deprived of food. But there are three factors in the problem, that which is nourished, that whereby it is nourished, and that which nourishes it. The primary soul is that which

Solution of  
the difficulty.

## ARISTOTLE

<sup>18 b</sup> ψυχή, τὸ δὲ τρεφόμενον τὸ ἔχον αὐτὴν σῶμα, φῶ  
δὲ τρέφεται, ἡ τροφή. ἐπεὶ δὲ ἀπὸ τοῦ τέλους  
ἀπαντα προσαγορεύειν δίκαιον, τέλος δὲ τὸ γεννῆσαι  
οἰον αὐτό, εἴη ἀνὴρ πρώτη ψυχὴ γεννητικὴ οἰον  
αὐτό. ἔστι δὲ φῶ τρέφεται διττόν, ὥσπερ καὶ φῶ  
κυβερνᾶ, ἡ χεὶρ καὶ τὸ πηδάλιον, τὸ μὲν κινοῦν  
καὶ κινούμενον, τὸ δὲ κινοῦν μόνον. πᾶσαν δὲ  
ἀναγκαῖον τροφὴν δύνασθαι πέττεσθαι, ἐργάζεται  
δὲ τὴν πέψιν τὸ θερμόν· διὸ πᾶν ἔμψυχον ἔχει θερ-  
μότητα. τύπω μὲν οὖν ἡ τροφὴ τί ἔστιν εἴρηται·  
διασαφητέον δὲ ἔστὶν ὕστερον περὶ αὐτῆς ἐν τοῖς  
οἰκείοις λόγοις.

V. Διωρισμένων δὲ τούτων λέγωμεν κοινῆ περὶ  
πάσης αἰσθήσεως. ἡ δὲ αἰσθησις ἐν τῷ κινεῖσθαι  
τε καὶ πάσχειν συμβαίνει, καθάπερ εἴρηται· δοκεῖ  
γὰρ ἀλλοίωσίς τις εἶναι. φασὶ δέ τινες καὶ τὸ  
7 a ὅμοιον ὑπὸ τοῦ ὁμοίου πάσχειν. τοῦτο δὲ πῶς  
δυνατὸν ἡ ἀδύνατον, εἴρηκαμεν ἐν τοῖς καθόλου  
λόγοις περὶ τοῦ ποιεῦν καὶ πάσχειν. ἔχει δὲ  
ἀπορίαν διὰ τί καὶ τῶν αἰσθήσεων αὐτῶν οὐ  
γίνεται αἰσθησις, καὶ διὰ τί ἄνευ τῶν ἔξω οὐ  
8 ποιοῦσιν αἰσθησιν, ἐνόντος πυρὸς καὶ γῆς καὶ τῶν  
ἄλλων στοιχείων, ὅντες ἔστιν ἡ αἰσθησις καθ' αὐτὰ  
ἡ τὰ συμβεβηκότα τούτοις. δῆλον οὖν ὅτι τὸ  
αἰσθητικὸν οὐκ ἔστιν ἐνεργείᾳ, ἀλλὰ δυνάμει μόνον.  
διὸ καθάπερ τὸ καυστὸν οὐ καίεται αὐτὸς καθ' αὐτὸς  
ἄνευ τοῦ καυστικοῦ· ἔκαιε γὰρ ἀνὴρ ἑαυτός, καὶ οὐθὲν  
10 ἐδεῦτο τοῦ ἐντελεχείᾳ πυρὸς ὄντος. ἐπειδὴ δὲ τὸ

<sup>a</sup> No such treatise has come down to us.

## ON THE SOUL. II. iv.—v.

nourishes, that which is nourished is the body which contains the soul, and that whereby it is nourished is the food. But since it is right to name everything in view of its end, and its end is the reproduction of the species, the primary soul would be that which reproduces another like itself. But the words “by which it is nourished” are used in two senses, just like the phrase “by which the helmsman steers,” meaning either his hand or the rudder, the latter both moving and being moved, and the former only moving. But all food must be digested, and it is heat which produces digestion ; consequently everything possessing a soul has heat. The meaning of food has thus been described in outline ; later on we must be more precise about it in a treatise of its own.<sup>a</sup>

V. Having completed these definitions let us discuss sensation in general. Sensation consists, as has been said, of being moved and acted upon ; for it seems to be some sort of change of state. Now some say that like is only affected by like. But the sense in which this is possible or impossible we have already stated in our general account of acting and being acted upon.<sup>b</sup> But a difficulty arises as to why there is no sensation of the senses themselves ; that is, why they give no sensation apart from external objects, seeing that fire and earth and the other elements enter into their composition, of which things there is sensation either in themselves, or in their accidental properties. It is clear from this that the faculty of sensation has no actual but only potential existence. So fuel does not burn by itself without something to set fire to it ; for otherwise it would burn of itself, and would not need any fire actually at work. But

<sup>a</sup> *De Gen. et Corr.* i. 7. 323 b 18 *sqq.*

αἰσθάνεσθαι λέγομεν διχῶς (τό τε γὰρ δυνάμει ἀκούον καὶ ὄρῶν ἀκούειν καὶ ὄρᾶν λέγομεν, καν τύχῃ καθεῦδον, καὶ τὸ ηδη ἐνεργοῦν), διχῶς ἀν λέγοιτο καὶ η αἰσθησις, η μὲν ὡς δυνάμει, η δὲ ὡς ἐνεργείᾳ. ὅμοίως δὲ καὶ τὸ αἰσθάνεσθαι, τό τε δυνάμει ὅν καὶ τὸ ἐνεργείᾳ.

15 Πρῶτον μὲν οὖν ὡς τοῦ αὐτοῦ ὄντος τοῦ πάσχειν καὶ τοῦ κινεῖσθαι καὶ τοῦ ἐνεργεῖν λέγωμεν· καὶ γὰρ ἔστιν η κίνησις ἐνέργειά τις, ἀτελής μέντοι, καθάπερ ἐν ἑτέροις εἴρηται. πάντα δὲ πάσχει καὶ κινεῖται ὑπὸ τοῦ ποιητικοῦ καὶ ἐνεργείᾳ ὄντος. διὸ ἔστι μὲν ὡς ὑπὸ τοῦ ὅμοίου πάσχει, ἔστι δὲ 20 ὡς ὑπὸ τοῦ ἀνομοίου, καθάπερ εἴπομεν· πάσχει μὲν γὰρ τὸ ἀνόμοιον, πεπονθός δ' ὅμοιόν ἔστιν.

Διαιρετέον δὲ καὶ περὶ δυνάμεως καὶ ἐντελεχείας· νῦν γὰρ ἀπλῶς λέγομεν περὶ αὐτῶν. ἔστι μὲν γὰρ οὕτως ἐπιστῆμόν τι ὡς ἀν εἴποιμεν ἀνθρωπον ἐπιστήμονα, ὅτι ὁ ἀνθρωπος τῶν ἐπιστημόνων καὶ ἔχόντων ἐπιστήμην· ἔστι δ' ὡς ηδη λέγομεν ἐπιστήμονα τὸν ἔχοντα τὴν γραμματικήν. ἔκάτερος δὲ τούτων οὐ τὸν αὐτὸν τρόπον δυνατός ἔστιν, ἀλλ' ὁ μὲν ὅτι τὸ γένος τοιοῦτον καὶ η ὕλη, ὁ δ' ὅτι βουληθεὶς δυνατὸς θεωρεῖν, ἀν μή τι κωλύσῃ τῶν ἔξωθεν· ὁ δ' ηδη θεωρῶν ἐντελεχείᾳ 30 ὡν καὶ κυρίως ἐπιστάμενος τόδε τὸ Α. ἀμφότεροι μὲν οὖν οἱ πρῶτοι κατὰ δύναμιν ἐπιστήμονες, ἀλλ' ὁ μὲν διὰ μαθήσεως ἀλλοιωθεὶς καὶ πολλάκις ἔξ ἐναντίας μεταβαλὼν ἔξεως, ὁ δ' ἐκ τοῦ ἔχειν τὴν

<sup>a</sup> e.g. *Phys.* iii. 2, 201 b 31.

## ON THE SOUL, II. v.

since we use the term *feeling* in two senses (for we say that that which has the power of hearing and seeing hears and sees, even if it happens to be asleep, as well as when the faculty is actually operative), so the term *sensation* must be used in two senses, as potential and as actual. And so *feeling* means both the faculty and the exercise of it.

To begin with, let us assume that being acted upon and moving is the same thing as exercising the function ; for movement is a form of exercise, though incomplete, as has been said in other treatises.<sup>4</sup> But everything is acted upon and moved by something which produces an effect and actually exists. Therefore, as we have said, a thing is acted upon both by like and by unlike ; for while it is being acted upon it is unlike, but when the action is complete, it is like.

But we must draw a distinction between potential and actual ; for at present we are speaking of both without discrimination. For knowledge is used in two senses : we might call a man wise because man belongs to the class of those who are wise and have knowledge ; but we may also call the man wise who has a knowledge, say, of grammar. Now each of these two has capacity, but in a different sense : the former, because it is characteristic of his class, and the matter of which he is made ; the latter, because he is capable of thinking whenever he likes, provided that external causes do not prevent him ; but the man who is now thinking is not potential but actual, and really knows something —for instance the letter A. The first two men are both wise only potentially ; the former becomes actually wise only after a change due to instruction, and often from the opposite condition, the latter undergoing change in another sense,

Potential and actual.

## ARISTOTLE

417 <sup>b</sup> αἰσθησιν ἡ τὴν γραμματικήν, μὴ ἐνεργεῖν δ' εἰς τὸ ἐνεργεῖν ἄλλον τρόπον. οὐκ ἔστι δ' ἀπλοῦν οὐδὲ τὸ πάσχειν, ἀλλὰ τὸ μὲν φθορά τις ὑπὸ τοῦ ἐναντίου, τὸ δὲ σωτηρία μᾶλλον τοῦ δυνάμει ὄντος ὑπὸ τοῦ ἐντελεχεία ὄντος καὶ ὅμοίου, οὕτως ὡς δύναμις ἔχει πρὸς ἐντελέχειαν. θεωροῦν γὰρ γίγνεται τὸ ἔχον τὴν ἐπιστήμην, ὅπερ ἡ οὐκ ἔστιν ἄλλοιούσθαι (εἰς αὐτὸν γὰρ ἡ ἐπίδοσις καὶ εἰς ἐντελέχειαν) ἡ ἔτερον γένος ἄλλοιώσεως. διὸ οὐ καλῶς ἔχει λέγειν τὸ φρονοῦν, ὅταν φρονῇ, ἄλλοιούσθαι, ὥσπερ οὐδὲ τὸν οἰκοδόμον ὅταν οἰκοδομῇ.

10 τὸ μὲν οὖν εἰς ἐντελέχειαν ἄγον ἐκ δυνάμει ὄντος κατὰ τὸ νοῦν καὶ φρονοῦν οὐ διδασκαλίαν ἀλλ' ἐτέραν ἐπωνυμίαν ἔχειν δίκαιον· τὸ δ' ἐκ δυνάμει ὄντος μανθάνον καὶ λαμβάνον ἐπιστήμην ὑπὸ τοῦ ἐντελεχεία ὄντος καὶ διδασκαλικοῦ ἥτοι οὐδὲ πάσχειν φατέον, ὥσπερ εἴρηται, ἡ δύο τρόπους

15 εἶναι ἄλλοιώσεως, τὴν τε ἐπὶ τὰς στερητικὰς διαθέσεις μεταβολὴν καὶ τὴν ἐπὶ τὰς ἔξεις καὶ τὴν φύσιν. τοῦ δ' αἰσθητικοῦ ἡ μὲν πρώτη μεταβολὴ γίνεται ὑπὸ τοῦ γεννῶντος, ὅταν δὲ γεννηθῇ, ἔχει ἥδη ὥσπερ ἐπιστήμην καὶ τὸ αἰσθάνεσθαι. καὶ τὸ κατ' ἐνέργειαν δὲ ὅμοίως λέγεται τῷ θεωρεῖν.

20 διαφέρει δέ, ὅτι τοῦ μὲν τὰ ποιητικὰ τῆς ἐνεργείας ἔξωθεν, τὸ δρατὸν καὶ τὸ ἀκουστόν, ὅμοίως δὲ καὶ τὰ λοιπὰ τῶν αἰσθητῶν. αἴτιον δ' ὅτι τῶν καθ' ἔκαστον ἡ κατ' ἐνέργειαν αἰσθησις, ἡ δ'

<sup>a</sup> When we see the colour red we see a particular object, which is red, at a particular time. But knowledge of "red" is not knowledge of any red object at any one time but of the colour red detached from such objects, i.e. in A.'s phraseology as "universal."

## ON THE SOUL, II. v.

that is, from possessing sensation, or the art of grammar, but not using them, to the exercise of these faculties. But even the term "being acted upon" is not used in a single sense, but sometimes it means a form of decay caused by an opposite, and sometimes rather a preservation of that which is only potential by that which is actual and like itself, in the sense that the potential is related to the actual ; for that which has the knowledge becomes a thinking being, which either is not a change of state (for it is only a growth into its real self, that is to actuality), or else is a different kind of change of state. So it is not sound to describe that which thinks as changing its state when it thinks, any more than it is true to say that the builder changes his state when he builds. That which produces development from potential to actual in the matter of understanding and thought ought not to be described as teaching, but needs some other name ; and that which in a state of potentiality learns, and acquires knowledge from what is actual and educative, either ought not to be called "being acted upon," as has been said, or else there are two kinds of change of state, one a change to a negative condition, and the other a change to a positive condition, that is, a realization of its nature. But in sense-perception the first change is caused by the parent, and when birth is complete the subject has already in a sense knowledge and feeling. We speak just in the same way of actual exercise in the case of thinking ; with this difference, that the things which produce the exercise of sensation are objects from outside, the visible and audible, and similarly with all the other objects of sense.<sup>a</sup> This is because active feeling is for particular objects, whereas knowledge

417 <sup>β</sup>

ἐπιστήμη τῶν καθόλου· ταῦτα δ' ἐν αὐτῇ πώς  
 ἔστι τῇ ψυχῇ. διὸ νοῆσαι μὲν ἐπ' αὐτῷ, ὅπόταν  
 25 βούληται, αἰσθάνεσθαι δ' οὐκ ἐπ' αὐτῷ· ἀναγκαῖον  
 γὰρ ὑπάρχειν τὸ αἰσθητόν. ὅμοίως δὲ τοῦτ' ἔχει  
 καν ταῖς ἐπιστήμαις ταῖς τῶν αἰσθητῶν, καὶ διὰ  
 τὴν αὐτὴν αἰτίαν, ὅτι τὰ αἰσθητὰ τῶν καθ' ἔκαστα  
 καὶ τῶν ἔξωθεν.

'Αλλὰ περὶ μὲν τούτων διασαφῆσαι καιρὸς γένοιτο  
 ἄν καὶ εἰσαῦθις. νῦν δὲ διωρίσθω τοσοῦτον, ὅτι  
 80 οὐχ ἀπλοῦ ὄντος τοῦ δυνάμει λεγομέγου, ἀλλὰ τοῦ  
 μὲν ὕσπερ ἄν εἴποιμεν τὸν παῖδα δύνασθαι στρατη-  
 γεῖν, τοῦ δὲ ὡς τὸν ἐν ἡλικίᾳ ὄντα, οὕτως ἔχει τὸ  
 418 <sup>α</sup> αἰσθητικόν. ἐπεὶ δ' ἀνώνυμος αὐτῶν ἡ διαφορά,  
 διώρισται δὲ περὶ αὐτῶν ὅτι ἔτερα καὶ πῶς ἔτερα,  
 χρῆσθαι ἀναγκαῖον τῷ πάσχειν καὶ ἀλλοιοῦσθαι  
 ὡς κυρίοις ὀνόμασιν· τὸ δ' αἰσθητικὸν δυνάμει  
 ἔστιν οἷον τὸ αἰσθητὸν ἥδη ἐντελεχείᾳ, καθάπερ  
 5 εἴρηται. πάσχει μὲν οὖν οὐχ ὅμοιον ὅν, πεπονθὸς  
 δ' ὡμοίωται καὶ ἔστιν οἷον ἐκεῖνο.

VI. Λεκτέον δὲ καθ' ἔκάστην αἰσθησιν περὶ τῶν  
 αἰσθητῶν πρῶτον. λέγεται δὲ τὸ αἰσθητὸν τριχῶς,  
 ὃν δύο μὲν καθ' αὐτά φαμεν αἰσθάνεσθαι, τὸ δὲ  
 10 ἐν κατὰ συμβεβηκός. τῶν δὲ δύο τὸ μὲν ἴδιον  
 ἔστιν ἔκάστης αἰσθήσεως, τὸ δὲ κοινὸν πασῶν.  
 λέγω δ' ἴδιον μὲν ὃ μὴ ἐνδέχεται ἔτέρᾳ αἰσθήσει  
 αἰσθάνεσθαι, καὶ περὶ ὃ μὴ ἐνδέχεται ἀπατηθῆναι,

## ON THE SOUL, II. v.--vi.

is of universals ; these in a sense exist in the soul itself. So it lies in man's power to use his mind, whenever he chooses, but it is not in his power to experience sensation ; for the presence of the object felt is essential. The same thing is true of those branches of knowledge, which deal with sensible objects, and, for the same reason, that things are felt among particular and outside objects.

But there will be a later opportunity to clear our impressions about these things. For the moment it will be enough to lay down that the term " potential " is used with two meanings ; first as we might say that a boy is a potential general, and secondly as we might say it of an adult ; it is only in the latter meaning that the potential applies to that which feels. But since there is no name corresponding to this difference in meaning, and we have now explained that the meanings differ, and how they differ, we must continue to use the words " acted upon " and " change of state " as though they were precise terms ; so that which feels is potentially what the thing felt is actually, as has been said. So long as it is being acted upon it is not like, but, when it has been acted upon, it becomes like, and is even as the object of sense.

VI. We must first of all discuss objects perceived in relation to each sense. Now the term " object perceived " is used with three meanings ; in two of them we say that we perceive directly, and in one indirectly. Of the first two, one is the particular thing perceived by each sense, and the other is a thing perceived by all the senses. By the particular I mean that which cannot be perceived by any other sense, and concerning which error is impossible, such

Potential  
as applied  
to sensation.

## ARISTOTLE

418 a

οῖον ὅψις χρώματος καὶ ἀκοὴ ψόφου καὶ γεῦσις χυμοῦ. ἡ δὲ ἀφὴ πλείους μὲν ἔχει διαφοράς· ἀλλ’ 15 ἔκάστη γε κρίνει περὶ τούτων, καὶ οὐκ ἀπατάται ὅτι χρῶμα οὐδὲ ὅτι ψόφος, ἀλλὰ τί τὸ κεχρω- σμένον ἢ ποῦ, ἢ τί τὸ ψοφοῦν ἢ ποῦ. τὰ μὲν οὖν τοιαῦτα λέγεται ἴδια ἔκάστου, κοινὰ δὲ κίνησις, ἡρεμία, ἀριθμός, σχῆμα, μέγεθος· τὰ γὰρ τοιαῦτα οὐδεμιᾶς ἔστιν ἴδια, ἀλλὰ κοινὰ πάσαις· καὶ γὰρ 20 ἀφῆ κίνησίς τις ἔστιν αἰσθητὴ καὶ ὅψει. κατὰ συμβεβηκὸς δὲ λέγεται αἰσθητόν, οῖον εἰ τὸ λευκὸν εἴη Διάρους νίός· κατὰ συμβεβηκὸς γὰρ τούτου αἰσθάνεται, ὅτι τῷ λευκῷ συμβέβηκε τοῦτο οὐ αἰσθάνεται. διὸ καὶ οὐδὲν πάσχει ἢ τοιοῦτον ὑπὸ τοῦ αἰσθητοῦ. τῶν δὲ καθ’ αὐτὰ αἰσθητῶν τὰ 25 ἴδια κυρίως ἔστιν αἰσθητά, καὶ πρὸς ἣ οὐσία πέφυκεν ἔκάστης αἰσθήσεως.

VII. Οὖν μὲν οὖν ἔστιν ἡ ὅψις, τοῦτ’ ἔστιν ὄρατόν. ὄρατὸν δὲ ἔστιν χρῶμά τε, καὶ ὁ λόγω μὲν ἔστιν εἰπεῖν, ἀνώνυμον δὲ τυγχάνει ὅν. δῆλον δὲ ἔσται ὁ λέγομεν προελθοῦσι μάλιστα. τὸ γὰρ ὄρατόν ἔστι χρῶμα. τοῦτο δὲ ἔστι τὸ ἐπὶ τοῦ 30 καθ’ αὐτὸ δόρατον· καθ’ αὐτὸ δὲ οὐ τῷ λόγῳ, ἀλλ’ ὅτι ἐν ἑαυτῷ ἔχει τὸ αἴτιον τοῦ εἶναι ὄρατόν. πᾶν 418 b δὲ χρῶμα κινητικόν ἔστι τοῦ κατ’ ἐνέργειαν διαφανοῦς, καὶ τοῦτ’ ἔστιν αὐτοῦ ἡ φύσις. διόπερ οὐχ ὄρατὸν ἄνευ φωτός, ἀλλὰ πᾶν τὸ ἔκάστου χρῶμα ἐν φωτὶ ὄρατόν.

## ON THE SOUL, II. vi.—vii.

as the seeing of a colour, or the hearing of a sound, or the tasting of a flavour. Touch of course has many varieties of object ; but in these cases a separate sense judges each, nor is it deceived as to that it is a colour or a sound, but only as to where or what the coloured object is, or what and where that is which sounds. All such things belong to each particular sense, but perception of movement, rest, number, shape and size is shared by several senses. For things of this kind are not peculiar to any special sense, but are shared by them all ; for instance, movement is perceived both by touch and by sight. By an object indirectly perceived I mean, for instance, that the white object is the son of Diares : this is an indirect perception, because that which is perceived (the son of Diares) only belongs incidentally to the whiteness. For the percipient is not acted upon by the thing perceived (the son of Diares) as such. But of things directly perceived the objects of a particular sense are "perceived" in the fullest sense, and it is these for which the real nature of each sense exists.

VII. The object of vision is the thing seen. The <sup>vision.</sup> thing seen is either colour, or a phenomenon which can be described in words, but has no name of its own ; what we mean by this will become clear when we get further on. The thing seen, then, is colour. And this lies on the surface of the object seen in itself ; by "in itself" we mean not that the object is by its definition visible but that it has in itself the reason of its being seen. Every colour can produce movement in the "transparent" in a state of activity, and this is its own nature. Therefore nothing is visible without light, but the colour of each individual thing is seen in light.

## ARISTOTLE

418 b

Διὸ περὶ φωτὸς πρῶτον λεκτέον τί ἔστιν. ἔστι δή τι διαφανές. διαφανὲς δὲ λέγω ὃ ἔστι μὲν ὅρατόν, οὐ καθ' αὐτὸ δὲ ὅρατὸν ὡς ἀπλῶς εἰπεῖν, ἀλλὰ δι' ἀλλότριον χρῶμα. τοιοῦτον δέ ἔστιν ἀήρ καὶ ὕδωρ καὶ πολλὰ τῶν στερεῶν· οὐ γὰρ ἦ τὸ ὕδωρ οὐδὲ ἦ ἀήρ, διαφανές, ἀλλ' ὅτι ἔστι φύσις ἐνυπάρχουσα ἡ αὐτὴ ἐν τούτοις ἀμφοτέροις καὶ ἐν τῷ αἰδίῳ τῷ ἄνω σώματι. φῶς δέ ἔστιν ἡ τούτου 10 ἐνέργεια τοῦ διαφανοῦς ἦ διαφανές. δυνάμει δὲ ἐν φῷ τοῦτ' ἔστι, καὶ τὸ σκότος. τὸ δὲ φῶς οἰον χρῶμά ἔστι τοῦ διαφανοῦς, ὅταν ἦ ἐντελεχείᾳ διαφανὲς ὑπὸ πυρὸς ἦ τοιούτου οἰον τὸ ἄνω σῶμα· καὶ γὰρ τούτῳ τι ὑπάρχει ἐν καὶ ταῦτόν. τί μὲν οὖν τὸ διαφανὲς καὶ τί τὸ φῶς, εἴρηται, ὅτι οὔτε 15 πῦρ οὔθ' ὅλως σῶμα οὐδὲ ἀπορροὴ σώματος οὐδενός (εἴη γὰρ ἄν σῶμά τι καὶ οὕτως), ἀλλὰ πυρὸς ἦ τοιούτου τινὸς παρουσίᾳ ἐν τῷ διαφανεῖ· οὐδὲ γὰρ δύο σώματα ἄμα δυνατὸν ἐν τῷ αὐτῷ εἶναι. δοκεῖ δὲ τὸ φῶς ἐναντίον εἶναι τῷ σκότει. ἔστι δὲ τὸ σκότος στέρησις τῆς τοιαύτης ἔξεως ἐκ 20 διαφανοῦς, ὥστε δῆλον ὅτι καὶ ἡ τούτου παρουσίᾳ τὸ φῶς ἔστιν. καὶ οὐκ ὄρθως Ἐμπεδοκλῆς, οὐδὲ εἴ τις ἄλλος οὕτως εἴρηκεν, ὡς φερομένου τοῦ φωτὸς καὶ γιγνομένου ποτὲ μεταξὺ τῆς γῆς καὶ τοῦ περιέχοντος, ἡμᾶς δὲ λανθάνοντος· τοῦτο γάρ ἔστι καὶ παρὰ τὴν τοῦ λόγου ἐνάργειαν<sup>1</sup> καὶ παρὰ 25 τὰ φαινόμενα· ἐν μικρῷ μὲν γὰρ διαστήματι λάθοι ἄν, ἀπ' ἀνατολῆς δ' ἐπὶ δυσμὰς τὸ λανθάνειν μέγα

<sup>1</sup> τὴν ἐν τῷ λόγῳ ἀλήθειαν B.

## ON THE SOUL, II. vii.

Consequently we must explain in the first place what light is. Transparency evidently exists. By transparency I mean that which is seen, but not directly seen without qualification, but as it were owing to a colour from elsewhere. This transparent character is shared by air, water, and many solid objects ; it is not transparent because it is water or air, but because the same nature belongs to these two as to the everlasting upper firmament. Now light is the activity of this transparency *qua* transparent. Potentially, wherever it is present, darkness is also present. Light is then in a sense the colour of the transparency, whenever it becomes actually transparent, owing to fire or any such agency as the upper firmament ; for one and the same quality belongs to this also. We have thus described what light and transparency are, that they are neither fire, nor in general any body, nor the emanation from any body (for in that case they would be a body of some kind themselves), but the presence of fire, or something of the kind in the transparency ; for there cannot be two bodies in the same place at the same time. Light is considered to be the opposite of darkness ; but darkness is a removal of an active condition from the transparency, so that obviously light is the presence of such an active transparency. Empedocles, and anyone else who has argued on similar lines, is wrong in saying that light travels, and comes into being between the earth and its envelope, but that we cannot see it ; this is contrary both to the light of reason, and to observed facts ; it would be possible for it to escape our observation in a small intervening space, but for it to do so all the way between east and west makes too big a de-

## ARISTOTLE

118 b

λίαν τὸ αἴτημα. ἔστι δὲ χρώματος μὲν δεκτικὸν τὸ ἄχρουν, ψόφου δὲ τὸ ἄψοφον. ἄχρουν δ' ἔστι τὸ διαφανὲς καὶ τὸ ἀδρατὸν ἢ τὸ μόλις ὄρώμενον, οἷον δοκεῖ τὸ σκοτεινόν. τοιοῦτον δὲ τὸ διαφανὲς 30 μέν, ἀλλ' οὐχ ὅταν ἢ ἐντελεχείᾳ διαφανές, ἀλλ' ὅταν δυνάμει· ἢ γὰρ αὐτὴ φύσις ὅτε μὲν σκότος 418 a ὅτε δὲ φῶς ἔστιν. οὐ πάντα δὲ ὄρατὰ ἐν φωτὶ ἔστιν, ἀλλὰ μόνον ἔκαστον τὸ οἰκεῖον χρῶμα· ἔντα γὰρ ἐν μὲν τῷ φωτὶ οὐχ ὄρᾶται, ἐν δὲ τῷ σκότει ποιεῖ αἰσθησιν, οἷον τὰ πυρώδη φαινόμενα καὶ λάμποντα (ἀνώνυμα δ' ἔστι ταῦτα ἐνὶ ὄνόματι), 5 οἷον μύκης, κέρας, κεφαλαὶ ἵχθύων καὶ λεπίδες καὶ ὄφθαλμοι· ἀλλ' οὐδενὸς ὄρᾶται τούτων τὸ οἰκεῖον χρῶμα. δι' ἦν μὲν οὖν αἰτίαν ταῦτα ὄρᾶται, ἀλλος λόγος· νῦν δ' ἐπὶ τοσοῦτον φανερόν ἔστιν, ὅτι τὸ μὲν ἐν φωτὶ ὄρώμενον χρῶμα. διὸ καὶ οὐχ ὄρᾶται 10 ἄνευ φωτός· τοῦτο γὰρ ἦν αὐτῷ τὸ χρώματι εἶναι τὸ κινητικῷ εἶναι τοῦ κατ' ἐνέργειαν διαφανοῦς· ἢ δ' ἐντελέχεια τοῦ διαφανοῦς φῶς ἔστιν. σημεῖον δὲ τούτου φανερόν· ἐὰν γάρ τις θῇ τὸ ἔχον χρῶμα ἐπ' αὐτὴν τὴν ὄψιν, οὐκ ὄψεται· ἀλλὰ τὸ μὲν χρῶμα κινεῖ τὸ διαφανές, οἷον τὸν ἀέρα, ὑπὸ 15 τούτου δὲ συνεχοῦς ὄντος κινεῖται τὸ αἰσθητήριον. οὐ γὰρ καλῶς τοῦτο λέγει Δημόκριτος οἰόμενος, εἰ γένοιτο κενὸν τὸ μεταξύ, ὄρᾶσθαι ἀν ἀκριβῶς καὶ εἰ μύρμηξ ἐν τῷ οὐρανῷ εἴη· τοῦτο γὰρ ἀδύνατόν ἔστιν. πάσχοντος γάρ τι τοῦ αἰσθητικοῦ γίνεται τὸ ὄραν· ὑπὸ αὐτοῦ μὲν οὖν τοῦ ὄρωμένου 20 χρώματος ἀδύνατον, λείπεται δὲ ὑπὸ τοῦ μεταξύ, ωστ' ἀναγκαῖόν τι εἶναι μεταξύ· κενοῦ δὲ γενομένου οὐχ ὅτι ἀκριβῶς, ἀλλ' ὅλως οὐθὲν ὄφθήσεται.

## ON THE SOUL, II. vii.

mand on our credulity. The colourless is receptive of colour, as the soundless of sound. Transparency, and what is unseen or only just seen, are colourless, just as darkness is admitted to be. This, then, is the nature of the transparency, not when it exists actually, but when it is only potential : for its nature is the same both when there is darkness and when there is light. But not everything is visible in the light, but only the particular colour of each individual thing ; for some things are not seen in the light, but only produce sensation in the dark, such as those which appear fiery or luminous (there is no single name for these two), like fungi, horn, the heads, scales, and eyes of certain fishes ; but in none of these is a particular colour seen ; why such things are visible is another question ; but at this point it is clear that what is visible in light is colour. So it is not seen without light ; for the essential nature of colour is its capacity to produce movement in the transparency, when it is active ; and the actuality of the transparency is light. The evidence for this is clear ; for if one puts that which has colour close up to the eye, it will not be visible ; but colour moves the transparency, for instance the air, and the sense organ is moved by this provided that it is continuous. Democritus is mis-  
The medium of vision.

## ARISTOTLE

19 a δι' ἦν μὲν οὖν αἰτίαν τὸ χρῶμα ἀναγκαῖον ἐν φωτὶ ὁρᾶσθαι, εἴρηται. πῦρ δὲ ἐν ἀμφοῖν ὁρᾶται, καὶ ἐν σκότει καὶ ἐν φωτὶ, καὶ τοῦτο ἐξ ἀνάγκης· τὸ  
25 γάρ διαφανὲς ὑπὸ τούτου γίνεται διαφανές.

‘Ο δ’ αὐτὸς λόγος καὶ περὶ ψόφου καὶ ὀσμῆς ἔστιν· οὐθὲν γάρ αὐτῶν ἀπτόμενον τοῦ αἰσθητηρίου ποιεῖ τὴν αἴσθησιν, ἀλλ’ ὑπὸ μὲν ὀσμῆς καὶ ψόφου τὸ μεταξὺ κινεῖται, ὑπὸ δὲ τούτου τῶν αἰσθητηρίων 20 ἔκάτερον. ὅταν δ’ ἐπ’ αὐτό τις ἐπιθῆ τὸ αἰσθητήριον τὸ ψοφοῦν ἢ τὸ ὄζον, οὐδεμίαν αἴσθησιν ποιήσει. περὶ δὲ ἀφῆς καὶ γεύσεως ἔχει μὲν ὅμοιῶς, οὐ φαίνεται δέ· δι’ ἦν δ’ αἰτίαν, ὕστερον ἔσται δῆλον. τὸ δὲ μεταξὺ ψόφων μὲν ἀήρ, ὀσμῆς δ’ ἀνώνυμον· κοινὸν γάρ δή τι πάθος ἐπ’ ἀέρος καὶ ὕδατός ἔστιν, ὥσπερ τὸ διαφανὲς χρώματι, 25 οὕτω τῷ ἔχοντι ὀσμὴν ὃ ἐν ἀμφοτέροις ὑπάρχει τούτοις· φαίνεται γάρ καὶ τὰ ἔνυδρα τῶν ζώων 19 b ἔχειν αἴσθησιν ὀσμῆς. ἀλλ’ ὁ μὲν ἄνθρωπος καὶ τῶν πεζῶν ὅσα ἀναπνεῖ, ἀδυνατεῖ ὀσμᾶσθαι μὴ ἀναπνέοντα. ἡ δ’ αἰτία καὶ περὶ τούτων ὕστερον λεχθήσεται.

VIII. Νῦν δὲ πρῶτον περὶ ψόφου καὶ ἀκοῆς διορίσωμεν. ἔστι δὲ διττὸς ὁ ψόφος· ὁ μὲν γάρ ἐνέργειά τις, ὁ δὲ δύναμις· τὰ μὲν γάρ οὐ φαμεν ἔχειν ψόφουν, οἷον σπόγγον, ἔρια, τὰ δ’ ἔχειν, οἷον χαλκὸν καὶ ὅσα στερεὰ καὶ λεῖα, ὅτι δύναται ψοφῆσαι. τοῦτο δ’ ἔστιν αὐτοῦ μεταξὺ καὶ τῆς

<sup>a</sup> 422 b 34 *sqq.*

<sup>b</sup> Fishes have certain olfactory apparatus, but it is very doubtful whether they have a sense of smell.

<sup>c</sup> 421 b 13 to 422 a 6.

<sup>d</sup> There seems to be little point in this distinction, nor does

## ON THE SOUL, II. VII.—VIII.

explained why colour can only be seen in the light. Now fire is visible both in darkness and light, and this is necessarily so ; for the transparency becomes transparent because of the fire.

The same theory applies both to sound and smell ; A medium is also necessary for sound and scent. neither of these provokes sensation because it touches the sense organ, but movement is produced in the medium by scent and sound, and each of the sense organs is stimulated by the medium ; but, when one puts either the sound or the scent close up to the sense organ, no sensation is produced. The same thing is true of touch and taste, but it is not so obvious ; why this is so will become clear later on.<sup>a</sup> The medium in the case of sound is air, but in the case of smell has no name ; for air and water have certainly a common characteristic, which is present in both of them, and bears the same relation to that which emits smell as the transparency does to colour ; for even animals which live under water seem to have the sense of smell.<sup>b</sup> But man, and all the land animals which breathe, cannot smell except when they are breathing. The reason for this will be discussed later.<sup>c</sup>

VIII. Now we must state our definitions of sound and hearing. Sound has two meanings ; sometimes it is actual, sometimes potential ; <sup>d</sup> for we say that some things have no sound, such as a sponge or wool, but that others have, such as bronze, and all things which are both solid and smooth, because they can give forth sound. That is to say, they are the cause of sound being actually produced between the object The conditions in which sound is heard.

A. make any use of it. What he means is that bronze has "potential" sound because sound can be produced from it, whereas from wool no sound can be produced.

## ARISTOTLE

**419 b** ἀκοῆς ἐμποιῆσαι ψόφον ἐνεργείᾳ. γίνεται δ' δ  
 10 κατ' ἐνέργειαν ψόφος ἀεὶ τινος πρός τι καὶ ἐν  
 τινι· πληγὴ γάρ ἐστιν ἡ ποιοῦσα. διὸ καὶ ἀδύνατον  
 ἐνὸς ὄντος γενέσθαι ψόφον· ἔτερον γὰρ τὸ τύπτον  
 καὶ τὸ τυπτόμενον· ὥστε τὸ ψιφοῦν πρός τι  
 ψιφεῖν. πληγὴ δ' οὐ γίνεται ἄνευ φορᾶς. ὥσπερ  
 δ' εἴπομεν, οὐ τῶν τυχόντων πληγὴ ὁ ψόφος·  
 15 οὐθένα γὰρ ποιεῖ ψόφον ἔρια ἀν πληγῇ, ἀλλὰ  
 χαλκὸς καὶ ὅσα λεῖα καὶ κοῦλα, ὁ μὲν χαλκός, ὅτι  
 λεῖος· τὰ δὲ κοῦλα τῇ ἀνακλάσει πολλὰς ποιεῖ  
 πληγὰς μετὰ τὴν πρώτην, ἀδυνατοῦντος ἐξελθεῖν  
 τοῦ κινηθέντος. ἔτι ἀκούεται ἐν ἀέρι καὶ ὕδατι,  
 ἀλλ' ἥττον. οὐκ ἔστι δὲ ψόφον κύριος ὁ ἀήρ οὐδὲ  
 20 τὸ ὕδωρ· ἀλλὰ δεῖ στερεῶν πληγὴν γενέσθαι πρὸς  
 ἄλληλα καὶ πρὸς τὸν ἀέρα. τοῦτο δὲ γίνεται,  
 ὅταν ὑπομένῃ πληγεὶς ὁ ἀήρ καὶ μὴ διαχυθῇ.  
 διὸ ἐὰν ταχέως καὶ σφοδρῶς πληγῇ, ψιφεῖ· δεῖ  
 γὰρ φθάσαι τὴν κίνησιν τοῦ ῥαπίζοντος τὴν  
 θρύψιν τοῦ ἀέρος, ὥσπερ ἀν εἰ σωρὸν ἡ ὄρμαθὸν  
 25 ϕάμμου τύπτοι τις φερόμενον ταχύ.

'Ηχῶ δὲ γίνεται, ὅταν ἀπὸ τοῦ ἀέρος ἐνὸς  
 γενομένου διὰ τὸ ἀγγεῖον τὸ διορίσαν καὶ κωλύσαν  
 θρυφθῆναι πάλιν ὁ ἀήρ ἀπωσθῇ, ὥσπερ σφαῖρα.  
 ἔοικε δ' ἀεὶ γίνεσθαι ἡχώ, ἀλλ' οὐ σαφῆς, ἐπεὶ  
 συμβαίνει γε ἐπὶ τοῦ ψόφου καθάπερ καὶ ἐπὶ τοῦ  
 30 φωτός· καὶ γὰρ τὸ φῶς ἀεὶ ἀνακλάται (οὐδὲ γὰρ  
 ἀν ἐγίνετο πάντῃ φῶς, ἀλλὰ σκότος ἔξω τοῦ ἡλιου-

## ON THE SOUL, II. viii.

itself and the sense of hearing. But the sound actually produced is of something striking against something else in a medium ; for that which produces the sound is a blow. So if there is only one condition present there can be no sound ; for the striker and the thing struck are two different things ; so that what produces the sound sounds against something else. But no blow occurs without movement. But, as we have said, sound is not caused by a blow upon any chance thing ; for wool produces no sound even if it is struck, but bronze and things which are hollow and smooth do ; bronze because it is smooth, and hollow things after the original blow produce a number of other sounds by reverberation, because that which is moved (*i.e.* the medium) cannot escape. Sound is heard also in water as well as in air, but less loudly. But neither the air nor the water is responsible for the sound ; but there must be a striking of solid objects against each other, and against the air. This occurs when the air remains in its place when struck, and is not dispersed. If then it is struck sharply and violently there is a sound ; for it is necessary that the movement of the striker should forestall the escape of air, just as it would be if one were to strike a heap of sand or a revolving sandstorm moving rapidly.

Echo occurs when air rebounds from air, which is *Echo*. continuous, because of the vessel which confines it, and prevents it from escaping, like a bouncing ball. It seems likely that there is always an echo, but it is not always noticeable, since the same thing happens with sound as with light ; for light is always reflected (otherwise there would not be light everywhere, but there would be darkness in every region outside that

419 b

μένον), ἀλλ' οὐχ οὕτως ἀνακλάται ὥσπερ ἀφ' ὕδατος ἡ χαλκοῦ ἡ καὶ τινος ἄλλου τῶν λείων, ὥστε σκιὰν ποιεῖν, ἢ τὸ φῶς ὅριζομεν. τὸ δὲ κενὸν ὅρθῶς λέγεται κύριον τοῦ ἀκούειν. δοκεῖ γὰρ εἶναι κενὸν ὁ ἀήρ, οὗτος δ' ἐστὶν ὁ ποιῶν <sup>420 a</sup> τοῦ ἀκούειν, ὅταν κινηθῇ συνεχῆς καὶ εἰς. ἀλλὰ διὰ τὸ ψαθυρὸς εἶναι οὐ γεγωνεῖ, ἀν<sup>1</sup> μὴ λεῖον ἢ τὸ πληγέν. τότε δὲ εἰς γίνεται ἄμα διὰ τὸ ἐπίπεδον· ἐν γὰρ τὸ τοῦ λείου ἐπίπεδον.

Ψοφητικὸν μὲν οὖν τὸ κινητικὸν ἐνὸς ἀέρος συνεχείᾳ μέχρις ἀκοῆς, ἀκοὴ δὲ συμφυῆς ἀέρι. διὰ δὲ τὸ ἐν ἀέρι εἶναι, κινουμένου τοῦ ἔξω τὸ εἴσω κινεῖται.<sup>2</sup> διόπερ οὐ πάντη τὸ ζῷον ἀκούει, οὐδὲ πάντη διέρχεται ὁ ἀήρ· οὐ γὰρ πάντη ἔχει ἀέρα τὸ κινησόμενον μέρος καὶ ἔμψυχον. αὐτὸς μὲν δὴ ἄφοφον ὁ ἀήρ διὰ τὸ εὑθρυπτον· ὅταν δὲ κωλυθῇ θρύπτεσθαι, ἡ τούτου κίνησις φόβος. ὁ δὲ ἐν τοῖς ὡσὶν ἐγκατωκοδόμηται πρὸς τὸ ἀκίνητος εἶναι, ὅπως ἀκριβῶς αἰσθάνηται πάσας τὰς διαφορὰς τῆς κινήσεως. διὰ ταῦτα δὲ καὶ ἐν ὕδατι ἀκούομεν, ὅτι οὐκ εἰσέρχεται πρὸς αὐτὸν τὸν συμφυῆ ἀέρα· ἀλλ' οὐδὲ εἰς τὸ οὖς διὰ τὰς ἔλικας. ὅταν δὲ τοῦτο συμβῇ, οὐκ ἀκούει· οὐδὲ ἀν ἡ <sup>15</sup> μῆνιγξ κάμη, ὥσπερ τὸ ἐπὶ τῇ κόρῃ δέρμα ὅταν κάμη. ἀλλὰ καὶ σημεῖον τοῦ ἀκούειν ἡ μὴ τὸ

<sup>1</sup> ἀν B.<sup>2</sup> κινεῖ B.

## ON THE SOUL, II. VIII.

directly illuminated by the sun), but it is not always reflected in such a way as to cause a shadow, by which the light is defined, as it is by water or bronze, or any other smooth surface. But the empty space is rightly described as the essential condition of hearing. For the air is thought to be empty, and it is this which causes hearing when it is moved and continuous. But the sound is not recognized unless the object struck is smooth, because the air is apt to be broken up. But if the object struck is smooth then the air is continuous because of the surface ; for the surface of what is smooth is continuous.

That, then, which can produce movement in continuous air, which remains continuous until it reaches the hearing, is sound-producing, and the air is connected by nature with the organ of hearing. But since this organ of hearing is in the air, when what is outside is moved, what is inside moves too. So that the animal does not hear with every part of it, nor does the air penetrate everywhere ; for the part which will be affected, that is the living animal, has not air everywhere. The air itself is incapable of sound, because it is easily thrust aside ; but when there is something to prevent its being thrust aside, its movement becomes sound. But the air in the ears is lodged deep, so as to be unmoved, in order that it may accurately perceive all differences of motion. That is why we can hear even in water, for the water does not enter as far as the air which belongs to the ear ; and it does not do so because of the spirals of which the ear is formed. When this does occur, there is no hearing ; nor again if the membrane is damaged, just as when the membrane over the eye is damaged. A proof of our hearing or not is the continual ringing

*The process of hearing.*

ARISTOTLE

420 a

ἡχεῖν αἰεὶ τὸ οὖς ὥσπερ τὸ κέρας· ἀεὶ γὰρ οἰκείαν τινὰ κίνησιν δὲ ἀήρ κινεῖται δὲ ἐν τοῖς ὥσιν· ἀλλ' ὁ ψόφος ἀλλότριος καὶ οὐκ ἴδιος. καὶ διὰ τοῦτο φασιν ἀκούειν τῷ κενῷ καὶ ἡχοῦντι, ὅτι ἀκούμεν 20 τῷ ἔχοντι ὡρισμένον τὸν ἀέρα. πότερον δὲ ψοφεῖ τὸ τυπτόμενον ἢ τὸ τύπτον; ἢ καὶ ἅμφω, τρόπον δὲ ἔτερον· ἔστι γὰρ ὁ ψόφος κίνησις τοῦ δυναμένου κινεῖσθαι τὸν τρόπον τοῦτον ὄνπερ τὰ ἀφαλλόμενα ἀπὸ τῶν λείων, ὅταν τις κρούσῃ. οὐ δὴ πᾶν, ὥσπερ εἴρηται, ψοφεῖ τυπτόμενον καὶ 25 τύπτον, οἷον ἐὰν πατάξῃ βελόνη βελόνην· ἀλλὰ δεῖ τὸ τυπτόμενον ὅμαλὸν εἶναι, ὥστε τὸν ἀέρα ἀθροῦν ἀφάλλεσθαι καὶ σείεσθαι. αἱ δὲ διαφοραὶ τῶν ψοφούντων ἐν τῷ κατ' ἐνέργειαν ψόφῳ δηλοῦνται· ὥσπερ γὰρ ἄνευ φωτὸς οὐχ ὅρᾶται τὰ χρώματα, οὕτως οὐδὲ ἄνευ ψόφου τὸ ὀξὺ καὶ τὸ βαρύ. ταῦτα δὲ λέγεται κατὰ μεταφορὰν ἀπὸ τῶν ἀπτῶν· τὸ μὲν γὰρ ὀξὺ κινεῖ τὴν αἰσθησιν ἐν ὀλίγῳ χρόνῳ ἐπὶ πολύ, τὸ δὲ βαρὺ ἐν πολλῷ ἐπ' ὀλίγον. οὐ δὴ ταχὺ τὸ ὀξύ, τὸ δὲ βαρὺ βραδύ, ἀλλὰ γίνεται τοῦ μὲν διὰ τὸ τάχος ἡ κίνησις 30 τοιαύτη, τοῦ δὲ διὰ βραδυτῆτα. καὶ ἔοικεν ἀνάλογον ἔχειν τῷ περὶ τὴν ἀφήν τὸ ὀξεῖν καὶ ἀμβλεῖν· τὸ μὲν γὰρ ὀξὺ οἷον κεντεῖ, τὸ δὲ ἀμβλὺ οἷον ὀθεῖ διὰ τὸ κινεῖν, τὸ μὲν ἐν ὀλίγῳ, τὸ δὲ ἐν πολλῷ, ὥστε συμβαίνει τὸ μὲν ταχὺ τὸ δὲ βραδὺ δεῖναι. περὶ μὲν οὖν ψόφου ταύτη διωρίσθω.

‘Η δὲ φωνὴ ψόφος τίς ἔστιν ἐμψύχου· τῶν γὰρ ἀψύχων οὐθὲν φωνεῖ, ἀλλὰ καθ' ὅμοιότητα λέγεται

## ON THE SOUL, II. VIII.

in the ear like a horn ; for the air in the ear always moves with a special movement of its own ; but sound is from an outside source, and not a property of the ear. This is why they say that we hear by something which is empty and resonant, because we hear by that which has the air enclosed in it. Now which of the two sounds—the struck or the striker ? Perhaps both but in a different sense ; for sound is the movement of what can be moved, in the same way as things leap off a smooth surface when one strikes it. But, as has been said, not everything struck and striking produces a sound, as, for instance, if one strikes a needle with a needle ; but that which is struck must be flat, so that the air compacted may rebound and vibrate. But the differences in things which sound are shown in sound actually realized ; for just as colours cannot be seen in the absence of light, so high and low pitch cannot be detected in the absence of sound. These terms are used by analogy from the sense of touch. The high pitch produces sensation by penetrating a long way in a short time, the low pitch penetrates a little way in a long time. It is not that the high pitch is itself quick, while the low pitch is slow, but the movement of the former becomes what it is because of its quickness, and the latter because of its slowness. It seems to be analogous to the sharp and blunt in the matter of touch ; for the sharp stabs, so to speak, but the blunt pushes its way in by its movement ; the former in a short time, the latter in a long time, so that the one is swift and the other slow. This is a sufficient account of sound.

But voice is the sound produced by a creature possessing a soul ; for none of the soulless creatures has

φωνεῦν, οἶον αὐλὸς καὶ λύρα καὶ ὅσα ἄλλα τῶν ἀφύχων ἀπότασιν ἔχει καὶ μέλος καὶ διάλεκτον. ἔοικε γὰρ ὅτι καὶ ἡ φωνὴ ταῦτ' ἔχει, πολλὰ δὲ 10 τῶν ζώων οὐκ ἔχουσι φωνήν, οἶον τά τε ἄναιμα καὶ τῶν ἐναίμων ἰχθύες. καὶ τοῦτ' εὐλόγως, εἴπερ ἀέρος κίνησίς τίς ἐστιν ὁ ψόφος. ἀλλ' οἱ λεγόμενοι φωνεῦν, οἶον ἐν τῷ Ἀχελώῳ, ψοφοῦσι τοῖς βραγχίοις ἡ τινι ἑτέρῳ τοιούτῳ. φωνὴ δ' ἐστὶ ζώου ψόφος, καὶ οὐ τῷ τυχόντι μορίῳ. ἀλλ' ἐπεὶ 15 πᾶν ψοφεῖ τύπτοντός τινος καὶ τι καὶ ἐν τινι, τοῦτο δ' ἐστὶν ἀήρ, εὐλόγως ἀν φωνοίη ταῦτα μόνα ὅσα δέχεται τὸν ἀέρα. ήδη γὰρ τῷ ἀναπνεομένῳ καταχρῆται ἡ φύσις ἐπὶ δύο ἔργα, καθάπερ τῇ γλώττῃ ἐπὶ τε τὴν γεῦσιν καὶ τὴν διάλεκτον, ὃν ἡ μὲν γεῦσις ἀναγκαῖον (διὸ καὶ πλείοσιν 20 ὑπάρχει), ἡ δ' ἐρμηνεία ἔνεκα τοῦ εὗ, οὗτω καὶ τῷ πνεύματι πρός τε τὴν θερμότητα τὴν ἐντὸς ὡς ἀναγκαῖον (τὸ δ' αἴτιον ἐν ἑτέροις εἰρήσεται) καὶ πρός τὴν φωνήν, ὅπως ὑπάρχῃ τὸ εὗ. ὅργανον δὲ τῇ ἀναπνοῇ ὁ φάρυγξ· οὐδὲ δ' ἔνεκα καὶ τὸ μόριόν ἐστι τοῦτο, πλεύμων· τούτῳ γὰρ τῷ μορίῳ 25 πλεῖστον ἔχει τὸ θερμὸν τὰ πεζὰ τῶν ἄλλων. δεῖται δὲ τῆς ἀναπνοῆς καὶ ὁ περὶ τὴν καρδίαν τόπος πρῶτος. διὸ ἀναγκαῖον εἴσω ἀναπνεομένου εἰσιέναι τὸν ἀέρα. ὥστε ἡ πληγὴ τοῦ ἀναπνεομένου ἀέρος ὑπὸ τῆς ἐν τούτοις τοῖς μορίοις ψυχῆς πρὸς

<sup>a</sup> *Hist. Anim.* iv. 9, 535 b 14 “the boar in the Achelous.” A cat-fish has been found in the Achelous of which this is true.

<sup>b</sup> *Cf. De Resp.* ch. viii.

## ON THE SOUL, II. viii.

a voice ; they can only be said to give tongue metaphorically, as for instance a flute or a lyre, and all the other soulless things, which have a musical compass, and tunc, and articulation ; it seems that the voice has these things, but many animals have no voice, such as all the bloodless animals, and the fishes among the animals with blood. And this is quite reasonable, since sound is due to a movement of the air. But those creatures which are said to have a voice, such as those in the Achelous,<sup>a</sup> only make a sound with their gills, or with some other part of them. Voice, then, is a sound made by a living animal, and even then not with any part of it taken at random. But, since sound only occurs when something strikes something else in a certain medium, and this medium is the air, it is natural that only those things should have voice which admit the air. Nature makes use of the constant supply of air breathed in for two functions, just as she uses the tongue both for taste and for articulate speech, of which taste is an essential to life (and consequently belongs to more species), and the power of interpretation is for the sake of living well ; so in the same way she employs breath both to conserve internal heat, which is an essential (the reason for this will be explained in another treatise),<sup>b</sup> and also for the voice, that well-being may be possible. The throat is the instrument of respiration ; the reason for which this part exists is the lung ; it is because of this part that the land animals have more heat than the rest ; and the region about the heart is the first to need this breathing. So it is necessary that during respiration the air should be breathed in. So the blow given to the air breathed in by the soul in these parts against

# ARISTOTLE

420 b

τὴν καλουμένην ἀρτηρίαν φωνή ἐστιν. οὐ γὰρ πᾶς  
 80 ζώου ψόφος φωνή, καθάπερ εἴπομεν (ἔστι γὰρ  
 καὶ τῇ γλώττῃ ψοφεῖν καὶ ὡς οἱ βήττοντες), ἀλλὰ  
 δεῖ ἔμψυχόν τε εἶναι τὸ τύπτον καὶ μετὰ φαντασίας  
 τινός· σημαντικὸς γὰρ δή τις ψόφος ἐστὶν ἡ  
 φωνή, καὶ οὐ τοῦ ἀναπνεομένου ἀέρος, ὥσπερ ἡ  
 421 a βήξ· ἀλλὰ τούτῳ τύπτει τὸν ἐν τῇ ἀρτηρίᾳ πρὸς  
 αὐτήν. σημεῖον δὲ τὸ μὴ δύνασθαι φωνεῖν ἀνα-  
 πνέοντα μηδ' ἐκπνέοντα, ἀλλὰ κατέχοντα· κινεῖ  
 γὰρ τοῦτο ὁ κατέχων. φανερὸν δὲ καὶ διότι οἱ  
 ἵχθύες ἄφωνοι· οὐ γὰρ ἔχουσι φάρυγγα. τοῦτο  
 5 δὲ τὸ μόριον οὐκ ἔχουσιν, ὅτι οὐ δέχονται τὸν  
 ἀέρα οὐδὲ ἀναπνέουσιν. δι' ἦν μὲν οὖν αἰτίαν,  
 ἔτερός ἐστι λόγος.

IX. Περὶ δὲ ὀσμῆς καὶ ὀσφραντοῦ ἥπτον εὐ-  
 διόριστόν ἐστι τῶν εἰρημένων· οὐ γὰρ δῆλον ποῖόν  
 τι ἐστιν ἡ ὀσμή, οὕτως ὡς ὁ ψόφος ἡ τὸ χρῶμα.  
 10 αἴτιον δ' ὅτι τὴν αἴσθησιν ταύτην οὐκ ἔχομεν  
 ἀκριβῆ, ἀλλὰ χείρω πολλῶν ζώων· φαύλως γὰρ  
 ἀνθρωπος ὀσμᾶται, καὶ οὐθενὸς αἰσθάνεται τῶν  
 ὀσφραντῶν ἄνευ τοῦ λυπηροῦ ἡ τοῦ ἡδεός, ὡς  
 οὐκ ὄντος ἀκριβοῦς τοῦ αἰσθητηρίου. εὔλογον δ'  
 οὕτω καὶ τὰ σκληρόφθαλμα τῶν χρωμάτων αἰσθά-  
 νεσθαι, καὶ μὴ διαδήλους αὐτοῖς εἶναι τὰς δια-  
 15 φορὰς τῶν χρωμάτων πλὴν τῷ φοβερῷ καὶ ἀφόβῳ.  
 οὕτω δὲ καὶ τὰς ὀσμὰς τὸ τῶν ἀνθρώπων γένος·  
 ἔοικε μὲν γὰρ ἀνάλογον ἔχειν πρὸς τὴν γεῦσιν καὶ  
 δομοίως τὰ εἴδη τῶν χυμῶν τοῖς τῆς ὀσμῆς, ἀλλ'  
 ἀκριβεστέραν ἔχομεν τὴν γεῦσιν διὰ τὸ εἶναι αὐτὴν

<sup>a</sup> Cf. *Part. Anim.* 669 a 2.

## ON THE SOUL, II. viii.—ix.

what is called the windpipe causes the voice. For not every sound made by a living creature is a voice, as we have said (for even those who cough are making a sound with their tongue), but that which strikes must possess a soul, and have some mental picture ; for the voice is a sound which means something, and is not merely indicative of air inhaled, as a cough is ; in this case one strikes the air in the windpipe against the windpipe itself. Proof of this lies in the fact that it is impossible to speak either when inhaling or exhaling, but only when holding the breath : for he that is holding his breath causes the movement by his breath. It is clear, then, why fishes are dumb ; it is because they have no throat. They have not this organ because they neither admit air nor exhale it. The reason for this is a different question.<sup>a</sup>

IX. Concerning sense of smell and objects smelt, smell. it is less easy to give a precise account than in the subjects we have already discussed. For the character of smell is not so obvious as that of sound and colour. The reason is that this sense with us is not highly discriminating, far less so indeed than with many animals ; for man's sense of smell is inferior, and it is also incapable of apprehending the object smelt without a consciousness that it is either pleasant or unpleasant, and this is because the sense organ is not discriminating. It is natural that the hard-eyed animals should perceive colours in a similar way, and that they should not be capable of distinguishing colours except as to be feared or the reverse. The human race is in the same position towards smells ; there would seem to be some analogy between taste and the different kinds of flavours on the one hand, and the objects of smell on the other, but taste is

## ARISTOTLE

421 a

20 ἀφήν τινα, ταύτην δ' ἔχειν τὴν αἰσθησιν τὸν ἄνθρωπον ἀκριβεστάτην· ἐν μὲν γὰρ ταῖς ἄλλαις λείπεται πολλῷ τῶν ζῷων, κατὰ δὲ τὴν ἀφήν πολλῶν τῶν ἄλλων διαφερόντως ἀκριβοῖ. διὸ καὶ φρονιμώτατόν ἐστι τῶν ζῷων. σημεῖον δὲ τὸ καὶ ἐν τῷ γένει τῶν ἀνθρώπων παρὰ τὸ αἰσθητήριον 25 τοῦτο εἶναι εὐφυεῖς καὶ ἀφυεῖς, παρ' ἄλλο δὲ μηδέν· οἱ μὲν γὰρ σκληρόσαρκοι ἀφυεῖς τὴν διάνοιαν, οἱ δὲ μαλακόσαρκοι εὐφυεῖς. ἐστι δ', ὥσπερ χυμὸς ὁ μὲν γλυκὺς ὁ δὲ πικρός, οὕτω καὶ ὄσμαι. ἀλλὰ τὰ μὲν ἔχουσι τὴν ἀνάλογον ὄσμὴν καὶ χυμόν (λέγω δὲ οἷον γλυκεῖαν ὄσμὴν καὶ γλυκὺν χυμόν), τὰ δὲ τούναντίον. δμοίως δὲ 30 καὶ δριμεῖα καὶ αὐστηρὰ καὶ ὀξεῖα καὶ λιπαρά ἐστιν ὄσμή.

421 b 'Αλλ' ὥσπερ εἴπομεν, διὰ τὸ μὴ σφόδρα διαδήλους εἶναι τὰς ὄσμὰς ὥσπερ τοὺς χυμούς, ἀπὸ τούτων εἴληφε τὰ ὄνόματα καθ' ὀμοιότητα τῶν πραγμάτων· ἡ μὲν γὰρ γλυκεῖα ἀπὸ τοῦ κρόκου καὶ τοῦ μέλιτος, ἡ δὲ δριμεῖα θύμου καὶ τῶν τοιούτων· τὸν αὐτὸν δὲ τρόπον καὶ ἐπὶ τῶν ἄλλων. ἐστι δ' ὥσπερ ἡ ἀκοὴ καὶ ἐκάστη τῶν αἰσθήσεων, 5 ἡ μὲν τοῦ ἀκουστοῦ καὶ ἀνηκούστου, ἡ δὲ τοῦ ὄρατοῦ καὶ ἀοράτου, καὶ ἡ ὄσφρησις τοῦ ὄσφραντοῦ καὶ ἀνοσφράντου. ἀνόσφραντον δὲ τὸ μὲν παρὰ τὸ ὄλως ἀδύνατον ἔχειν ὄσμήν, τὸ δὲ μικρὰν ἔχον καὶ φαύλην. δμοίως δὲ καὶ τὸ ἄγευστον λέγεται. ἐστι δὲ καὶ ἡ ὄσφρησις διὰ τοῦ μεταξύ, οἷον ἀέρος 10 ἡ ὕδατος· καὶ γὰρ τὰ ἔνυδρα δοκοῦσιν ὄσμῆς αἰσθάνεσθαι. δμοίως δὲ καὶ τὰ ἔναιμα καὶ τὰ ἄναιμα, ὥσπερ καὶ τὰ ἐν τῷ ἀέρι· καὶ γὰρ τούτων

## ON THE SOUL, II. ix.

with us more discriminating because it is itself a form of touch, and this sense in man is highly discriminating ; in the other senses he is far behind the animal, but in the matter of touch he is much more discriminating than most of the rest of creation. This is why he is of all living creatures the most capable of thought. Proof of this lies in the fact that among the human race men are well or poorly endowed with intelligence in proportion to their sense of touch, and no other sense ; for men of hard skin and flesh are poorly, and men of soft flesh well endowed with intelligence. And just as flavours are sweet and bitter, so are smells. . But though there are some analogies between scents and flavours (I mean, for instance, we can speak of a sweet smell and a sweet taste), yet in some attributes they differ. Scent like flavour may be pungent, rough, acid or oily.

But, as we have said, smells being, unlike flavours, not easily differentiated, they have taken their names from their similarities ; for instance from saffron and honey comes a sweet smell, while from thyme and such things comes a pungent smell. And the same thing is true of all such things. As with the other senses so with hearing : hearing is concerned both with what is heard and what is not heard ; so vision refers to what is seen and what is not seen, and smell to what is smelt and what is not smelt. That which is not smelt means both that which, generally speaking, cannot have smell, and that which has a very small and slight smell. That which has no taste is used in the same sense. But the sense of smell also operates through a medium, such as air or water ; for the water animals also seem to have a sense of smell ; so do both the animals with and those without blood, just

# ARISTOTLE

421 <sup>b</sup>

ένια πόρρωθεν ἀπαντῷ πρὸς τὴν τροφὴν ὑποσμα γινόμενα.

Διὸ καὶ ἄπορον φαίνεται, εἰ πάντα μὲν ὁμοίως ὀσμᾶται, δὸς ἀνθρωπος ἀναπνέων μέν, μὴ ἀνα-  
15 πνέων δὲ ἀλλ’ ἐκπνέων ἢ κατέχων τὸ πνεῦμα οὐκ ὀσμᾶται, οὔτε πόρρωθεν οὔτ’ ἐγγύθεν, οὐδὲ ἀν ἐπὶ τοῦ μυκτῆρος ἐντὸς τεθῆ. καὶ τὸ μὲν ἐπ’ αὐτῷ τιθέμενον τῷ αἰσθητηρίῳ ἀναίσθητον εἶναι κοινὸν πάντων· ἀλλὰ τὸ ἄνευ τοῦ ἀναπνεῖν μὴ αἰσθάνεσθαι ἴδιον ἐπὶ τῶν ἀνθρώπων· δῆλον δὲ 20 πειρωμένοις. ὥστε τὰ ἀναιμα, ἐπειδὴ οὐκ ἀνα- πνέουσιν, ἔτέραν ἄν τιν’ αἰσθησιν ἔχοι παρὰ τὰς λεγομένας. ἀλλ’ ἀδύνατον, εἴπερ τῆς ὀσμῆς αἰ-  
σθάνεται· ἢ γὰρ τοῦ ὀσφραντοῦ αἰσθησις καὶ δυσώδους καὶ εὐώδους ὄσφρησίς ἐστιν. ἔτι δὲ καὶ φθειρόμενα φαίνεται ὑπὸ τῶν ἴσχυρῶν ὀσμῶν 25 ὑφ’ ὥνπερ ἀνθρωπος, οἷον ἀσφάλτου καὶ θείου καὶ τῶν τοιούτων. ὄσφραίνεσθαι μὲν οὖν ἀναγ- καῖον, ἀλλ’ οὐκ ἀναπνέοντα.

“Εοικε δὲ τοῖς ἀνθρώποις διαφέρειν τὸ αἰσθη-  
τήριον τοῦτο πρὸς τὸ τῶν ἀλλων ζώων, ὥσπερ τὰ ὄμματα πρὸς τὰ τῶν σκληροφθάλμων· τὰ μὲν γὰρ ἔχει φράγμα καὶ ὥσπερ ἔλυτρον τὰ βλέφαρα,  
30 ἀ μὴ κινήσας μηδὲ ἀνασπάσας οὐχ ὄρῳ· τὰ δὲ σκληρόφθαλμα οὐδὲν ἔχει τοιοῦτον, ἀλλ’ εὐθέως ὄρῳ τὰ γινόμενα ἐν τῷ διαφανεῖ. οὔτως οὖν καὶ 422 <sup>a</sup> τὸ ὄσφραντικὸν αἰσθητήριον τοῖς μὲν ἀκάλυφες εἶναι, ὥσπερ τὸ ὄμμα, τοῖς δὲ τὸν ἀέρα δεχο-  
μένοις ἔχειν ἐπικάλυμμα, δὸς ἀναπνεόντων ἀπο-  
καλύπτεσθαι, διευρυνομένων τῶν φλεβίων καὶ τῶν πόρων. καὶ διὰ τοῦτο τὰ ἀναπνέοντα οὐκ ὀσμᾶται

## ON THE SOUL, II. ix.

as those in air ; for some of these approach from a great distance towards their food guided by the scent.

There is a problem here whether all animals smell in the same way, while man only smells during inhalation; when not inhaling, but either exhaling or holding the breath, man does not smell either at a distance or at close range, nor even if the object of smell is placed within, or up against the nostril. That what is placed on the sense organ should be imperceptible is common to all senses ; but not to smell without inhaling seems to be peculiar to man ; anyone who tries it will find this quite clear. So that apparently bloodless animals, since they do not inhale, would seem to have another sense beyond the usually accepted ones. But this is impossible if they apprehend smell ; for perception of the object smelt, both sweet-smelling and evil-smelling, is a sense of smell. Again, they seem to be destroyed by the same strong smells as a man, such as bitumen, sulphur and the like. So they must smell, but without inhaling.

Probably the sense organ among men is different from that of other living creatures, in the same way as their eyes are different from the animals which have hard eyes ; for men's eyes have lids as a covering, and a sheath as it were, without moving and withdrawing which, they cannot see ; but hard-eyed animals have nothing of the kind, but see directly what appears in the transparency. So, then, the sense organ of smell among animals is uncovered like the eye, but men who admit the air have a veil which is lifted when they inhale, the veins and passages dilating. For this reason inhaling animals do not

How the  
sense of  
smell oper-  
ates.

Man differs  
from the  
animal.

5 ἐν τῷ ὑγρῷ· ἀναγκαῖον γὰρ ὀσφρανθῆναι ἀναπνεύσαντα, τοῦτο δὲ ποιεῖν ἐν τῷ ὑγρῷ ἀδύνατον. ἔστι δ' ἡ ὀσμὴ τοῦ ἔνεροῦ, ὥσπερ ὁ χυμὸς τοῦ ὑγροῦ· τὸ δὲ ὀσφραντικὸν αἰσθητήριον δυνάμει τοιοῦτον.

Χ. Τὸ δὲ γευστόν ἔστιν ἀπτόν τι· καὶ τοῦτο ἀἴτιον τοῦ μὴ εἶναι αἰσθητὸν διὰ τοῦ μεταξύ 10 ἀλλοτρίου ὄντος σώματος· οὐδὲ γὰρ ἡ ἀφή· καὶ τὸ σῶμα δὲ ἐν φῷ ὁ χυμός, τὸ γευστόν, ἐν ὑγρῷ ὡς ὕλη· τοῦτο δ' ἀπτόν τι. διὸ κανεὶς ἐν ὕδατι εἶμεν, αἰσθανοίμεθ' ἀν ἐμβληθέντος τοῦ γλυκέος, οὐκ ἡν δ' ἀν ἡ αἰσθησις ἡμῶν διὰ τοῦ μεταξύ, ἀλλὰ τῷ μιχθῆναι τῷ ὑγρῷ, καθάπερ ἐπὶ τοῦ 15 ποτοῦ. τὸ δὲ χρῶμα οὐχ οὕτως ὀράται τῷ μίγνυσθαι, οὐδὲ ταῖς ἀπορροίαις. ὡς μὲν οὖν τὸ μεταξύ οὐθέν ἔστιν· ὡς δὲ χρῶμα τὸ δρατόν, οὕτω τὸ γευστὸν ὁ χυμός. οὐθέν δὲ ποιεῖ χυμοῦ αἰσθησιν ἄνευ ὑγρότητος, ἀλλ' ἔχει ἐνεργείᾳ ἡ δυνάμει ὑγρότητα, οἷον τὸ ἀλμυρόν· εὔτηκτόν τε γὰρ αὐτὸν καὶ συντηκτικὸν γλώττης.

20 "Ωσπερ δὲ καὶ ἡ ὄψις ἔστι τοῦ τε ὄρατοῦ καὶ τοῦ ἀοράτου (τὸ γὰρ σκότος ἀόρατον, κρίνει δὲ καὶ τοῦτο ἡ ὄψις), ἔτι τοῦ λίαν λαμπροῦ (καὶ γὰρ τοῦτο ἀόρατον, ἀλλον δὲ τρόπον τοῦ σκότους), δόμοίως δὲ καὶ ἡ ἀκοὴ ψόφου τε καὶ σιγῆς, ὥν τὸ μὲν ἀκουστὸν τὸ δ' οὐκ ἀκουστόν, καὶ μεγάλου 25 ψόφου, καθάπερ ἡ ὄψις τοῦ λαμπροῦ· ὥσπερ γὰρ ὁ μικρὸς ψόφος ἀνήκουστος τρόπον τινά, καὶ ὁ μέγας τε καὶ ὁ βίαιος· ἀόρατον δὲ τὸ μὲν ὄλως λέγεται, ὥσπερ καὶ ἐπ' ἄλλων τὸ ἀδύνατον, τὸ δ',

## ON THE SOUL, II. ix.—x.

smell in water ; for they can only smell when inhaling, and it is impossible to do this in water. Smell is of the dry, as flavour is of the wet. Such is the nature of the organ of smell potentially.

X. An object of taste is an object of touch ; and this is the reason why it is not perceived through the medium of any foreign body ; for the same thing is true of touch. The body in which flavour resides, that is the object of taste, is in liquid as its matter ; and this is tangible. And so, even if we were in water, we should perceive sweetness injected into it, but our perception would not come through any medium, but by being mixed with the water, just as in a drink. But colour is not seen by being mixed, nor by an emanation. There is nothing, then, in the place of a medium ; but as that which is seen is a colour, so that which is tasted is a flavour. But nothing can produce a perception of flavour without liquid ; it must possess wetness actually or potentially, like salt ; for that is soluble and easily liquefied by the tongue.

Taste like touch requires no medium, but liquid must be present.

Now the power of sight is concerned both with what can be seen and what cannot (for darkness cannot be seen, and the power of sight recognizes this), and also with that which is too bright (for this also cannot be seen, though in a different sense from darkness), and in the same way the power of hearing is concerned both with sound and silence, the former being that which is heard, and the latter that which is not heard including a very loud noise, exactly as the vision is concerned with the too bright ; for as a slight sound is in a sense inaudible, so also is a loud and violent one ; the word invisible is then used quite generally, like the word impossible to see in another

## ARISTOTLE

422 a

έὰν πεφυκὸς μὴ ἔχῃ ἡ φαύλωσ, ὥσπερ τὸ ἄπουν  
καὶ τὸ ἀπύρηνοι· οὕτω δὴ καὶ ἡ γεῦσις τοῦ  
γευστοῦ τε καὶ ἀγεύστου· τοῦτο δὲ τὸ μικρὸν ἡ  
φαῦλον ἔχον χυμὸν ἡ φθαρτικὸν τῆς γεύσεως.  
δοκεῖ δὲ εἶναι ἀρχὴ τὸ ποτὸν καὶ ἄποτον· γεῦσις  
γάρ τις ἀμφότερα· ἀλλὰ τὸ μὲν φαύλη καὶ φθαρ-  
τικὴ τῆς γεύσεως, τὸ δὲ κατὰ φύσιν. ἔστι δὲ  
κοινὸν ἀφῆς καὶ γεύσεως τὸ ποτόν.

422 b Ἐπεὶ δὲ ὑγρὸν τὸ γευστόν, ἀνάγκη καὶ τὸ  
αἰσθητήριον αὐτοῦ μήτε ὑγρὸν εἶναι ἐντελεχείᾳ  
μήτε ἀδύνατον ὑγραίνεσθαι· πάσχει γάρ τι ἡ γεῦ-  
σις ὑπὸ τοῦ γευστοῦ, ἢ γευστόν. ἀναγκαῖον ἄρα  
ὑγρανθῆναι τὸ δυνάμενον μὲν ὑγραίνεσθαι σωζό-  
μενον, μὴ ὑγρὸν δέ, τὸ γευστικὸν αἰσθητήριον.  
σημεῖον δὲ τὸ μήτε κατάξηρον οὖσαν τὴν γλώτταν  
αἰσθάνεσθαι μήτε λίαν ὑγράν· αὕτη γὰρ ἀφὴ γί-  
νεται τοῦ πρώτου ὑγροῦ, ὥσπερ ὅταν προγευμα-  
τίσας τις ἴσχυροῦ χυμοῦ γεύηται ἐτέρου· καὶ  
οίλον τοῖς κάμνουσι πικρὰ πάντα φαίνεται διὰ τὸ  
10 τῇ γλώττῃ πλήρει τοιαύτης ὑγρότητος αἰσθάνε-  
σθαι. τὰ δὲ εἴδη τῶν χυμῶν, ὥσπερ καὶ ἐπὶ τῶν  
χρωμάτων, ἀπλά μὲν τάνατία, τὸ γλυκὺ καὶ τὸ  
πικρόν, ἔχόμενα δὲ τοῦ μὲν τὸ λιπαρόν, τοῦ δὲ τὸ  
ἀλμυρόν· μεταξὺ δὲ τούτων τό τε δριμὺ καὶ τὸ  
αὐστηρὸν καὶ στρυφνὸν καὶ δέξι· σχεδὸν γὰρ αὗται  
15 δοκοῦσιν εἶναι διαφοραὶ χυμῶν. ὥστε τὸ γευ-  
στικόν ἔστι τὸ δυνάμει τοιοῦτον, γευστὸν δὲ τὸ  
ποιητικὸν ἐντελεχείᾳ αὐτοῦ.

XI. Περὶ δὲ τοῦ ἀπτοῦ καὶ ἀφῆς ὁ αὐτὸς λόγος.

## ON THE SOUL, II. x.—xi.

connexion, and also in the sense of not having the quality or having it to a very small extent, though by nature qualified to possess it, like the words footless or stoneless. In just the same way the sense of taste is concerned both with that which is tasted and that which is not ; the latter being that which has little or slight taste, or which is destructive of taste. Our starting-point then seems to be drinkable and undrinkable ; for each implies a tasting ; but the latter is slight or destructive of taste, while the former is natural. But the drinkable is common both to touch and taste.

Since what is tasted is wet, the sense organ which perceives it must be not actually liquid but capable of liquefaction ; for the sense of taste is affected by what is tasted, in so far as it is tasted. The sense organ of taste, then, is that which is capable of becoming liquefied, while preserving its identity, but is not itself liquid. This is proved by the fact that the tongue cannot taste when it is dry, nor when too wet ; for this contact takes place with the first moisture, just as when a man having previously tasted a strong flavour meets another flavour ; and so when a man is ill everything tastes bitter, because he is perceiving it with a tongue infected with a bitter taste. But the types of flavours, just as in the case of colours, in their simplest form are opposite, sweet and bitter, but connected with these are oily and saline ; in between these come acid, pungent, astringent and sharp. These seem to be nearly all the differences in flavours. The faculty of taste is potentially like this, while that which makes it actually so is the object tasted.

XI. The same account applies to the tangible and *Touch*.

# ARISTOTLE

422 b

εἰ γὰρ ἡ ἀφὴ μὴ μία ἔστιν αἰσθησις ἀλλὰ πλείους,  
ἀναγκαῖον καὶ τὰ ἀπτὰ αἰσθητὰ πλείω εἶναι.  
20 ἔχει δ' ἀπορίαν πότερον πλείους εἰσὶν ἡ μία, καὶ  
τί τὸ αἰσθητήριον τὸ τοῦ ἀπτοῦ ἀπτικόν, πότερον  
ἡ σάρξ καὶ ἐν τοῖς ἄλλοις τὸ ἀνάλογον, ἡ οὐ, ἀλλὰ  
τοῦτο μέν ἔστι τὸ μεταξύ, τὸ δὲ πρῶτον αἰσθη-  
τήριον ἄλλο τί ἔστιν ἐντός. πᾶσά τε γὰρ αἰσθησις  
μιᾶς ἐναντιώσεως εἶναι δοκεῖ, οἷον ὄψις λευκοῦ  
25 καὶ μέλανος καὶ ἀκοὴ ὀξέος καὶ βαρέος καὶ γεῦσις  
πικροῦ καὶ γλυκέος· ἐν δὲ τῷ ἀπτῷ πολλαὶ ἔνεισιν  
ἐναντιώσεις, θερμὸν ψυχρόν, ξηρὸν υγρόν, σκληρὸν  
μαλακόν, καὶ τῶν ἄλλων ὅσα τοιαῦτα. ἔχει δέ  
τινα λύσιν πρός γε ταύτην τὴν ἀπορίαν, ὅτι καὶ  
ἐπὶ τῶν ἄλλων αἰσθήσεών εἰσιν ἐναντιώσεις  
30 πλείους, οἷον ἐν φωνῇ οὐ μόνον ὀξύτης καὶ  
βαρύτης, ἀλλὰ καὶ μέγεθος καὶ μικρότης καὶ  
λειότης καὶ τραχύτης φωνῆς καὶ τοιαῦθ' ἔτερα.  
εἰσὶ δὲ καὶ περὶ χρῶμα διαφοραὶ τοιαῦται ἔτεραι.  
ἀλλὰ τί τὸ ἐν τὸ ὑποκείμενον, ὥσπερ ἀκοὴ ψόφος,  
οὕτω τῇ ἀφῇ, οὐκ ἔστιν ἐνδηλον.

Πότερον δ' ἔστι τὸ αἰσθητήριον ἐντός, ἡ οὐ,  
423 a ἀλλ' εὐθέως ἡ σάρξ; οὐδὲν δοκεῖ σημεῖον εἶναι  
τὸ γίνεσθαι τὴν αἰσθησιν ἀμα θιγγανομένων. καὶ  
γὰρ νῦν εἴ τις περὶ τὴν σάρκα περιτείνειν οἷον  
νῦμένα ποιήσας, ὅμοίως τὴν αἰσθησιν εὐθέως ἀφά-  
μενος ἐνσημαίνει· καίτοι δῆλον ὡς οὐκ ἔστιν ἐν  
5 τούτῳ τὸ αἰσθητήριον· εἰ δὲ καὶ συμφυὲς γένοιτο,  
θᾶττον ἔτι διϊκνοῦτ' ἀν ἡ αἰσθησις. διὸ τὸ τοιοῦτο  
μόριον τοῦ σώματος ἔοικεν οὕτως ἔχειν ὥσπερ ἀν  
εἰ κύκλῳ ἡμῖν περιεπεφύκει ὁ ἀήρ· ἐδοκοῦμεν

## ON THE SOUL, II. xi.

the sense of touch. For if touch is not one sense, but more than one, objects of touch must also be plural. It is difficult to determine whether touch is one sense or more than one, and what the sense organ is which is affected by the object of touch, whether it is flesh, and whatever is analogous to this in creatures without flesh, or whether this is only the medium, and the primary sense organ is something distinct and internal. For every sensation appears to be concerned with one pair of opposites, just as vision is sight of white and black, hearing of high and low pitch, and taste of bitter and sweet ; but in the object touched there are many pairs of opposites, hot and cold, dry and wet, hard and soft, and many other similar pairs. Some solution may be found to this difficulty in the fact that the other senses too are conscious of more than one pair of opposites : so in voice there is not merely high and low pitch, but also loud and soft, smooth and rough, and so on. There are similarly other differences in colour. But what is the single basis in the case of touch corresponding to sound in hearing is not obvious.

Whether the sense organ is within, or whether the flesh feels directly, is not proved by the fact that things feel as soon as they are touched. For if one were to surround the whole flesh with a membrane, for instance, the moment it touched an object sensation would be registered. And yet it is quite clear that the sense organ would not reside in the membrane ; though if it grew to be one with the flesh, the sensation would be transmitted even more quickly. So this part of the body appears to be in the same position as if the air were naturally attached to us in

What is the  
sense organ  
of touch?

## ARISTOTLE

423 a

γάρ ἂν ἐνί τινι αἰσθάνεσθαι καὶ φόφου καὶ χρώματος καὶ ὀσμῆς, καὶ μία τις αἰσθησις εἶναι ὅφις 10 ἀκοή ὅσφρησις. νῦν δὲ διὰ τὸ διωρίσθαι δι' οὐ γίνονται αἱ κινήσεις, φανερὰ τὰ εἰρημένα αἰσθητήρια ἔτερα ὄντα. ἐπὶ δὲ τῆς ἀφῆς τοῦτο νῦν ἄδηλον· ἐξ ἀέρος μὲν γάρ ἡ ὕδατος ἀδύνατον συστῆναι τὸ ἔμψυχον σῶμα· δεῖ γάρ τι στερεὸν εἶναι. λείπεται δὴ μικτὸν ἐκ γῆς καὶ τούτων 15 εἶναι, οἷον βιούλεται ἡ σάρξ καὶ τὸ ἀνάλογον· ὥστε ἀναγκαῖον καὶ τὸ σῶμα εἶναι μεταξὺ τοῦ ἀπτικοῦ προσπεφυκὸς, δι' οὖν γίνονται αἱ αἰσθήσεις πλείους οὖσαι. δηλοῖ δ' ὅτι πλείους ἡ ἐπὶ τῆς γλώττης ἀφή· ἀπάντων γάρ τῶν ἀπτῶν αἰσθάνεται κατὰ τὸ αὐτὸ μόριον καὶ χυμοῦ. εἰ μὲν οὖν καὶ ἡ 20 ἄλλη σάρξ ἡσθάνετο τοῦ χυμοῦ, ἐδόκει ἂν ἡ αὐτὴ καὶ μία εἶναι αἰσθησις ἡ γενούσις καὶ ἡ ἀφή· νῦν δὲ δύο διὰ τὸ μὴ ἀντιστρέφειν.

’Απορήσειε δ’ ἂν τις, εἰ πᾶν σῶμα βάθος ἔχει· τοῦτο δ’ ἐστὶ τὸ τρίτον μέγεθος· ὡν δ’ ἐστὶ δύο σωμάτων μεταξὺ σῶμά τι, οὐκ ἐνδέχεται ταῦτα ἀλλήλων ἀπτεσθαι. τὸ δ’ ὑγρὸν οὐκ ἔστιν ἄνευ σώματος, οὐδὲ τὸ διερόν, ἀλλ’ ἀναγκαῖον ὕδωρ εἶναι ἡ ἔχειν ὕδωρ. τὰ δὲ ἀπτόμενα ἀλλήλων ἐν τῷ ὕδατι, μὴ ἐγρῶν τῶν ἄκρων ὄντων, ἀναγκαῖον ὕδωρ ἔχειν μεταξύ, οὐ ἀνάπλεα τὰ ἔσχατα. εἰ δὲ τοῦτ’ ἀληθές, ἀδύνατον ἀφασθαι ἄλλο ἄλλου ἐν ὕδατι. τὸν αὐτὸν δὲ τρόπον καὶ ἐν τῷ ἀέρι· 25 δόμοίως γάρ ἔχει ὁ ἀὴρ πρὸς τὰ ἐν αὐτῷ καὶ τὸ ὕδωρ πρὸς τὰ ἐν τῷ ὕδατι. λανθάνει δὲ μᾶλλον 423 b ἡμᾶς, ὥσπερ καὶ τὰ ἐν τῷ ὕδατι ζῶα, εἰ διερὸν

## ON THE SOUL, II. xi.

a circle ; for in that case we should suppose that our perception of sound, colour, and smell were all due to the one thing, and that vision, hearing, and smell were all one and the same sensation. But, as it is, having laid down the medium through which the movements occur, it is obvious that the sense organs mentioned are different. But in the case of touch this is not obvious ; for the body possessing soul cannot be made of water or air ; it must be something solid. The only alternative is that it is a mixture of earth and such substances as flesh and the like claim to be ; so that the body must be the natural medium of the tangible, through which the various sensations arise. And it shows that the sense of touch on the tongue is really plural ; for the tongue perceives all tangible objects with the same part as it perceives flavour. If then the rest of the flesh could perceive flavour, tasting and touch would seem to be one and the same sensation. But, as it is, they are proved two, because they are not convertible.

But here a difficulty arises ; every body has depth ; this is the third dimension ; in a case, then, in which a body exists between two others, the two cannot touch each other. But the liquid and wet cannot exist without a body, and the body must either be, or contain, water. Those things, then, which touch each other in water, as their extremities are not dry, must have water between them, of which their extremities are full. If this is true, then it is impossible for one thing to touch another in water. The same thing will be true of air, for air has the same relation to things in it, as water has to things in water. But we do not notice the problem in the case of water, just as animals living in water do not notice if wet touches

The medium  
in the case  
of touch.

## ARISTOTLE

428 b

διεροῦ ἄπτεται. πότερον οὖν πάντων ὁμοίως ἐστὶν  
 ἡ αἰσθησις, ἡ ἄλλων ἄλλως, καθάπερ νῦν δοκεῖ  
 ἡ μὲν γεῦσις καὶ ἡ ἀφὴ τῷ ἄπτεσθαι, αἱ δὲ ἄλλαι  
 ἄποθεν; τὸ δὲ οὐκ ἔστιν, ἀλλὰ καὶ τὸ σκληρὸν  
 5 καὶ τὸ μαλακὸν δι’ ἔτέρων αἰσθανόμεθα, ὥσπερ  
 καὶ τὸ ψοφητικὸν καὶ τὸ ὅρατὸν καὶ τὸ ὀσφραντόν·  
 ἀλλὰ τὰ μὲν πόρρωθεν, τὰ δὲ ἐγγύθεν. διὸ λαν-  
 θάνει, ἐπεὶ αἰσθανόμεθά γε πάντων διὰ τοῦ μέσου·  
 ἀλλ’ ἐπὶ τούτων λαιθάνει. καίτοι καθάπερ εἴπαμεν  
 καὶ πρότερον, κανεὶς δι’ ὑμένος αἰσθανοίμεθα τῶν  
 10 ἄπτῶν ἀπάντων λανθάνοντος ὅτι διείργει, ὁμοίως  
 ἀντίχοιμεν ὥσπερ καὶ νῦν ἐν τῷ ὕδατι καὶ ἐν τῷ  
 ἀέρι· δοκοῦμεν γὰρ αὐτῶν ἄπτεσθαι καὶ οὐδὲν  
 εἶναι διὰ μέσου. ἀλλὰ διαφέρει τὸ ἀπτόν τῶν  
 ὅρατῶν καὶ τῶν ψοφητικῶν, ὅτι ἐκείνων μὲν  
 αἰσθανόμεθα τῷ τὸ μεταξὺ ποιεῦν τι ἡμᾶς, τῶν  
 15 δὲ ἄπτῶν οὐχ ὑπὸ τοῦ μεταξύ ἀλλ’ ἄμα τῷ μεταξύ,  
 ὥσπερ ὁ δι’ ἀσπίδος πληγείς· οὐ γὰρ ἡ ἀσπὶς  
 πληγεῖσα ἐπάταξεν, ἀλλ’ ἀμφὶ ἄμφω<sup>1</sup> συνέβη πλη-  
 γῆναι. ὅλως δὲ ἔοικεν ἡ σάρξ καὶ ἡ γλῶττα, ὡς  
 ὁ ἀὴρ καὶ τὸ ὕδωρ πρὸς τὴν ὄψιν καὶ τὴν ἀκοὴν  
 καὶ τὴν ὄσφρησιν ἔχουσιν, οὕτως ἔχειν πρὸς τὸ  
 20 αἰσθητήριον ὥσπερ ἐκείνων ἔκαστον. αὐτοῦ δὲ  
 τοῦ αἰσθητηρίου ἀπτομένου οὕτ’ ἐκεῖ οὕτ’ ἐνταῦθα  
 γένοιτ’ ἀντίσθησις, οἷον εἴ τις σῶμα τὸ λευκὸν  
 ἐπὶ τοῦ ὅμματος θείη τὸ ἔσχατον. ἢ καὶ δῆλον  
 ὅτι ἐντὸς τὸ τοῦ ἀπτοῦ αἰσθητικόν. οὕτω γὰρ  
 25 ἀντίσθησις συμβαίνει ὥσπερ καὶ ἐπὶ τῶν ἄλλων· ἐπι-  
 τιθεμένων γὰρ ἐπὶ τὸ αἰσθητήριον οὐκ αἰσθάνεται,

<sup>1</sup> ἀλλ’ ἀμφω B.

## ON THE SOUL, II. xi.

wet. Is then the perception of all things one only, or is it different of different things, just as it is now generally supposed that taste and touch both act by contact, but that the other senses act at a distance? This is not the truth, but we perceive hard and soft through a medium, just as we apprehend what sounds, or are heard, or smelt. But we perceive the latter from a distance, the former from near by. So we do not notice that we perceive all things through a medium; but in the case of objects of touch the medium is not obvious. Still, as we have said before, if we were to perceive all tangible things through a membrane, without noticing the separation caused by it, we should react exactly in the same way as we do now in water and in air; for we seem to touch them directly without the intervention of any medium. But there is a difference between tangible things, and visible or audible things. We perceive the latter because some medium acts on us, but we perceive tangible things not by a medium, but at the same time as the medium, like a man wounded through his shield; for it is not the stricken shield that struck him, but both he and the shield were struck simultaneously. In a general sense we may say that just as the air and the water act in the case of vision, hearing and smell, so is the relation of the flesh and the tongue to the sense organ in the case of touch. In neither class of case mentioned would sensation result from touching the sense organ; for instance, if one were to put a white body on the surface of the eye. From this it is clear that that which is perceptive of what is touched is within. Thus would occur what is true in the other cases; for when placed on the other sense organs no sensation occurs, but

ARISTOTLE

423 <sup>b</sup>

ἐπὶ δὲ τὴν σάρκα ἐπιτιθεμένων αἰσθάνεται· ὥστε τὸ μεταξὺ τοῦ ἀπτικοῦ ἡ σάρξ.

‘Απταὶ μὲν οὖν εἰσὶν αἱ διαφοραὶ τοῦ σώματος ἢ σῶμα· λέγω δὲ διαφορὰς αἱ τὰ στοιχεῖα διορίζουσι, θερμὸν ψυχρόν, ξηρὸν ύγρόν, περὶ ὧν εἰρήκαμεν πρότερον ἐν τοῖς περὶ στοιχείων. τὸ δὲ αἰσθητὸν αὐτῶν τὸ ἀπτικόν, καὶ ἐν ᾧ ἡ καλουμένη ἀφὴ ύπάρχει πρώτῳ, τὸ δυνάμει τοιοῦτον ἔστι μόριον· τὸ γὰρ αἰσθάνεσθαι πάσχειν τι ἔστιν.

ώστε τὸ ποιοῦν οἷον αὐτὸν ἐνεργείᾳ, τοιοῦτον ἐκεῖνο ποιεῖ δυνάμει ὅν. διὸ τοῦ ὁμοίως θερμοῦ καὶ ψυχροῦ ἡ σκληροῦ καὶ μαλακοῦ οὐκ αἰσθανόμεθα, ἀλλὰ τῶν ύπερβολῶν, ὡς τῆς αἰσθήσεως οἷον μεσότητός τινος οὕσης τῆς ἐν τοῖς αἰσθητοῖς ἐναντιώσεως. καὶ διὰ τοῦτο κρίνει τὰ αἰσθητά. τὸ γὰρ μέσον κριτικόν· γίνεται γὰρ πρὸς ἑκάτερον αὐτῶν θάτερον τῶν ἄκρων· καὶ δεῖ ὥσπερ τὸ μέλλον αἰσθήσεσθαι λευκοῦ καὶ μέλανος μηδέτερον αὐτῶν εἶναι ἐνεργείᾳ, δυνάμει δὲ ἄμφω, οὕτω δὴ 10 καὶ ἐπὶ τῶν ἄλλων καὶ ἐπὶ τῆς ἀφῆς μήτε θερμὸν μήτε ψυχρόν. ἔτι δὲ ὥσπερ ὄρατοῦ καὶ ἀοράτου ἦν πως ἡ ὄψις, ὁμοίως δὲ καὶ αἱ λοιπαὶ τῶν ἀντικειμένων, οὕτω καὶ ἡ ἀφὴ τοῦ ἀπτοῦ καὶ ἀνάπτου· ἄναπτον δὲ ἔστι τό τε μικρὰν ἔχον πάμπαν διαφορὰν τῶν ἀπτῶν, οἷον πέπονθεν ὁ ἀήρ, καὶ τῶν 15 ἀπτῶν αἱ ύπερβολαί, ὥσπερ τὰ φθαρτικά. καθ' ἐκάστην μὲν οὖν τῶν αἰσθήσεων εἰρηται τύπῳ.

<sup>a</sup> *De Gen. et Corr. cc. ii. and iii.*

## ON THE SOUL, II. xi.

when placed on the flesh it does ; so that the medium in tangible things is the flesh.

The distinguishing characteristics of the body, *qua* The sense is a mean. body, are objects of touch ; by distinguishing characteristics I mean those which differentiate the elements hot and cold, dry and wet, about which we have spoken before in our discussion of the elements.<sup>a</sup> But the sense organ which perceives them is the sense of touch, and that in which the sense of touch, as it is called, primarily resides, a part which has potentially the qualities of the objects touched. For perception is a form of being acted upon. So that what makes something actually like itself has these qualities potentially itself. Consequently we have no sensation of what is as hot, cold, hard, or soft as we are, but only of what is more so, sensation being then a sort of mean between opposites in things felt. And it is because of this that a man discriminates between things felt. For the mean is capable of discriminating ; for it becomes an extreme in relation to each of the extremes in turn ; and just as that which is going to perceive white and black must be actually neither, but potentially both, so also in other cases, and particularly in the case of touch, it must be neither hot nor cold. And just as we saw that vision relates both to the visible and the invisible, and so also in the same way with the remaining contraries, so touch must relate both to the tangible and intangible ; by intangible we mean what has the quality of the tangible to an extremely small extent, as is the case with air, and also those excesses among tangible things, such as those which destroy. Now we have described in outline each of the senses.

424 a

XII. Καθόλου δὲ περὶ πάσης αἰσθήσεως δεῖ λαβεῖν ὅτι ἡ μὲν αἴσθησίς ἔστι τὸ δεκτικὸν τῶν αἰσθητῶν εἰδῶν ἄνευ τῆς ὕλης, οἷον ὁ κηρὸς τοῦ δακτυλίου ἄνευ τοῦ σιδήρου καὶ τοῦ χρυσοῦ δέχεται τὸ σημεῖον, λαμβάνει δὲ τὸ χρυσοῦν ἡ τὸ χαλκοῦν σημεῖον, ἀλλ’ οὐχ ἡ χρυσὸς ἡ χαλκός, ὅμοίως δὲ καὶ ἡ αἴσθησις ἔκαστου ὑπὸ τοῦ ἔχοντος χρῶμα ἡ χυμὸν ἡ ψόφον πάσχει, ἀλλ’ οὐχ ἡ ἔκαστον ἔκείνων λέγεται, ἀλλ’ ἡ τοιονδί, καὶ κατὰ τὸν λόγον. αἰσθητήριον δὲ πρῶτον ἐν ᾧ ἡ τοιαύτη δύναμις. ἔστι μὲν οὖν ταῦτον, τὸ δὲ εἶναι ἔτερον μέγεθος μὲν γὰρ ἄν τι εἴη τὸ αἰσθανόμενον οὐ μὴν τό γε αἰσθητικῷ εἶναι, οὐδὲ ἡ αἴσθησις μέγεθός ἔστιν, ἀλλὰ λόγος τις καὶ δύναμις ἔκείνου. φανερὸν δὲ ἐκ τούτων καὶ διὰ τί ποτε τῶν αἰσθητῶν αἱ ὑπερβολαὶ φθείρουσι τὰ αἰσθητήρια. ἐὰν γὰρ ἡ ἴσχυροτέρα τοῦ αἰσθητηρίου ἡ κίνησις, λύεται ὁ λόγος· τοῦτο δὲ ἡνὶ ἡ αἴσθησις, ὥσπερ καὶ ἡ συμφωνία καὶ ὁ τόνος κρονομένων σφόδρα τῶν χορδῶν. καὶ διὰ τί ποτε τὰ φυτὰ οὐκ αἰσθάνεται, ἔχοντά τι μόριον ψυχικὸν καὶ πάσχοντά τι ὑπὸ τῶν ἀπτῶν· καὶ γὰρ ψύχεται καὶ θερμαίνεται· αἴτιον γὰρ τὸ μὴ ἔχειν μεσότητα, μηδὲ τοιαύτην ἀρχὴν οἷαν τὰ εἴδη δέχεσθαι τῶν αἰσθητῶν, ἀλλὰ πάσχειν μετὰ τῆς ὕλης. ἀπορήσειε δὲ ἄν τις εἰ πάθοι ἄν τι ὑπὸ ὄσμῆς τὸ ἀδύνατον 5 ὀσφρανθῆναι, ἡ ὑπὸ χρώματος τὸ μὴ δυνάμενον ἰδεῖν· ὅμοίως δὲ καὶ ἐπὶ τῶν ἄλλων. εἰ δὲ τὸ ὀσφραντὸν ὄσμή, εἴ τι ποιεῖ τὴν ὄσφρησιν, ἡ

## ON THE SOUL, II. xii.

XII. On the general question of sensation one Definition of sensation. must lay down that sensation is the reception of the form of sensible objects without the matter, just as the wax receives the impression of the signet-ring without the iron or the gold, and receives the impression of the gold or bronze, but not as gold or bronze ; so the sense is affected by each thing which has colour, or flavour, or sound ; not in the sense in which each of them is so called, but in the sense that its character is of this kind, and in virtue of its form. And the sense organ in its primary meaning is that in which this capacity lies. The sense organ and the capacity exist in conjunction, but their essential nature is not the same ; for that which perceives has a definite magnitude ; but its capacity for perceiving has not, nor is sensation a magnitude, but the form and potentiality of this. From this it is also clear why excess of objects perceived destroy the sense organs ; for if the movement imparted to the sense organ is too strong, the form is destroyed ; and this form is the sensation ; just as the harmony and musical note is destroyed when the strings are struck hard. It also explains why plants do not feel, though they have some share in the soul, and are affected to some extent by objects touched ; for they show both cold and heat ; the reason is that they have no mean, nor any such first principle so as to receive the form of sensible objects, but are affected by the matter at the same time as the form. One might wonder whether anything that cannot smell is affected at all by smell, or that which cannot see by colour ; and in the same way with all other sensible objects. But seeing that smell is of the thing smelt, if anything affects the sense of smell, it must be smell, so

## ARISTOTLE

424 b

δύμη ποιεῖ. ὥστε τῶν ἀδυνάτων δύσφρανθῆναι  
 οὐθὲν οἶν τε πάσχειν ὑπ' ὀδμῆς· ὁ δ' αὐτὸς  
 λόγος καὶ ἐπὶ τῶν ἄλλων· οὐδὲ τῶν δυνατῶν,  
 ἀλλ' ἢ αἰσθητικὸν ἔκαστον. ἅμα δὲ δῆλον καὶ  
 10 οὕτως. οὕτε γὰρ φῶς καὶ σκότος οὕτε ψόφος  
 οὕτε δύμη οὐδὲν ποιεῖ τὰ σώματα, ἀλλ' ἐν οἷς  
 ἐστίν, οἷον ἀήρ ὁ μετὰ βροντῆς διέστησι τὸ ξύλον.  
 ἀλλὰ τὰ ἀπτὰ καὶ οἱ χυμοὶ ποιοῦσιν· εἰ γὰρ μή,  
 ὑπὸ τίνος ἀν πάσχοι τὰ ἄψυχα καὶ ἀλλοιοῦτο;  
 ἀρ' οὖν κάκεῦνα ποιήσει; ἢ οὐ πᾶν· σῶμα παθη-  
 15 τικὸν ὑπ' ὀδμῆς καὶ ψόφου· καὶ τὰ πάσχοντα  
 ἀόριστα, καὶ οὐ μένει, οἷον ἀήρ· ὅζει γὰρ ὥσπερ  
 παθῶν τι. τί οὖν ἐστὶ τὸ δύσμάσθαι παρὰ τὸ  
 πάσχειν τι; ἢ τὸ μὲν δύσμάσθαι αἰσθάνεσθαι, ὁ  
 δ' ἀήρ παθῶν ταχέως αἰσθητὸς γίνεται.

## ON THE SOUL, II. XII.

that it is impossible for anything which cannot smell to be affected by a smell ; and the same argument applies to the other senses ; nor can any of those things which can be acted upon be affected, except in so far as each has the sense in question. And the point is equally clear from the following argument. For neither light and darkness, nor sound, nor smell affect the bodies at all : it is the things in which they reside that produce the effect, just as the air splits wood when combined with thunder. But it may be said that tangible objects and flavours do affect bodies ; otherwise, by what should things not possessing soul be affected and changed ? Will then the objects of other senses affect things ? Or perhaps it is not every body that is affected by smell and sound : the things affected are indefinable and are not permanent, such as air ; for it smells as though affected somehow. What, then, is smelling apart from being affected in some way ? Probably smelling is perception, but the air when affected quickly becomes perceptible.

Γ

424 b

I. "Οτι δ' οὐκ ἔστιν αἰσθησις ἐτέρα παρὰ τὰς πέντε (λέγω δὲ ταύτας ὅψιν, ἀκοήν, ὅσφρησιν, γεῦσιν, ἀφήν), ἐκ τῶνδε πιστεύσειν ἄν τις. εἰ 25 γὰρ παντὸς οὐδὲ ἔστιν αἰσθησις ἀφή, καὶ νῦν αἰσθησιν ἔχομεν (πάντα γὰρ τὰ τοῦ ἀπτοῦ ή ἀπτὸν πάθη τῇ ἀφῇ ἡμῖν αἰσθητά ἔστιν), ἀνάγκη τ', εἴπερ ἐκλείπει τις αἰσθησις, καὶ αἰσθητήριόν τι ἡμῖν ἐκλείπειν· καὶ δοσῶν μὲν αὐτῶν ἀπτόμενοι αἰσθανόμεθα, τῇ ἀφῇ αἰσθητά ἔστιν, ἦν τυγχάνομεν ἔχοντες· ὅσα δὲ διὰ τῶν μεταξύ, καὶ μὴ 30 αὐτῶν ἀπτόμενοι, τοῖς ἀπλοῖς, λέγω δ' οἷον ἀέρι καὶ ὕδατι. ἔχει δ' οὕτως, ὥστ' εἰ μὲν δι' ἐνὸς πλείω αἰσθητὰ ἐτέρα ὅντα ἀλλήλων τῷ γένει, ἀνάγκη τὸν ἔχοντα τὸ τοιοῦτον αἰσθητήριον ἀμφοῖν αἰσθητικὸν εἶναι· οἷον εἰ ἐξ ἀέρος ἔστι τὸ αἰσθητήριον, καὶ ἔστιν δ. ἀὴρ καὶ ψόφου καὶ 425 a χρόας. εἰ δὲ πλείω τοῦ αὐτοῦ, οἷον χρόας καὶ ἀὴρ καὶ ὕδωρ (ἀμφω γὰρ διαφανῆ), καὶ δ τὸ ἐτερον αὐτῶν ἔχων μόνον αἰσθήσεται ἀμφοῖν. τῶν δὲ ἀπλῶν ἐκ δύο τούτων αἰσθητήρια μόνον ἔστιν, ἐξ ἀέρος καὶ ὕδατος· ή μὲν γὰρ κόρη

## BOOK III

I. One may be satisfied that there are no senses There are only five senses. apart from the five (I mean vision, hearing, smell, taste and touch) from the following arguments. We may assume that we actually have perception of everything which is apprehended by touch (for by touch we perceive all those things which are qualities of the tangible object, *qua* tangible). Again, if we lack any perception, we must lack some sense organ ; and, again, all the things which we perceive by touching them are perceived by touch, a sense which we happen to possess ; but all those things which are perceived through media, and not by actually touching them, are perceived through simple elements, such as air and water. Again, it is a fact that, if things differing from one another in kind are perceived through one medium, the man who has the appropriate sense organ will apprehend both (for instance, if the sense organ is composed of air, air is the medium both of sound and of colour), but if more than one thing is the medium of the same thing, as for instance both air and water are the media through which colour is perceived (for both are transparent), then he that has either of these will perceive both. But sense organs are only composed of these two simple elements, air and water (for the pupil of the eye is composed of water, and the hearing

## ARISTOTLE

425 a

5 ὕδατος, ἡ δ' ἀκοὴ ἀέρος, ἡ δ' ὅσφρησις θατέρου τούτων. τὸ δὲ πῦρ ἡ οὐθενὸς ἡ κοινὸν πάντων· οὐθὲν γάρ ἄνευ θερμότητος αἰσθητικόν. γῆ δὲ ἡ οὐθενός, ἡ ἐν τῇ ἀφῇ μάλιστα μέμικται ἴδιας. διὸ λείποιτ<sup>a</sup> ἀν μηθὲν εἶναι αἰσθητήριον ἔξω ὕδατος καὶ ἀέρος. ταῦτα δὲ καὶ νῦν ἔχουσιν ἔνια ζῶα.  
 10 πᾶσαι ἀρά αἱ αἰσθήσεις ἔχονται ὑπὸ τῶν μὴ ἀτελῶν μηδὲ πεπηραμένων· φαίνεται γάρ καὶ ἡ σπάλαξ ὑπὸ τὸ δέρμα ἔχουσα ὀφθαλμούς. ὥστ<sup>b</sup> εἰ μή τι ἔτερόν ἔστι σῶμα, καὶ πάθος ὃ μηθενός ἔστι τῶν ἐνταῦθα σωμάτων, οὐδεμία ἀν ἐκλίποι αἰσθησις.

15 'Αλλὰ μὴν οὐδὲ τῶν κοινῶν οἷόν τ' εἶναι αἱ σθητήριόν τι ἴδιον, ὃν ἔκάστη αἰσθήσει αἰσθανομεθα κατὰ συμβεβηκός, οἷον κινήσεως, στάσεως, σχήματος, μεγέθους, ἀριθμοῦ, ἐνός· ταῦτα γάρ πάντα κινήσει αἰσθανόμεθα, οἷον μέγεθος κινήσει. ὥστε καὶ σχῆμα· μέγεθος γάρ τι τὸ σχῆμα. τὸ δ' ἡρεμοῦν τῷ μὴ κινεῖσθαι· ὃ δ' ἀριθμὸς τῇ ἀποφάσει τοῦ συνεχοῦς καὶ τοῖς ἴδιοις· ἔκάστη γάρ ἐν αἰσθάνεται αἰσθησις. ὥστε δῆλον ὅτι ἀδύνατον δτουοῦν ἴδιαν αἰσθησιν εἶναι τούτων, οἷον κινήσεως· οὕτω γάρ ἔσται ὥσπερ νῦν τῇ ὄψει τὸ γλυκὺν αἰσθανόμεθα. τοῦτο δ' ὅτι ἀμφοῦν ἔχοντες τυγχάνομεν αἰσθησιν, ἥ καὶ ὅταν συμπέσωσιν ἀναγνωρίζομεν· εἰ δὲ μή, οὐδαμῶς ἀν ἀλλ' ἡ κατὰ

<sup>a</sup> This is the conclusion to which all the preceding arguments lead.

<sup>b</sup> i.e. when and because they move.

<sup>c</sup> When a thing is "continuous" it is "one," which in the Greek mind was not a number.

<sup>d</sup> A. is definitely wrong here. We do not "perceive" sweetness by sight; we may assume sweetness by association

## ON THE SOUL, III. I.

organ of air, while the organ of smell is composed of one or other of these). But fire is the medium of no perception, or else is common to them all (for there is no possibility of perception without heat), and earth is the medium of no sense perception, or else is connected with a sense of touch in a special way. So we are left to suppose that there is no sense organ apart from water and air ; and some animals actually have organs composed of these ; <sup>a</sup> the conclusion is that all the senses are possessed by all such animals as are neither undeveloped nor maimed ; even the mole seems to have eyes under the skin. If then there is no other body, and no other property which belongs to any of the bodies in the world, there can be no sense perception omitted from our list.

But, again, it is impossible that there should be a special sense organ to perceive common sensibles, which we perceive incidentally by each sense, such, I mean, as motion, rest, shape, magnitude, number and unity ; for we perceive all these things by movement ; <sup>b</sup> for instance we perceive magnitude by movement, and shape also ; for shape is a form of magnitude. We perceive rest by absence of movement ; number is perceived by absence of continuity, <sup>c</sup> and by the special senses ; for each sense perceives one thing. So that it is clearly impossible for there to be any special sense of any one of these things, such as movement ; if there were, it would be in the same way as we now perceive sweetness by sight. <sup>d</sup> But this is because we happen to have perception of both, whereby we recognize them when they occur together, otherwise we should never perceive ideas, or infer it in some other way, but we do not perceive it.

The perception of common sensibles.

## ARISTOTLE

425 a

25 συμβεβηκὸς ἡσθανόμεθα, οἷον τὸν Κλέωνος υἱὸν  
οὐχ ὅτι Κλέωνος υἱός, ἀλλ' ὅτι λευκός· τούτῳ δὲ  
συμβεβηκεν υἱῷ Κλέωνος εἶναι. τῶν δὲ κοινῶν ἥδη  
ἔχομεν αἰσθησιν κοινήν, οὐ κατὰ συμβεβηκός· οὐκ  
ἄρ' ἐστὶν ἴδια· οὐδαμῶς γὰρ ἀν ἡσθανόμεθα ἀλλ'  
80 ἡ οὕτως ὥσπερ εἴρηται τὸν Κλέωνος υἱὸν ἡμᾶς  
δρᾶν. τὰ δ' ἀλλήλων ἴδια κατὰ συμβεβηκός  
αἰσθάνονται αἱ αἰσθήσεις, οὐχ ἡ αἱ αὐταί, ἀλλ' ἡ  
425 b μία, ὅταν ἄμα γένηται ἡ αἰσθησις ἐπὶ τοῦ αὐτοῦ,  
οἷον χολὴν ὅτι πικρὰ καὶ ξανθή· οὐ γὰρ δὴ ἐτέρας  
γε τὸ εἰπεῖν ὅτι ἄμφω ἔν· διὸ καὶ ἀπατᾶται, καὶ  
ἐὰν ἡ ξανθόν, χολὴν οἴεται εἶναι. ζητήσειε δ' ἄν  
ν τις τίνος ἔνεκα πλείους ἔχομεν αἰσθήσεις, ἀλλ' οὐ  
μίαν μόνην. ἡ ὅπως ἥττον λανθάνῃ τὰ ἀκολου-  
θοῦντα καὶ κοινά, οἷον κίνησις καὶ μέγεθος καὶ  
ἀριθμός· εἰ γὰρ ἡ ὅψις μόνη, καὶ αὕτη<sup>1</sup> λευκοῦ,  
ἐλάνθανεν ἄν μᾶλλον καὶ ἐδόκει ταῦτὸν εἶναι πάντα  
διὰ τὸ ἀκολουθεῖν ἀλλήλους ἄμα χρῶμα καὶ  
10 μέγεθος. νῦν δ' ἐπεὶ καὶ ἐν ἐτέρῳ αἰσθητῷ τὰ  
κοινὰ ὑπάρχει, δῆλον ποιεῖ ὅτι ἄλλο τι ἔκαστον  
αὐτῶν.

II. Ἐπεὶ δ' αἰσθανόμεθα ὅτι ὄρῶμεν καὶ ἀκούο-  
μεν, ἀνάγκη ἡ τῇ ὅψει αἰσθάνεσθαι ὅτι ὄρᾳ, ἡ  
ἐτέρᾳ. ἀλλ' ἡ αὐτὴ ἔσται τῆς ὅψεως καὶ τοῦ  
15 ὑποκειμένου χρώματος. ὥστε ἡ δύο τοῦ αὐτοῦ  
ἔσονται ἡ αὐτὴ αὐτῆς. ἔτι δ' εἰ καὶ ἐτέρα εἴη ἡ<sup>2</sup>  
τῆς ὅψεως αἰσθησις, ἡ εἰς ἅπειρον εἰσιν ἡ αὐτὴ

<sup>1</sup> αὐτὴ B.

<sup>2</sup> οὐ. ἡ B.

### ON THE SOUL, III. I.—II.

ceive them except incidentally ; for instance we perceive Cleon's son, not because he is Cleon's son, but because he is white ; his being Cleon's son is merely incidental. We have then a common sense which apprehends common sensibles, not incidentally ; and it is not a special sense. If there were such, we should never perceive in any other way, except as we said that we saw Cleon's son. But the senses do perceive each other's proper objects incidentally, not in their own identity, but acting together as one, when sensation occurs simultaneously in the case of the same object, as for instance of bile, that it is bitter and yellow ; for saying that both are one is not attributing it to another sense ; and so the sense can be deceived, and, if an object is yellow, thinks that it is bile. One might ask why we have several senses and not one only. It may be in order that the accompanying and common properties, such as movement, magnitude and number should escape us less ; for if vision were our only sense, and it perceived something white, there would be more room for error, and colour and magnitude would appear to be the same thing, because they accompany each other. But, as it is, since the common sensibles exist in a second object, it becomes clear that each of them is something separate.

II. But since we are conscious that we see and hear, either sight itself must perceive that it sees, or some other sense. But in the former case the same sense must perceive both sight and colour, the proper object of sight. So that either two senses perceive the same object, or sight perceives itself. Again, if there is a separate sense perceiving sight, either the process will go on *ad infinitum*, or a sense must per-

How do we  
know that  
we see?

# ARISTOTLE

425 b

τις ἔσται αὐτῆς. ὥστ' ἐπὶ τῆς πρώτης τοῦτο ποιητέον. ἔχει δ' ἀπορίαν· εἰ γὰρ τὸ τῇ ὄψει αἰσθάνεσθαι ἔστιν ὅραν, ὅραται δὲ χρῶμα ἢ τὸ ἔχον, εἰ ὄψεται τις τὸ ὅραν, καὶ χρῶμα ἔξει τὸ 20 ὅραν πρῶτον. φανερὸν τοίνυν ὅτι οὐχ ἐν τὸ τῇ ὄψει αἰσθάνεσθαι· καὶ γὰρ ὅταν μὴ ὅρωμεν, τῇ ὄψει κρίνομεν καὶ τὸ σκότος καὶ τὸ φῶς, ἀλλ' οὐχ ὡσαύτως. ἔτι δὲ καὶ τὸ ὅραν ἔστιν ὡς κεχρωμάτισται· τὸ γὰρ αἰσθητήριον δεκτικὸν τοῦ αἰσθητοῦ ἄνευ τῆς ὑλῆς ἔκαστον. διὸ καὶ ἀπ- 25 ελθόντων τῶν αἰσθητῶν ἔνεισιν αἱ αἰσθήσεις καὶ φαντασίαι ἐν τοῖς αἰσθητηρίοις.

‘Η δὲ τοῦ αἰσθητοῦ ἐνέργεια καὶ τῆς αἰσθήσεως ἡ αὐτὴ μέν ἔστι καὶ μία, τὸ δ' εἶναι οὐ ταύτων αὐταῖς· λέγω δ' οἷον ψόφος ὁ κατ' ἐνέργειαν καὶ ἀκοὴ ἡ κατ' ἐνέργειαν· ἔστι γὰρ ἀκοὴν ἔχοντα μὴ ἀκούειν, καὶ τὸ ἔχον ψόφον οὐκ ἀεὶ ψοφεῖ. 30 ὅταν δ' ἐνεργῇ τὸ δυνάμενον ἀκούειν καὶ ψοφῇ τὸ δυνάμενον ψοφεῖν, τότε ἡ κατ' ἐνέργειαν ἀκοὴ 428 a ἄμα γίνεται καὶ ὁ κατ' ἐνέργειαν ψόφος, ὃν εἴπειεν ἄν τις τὸ μὲν εἶναι ἀκουσιν τὸ δὲ ψόφησιν.

Εἰ δ' ἔστιν ἡ κίνησις καὶ ἡ ποίησις καὶ τὸ πάθος ἐν τῷ ποιουμένῳ, ἀνάγκη καὶ τὸν ψόφον καὶ τὴν ἀκοὴν τὴν κατ' ἐνέργειαν ἐν τῇ κατὰ δύναμιν 5 εἶναι· ἡ γὰρ τοῦ ποιητικοῦ καὶ κινητικοῦ ἐνέργεια ἐν τῷ πάσχοντι ἐγγίνεται. διὸ οὐκ ἀνάγκη τὸ κινοῦν κινεῖσθαι. ἡ μὲν οὖν τοῦ ψοφητικοῦ ἐνέργειά ἔστι ψόφος ἢ ψόφησις, ἡ δὲ τοῦ ἀκουστικοῦ

<sup>a</sup> If we suppose a special sense to apprehend that we see, we must suppose another to apprehend this and so on.

<sup>b</sup> Cf. ch. viii.

### ON THE SOUL, III. II.

ceive itself.<sup>a</sup> So we may assume that it occurs with the first sense. But here is a difficulty ; for if perception by vision is seeing, and that which is seen either is colour or has colour, then if anyone sees that which sees, it follows that what primarily sees will possess colour. It is therefore obvious that the phrase "perceiving by vision" has not merely one meaning ; for, even when we do not see, we judge both darkness and light by vision, but not in the same way. Moreover that which sees does in a sense possess colour ; for each sense organ is receptive of the perceived object, but without its matter. So that even when the objects of perception are absent, perception and mental pictures are present in the sense organ.

But the activity of the object felt and of the <sup>What is</sup> sensation are one and the same thing,<sup>b</sup> though their <sup>sensation ?</sup> actual essence is not the same ; by saying that they are the same, I mean the sound actively and the hearing actively ; for it is possible for one who possesses hearing not to hear, and that which has sound is not always sounding. But when that which has the power of hearing is exercising its power, and that which can sound is sounding, then the active hearing and the active sound occur together, of which one may call one hearing and one sounding.

If then the movement, that is, the acting and being acted upon, takes place in that which is acted upon, then the sound and the hearing in a state of activity must reside in the potential hearing ; for the activity of what is moving and active takes place in what is being acted upon. Hence that which causes motion need not be moved. The activity, then, of the object producing sound is sound, or sounding, and of that

## ARISTOTLE

426 a

ἀκοή ἡ ἄκουσις· διττὸν γὰρ ἡ ἀκοή, καὶ διττὸν ὁ φόφος. ὁ δ' αὐτὸς λόγος καὶ ἐπὶ τῶν ἄλλων αἰσθήσεων καὶ αἰσθητῶν. ὥσπερ γὰρ ἡ ποίησις 10 καὶ ἡ πάθησις ἐν τῷ πάσχοντι ἀλλ' οὐκ ἐν τῷ ποιοῦντι, οὗτῳ καὶ ἡ τοῦ αἰσθητοῦ ἐνέργεια καὶ ἡ τοῦ αἰσθητικοῦ ἐν τῷ αἰσθητικῷ. ἀλλ' ἐπ' ἐνίων μὲν ἀνόμασται, οἷον ἡ ψόφησις καὶ ἡ ἄκουσις, ἐπὶ δ' ἐνίων ἀνώνυμον θάτεροι· ὄρασις γὰρ λέγεται ἡ τῆς ὅψεως ἐνέργεια, ἡ δὲ τοῦ 15 χρώματος ἀνώνυμος, καὶ γεῦσις ἡ τοῦ γευστικοῦ, ἡ δὲ τοῦ χυμοῦ ἀνώνυμος. ἐπεὶ δὲ μία μέν ἐστιν ἐνέργεια ἡ τοῦ αἰσθητοῦ καὶ ἡ τοῦ αἰσθητικοῦ, τὸ δ' εἶναι ἔτερον, ἀνάγκη ἀμα φθείρεσθαι καὶ σώζεσθαι τὴν οὕτω λεγομένην ἀκοήν καὶ φόφον, καὶ χυμὸν δὴ καὶ γεῦσιν καὶ τὰ ἄλλα ὄμοιῶς. 20 τὰ δὲ κατὰ δύναμιν λεγόμενα οὐκ ἀνάγκη, ἀλλ' οἱ πρότερον φυσιολόγοι τοῦτο οὐ καλῶς ἔλεγον, οὐθὲν οὐόμενοι οὔτε λευκὸν οὔτε μέλαν εἶναι ἄνευ ὅψεως, οὐδὲ χυμὸν ἄνευ γεύσεως. τῇ μὲν γὰρ ἔλεγον ὀρθῶς, τῇ δ' οὐκ ὀρθῶς· διχῶς γὰρ λεγομένης τῆς αἰσθήσεως καὶ τοῦ αἰσθητοῦ, τῶν μὲν 25 κατὰ δύναμιν τῶν δὲ κατ' ἐνέργειαν, ἐπὶ τούτων μὲν συμβαίνει τὸ λεχθέν, ἐπὶ δὲ τῶν ἔτερων οὐ συμβαίνει. ἀλλ' ἐκεῖνοι ἀπλῶς ἔλεγον περὶ τῶν λεγομένων οὐχ ἀπλῶς.

Εἰ δ' ἡ συμφωνία φωνή τίς ἐστιν, ἡ δὲ φωνὴ καὶ ἡ ἀκοή ἐστιν ὡς ἐν ἐστι καὶ ἐστιν ὡς οὐχ ἐν τὸ αὐτό, λόγος δ' ἡ συμφωνία, ἀνάγκη καὶ τὴν 30 ἀκοήν λόγον τινὰ εἶναι. καὶ διὰ τοῦτο καὶ φθείρει

<sup>a</sup> If a red object is in the dark it does not appear red. Some philosophers maintained that it is not red, and that

## ON THE SOUL, III. II.

producing hearing is hearing or audition, for hearing is used in two senses, and so is sound. The same argument applies to the case of other senses and sensible objects. For just as acting and being acted upon resides in that which is acted upon, and not that which acts, so also the activity of the object perceived and of the percipient lies in the percipient. In some cases we have names for both, such as sounding and hearing, but in others one of the terms has no name ; for the activity of vision is called seeing, but that of colour has no name ; the activity of taste is called tasting, but that of flavour has no name. But since the activity of the perceived and of the percipient are the same, though their essence is different, it necessarily follows that what is called hearing must be destroyed and preserved at the same time as sound, and so with flavour and taste and the rest ; but this does not apply to things potential, though the earlier natural philosophers did not understand this, supposing that white and black had no existence without vision, nor flavour without taste.<sup>a</sup> In one sense they were right, but in another wrong ; for sensation and the sensible object being used in two senses, that is potentially and actually, their statements apply to the latter class, but not to the former. In other words, they were speaking in one sense about terms which are used in two.

If, then, harmony is a voice of some kind (and voice and hearing are in one sense one and the same, and in another not), and if harmony is a ratio, then it follows that hearing is in some sense a ratio. That

<sup>a</sup> " red " has no existence except when we see it. A. argues that such an object is " potentially " red, because, given the right conditions, it will appear red.

Sensation  
as a  
harmony.

## ARISTOTLE

426 a

ἔκαστον ὑπερβάλλον, καὶ τὸ ὄξὺ καὶ τὸ βαρύ, τὴν  
 428 b ἀκοήν· ὅμοίως δὲ καὶ ἐν χυμοῖς τὴν γεῦσιν, καὶ  
 ἐν χρώμασι τὴν ὄψιν τὸ σφόδρα λαμπρὸν ἢ  
 ζοφερόν, καὶ ἐν δισφρήσει ἡ ἴσχυρὰ δύνη καὶ  
 γλυκεῖα καὶ πικρά, ὡς λόγου τινὸς ὄντος τῆς  
 αἰσθήσεως. διὸ καὶ ἡδέα μέν, ὅταν εἰλικρινῆ καὶ  
 ἀμιγῆ ἄγηται εἰς τὸν λόγον, οἷον τὸ ὄξὺ ἢ γλυκὺ<sup>ν</sup>  
 ἢ ἀλμυρόν· ἡδέα γάρ τότε. ὅλως δὲ μᾶλλον τὸ  
 μικτὸν συμφωνία ἢ τὸ ὄξὺ ἢ βαρύ, ἀφῇ δὲ τὸ  
 θερμαντὸν ἢ φυκτόν· ἡ δ' αἰσθησις ὁ λόγος·  
 ὑπερβάλλοντα δὲ λυπεῖ ἢ φθείρει.

Ἐκάστη μὲν οὖν αἰσθησις τοῦ ὑποκειμένου  
 αἰσθητοῦ ἐστίν, ὑπάρχουσα ἐν τῷ αἰσθητηρίῳ ἢ  
 10 αἰσθητήριον, καὶ κρίνει τὰς τοῦ ὑποκειμένου αἰ-  
 σθητοῦ διαφοράς, οἷον λευκὸν μὲν καὶ μέλαν ὄψις,  
 γλυκὺ δὲ καὶ πικρὸν γεῦσις. ὅμοίως δ' ἔχει τοῦτο  
 καὶ ἐπὶ τῶν ἄλλων. ἐπεὶ δὲ καὶ τὸ λευκὸν καὶ  
 τὸ γλυκὺ καὶ ἔκαστον τῶν αἰσθητῶν πρὸς ἔκαστον  
 κρίνομεν, τίνι καὶ αἰσθανόμεθα ὅτι διαφέρει;  
 15 ἀνάγκη δὴ αἰσθήσει αἰσθητὰ γάρ ἐστιν. ἢ καὶ  
 δῆλον ὅτι ἡ σὰρξ οὐκ ἔστι τὸ ἔσχατον αἰσθητήριον·  
 ἀνάγκη γάρ ἦν ἀπτόμενον αὐτοῦ κρίνειν τὸ κρῦνον.  
 οὕτω δὴ κεχωρισμένοις ἐνδέχεται κρίνειν ὅτι ἔτερον  
 τὸ γλυκὺ τοῦ λευκοῦ, ἀλλὰ δεῖ ἐνί τινι ἀμφῷ δῆλα  
 εἶναι. οὕτω μὲν γάρ κανεὶς εἰ τοῦ μὲν ἐγώ τοῦ δὲ  
 20 σὺ αἰσθοιο, δῆλον ἂν εἴη ὅτι ἔτερα ἄλλήλων. δεῖ  
 δὲ τὸ ἐν λέγειν ὅτι ἔτερον ἔτερον γάρ τὸ γλυκὺ<sup>ν</sup>  
 τοῦ λευκοῦ. λέγει ἄρα τὸ αὐτό, ὥστε, ὡς λέγει,

### ON THE SOUL, III. II.

is why both high and low pitch, if excessive, destroy hearing ; in the same way in flavours excess destroys taste, and in colours the over-brilliant or over-dark destroys vision, and in smelling, the strong scent, whether sweet or bitter, destroys smell, because sensation is some kind of harmony. That is also why things are pleasant when they are brought into the proportion pure and unmixed, such as acid, sweet or salt ; for in that case they are pleasant. But generally speaking a mixed constitution produces a better harmony than the high or low pitch, and to the touch the warm is more pleasurable than the cold ; but perception is a proportion, and excess hurts or destroys.

Each sensation then relates to the subject perceived, existing in the sense organ as such, and judges differences in the subject perceived ; for instance, vision discriminates between white and black, and taste between sweet and bitter. And the same process occurs in all other cases. But, since we distinguish white and sweet, and compare all objects perceived with each other, by what sense do we perceive that they differ ? It must evidently be by some sense that we perceive the difference ; for they are objects of sense. Incidentally it becomes clear that flesh is not the ultimate sense organ ; for, if it were, judgement would depend on being in contact. Nor, again, is it possible to judge that sweet and white are different by separate senses, but both must obviously be determined by one sense. For, in the other case, if you perceived one thing and I another, it would be obvious that they differed from each other. It can only be one thing which declares the difference ; for sweet differs from white. The same faculty, then, makes this statement so that, just as it speaks, so

How do we apprehend the difference between the objects of different senses ?

## ARISTOTLE

426 <sup>β</sup>

οὗτω καὶ νοεῖ καὶ αἰσθάνεται. ὅτι μὲν οὖν οὐχ οἷόν τε κεχωρισμένοις κρίνειν τὰ κεχωρισμένα, δῆλον· ὅτι δ' οὐδ' ἐν κεχωρισμένῳ χρόνῳ, ἐντεῦθεν. <sup>γ</sup> ὥσπερ γὰρ τὸ αὐτὸν λέγει ὅτι ἔτερον τὸ ἀγαθὸν καὶ τὸ κακόν, οὗτω καὶ ὅτε θάτερον λέγει ὅτι ἔτερον, καὶ θάτερον οὐ κατὰ συμβεβηκός τὸ ὅτε (λέγω δ', οἷον νῦν λέγω ὅτι ἔτερον, οὐ μέντοι ὅτι νῦν ἔτερον). ἀλλ' οὕτω λέγει, καὶ νῦν, καὶ ὅτι νῦν· ἅμα ἄρα. ὥστε ἀχώριστον καὶ ἐν ἀχωρίστῳ χρόνῳ. ἀλλὰ μὴν ἀδύνατον ἅμα τὰς ἐναντίας κινήσεις κινεῖσθαι τὸ αὐτὸν ἢ ἀδιαιρέτον καὶ ἐν ἀδιαιρέτῳ χρόνῳ. εἰ γὰρ τὸ γλυκὺν ὥδι κινεῖ τὴν <sup>427</sup> αἰσθησιν ἢ τὴν νόησιν, τὸ δὲ πικρὸν ἐναντίως, καὶ τὸ λευκὸν ἔτέρως. ἀρ' οὖν ἅμα μὲν καὶ ἀριθμῷ ἀδιαιρέτον καὶ ἀχώριστον τὸ κρίνον, τῷ εἶναι δὲ κεχωρισμένον; ἔστι δή πως ὡς τὸ διαιρετὸν τῶν διηρημένων αἰσθάνεται, ἔστι δ' ὡς ἢ τὸ ἀδιαιρέτον· τῷ εἶναι μὲν γὰρ διαιρετόν, τόπῳ δὲ καὶ ἀριθμῷ ἀδιαιρέτον. ἢ οὐχ οἷόν τε; δυνάμει μὲν γὰρ τὸ αὐτὸν καὶ ἀδιαιρέτον τάναντία, τῷ δ' εἶναι οὕ, ἀλλὰ τῷ ἐνεργεῖσθαι διαιρετόν, καὶ οὐχ οἷόν τε ἅμα λευκὸν καὶ μέλαν εἶναι. ὥστ' οὐδὲ τὰ εἴδη πάσχειν αὐτῶν, εἰ τοιοῦτον ἢ αἰσθησις <sup>10</sup> καὶ ἡ νόησις, ἀλλ' ὥσπερ ἦν καλοῦσί τινες στιγμήν, ἢ μία καὶ ἢ δύο, ταύτη καὶ διαιρετή. ἢ μὲν οὖν ἀδιαιρέτον, ἐν τὸ κρίνον ἔστι καὶ ἅμα, ἢ δὲ

### ON THE SOUL, III. II.

does it judge and perceive. It is quite evident that it is impossible to pass judgement on separate objects by separate faculties ; and it is also obvious that they are not judged at separate times from the following considerations. For just as the same faculty declares that good and evil are different, so also when it declares that one thing is different from another thing, the "time when" is not merely incidental (in the sense, that is, that I now say that there is a difference, but not that I say that there is now a difference). But the faculty says now, and also that the difference is now, and both statements are true at once. So the judging sense must be inseparable, and also must judge without an interval. But, again, it is impossible that the same faculty should be moved in opposite directions at the same time, in so far as it is undivided, and in undivided time. For if the sweet promotes sensation or understanding in one direction, and bitter in the opposite, white moves it in a different direction altogether. Are we, then, to suppose that the judging faculty is numerically indivisible and inseparable, but is divided in essence ? It is, then, in its divisible nature that it perceives divided things, and it is otherwise indivisible. For it is divisible in essence, but indivisible spatially and numerically. Or is this impossible ? For the same thing, then, becomes indivisible potentially, but not in essence, but divisible actually ; but it is impossible for anything to be black and white at the same time. So that the forms of these things are not affected, if sensation and understanding are of this kind. But just as some men speak of a point as both one and two, in this sense the point is divisible. In so far, then, as the judging faculty is indivisible, it is one

427 a

διαιρετὸν ὑπάρχει, δὶς τῷ αὐτῷ χρῆται σημείῳ  
άμα. ἢ μὲν οὖν δυσὶ χρῆται τῷ πέρατι, δύο  
κρίνει, καὶ κεχωρισμένα ἔστιν ὡς κεχωρισμένω<sup>1</sup>.  
15 ἢ δ' ἐν, ἐνὶ καὶ ἄμα.

Περὶ μὲν οὖν τῆς ἀρχῆς ἢ φαμὲν τὸ ζῷον αἰσθη-  
τικὸν εἶναι, διωρίσθω τὸν τρόπον τοῦτον.

III. Ἐπεὶ δὲ δύο διαφοραῖς δρίζονται μάλιστα  
τὴν ψυχήν, κινήσει τε τῇ κατὰ τόπον καὶ τῷ νοεῖν  
καὶ τῷ κρίνειν καὶ αἰσθάνεσθαι, δοκεῖ δὲ καὶ τὸ  
20 νοεῖν καὶ τὸ φρονεῖν ὥσπερ αἰσθάνεσθαι τι εἶναι·  
ἐν ἀμφοτέροις γὰρ τούτοις κρίνει τι ἡ ψυχὴ καὶ  
γνωρίζει τῶν ὅντων, καὶ οἴ γε ἀρχαῖοι τὸ φρονεῖν  
καὶ τὸ αἰσθάνεσθαι ταῦτὸν εἶναι φασιν, ὥσπερ καὶ  
Ἐμπεδοκλῆς εἴρηκε “πρὸς παρεὸν γὰρ μῆτις  
ἀέξεται ἀνθρώποισιν” καὶ ἐν ἄλλοις “ὅθεν σφίσιν  
25 αἱεὶ καὶ τὸ φρονεῖν ἀλλοῖα παρίσταται.” τὸ δ'  
αὐτὸ τούτοις βούλεται καὶ τὸ Ὀμήρου “τοῖος γὰρ  
νόος ἔστιν.” πάντες γὰρ οὖτοι τὸ νοεῖν σωμα-  
τικὸν ὥσπερ τὸ αἰσθάνεσθαι ὑπόλαμβάνοντιν, καὶ  
αἰσθάνεσθαι τε καὶ φρονεῖν τῷ δόμοιῷ τὸ ὅμοιον,  
ὥσπερ καὶ ἐν τοῖς κατ' ἀρχὰς λόγοις διωρίσαμεν.  
427 b καίτοι ἔδει ἄμα καὶ περὶ τοῦ ἡπατῆσθαι αὐτοὺς  
λέγειν· οἰκειότερον γὰρ τοῖς ζῷοις, καὶ πλείω  
χρόνον ἐν τούτῳ διατελεῖ ἡ ψυχή. διὸ ἀνάγκη  
ἥτοι ὥσπερ ἐνιοι λέγουσι, πάντα τὰ φαινόμενα  
εἶναι ἀληθῆ, ἢ τὴν τοῦ ἀνομοίου θίξιν ἀπάτην  
6 εἶναι· τοῦτο γὰρ ἐναντίον τῷ τῷ δόμοιῷ τὸ ὅμοιον  
γνωρίζειν· δοκεῖ δὲ καὶ ἡ ἀπάτη καὶ ἡ ἐπιστήμη

<sup>1</sup> κεχωρισμένων B.

### ON THE SOUL, III. II.—III.

and instantaneous in action ; but in so far as it is divisible, it uses the same symbol twice at the same time. In so far, then, as it treats a limit as two things it passes judgement on two, and judges of two distinct things in its capacity as distinct ; but in so far as it judges of it as only one, it judges by one faculty and at one time.

Concerning the principle in virtue of which we call the living creature sensible, enough has been said.

III. But since men generally define the soul by two different faculties, movement in space on the one hand, and thinking, judging and perceiving on the other, they would seem to suppose that thinking and considering are forms of perception ; for in both cases the soul in a sense judges and has cognisance of what exists, and the older philosophers actually assert that thinking and perceiving are identical. For instance Empedocles has said, " Judgement will grow with a man according to what appears to him," and in another passage " whence their thinking continually appears to them in different forms." Homer's phrase, again, " Such is the nature of man's thought" <sup>a</sup> implies the same thing. For all these authors suppose the process of thinking to be a bodily function like perception, and that men both perceive and recognize like by like, as we have explained at the beginning of this treatise.<sup>b</sup> And yet they ought to have made some mention of error at the same time ; for error seems to be more natural to living creatures, and the soul spends more time in it. From this belief it will follow, as some say, that all things which appear to man are true, or that error is contact with the unlike ; for this is the opposite to recognizing like by like ; but it appears that error and knowledge

Relation  
between  
sensation  
and  
thinking.

427 b

τῶν ἐναντίων ἡ αὐτὴ εἶναι. ὅτι μὲν οὖν οὐ ταῦτόν ἐστι τὸ αἰσθάνεσθαι καὶ τὸ φρονεῖν, φανερόν· τοῦ μὲν γάρ πᾶσι μέτεστι, τοῦ δὲ ὀλίγοις τῶν ζώων. ἀλλ' οὐδὲ τὸ νοεῖν, ἐν ᾧ ἐστὶ τὸ ὄρθως 10 καὶ τὸ μὴ ὄρθως, τὸ μὲν ὄρθως φρόνησις καὶ ἐπιστήμη καὶ δόξα ἀληθής, τὸ δὲ μὴ ὄρθως τάνατία τούτων οὐδὲ τοῦτο ἐστὶ ταῦτὸ τῷ αἰσθάνεσθαι· ἡ μὲν γάρ αἴσθησις τῶν ιδίων ἀεὶ ἀληθής, καὶ πᾶσιν ὑπάρχει τοῖς ζώοις, διανοεῖσθαι δ' ἐνδέχεται καὶ φευδῶς, καὶ οὐδενὶ ὑπάρχει ὥς 15 μὴ καὶ λόγος· φαντασία γάρ ἔτερον καὶ αἰσθήσεως καὶ διανοίας· αὐτή τε οὐ γίγνεται ἀνευ αἰσθήσεως, καὶ ἀνευ ταύτης οὐκ ἐστιν ὑπόληψις. ὅτι δ' οὐκ ἐστιν ἡ αὐτὴ νόησις καὶ ὑπόληψις, φανερόν. τοῦτο μὲν γάρ τὸ πάθος ἐφ' ἡμῖν ἐστίν, ὅταν βουλώμεθα (πρὸ δύμμάτων γάρ ἐστι ποιήσασθαι, 20 ὥσπερ οἱ ἐν τοῖς μνημονικοῦσι τιθέμενοι καὶ εἰδωλοποιοῦντες), δοξάζειν δ' οὐκ ἐφ' ἡμῖν· ἀνάγκη γάρ ἡ φεύδεσθαι ἢ ἀληθεύειν. ἔτι δὲ ὅταν μὲν δοξάσωμεν δεινόν τι ἢ φοβερόν, εὐθὺς συμπάσχομεν, δόμοίως δὲ κανθαραλέον· κατὰ δὲ τὴν φαντασίαν ὥσαύτως ἔχομεν ὥσπερ ἂν οἱ θεώμενοι ἐν γραφῇ 25 τὰ δεινὰ ἢ θαρραλέα. εἰσὶ δὲ καὶ αὐτῆς τῆς ὑπολήψεως διαφοραί, ἐπιστήμη καὶ δόξα καὶ φρόνησις καὶ τάνατία τούτων, περὶ ὃν τῆς διαφορᾶς ἔτερος ἐστω λόγος.

Περὶ δέ τοῦ νοεῖν, ἐπεὶ ἔτερον τοῦ αἰσθάνεσθαι, τούτου δὲ τὸ μὲν φαντασία δοκεῖ εἶναι τὸ δὲ

<sup>a</sup> In normal cases if a man sees a red object, it is red.

### ON THE SOUL, III. III.

in the case of opposites are the same. Now it is quite clear that the processes of feeling and thinking are not the same ; for all living creatures have a share in the former, but only a few in the latter. Nor is it right to suppose that in thinking, which may be divided into correct and incorrect thinking, correct thinking is wisdom and knowledge and true opinion, and that incorrect thinking is the opposite of these ; nor is this the same thing as perceiving ; for the perception of individual things is always true,<sup>a</sup> and is a characteristic of all living creatures, but it is possible to think falsely, and this belongs to no animal which has not reasoning power ; for imagination is different both from perception and thought ; imagination does not occur without perception, and without imagination there is no belief. But that thinking and believing are not identical is obvious. For the former is an affection which lies in our power whenever we choose (for it is possible to put things before our eyes, just as those do who invent mnemonics and construct images), but it is not in our power to form opinions as we will ; for we must either hold a false opinion or a true one. Again, when we form an opinion that something is threatening or frightening, we are immediately affected by it, and the same is true of our opinion of something that inspires courage ; but in imagination we are like spectators looking at something dreadful or encouraging in a picture. There are also differences in belief itself, knowledge, opinion, thinking, and their opposites, but these differences must be the subject of another discussion.<sup>b</sup>

As for thought, since it is distinct from perception, <sup>Imagina-</sup>  
and is held to include both imagination and belief, it <sup>tion.</sup>

<sup>a</sup> ? *Eth. Nic.* 1139 b 15.

## ARISTOTLE

427<sup>b</sup> ὑπόληψις, περὶ φαντασίας διορίσαντας οὕτω περὶ  
 428<sup>a</sup> θατέρου λεκτέον. εἰ δή ἐστιν ἡ φαντασία καθ'  
 ἦν λέγομεν φάντασμά τι ἡμῖν γίγνεσθαι καὶ μὴ  
 εἴ τι κατὰ μεταφορὰν λέγομεν, μία τίς ἐστι τού-  
 των δύναμις ἡ ἔξις, καθ' ἦν κρίνομεν καὶ ἀλη-  
 θεύομεν ἡ φευδόμεθα. τοιαῦται δ' εἰσὶν αἰσθησις,  
 ἰδόξα, ἐπιστήμη, νοῦς. ὅτι μὲν οὖν οὐκ ἐστιν  
 αἰσθησις, δῆλον ἐκ τῶνδε. αἰσθησις μὲν γὰρ ἦτοι  
 δύναμις ἡ ἐνέργεια, οἷον ὄψις καὶ ὥρασις, φαίνεται  
 δέ τι καὶ μηδετέρου ὑπάρχοντος τούτων, οἷον τὰ  
 ἐν τοῖς ὑπνοῖς. εἴτα αἰσθησις μὲν ἀεὶ πάρεστι,  
 φαντασία δ' οὐ. εἰ δὲ τῇ ἐνεργείᾳ τὸ αὐτό, πᾶσιν  
 10 ἄν ἐνδέχοιτο τοῖς θηρίοις φαντασίαν ὑπάρχειν.  
 δοκεῖ δ' οὐ, οἷον μύρμηκι ἡ μελίτη ἡ σκώληκι.  
 εἴτα αἱ μὲν ἀληθεῖς αἱεὶ, αἱ δὲ φαντασίαι γίνονται  
 αἱ πλείους φευδεῖς. ἐπειτ' οὐδὲ λέγομεν, ὅταν  
 ἐνεργῶμεν ἀκριβῶς περὶ τὸ αἰσθητόν, ὅτι φαίνεται  
 τοῦτο ἡμῖν ἄνθρωπος· ἀλλὰ μᾶλλον ὅταν μὴ ἐν-  
 15 αργῶς αἰσθανώμεθα. καὶ ὅπερ δὲ ἐλέγομεν πρό-  
 τερον, φαίνεται καὶ μύουσιν ὄράματα. ἀλλὰ μὴν  
 οὐδὲ τῶν ἀεὶ ἀληθεύοντων οὐδεμίᾳ ἐσται, οἷον  
 ἐπιστήμη ἡ νοῦς· ἐστι γὰρ φαντασία καὶ φευδής.  
 λείπεται ἄρα ἴδειν εἰ δόξα· γίνεται γὰρ δόξα καὶ  
 20 ἀληθής καὶ φευδής. ἀλλὰ δόξῃ μὲν ἐπεται πίστις  
 (οὐκ ἐνδέχεται γὰρ δοξάζοντα οἷς δοκεῖ μὴ  
 πιστεύειν), τῶν δὲ θηρίων οὐθενὶ ὑπάρχει πίστις,  
 φαντασία δὲ πολλοῖς. ἔτι πάσῃ μὲν δόξῃ ἀκο-  
 λουθεῖ πίστις, πίστει δὲ τὸ πεπεῖσθαι, πειθοῖ δὲ  
 λόγος· τῶν δὲ θηρίων ἐνίοις φαντασία μὲν ὑπάρχει,  
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### ON THE SOUL, III. iii.

will be best to discuss it after having completed our definition of imagination. If imagination is the process by which we say that an image is presented to us, and not anything which we call imagination metaphorically, it is one of those faculties or states of mind by which we judge and speak truly or falsely. Of this kind are sensation, opinion, knowledge and mind. It is clear from the following considerations that imagination is not sensation. Sensation is either potential or actual, such as either vision or seeing, but imagination occurs when neither of these is present, as when objects are seen in dreams. Secondly, sensation is always present but imagination is not. If sensation and imagination were identical in activity, then imagination would be possible for all wild animals ; and this appears not to be the case ; for instance it is not true of the ant, the bee, or the earthworm. Again, all sensations are true, but most imaginations are false. So we do not say when we are concerned with accurate observation of the sensible object that this seems to us to be a man ; but only when we do not perceive distinctly. And, as we have said before, things are seen by men even with their eyes shut. Nor is imagination one of the faculties which always speaks the truth, such as knowledge or mind ; for imagination may be false. It remains, then, to consider whether it is opinion ; for opinion may be either true or false. But conviction follows opinion (for one cannot hold opinions by which one is not convinced), but no animal has conviction, but many have imagination. Again, conviction is associated with every opinion, being persuaded with conviction, and reason with conviction ; but some wild animals have imagination, but none

## ARISTOTLE

428 a 25 λόγος δ' οὗ. φανερὸν τοίνυν ὅτι οὐδὲ δόξα μετ' αἰσθήσεως, οὐδὲ δι' αἰσθήσεως, οὐδὲ συμπλοκὴ δόξης καὶ αἰσθήσεως φαντασία ἀν εἴη, διά τε ταῦτα καὶ δῆλον ὅτι οὐκ ἄλλον τινός ἐστιν ἡ δόξα, ἀλλ' ἐκείνου ἐστὶν οὖν καὶ αἰσθησις. λέγω δ', ἐκ τῆς τοῦ λευκοῦ δόξης καὶ αἰσθήσεως ἡ 30 συμπλοκὴ φαντασία ἐστίν· οὐ γάρ δὴ ἐκ τῆς δόξης

428 b μὲν τῆς τοῦ ἀγαθοῦ, αἰσθήσεως δὲ τῆς τοῦ λευκοῦ. τὸ οὖν φαίνεσθαι ἐστι τὸ δοξάζειν ὅπερ αἰσθάνεται μὴ κατὰ συμβεβηκός. φαίνεται δὲ καὶ ψευδῆ, περὶ ὧν ἄμα ὑπόληψιν ἀληθῆ ἔχει, οἶνον φαίνεται μὲν ὁ ἥλιος ποδιαῖος, πεπίστευται δ' εἶναι μείζων 5 τῆς οὐκουμένης· συμβαίνει οὖν ἡτοι ἀποβεβληκέναι τὴν ἔαυτοῦ ἀληθῆ δόξαν, ἥν εἶχε, σωζομένου τοῦ πράγματος, μὴ ἐπιλαθόμενον μηδὲ μεταπεισθέντα, ἡ εἰ ἔτι ἔχει, ἀνάγκη τὴν αὐτὴν ἀληθῆ εἶναι καὶ ψευδῆ. ἀλλὰ ψευδῆς ἐγένετο, ὅτε λάθοι μεταπεσὸν τὸ πρᾶγμα. οὐτ' ἄρα ἐν τι τούτων 10 ἐστὶν οὕτ' ἐκ τούτων ἡ φαντασία.

'Αλλ' ἐπειδή ἐστι κινηθέντος τουδὶ κινεῖσθαι ἔτερον ὑπὸ τούτου, ἡ δὲ φαντασία κίνησίς τις δοκεῖ εἶναι καὶ οὐκ ἄνευ αἰσθήσεως γίγνεσθαι ἀλλ' αἰσθανομένοις καὶ ὧν αἰσθησις ἐστίν, ἐστι δὲ γίγνεσθαι κίνησιν ὑπὸ τῆς ἐνεργείας τῆς αἰσθήσεως, καὶ ταύτην ὁμοίαν ἀνάγκη εἶναι τῇ αἰσθήσει, 15 εἴη ἀν αὐτῇ ἡ κίνησις οὔτε ἄνευ αἰσθήσεως ἐνδεχομένη οὔτε μὴ αἰσθανομένοις ὑπάρχειν, καὶ πολλὰ κατ' αὐτὴν καὶ ποιεῖν καὶ πάσχειν τὸ ἔχον, καὶ εἶναι καὶ ἀληθῆ καὶ ψευδῆ. τοῦτο δὲ συμβαίνει

### ON THE SOUL, III. III.

has reasoning power. It is clear, then, that neither does opinion exist in conjunction with perception, nor does it arise through perception, nor could imagination be a blending of opinion and sensation, and therefore it is clear that opinion is not concerned with anything else, but belongs to that to which sensation belongs ; I mean that imagination is a compound of an opinion of white with a sensation of white ; it could not be compounded of an opinion of good with a sensation of white. In that case imagination would be the forming of a direct opinion upon what we perceive not incidentally. But it is possible for things to have a false appearance about which we have a true belief ; for instance the sun appears to measure a foot across, but we are convinced that it is greater than the inhabited globe ; imagination appears, then, in this case either to have rejected the true opinion which it had, without any alteration in the thing itself, and without our forgetting or changing our minds, or, if we still hold our view, then the same opinion must be both true and false. A true opinion of course becomes false when we do not see that the facts have changed. Imagination, then, is not one of these things, nor a compound of them.

But since when a particular thing is moved another thing may be moved by it, and since imagination seems to be some kind of movement, and not to occur apart from sensation, but only to men when perceiving, and in connexion with what they perceive, and since movement is caused by the activity of sensation, and this activity must be similar to the sensation, this movement would be impossible without sensation, and could not exist in insentient beings, and in the light of it the possessor acts and is acted upon in many ways, and these effects may be both true and false. This occurs for the

The region  
of error.

## ARISTOTLE

428 <sup>b</sup>

διὰ τάδε. ἡ αἰσθησις τῶν μὲν ἴδιων ἀληθῆς ἐστιν  
 ἡ ὅτι ὀλίγιστον ἔχουσα τὸ ψεῦδος. δεύτερον δὲ  
 τοῦ συμβεβηκέναι ταῦτα· καὶ ἐνταῦθα ἥδη ἐνδέ-  
 χεται διαφεύδεσθαι· ὅτι μὲν γάρ λευκόν, οὐ ψεύ-  
 δεται, εἰ δὲ τοῦτο τὸ λευκὸν ἡ ἄλλο τι, ψεύδεται.  
 τρίτον δὲ τῶν κοινῶν καὶ ἐπομένων τοῖς συμ-  
 βεβηκόσιν, οἷς ὑπάρχει τὰ ἴδια· λέγω δ' οἷον  
 κίνησις καὶ μέγεθος, ἀ συμβέβηκε τοῖς αἰσθητοῖς,  
 25 περὶ ἀ μάλιστα ἥδη ἐστιν ἀπατηθῆναι κατὰ τὴν  
 αἰσθησιν. ἡ δὲ κίνησις ἡ ὑπὸ τῆς ἐνεργείας γνο-  
 μένη διοίσει τῆς αἰσθήσεως τῆς ἀπὸ τούτων τῶν  
 τριῶν αἰσθήσεων. καὶ ἡ μὲν πρώτη παρούσης  
 τῆς αἰσθήσεως ἀληθῆς, αἱ δ' ἔτεραι καὶ παρούσης  
 καὶ ἀπούσης εἰναι ἀν ψευδεῖς, καὶ μάλιστα ὅταν  
 30 πόρρω τὸ αἰσθητὸν ἥ. εἰ οὖν μηθὲν μὲν ἄλλο  
 429 <sup>a</sup> ἔχει τὰ εἰρημένα ἡ μὴ φαντασίαν, τοῦτο δ' ἐστὶ  
 τὸ λεχθέν, ἡ φαντασία ἀν εἴη κίνησις ὑπὸ τῆς  
 αἰσθήσεως τῆς κατ' ἐνέργειαν γιγνομένης. ἐπεὶ  
 δ' ἡ ὅψις μάλιστα αἰσθησίς ἐστι, καὶ τὸ ὅνομα  
 ἀπὸ τοῦ φάους εἴληφεν, ὅτι ἀνευ φωτὸς οὐκ ἐστιν  
 5 ἴδειν. καὶ διὰ τὸ ἐμμένειν καὶ ὅμοιώς εἶναι ταῖς  
 αἰσθήσεσι, πολλὰ κατ' αὐτὰς πράττει τὰ ζῶα, τὰ  
 μὲν διὰ τὸ μὴ ἔχειν νοῦν, οἷον τὰ θηρία, τὰ δὲ  
 διὰ τὸ ἐπικαλύπτεσθαι τὸν νοῦν ἐνίστε πάθει ἡ  
 νόσοις ἡ ὑπνω, οἷον οἱ ἀνθρωποι. περὶ μὲν οὖν  
 φαντασίας, τί ἐστι καὶ διὰ τί ἐστιν, εἰρήσθω ἐπὶ  
 τοσοῦτον.

10 IV. Περὶ δὲ τοῦ μορίου τοῦ τῆς ψυχῆς φ γινώ-  
 σκει τε ἡ ψυχὴ καὶ φρονεῖ, εἴτε χωριστοῦ ὅντος

### ON THE SOUL, III. iii.—iv.

following reasons. The sensation of particular things is true, or is only capable of error to the least possible degree. In the second place perception recognizes that these things are accidental, and therefore there is a possibility of error; for perception does not err in perceiving that this is white, but only as to whether it is this white object or another. Thirdly, sensation is of properties, which are shared and follow the accidental qualities to which the individual things belong; I mean such things as movement and size, which are accidental properties of sensible objects, concerning which it is emphatically possible to be deceived in sense. But the movement produced by the activity will differ from the sensation which arises from these three senses. The first is true whenever the sensation is present, but the others may be false both when it is present and when it is absent, and especially when the sensible object is at a distance. If, then, the facts stated involve the presence of nothing but imagination, and if this is as we have described, then imagination would be a movement produced by sensation actively operating. But since vision is pre-eminently sensation, the name *φαντασία* (imagination) is derived from *φῶς* (light), because without light it is impossible to see. Again, because imagination resides within us and corresponds with the senses, living creatures frequently act in accordance with them, sometimes because they have no mind, like the wild animals, and sometimes the mind is temporarily clouded over by feeling, or disease, or sleep, as in man. Let this suffice about the nature and cause of imagination.

IV. Concerning that part of the soul with which it knows and thinks, whether it is separable, or not

Feeling and  
thinking  
are not  
analogous.

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εἴτε καὶ μὴ χωριστοῦ κατὰ μέγεθος ἀλλὰ κατὰ λόγον, σκεπτέον τὸν ἔχει διαφοράν, καὶ πῶς ποτὲ γίνεται τὸ νοεῖν. εἰ δή ἐστι τὸ νοεῖν ὥσπερ τὸ αἰσθάνεσθαι, ἢ πάσχειν τι ἀν εἴη ὑπὸ τοῦ νοητοῦ 15 ἢ τι τοιοῦτον ἔτερον. ἀπαθὲς ἄρα δεῖ εἶναι, δεκτικὸν δὲ τοῦ εἴδους καὶ δυνάμει τοιοῦτον ἀλλὰ μὴ τοῦτο, καὶ ὅμοίως ἔχειν, ὥσπερ τὸ αἰσθητικὸν πρὸς τὰ αἰσθητά, οὕτω τὸν νοῦν πρὸς τὰ νοητά. ἀνάγκη ἄρα, ἐπεὶ πάντα νοεῖν, ἀμιγῆ εἶναι, ὥσπερ φησὶν Ἀναξαγόρας, ἵνα κρατῇ, τοῦτο δὲ ἐστὶν ἵνα 20 γνωρίζῃ· παρεμφαινόμενον γάρ κωλύει τὸ ἀλλότριον καὶ ἀντιφράττει, ὥστε μηδὲ αὐτοῦ εἶναι φύσιν μηδεμίαν ἀλλ’ ἢ ταύτην, ὅτι δυνατόν. ὁ ἄρα καλούμενος τῆς ψυχῆς νοῦς (λέγω δὲ νοῦν ὡς διαινοεῖται καὶ ὑπολαμβάνει ἡ ψυχή) οὐθέν ἐστιν ἐνεργείᾳ τῶν ὅντων πρὶν νοεῖν. διὸ οὐδὲ μεμῆθαι 25 εὔλογον αὐτὸν τῷ σώματι ποιός τις γάρ ἀν γίγνοιτο, ψυχρὸς ἢ θερμός, ἢ κανὸργανόν τι εἴη, ὥσπερ τῷ αἰσθητικῷ· νῦν δὲ οὐθέν ἐστιν. καὶ εὖ δὴ οἱ λέγοντες τὴν ψυχὴν εἶναι τόπον εἰδῶν, πλὴν ὅτι οὕτε ὅλη ἀλλ’ ἡ νοητική, οὕτε ἐντελεχείᾳ ἀλλὰ 30 δυνάμει τὰ εἴδη. ὅτι δὲ οὐχ ὅμοία ἡ ἀπάθεια τοῦ αἰσθητικοῦ καὶ τοῦ νοητικοῦ, φανερὸν ἐπὶ τῶν αἰσθητηρίων καὶ τῆς αἰσθήσεως. ἡ μὲν γάρ 429 b αἰσθησις οὐ δύναται αἰσθάνεσθαι ἐκ τοῦ σφόδρα αἰσθητοῦ, οἷον ψόφου ἐκ τῶν μεγάλων ψόφων, οὐδὲ

### ON THE SOUL, III. iv.

separable actually but only in thought, we have to consider what is its distinguishing characteristic, and how the process of thinking arises. If the process of thinking is analogous to feeling, it must be something acted on by the thing thought, or something else of a similar kind. It must (accurately speaking) be not acted upon, but receptive of the form, and potentially of this character though not actually so, and the relation of the thinking capacity to the thing thought must be similar to the relation between the feeling capacity and the thing felt. It is necessary then, seeing that it thinks all thoughts, for it to be unmixed, as Anaxagoras says, in order that it may be in control, that is, that it may know ; for otherwise the foreign body, if it obtruded itself, would hinder and exclude, so that the mind in itself can have no characteristic except its capacity to receive. That part of the soul, then, which we call mind (by mind I mean that part by which the soul thinks and attains belief) has no actual existence until it thinks. So it is unreasonable to suppose that it is mixed with the body ; for in that case it would have a quality of some kind, e.g. hot or cold, or would be an organ of some kind, as is the case with what perceives. But, as it is, it has no existence. It has been well said that the soul is the place of forms, except that this does not apply to the soul as a whole, but only in its thinking capacity, and the forms are not actual but only potential. But that the perceptive and thinking faculties are not alike in their incapacity to be acted upon is obvious in the case of the sense organs and sensation. For the sense cannot feel at all under the action of a too violent sensible object ; for instance sounds are not heard when they are loud, and neither

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ἐκ τῶν ἴσχυρῶν χρωμάτων καὶ ὁσμῶν οὕτε ὄραν  
οὕτε ὁσμᾶσθαι· ἀλλ' ὁ νοῦς ὅταν τι νοήσῃ σφόδρα  
νοητόν, οὐχ ἥττον νοεῖ τὰ ὑποδεέστερα, ἀλλὰ καὶ  
τοῦ μᾶλλον· τὸ μὲν γὰρ αἰσθητικὸν οὐκ ἄνευ σώματος,  
ὅ δὲ χωριστός. ὅταν δ' οὕτως ἔκαστα γένηται  
ώς ἐπιστήμων λέγεται ὁ κατ' ἐνέργειαν (τοῦτο δὲ  
συμβαίνει, ὅταν δύνηται ἐνεργεῖν δι' αὐτοῦ), ἔστι  
μὲν<sup>1</sup> καὶ τότε δυνάμει πως, οὐ μὴν ὅμοιῶς καὶ  
πρὸν μαθεῖν ἢ εὑρεῖν· καὶ αὐτὸς δὲ αὐτὸν τότε  
δύναται νοεῖν.

Ἐπεὶ δ' ἄλλο ἔστι τὸ μέγεθος καὶ τὸ μεγέθει  
εἶναι καὶ ὕδωρ καὶ ὕδατι εἶναι· οὕτω δὲ καὶ ἐφ'  
ἐτέρων πολλῶν, ἀλλ' οὐκ ἐπὶ πάντων· ἐπ' ἐνίων  
γὰρ ταῦτόν ἔστι τὸ σαρκὶ εἶναι καὶ σάρκα· ἡ ἄλλω  
ἢ ἄλλως ἔχοντι κρίνει· ἡ γὰρ σάρξ οὐκ ἄνευ τῆς  
ὑλῆς, ἀλλ' ὥσπερ τὸ σιμὸν τόδε ἐν τῷδε. τῷ  
μὲν οὖν αἰσθητικῷ τὸ θερμὸν καὶ τὸ ψυχρὸν κρίνει,  
καὶ ὅν λόγος τις ἡ σάρξ· ἄλλω δὲ ἥτοι χωριστῷ,  
ἢ ὡς ἡ κεκλασμένη ἔχει πρὸς αὐτὴν ὅταν ἐκταθῇ,  
τὸ σαρκὶ εἶναι κρίνει. πάλιν δ' ἐπὶ τῶν ἐν ἀφ-  
αιρέσει ὄντων τὸ εὐθὺν ὡς τὸ σιμόν· μετὰ συνεχοῦς  
γάρ· τὸ δὲ τί ἦν εἶναι, εἰ ἔστιν ἐτέρον τὸ εὐθεῖν  
εἶναι καὶ τὸ εὐθὺν ἄλλω· ἔστω γὰρ δυάς. ἐτέρῳ  
ἄρα ἡ ἐτέρως ἔχοντι κρίνει. καὶ ὅλως ἄρα ὡς

<sup>1</sup> ἔστι μὲν ὅμοιως B.

### ON THE SOUL, III. iv.

seeing nor smelling is possible when colour and scents are strong ; but when the mind thinks an intense thought, it is not less able to think of slighter things, but even more able ; for the faculty of sense is not apart from the body, whereas the mind is separable. But when the mind has achieved the power of thinking all thoughts, as the learned man when active is said to have done (and this happens, when he can exercise his functions by himself), even then the mind is in a sense potential, though not quite in the same way as before it learned and discovered ; and so, then, the mind is capable of thinking itself.

Now size concrete and size in the abstract are different things, so is water and wateriness ; and so also in many other cases but not in all ; for instance at times fleshiness and flesh are the same thing ; the mind then judges these by a different faculty, or by a faculty in a different condition ; for flesh cannot exist without its matter, but just like "snub-nosed" is a definite form in a definite matter. Now it is by the perceptive faculty that sense judges hot and cold, and all the things of which flesh is the explanation ; but it is by a different sense, either quite distinct, or related to it in the same way as a bent line to itself when pulled out straight, that we judge what fleshiness is ; again, among abstractions straightness is similar to snub-nosed, for it is always combined with extension ; but its essential nature, if "straight" and "straightness" are different things, it judges by another sense. We may grant that its definition is the number Two ; but in that case it judges by another faculty, or by the same faculty in a different condition. And speaking generally, as objects are

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χωριστὰ τὰ πράγματα τῆς ὕλης, οὗτω καὶ τὰ περὶ τὸν νοῦν.

’Απορήσειε δ’ ἄν τις, εἰ ὁ νοῦς ἀπλοῦν ἔστι καὶ ἀπαθὲς καὶ μηθενὶ μηθὲν ἔχει κοινόν, ὥσπερ φησὶν

25 ’Αναξαγόρας, πῶς νοήσει, εἰ τὸ νοεῖν πάσχειν τί ἔστιν. ἦ γάρ τι κοινὸν ἀμφοῖν ὑπάρχει, τὸ μὲν ποιεῖν δοκεῖ τὸ δὲ πάσχειν. ἔτι δ’ εἰ νοητὸς καὶ αὐτός. ἦ γάρ τοῖς ἄλλοις ὁ νοῦς ὑπάρξει (εἰ μὴ κατ’ ἄλλο αὐτὸς νοητός, ἐν δέ τι τὸ νοητὸν εἴδει), ἦ μεμιγμένον τι ἔξει, ὃ ποιεῖ νοητὸν αὐτὸν ὥσπερ

80 τάλλα. ἦ τὸ μὲν πάσχειν κατὰ κοινόν τι διηγηται πρότερον, δῆτι δυνάμει πώς ἔστι τὰ νοητὰ ὁ νοῦς, ἀλλ’ ἐντελεχείᾳ οὐδέν, πρὶν ἄν νοῆ. δεῖ δὲ οὕτως 480 a ὥσπερ ἐν γραμματείᾳ φὶ μηθὲν ὑπάρχει ἐντελεχείᾳ γεγραμμένον. διπέρ συμβαίνει ἐπὶ τοῦ νοῦ. καὶ αὐτὸς δὲ νοητός ἔστιν ὥσπερ τὰ νοητά. ἐπὶ μὲν γάρ τῶν ἄνευ ὕλης τὸ αὐτό ἔστι τὸ νοοῦν καὶ τὸ 5 νοούμενον. ἦ γάρ ἐπιστήμη ἦ θεωρητικὴ καὶ τὸ οὕτως ἐπιστητὸν τὸ αὐτό ἔστιν. τοῦ δὲ μὴ ἀεὶ νοεῖν τὸ αἴτιον ἐπισκεπτέον. ἐν δὲ τοῖς ἔκαστοις ὕλην δυνάμει ἔκαστον ἔστι τῶν νοητῶν. ὥστ’ ἐκείνοις μὲν οὐχ ὑπάρξει νοῦς (ἄνευ γάρ ὕλης δύναμις ὁ νοῦς τῶν τοιούτων), ἐκείνῳ δὲ τὸ νοητὸν ὑπάρξει.

<sup>a</sup> This and the succeeding sentence are not very satisfactory; but A. is apparently arguing that if mind is *sui generis* it cannot be an object of thought, for this would put it in the same class as other objects of thought.

<sup>b</sup> Cf. *Met.* xi. 7 and 9.

## ON THE SOUL, III. iv.

separable from their matter so also are the functions of the mind.

One might, then, raise the question, if the mind is a simple thing, and not liable to be acted upon, and has nothing in common with anything else, as Anaxagoras says, how will it think, if thinking is a form of being (1) How does the mind think ? acted upon ? For in so far as there is something in it common to both, it seems partly acting and partly being acted upon. And our second problem is (2) Is the mind an object of thought ? " For either the mind will belong to the same category as other objects (if, that is, mind is an object of thought in itself and not in virtue of something else, what is thought being always identical in form), or else it will contain some mixed element, which makes it an object of thought like other things. Or there is the explanation which we have given before of the phrase " being acted upon in virtue of some common element," that the objects of thought and the mind are potentially identical but not actually so, until the mind thinks. This would be in the same sense as when we say that a tablet which is empty is potentially written upon ; which actually occurs in the case of the mind. It is, then, itself an object of thought, just like other objects of thought.<sup>b</sup> For in the case of things without matter the process of thinking and being thought are the same ; just as speculative thinking is the same thing as the object speculatively thought ; but we must consider the cause of our not always thinking. But among things having matter potentially, each is an object of thought. So that mind will not belong to the object thought (for mind in such cases is potential and without matter), but the object of thought will belong to the mind.

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10 V. Ἐπεὶ δ' ὥσπερ ἐν ἀπάσῃ τῇ φύσει ἔστι τι  
 τὸ μὲν ὅλη ἑκάστῳ γένει (τοῦτο δὲ ὁ πάντα  
 δυνάμει ἐκεῖνα), ἔτερον δὲ τὸ αἴτιον καὶ ποιητικόν,  
 τῷ ποιεῖν πάντα, οἷον ἡ τέχνη πρὸς τὴν ὅλην  
 πέπονθεν, ἀνάγκη καὶ ἐν τῇ ψυχῇ ὑπάρχειν ταῦτα  
 τὰς διαφοράς. καὶ ἔστιν δὲ μὲν τοιοῦτος νοῦς τῷ  
 15 πάντα γίνεσθαι, δὲ τῷ πάντα ποιεῖν, ὡς ἔξις  
 τις, οἷον τὸ φῶς· τρόπον γάρ τινα καὶ τὸ φῶς  
 ποιεῖ τὰ δυνάμει ὅντα χρώματα ἐνεργείᾳ χρώματα.  
 καὶ οὗτος δὲ νοῦς χωριστὸς καὶ ἀπαθῆς καὶ ἀμιγῆς  
 τῇ οὐσίᾳ ὡν ἐνεργείᾳ. ἀεὶ γάρ τιμιώτερον τὸ  
 ποιοῦν τοῦ πάσχοντος καὶ ἡ ἀρχὴ τῆς ὅλης. τὸ  
 20 δὲ αὐτόν ἔστιν ἡ κατ' ἐνέργειαν ἐπιστήμη τῷ πράγ-  
 ματι· ἡ δὲ κατὰ δύναμιν χρόνῳ προτέρα ἐν τῷ  
 ἐνί, ὅλως δὲ οὐ χρόνῳ· ἀλλ' οὐχ ὅτε μὲν νοεῖ ὅτε  
 δὲ οὐ νοεῖ. χωρισθεὶς δὲ ἔστι μόνον τοῦθ' ὅπερ  
 ἔστι, καὶ τοῦτο μόνον ἀθάνατον καὶ ἀΐδιον. οὐ  
 μημονεύομεν δέ, ὅτι τοῦτο μὲν ἀπαθές, δὲ  
 25 παθητικὸς νοῦς φθαρτός, καὶ ἄνευ τούτου οὐθὲν  
 νοεῖ.

VI. Ἡ μὲν οὖν τῶν ἀδιαιρέτων νόσησις ἐν τούτοις,  
 περὶ ἀ οὐκ ἔστι τὸ ψεῦδος· ἐν οἷς δὲ καὶ τὸ ψεῦδος  
 καὶ τὸ ἀληθές, σύνθεσίς τις ἡδη νοημάτων ὥσπερ  
 ἐν ὅντων, καθάπερ Ἐμπεδοκλῆς ἔφη “ἢ πολλῶν  
 80 μὲν κόρσαι ἀναύχενες ἐβλάστησαν,” ἔπειτα συν-  
 τίθεσθαι τῇ φιλίᾳ. οὕτω καὶ ταῦτα κεχωρισμένα  
 συντίθεται, οἷον τὸ ἀσύμμετρον καὶ ἡ διάμετρος,  
 480 b ἀν δὲ γινομένων ἡ ἐσομένων, τὸν χρόνον προσ-

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V. But since in all nature each class has its matter (this is what they all are potentially), and separate from this is the cause and the agent, in virtue of its making all things, just as art is related to its matter, so similar distinctions must exist in the soul. Mind is then of one kind in virtue of its becoming everything, and of another by making everything, as a state like light; for in a sense light makes what are potentially colours into actual colours. And this mind when acting is separable, not acted upon and unmixed in its essence. For acting upon is always superior to being acted upon, and the final cause superior to the matter. But knowledge, when acting, is identical with its object. The potential is prior in time to the actual in a single individual, but speaking generally it is not prior in time; the mind does not think at times, and at other times not think. But it only realizes its true nature when it is separated, and this is the only time when it is immortal and everlasting. We do not remember because the mind in this sense cannot be acted upon, but the mind which is acted upon is perishable and without this does not think.

VI. Thinking of indivisible units occurs among things concerning which there is no possibility of falsehood; in cases where truth and falsehood are possible, there is a compounding of thoughts made into a fresh unity, as Empedocles said, "whereby the heads of many beings grew without necks," and then were joined together by Love. So also these separate entities are combined, as for instance the incommensurable and the diagonal. But if the thinking is concerned with things becoming or about to exist, then in its thought it adds and combines

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430<sup>10</sup> ευνοῶν καὶ συντιθείσ. τὸ γὰρ ψεῦδος ἐν συνθέσει ἀεί· καὶ γὰρ ἀν τὸ λευκὸν μὴ λευκόν, τὸ μὴ λευκὸν συνέθηκεν. ἐνδέχεται δὲ καὶ διαιρεσιν φάναι πάντα. ἀλλ' οὖν ἔστι γε οὐ μόνον τὸ ψεῦδος ἢ ἀληθές, ὅτι λευκὸς Κλέων ἔστιν, ἀλλὰ καὶ ὅτι ἦν ἢ ἔσται. τὸ δὲ ἐν ποιοῦν, τοῦτο ὁ νοῦς ἔκαστον.

Τὸ δ' ἀδιαιρετον ἐπεὶ διχῶς, ἢ δυνάμει ἢ ἐνεργείᾳ, οὐθὲν κωλύει νοεῦν τὸ ἀδιαιρετον, ὅταν νοῇ τὸ μῆκος· ἀδιαιρετον γὰρ ἐνεργείᾳ καὶ ἐν χρόνῳ ἀδιαιρέτῳ ὅμοίως γὰρ δὲ χρόνος διαιρετὸς 10 καὶ ἀδιαιρετος τῷ μήκει. οὐκον ἔστιν εἰπεῖν ἐν τῷ ἡμίσει τί ἐννοεῖν ἔκατέρῳ· οὐ γάρ ἔστιν, ἀν μὴ διαιρεθῆ, ἀλλ' ἢ δυνάμει. χωρὶς δ' ἔκάτερον νοῶν τῶν ἡμίσεων διαιρεῖ καὶ τὸν χρόνον ἄμα· τότε δ' οἰονεὶ μήκη. εἰ δ' ὡς ἐξ ἀμφοῖν, καὶ ἐν τῷ χρόνῳ τῷ ἐπ' ἀμφοῖν.

15 Τὸ δὲ μὴ κατὰ ποσὸν ἀδιαιρετον ἀλλὰ τῷ εἴδει νοεῖν ἐν ἀδιαιρέτῳ χρόνῳ καὶ ἀδιαιρέτῳ τῆς ψυχῆς· κατὰ συμβεβηκὸς δέ, καὶ οὐχ ἢ ἔκεινα διαιρετά, ὡς νοεῖ καὶ ἐν ὧ χρόνῳ, ἀλλ' ἢ ἀδιαιρετα· ἔνεστι γὰρ κάν τούτοις τι ἀδιαιρετον, ἀλλ' ἵσως οὐ χωριστόν, δὲ ποιεῖ ἔνα τὸν χρόνον καὶ τὸ μῆκος. 20 καὶ τοῦθ' ὅμοίως ἐν ἅπαντί ἔστι τῷ συνεχεῖ καὶ χρόνῳ καὶ μήκει. ἢ δὲ στιγμὴ καὶ πᾶσα διαιρεσις, καὶ τὸ οὕτως ἀδιαιρετον, δηλοῦται ὥσπερ ἢ

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the notion of time. For falsehood always lies in the process of combination, for if a man calls white not-white, he has combined the notion not-white. It is equally possible to say that everything involves division. But it is not merely true or false to say that Cleon is white, but we must add that he was or will be. But the principle which unifies is in every case the mind.

But because the indivisible has two senses—  
Indivisible has two meanings.  
potential or actual—there is nothing to prevent the mind from thinking of the indivisible when it thinks of length ; for it is in actuality indivisible, and is in indivisible time. Time is also both divisible and indivisible in the same sense as length. So it is impossible to say what the mind thinks in each half of the time ; for it has no existence, unless it is divided, except potentially. But by thinking of each of the halves separately, it divides the time and the line as well, and then thinks of the line as two lengths. But if the mind is thinking of the line as composed of two halves, so also it is considering the time as composed of two halves.

But when the object of thought is not quantitatively indivisible, but only in form, the mind thinks of it in indivisible time, and with the indivisible faculty of the soul ; but incidentally this whole is divisible, not in the sense in which the faculty used and the time are divisible, but in the sense in which they are indivisible ; for there is an indivisible element even in these, though perhaps incapable of separate existence, which makes the line and the length one. And this is equally true of every continuous thing whether time or length. A point and every sort of division and everything undivided in this

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στέρησις. καὶ ὅμοιος ὁ λόγος ἐπὶ τῶν ἄλλων, οἷον πῶς τὸ κακὸν γνωρίζει ἢ τὸ μέλαν· τῷ ἐναντίῳ γάρ πως γνωρίζει. δεῖ δὲ δυνάμει εἶναι τὸ γνωρίζον καὶ ἐνεῖναι ἐν αὐτῷ. εἰ δέ τινι μή 25 ἐστιν ἐναντίον,<sup>1</sup> αὐτὸν ἔαυτὸν γινώσκει καὶ ἐνεργείᾳ ἐστὶ καὶ χωριστόν. ἔστι δ' ἡ μὲν φάσις τι κατά τινος, ὥσπερ ἡ κατάφασις, καὶ ἀληθής ἡ ψευδής πᾶσα· ὁ δὲ νοῦς οὐ πᾶς, ἀλλ' ὁ τοῦ τι ἐστι κατὰ τὸ τι ἦν εἶναι ἀληθής, καὶ οὐ τὶ κατά τινος· ἀλλ' 30 ὥσπερ τὸ ὄραν τοῦ ἴδιου ἀληθές, εἰ δ' ἄνθρωπος τὸ λευκὸν ἡ μή, οὐκ ἀληθὲς ἀεί, οὕτως ἔχει ὅσα ἀνεν ὕλης.

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VII. Τὸ δ' αὐτό ἐστιν ἡ κατ' ἐνέργειαν ἐπιστήμη τῷ πράγματι. ἡ δὲ κατὰ δύναμιν χρόνῳ προτέρᾳ ἐν τῷ ἐνί, ὅλως δὲ οὐδὲ χρόνῳ· ἔστι γὰρ ἐξ ἐντελεχείᾳ ὅντος πάντα τὰ γιγνόμενα. φαίνεται δὲ 5 τὸ μὲν αἰσθητὸν ἐκ δυνάμει ὅντος τοῦ αἰσθητικοῦ ἐνεργείᾳ ποιοῦν· οὐ γὰρ πάσχει οὐδὲ ἀλλοιοῦται. διὸ ἄλλο εἶδος τοῦτο κινήσεως· ἡ γὰρ κίνησις τοῦ ἀτελοῦς ἐνέργεια ἦν, ἡ δ' ἀπλῶς ἐνέργεια ἔτερα ἡ τοῦ τετελεσμένου. τὸ μὲν οὖν αἰσθάνεσθαι 10 ὅμοιον τῷ φάναι μόνον καὶ νοεῖν· ὅταν δὲ ἡδὺ ἡ λυπηρόν, οἷον καταφάσα τὴν ἀποφάσα, διώκει ἡ φεύγει· καὶ ἔστι τὸ ἥδεσθαι καὶ λυπεῖσθαι τὸ ἐνεργεῖν τῇ αἰσθητικῇ μεσότητι πρὸς τὸ ἀγαθὸν ἡ κακόν, ἡ τοιαῦτα. καὶ ἡ φυγὴ δὲ καὶ ἡ ὅρεξις τοῦτο ἡ κατ' ἐνέργειαν, καὶ οὐχ ἔτερον τὸ

<sup>1</sup> ἐναντίον τῶν αἰτιῶν B.

### ON THE SOUL, III. vi.—vii.

sense is made clear to us in the case of negation. And the same reasoning applies in other cases ; for instance how the mind knows evil or black ; for it recognizes each in some sense by its opposite. But the recognizing faculty must reside potentially in the mind. But if there is anything which has no opposite then it recognizes itself, and is also in actuality separate. But a statement asserts something of something like any affirmation, and every one is either true or false ; but this is not always so with the mind : when it is dealing with the nature of a thing in the abstract sense, and not with any particular example of it, it is always true ; just as vision of a particular thing is always true, but when seeing whether the white object is a man or not, it is not always true, so it is with every quality apart from its matter.

VII. Knowledge when actively operative is identical with its object. In the individual potential knowledge has priority in time, but speaking absolutely it has no such priority ; for that which becomes grows out of that which actually is. And clearly the sensible object makes the sense capacity actually operative from being only potential ; it is not acted upon, nor does it undergo change of state ; and so, if it is motion, it is motion of a distinct kind ; for movement is the activity of the imperfect, but movement in the simplest sense, that is movement of the perfect, is different. Sensation, then, is like mere assertion and mere thinking ; when sensation asserts or denies that something is pleasant or unpleasant, it pursues or avoids it. In fact to feel pleasure or pain is to adopt an attitude with the sensitive mean towards good and evil as such. This is what avoidance or pursuit, when active, really means, and the

*The practical intellect in operation.*

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όρεκτικὸν καὶ φευκτικόν, οὕτ' ἀλλήλων οὕτε τοῦ αἰσθητικοῦ ἀλλὰ τὸ εἶναι ἄλλο. τῇ δὲ διανοητικῇ 15 ψυχῇ τὰ φαντάσματα οἷον αἰσθήματα ὑπάρχει. ὅταν δὲ ἀγαθὸν ἢ κακὸν φήσῃ ἢ ἀποφήσῃ, φεύγει ἢ διώκει. διὸ οὐδέποτε νοεῖ ἄνευ φαντάσματος ἢ ψυχή, ὥσπερ δὲ ὁ ἀήρ τὴν κόρην τοιανδὶ ἐποίησεν, αὐτὴ δ' ἔτερον, καὶ ἡ ἀκοὴ ὥσαύτως τὸ δὲ ἔσχατον ἔν, καὶ μία μεσότης· τὸ δ' εἶναι αὐτῇ 20 πλείω.

Τίνι δ' ἐπικρίνει τί διαφέρει γλυκὺ καὶ θερμόν, εἴρηται μὲν καὶ πρότερον, λεκτέον δὲ καὶ ὀδε. 25 ἔστι γὰρ ἔν τι, οὕτω δὲ καὶ ὡς ὄρος. καὶ ταῦτα ἔν τῷ ἀνάλογον καὶ τῷ ἀριθμῷ διν ἔχει πρὸς ἑκάτερον, ὡς ἐκεῖνα πρὸς ἄλληλα· τί γὰρ διαφέρει τὸ ἀπορεῖν πῶς τὰ ὁμογενῆ κρίνει ἢ τάνατία, οἷον λευκὸν καὶ μέλαν; ἔστω δὴ ὡς τὸ Α τὸ λευκὸν πρὸς τὸ Β τὸ μέλαν, τὸ Γ πρὸς τὸ Δ ὡς ἐκεῖνα πρὸς ἄλληλα· ὥστε καὶ ἐναλλάξ. εἰ δὴ τὰ ΓΔ ἔνι εἴη ὑπάρχοντα, οὕτως ἔξει ὥσπερ καὶ τὰ ΑΒ, τὸ αὐτὸ μὲν καὶ ἔν, τὸ δ' εἶναι οὐ τὸ 481 b αὐτό, κάκενο ὁμοίωσ. ὁ δ' αὐτὸς λόγος καὶ εἰ τὸ μὲν Α τὸ γλυκὺ εἴη, τὸ δὲ Β τὸ λευκόν.

Τὰ μὲν οὖν εἴδη τὸ νοητικὸν ἐν τοῖς φαντάσμασι - νοεῖ, καὶ ὡς ἐν ἐκείνοις ὥρισται αὐτῷ τὸ διωκτὸν καὶ φευκτόν, καὶ ἐκτὸς τῆς αἰσθήσεως, ὅταν ἐπὶ τῶν φαντασμάτων ἢ, κινεῖται, οἷον αἰσθανόμενος

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<sup>a</sup> Aristotle is referring to a mathematical theorem. If  $A:B::C:D$  then  $A:C::B:D$ .

### ON THE SOUL, III. vii.

instincts to pursue or avoid are not really different from each other, or from the sensitive faculty, though their actual essence is different. Now images occur in the soul in its thinking capacity, just like feelings. But when the soul asserts or denies that something is good or evil, it avoids or pursues. Hence the soul never thinks without a mental picture ; and just as the air is the medium which makes the eye in such a state, and the eye again affects something else, so also does the hearing ; but the last thing to be affected is a single unit, and a single mean. But its essence is really plural.

We have explained before by what means the soul distinguishes between sweet and hot, but some further considerations must be added. For it is a unit, and in this sense some sort of limit. But this is a unit which, by analogy or by number, bears the same relation to each of the two, as they do to each other. For what does it matter whether we ask how the soul distinguishes things which are not of the same class, or homogeneous opposites, like white and black ? Suppose the relation of A (white) to B (black) to be the same as the relation of C to D. Then the proposition *alternando* will be true.<sup>a</sup> If again C and D belong to one subject, their ratio will be the same as A to B, the same and a unity, but their real essence will not be the same, and similarly with the other term. The same ratio would be established if A were sweet and B white.

So the thinking faculty thinks of its forms in mental pictures, and, just as what is pursued and avoided is defined in them, so also it is outside sensation ; whenever it is a case of mental pictures, there is movement. For instance in perceiving a beacon a man

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τὸν φρυκτὸν ὅτι πῦρ,<sup>1</sup> γνωρίζει, ὅρῶν κινούμενον, ὅτι πολέμιος. ὅτε δὲ τοῖς ἐν τῇ ψυχῇ φαντάσμασι ἡ νοήμασιν ὥσπερ ὅρῶν λογίζεται καὶ βουλεύεται τὰ μέλλοντα πρὸς τὰ παρόντα· καὶ ὅταν εἴπη ὡς ἐκεῖ τὸ ἥδυ ἡ λυπηρόν, ἐνταῦθα φεύγει ἡ διώκει, <sup>10</sup> καὶ ὅλως ἐν πράξει. καὶ τὸ ἄνευ δὲ πράξεως, τὸ ἀληθὲς καὶ τὸ ψεῦδος ἐν τῷ αὐτῷ γένει ἐστὶ τῷ ἀγαθῷ καὶ κακῷ· ἀλλὰ τῷ γε ἀπλῶς διαφέρει καὶ τινί. τὰ δὲ ἐν ἀφαιρέσει λεγόμενα νοεῖν ὥσπερ ἄν εἰ τὸ σιμόν, ἢ μὲν σιμόν, οὐ κεχωρισμένως, ἢ <sup>15</sup> δὲ κοῦλον, εἴ τις ἐνόει ἐνεργείᾳ, ἄνευ τῆς σαρκὸς ἄν ἐνόει ἐν ἣ τὸ κοῦλον. οὕτω τὰ μαθηματικὰ οὐ κεχωρισμένα ὡς κεχωρισμένα νοεῖν, ὅταν νοῆ ἐκεῖνα. ὅλως δὲ ὁ νοῦς ἐστὶν ὁ κατ' ἐνέργειαν τὰ πράγματα νοῶν. ἀρα δ' ἐνδέχεται τῶν κεχωρισμένων τι νοεῖν ὅντα αὐτὸν μὴ κεχωρισμένον μεγέθους, ἢ οὐ, σκεπτέον ὅστερον.

20 VIII. Νῦν δὲ περὶ ψυχῆς τὰ λεχθέντα συγκεφαλαιώσαντες, εἴπωμεν πάλιν ὅτι ἡ ψυχὴ τὰ ὅντα πώς ἐστι πάντα. ἡ γὰρ αἰσθητὰ τὰ ὅντα ἡ νοητά, ἐστι δ' ἡ ἐπιστήμη μὲν τὰ ἐπιστητά πως, ἡ δ' αἰσθησις τὰ αἰσθητά· πῶς δὲ τοῦτο, δεῖ ζητεῖν. τέμνεται <sup>25</sup> οὖν ἡ ἐπιστήμη καὶ ἡ αἰσθησις εἰς τὰ πράγματα, ἡ μὲν δυνάμει εἰς τὰ δυνάμει, ἡ δ' ἐντελεχείᾳ εἰς τὰ ἐντελεχείᾳ. τῆς δὲ ψυχῆς τὸ αἰσθητικὸν καὶ τὸ ἐπιστημονικὸν δυνάμει ταῦτον ἐστι, τὸ μὲν ἐπιστητὸν τὸ δὲ αἰσθητόν. ἀνάγκη δ' ἡ αὐτὰ ἡ

<sup>1</sup> πῦρ, τῇ κοινῇ B.

### ON THE SOUL, III. vii.—viii.

recognizes that it is fire ; then seeing it moving he knows that it signifies an enemy. But at other times one calculates by images or thoughts residing in the soul, as if one saw them, and plans for the future in view of the present ; and when one says in the case of sensation that it is pleasant or unpleasant, in the realm of thought one avoids or pursues, and so generally in action. Setting aside the question of action, what is true or false belongs to the same category as what is good or evil ; but they differ by being universal, or referring to some particular. In mathematical abstraction, as it is called, the mind thinks as if it were considering snub-nosed *qua* snub-nosed, not as a quality detached from flesh, but as hollow ; if the mind were actively thinking it could conceive snub-nosed apart from the flesh in which the hollow resides. So when the mind thinks of mathematics, it thinks of them as separable though actually they are not. But speaking generally the mind means the mind actually thinking on its objects. Whether it is possible for the mind to think of qualities separated from their objects without being itself separated from dimension or not, must be considered later.

VIII. Now summing up what we have said about the soul, let us assert once more that in a sense the soul is all the existing universe. For the universe consists of objects felt, and objects thought of, and knowledge relates to the latter and sensation to the former ; but we must consider how this comes about. Both knowledge and sensation are divided into two in relation to their objects, the potential to the potential, and the actual to the actual. The potential faculty of the soul both sensitive and intellectual is the same, partly intellectual and partly sensitive. These

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481 <sup>b</sup> τὰ εἴδη εἶναι. αὐτὰ μὲν γάρ δὴ οὕ· οὐ γάρ ὁ  
 482 <sup>a</sup> λίθος ἐν τῇ ψυχῇ, ἀλλὰ τὸ εἶδος· ὥστε ἡ ψυχὴ  
 ὥσπερ ἡ χείρ ἔστιν· καὶ γάρ ἡ χείρ ὅργανόν ἔστιν  
 ὅργανων, καὶ ὁ νοῦς εἶδος εἰδῶν καὶ ἡ αἰσθησις  
 εἶδος αἰσθητῶν. ἐπεὶ δὲ οὐδὲ πρᾶγμα οὐθέν ἔστι  
 παρὰ τὰ μεγέθη, ὡς δοκεῖ, τὰ αἰσθητὰ κεχωρισ-  
 μένον, ἐν τοῖς εἴδεσι τοῖς αἰσθητοῖς τὰ νοητά ἔστι,  
 τά τε ἐν ἀφαιρέσει λεγόμενα, καὶ ὅσα τῶν αἰσθητῶν  
 ἔξεις καὶ πάθη. καὶ διὰ τοῦτο οὔτε μὴ αἰσθανό-  
 μενος μηθὲν οὐθὲν ἀν μάθοι οὐδὲ ξυνείνῃ· ὅταν τε  
 θεωρῇ, ἀνάγκη ἄμα φάντασμά τι θεωρεῖν· τὰ γάρ  
 10 φαντάσματα ὥσπερ αἰσθήματά ἔστι, πλὴν ἀνευ  
 ὕλης. ἔστι δὲ ἡ φαντασία ἔτερον φάσεως καὶ  
 ἀποφάσεως· συμπλοκὴ γάρ νοημάτων ἔστι τὸ  
 ἀληθὲς ἡ ψεῦδος. τὰ δὲ πρῶτα νοήματα τίνι  
 διοίσει τοῦ μὴ φαντάσματα εἶναι; ἡ οὐδὲ τὰλλα  
 φαντάσματα, ἀλλ’ οὐκ ἀνευ φαντασμάτων.

15 IX. Ἐπεὶ δὲ ἡ ψυχὴ κατὰ δύο ὕρισται δυνάμεις  
 ἡ τῶν ζώων, τῷ τε κριτικῷ, ὁ διαινοίας ἔργον ἔστι  
 καὶ αἰσθήσεως, καὶ ἔτι τῷ κινεῖν τὴν κατὰ τόπον  
 κίνησιν, περὶ μὲν αἰσθήσεως καὶ νοῦ διωρίσθω  
 τοσαῦτα, περὶ δὲ τοῦ κινοῦντος, τί ποτέ ἔστι τῆς  
 20 ψυχῆς, σκεπτέον, πότερον ἐν τι μόριον αὐτῆς  
 χωριστὸν ὃν ἡ μεγέθει ἡ λόγω, ἡ πᾶσα ἡ ψυχή,

## ON THE SOUL, III. viii.—ix.

faculties, then, are identical either with the objects themselves or with their forms. Now they are not identical with the object themselves ; for the stone does not exist in the soul, but only the form of the stone. The soul, then, acts like a hand ; for the hand is an instrument which employs instruments, and in the same way the mind is a form which employs forms, and sensation is a form which employs the forms of sensible objects. But since apparently nothing has a separate existence, except apprehended magnitudes, things thought appear in the forms of sensible objects ; so do the so-called mathematical abstractions, and all those things which are the conditions or affections of sensible objects. And for this reason no one could ever learn or understand anything, if he had not the faculty of perception ; even when he thinks speculatively, he must have some mental picture of which to think ; for mental images are similar to objects perceived except that they are without matter. But imagination is not the same thing as assertion and denial ; for truth and falsehood is a combination of things thought. How then will the simplest thoughts differ from mental pictures ? Surely neither these simple thoughts nor others are mental pictures, but cannot occur without such mental pictures.

Thought  
and feeling  
are not  
identical  
but inter-  
dependent.

IX. But since the soul in living creatures is defined by two functions, the judging capacity which is a function of the intellect and of sensation combined, and secondly by the capacity for movement in space, we have completed our account of sensation and mind and must now consider what part of the soul the capacity for movement is ; whether it is a part separable from the soul itself, either in actual magnitude

The relation  
of the soul  
to move-  
ment.

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καν εἰ μόριόν τι, πότερον ἕδιόν τε παρὰ τὰ εἰωθότα λέγεσθαι καὶ τὰ εἰρημένα, ἢ τούτων ἐν τι. ἔχει δὲ ἀπορίαν εὐθὺς πῶς τε δεῖ μόρια λέγειν τῆς ψυχῆς καὶ πόσα. τρόπον γάρ τινα ἅπειρα φαίνεται, <sup>25</sup> καὶ οὐ μόνον ἡ τινες λέγουσι διορίζοντες, λογιστικὸν καὶ θυμικὸν καὶ ἐπιθυμητικόν, οἱ δὲ τὸ λόγον ἔχον καὶ τὸ ἄλογον· κατὰ γὰρ τὰς διαφορὰς δι’ ἃς ταῦτα χωρίζουσι, καὶ ἄλλα φανεῖται μόρια μείζω διάστασιν ἔχοντα τούτων, περὶ ὅν καὶ νῦν εἴρηται, τό τε θρεπτικόν, ὁ καὶ τοῖς φυτοῖς <sup>80</sup> ὑπάρχει καὶ πᾶσι τοῖς ζώοις, καὶ τὸ αἰσθητικόν, ὁ οὔτε ὡς ἄλογον οὔτε ὡς λόγον ἔχον θείη ἀν τις <sup>432 b</sup> ραδίως. ἔτι δὲ τὸ φανταστικόν, ὁ τῷ μὲν εἶναι πάντων ἔτερον, τινὶ δὲ τούτων ταῦτὸν ἢ ἔτερον, ἔχει πολλὴν ἀπορίαν, εἴ τις θήσει κεχωρισμένα μόρια τῆς ψυχῆς. πρὸς δὲ τούτοις τὸ ὀρεκτικόν, ὁ καὶ λόγω καὶ δυνάμει ἔτερον ἀν δόξειεν εἶναι πάντων. καὶ ἄτοπον δὴ τοῦτο διασπᾶν· ἐν τε τῷ λογιστικῷ γὰρ ἡ βούλησις γίνεται, καὶ ἐν τῷ ἀλόγῳ ἡ ἐπιθυμία καὶ ὁ θυμός· εἰ δὲ τρία ἡ ψυχή, ἐν ἑκάστῳ ἔσται ὄρεξις.

Καὶ δὴ καὶ περὶ οὐ νῦν ὁ λόγος ἐνέστηκε, τί τὸ κινοῦν κατὰ τόπον τὸ ζῷόν ἔστιν; τὴν μὲν γὰρ κατ’ αὐξῆσιν καὶ φθίσιν κίνησιν, ἅπασιν ὑπάρχουσαν, τὸ πᾶσιν ὑπάρχον δόξειεν ἀν κινεῖν τὸ

### ON THE SOUL, III. ix.

or only in thought, or whether it is the whole soul ; and if it is a part, whether it is a special part beyond those usually described, and of which we have given an account, or whether it is one of them. The first difficulty that arises is this : in what sense can we speak of parts of the soul, and how many are there ? For in one sense they seem to be infinite, and not confined to those which men refer to, when they attempt definition ; men call the parts rational, passionate, and appetitive, or, as others have it, rational and irrational. Now when we consider the differences according to which they classify, we shall find other parts exhibiting greater differences than those of which we have already spoken ; for instance the nutritive part, which belongs to plants and to all living creatures, and the sensitive part which one could not easily assign either to the rational or irrational part, and also the imaginative part, which appears to be different in essence from them all, but which is extremely difficult to identify with, or to distinguish from any one of them. All this creates serious problems, if one supposes separate parts of the soul. Beyond these again is the appetitive part, which both logically and potentially appears to be different from them all. And it is unreasonable to divorce this from the rest ; for there is purpose in the reasoning faculty, and desire and anger in the irrational part ; but if the soul is divided into three, appetite will be found in each.

Moreover in the subject with which our present argument is concerned, which is the part which makes the living creature move in space ? The generative and nutritive faculties, which all share, would seem responsible for movement in the sense of growth and

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γεννητικὸν καὶ θρεπτικόν· περὶ δὲ ἀναπνοῆς καὶ  
ἐκπνοῆς καὶ ὑπνου καὶ ἐγρηγόρσεως ὕστερον ἐπι-  
σκεπτέον· ἔχει γὰρ καὶ ταῦτα πολλὴν ἀπορίαν.  
ἀλλὰ περὶ τῆς κατὰ τόπον κινήσεως, τί τὸ κινοῦν  
τὸ ζῷον τὴν πορευτικὴν κίνησιν, σκεπτέον. ὅτι  
16 μὲν οὖν οὐχ ἡ θρεπτικὴ δύναμις, δῆλον· ἀεὶ τε  
γὰρ ἔνεκά του ἡ κίνησις αὕτη, καὶ ἡ μετὰ φαν-  
τασίας ἡ ὀρέξεως ἐστιν· οὐθὲν γὰρ μὴ ὀρεγόμενον  
ἢ φεῦγον κινεῖται ἀλλ’ ἡ βίᾳ. ἔτι καν τὰ φυτὰ  
κινητικὰ ἦν, καν εἶχε τι μόριον ὀργανικὸν πρὸς  
τὴν κίνησιν ταύτην. δόμοίως δὲ οὐδὲ τὸ αἰσθη-  
20 τικόν· πολλὰ γάρ ἔστι τῶν ζώων ἀ αἰσθησιν μὲν  
ἔχει, μόνυμα δ’ ἔστι καὶ ἀκίνητα διὰ τέλους. εἰ  
οὖν ἡ φύσις μήτε ποιεῖ μάτην μηθὲν μήτε ἀπο-  
λείπει τι τῶν ἀναγκαίων, πλὴν ἐν τοῖς πηρώμασι  
καὶ ἐν τοῖς ἀτελέσιν· (τὰ δὲ τοιαῦτα τῶν ζώων  
τέλεια καὶ οὐ πηρώματά ἔστιν· σημεῖον δ’ ὅτι  
25 ἔστι γεννητικὰ καὶ ἀκμὴν ᔁρεῖ καὶ φθίσιν<sup>α</sup>) ὥστ’  
εἶχεν ἀν καὶ τὰ ὀργανικὰ μέρη τῆς πορείας. ἀλλὰ  
μὴν οὐδὲ τὸ λογιστικὸν καὶ ὁ καλούμενος νοῦς  
ἔστιν ὁ κινῶν· ὁ μὲν γὰρ θεωρητικὸς οὐθὲν νοεῖ  
πρακτόν, οὐδὲ λέγει περὶ φευκτοῦ καὶ διωκτοῦ  
οὐθέν, ἡ δὲ κίνησις ἡ φεύγοντός τι ἡ διώκοντός  
30 τι ἔστιν. ἀλλ’ οὐδ’ ὅταν θεωρῇ τι τοιαῦτον, ἥδη  
κελεύει φεύγειν ἡ διώκειν, οἷον πολλάκις διανοεῖται  
φοβερόν τι ἡ ἥδυ, οὐ κελεύει δὲ φοβεῖσθαι, ἡ δὲ  
433 a καρδία κινεῖται, ἀν δ’ ἥδυ, ἔτερόν τι μόριον. ἔτι

<sup>a</sup> i.e. if movement in space were due to the sensitive faculty.

### ON THE SOUL, III. ix.

decay, as this movement belongs to them all ; later on we shall have to consider inspiration and expiration, and sleep and wakefulness : for these also present considerable difficulty. But dealing with movement in space, we must consider what it is that causes the living animal to exhibit a travelling movement. It is obvious that it is not the nutritive capacity ; for this movement always has an object in view, and is combined with imagination or appetency ; for nothing moves except under compulsion, unless it is seeking or avoiding something. But then plants should show capacity for movement, and should be seen to have some part instrumental towards this movement. Nor is it the sensitive faculty ; for there are many living creatures which have feeling, but are stationary, and do not move throughout their existence. Then seeing that nature does nothing in vain, nor omits anything essential, except in maimed or imperfect animals (and the sort of animal under consideration is perfect and not maimed ; this is proved by the fact that they propagate their species and have a zenith and decline), they would have parts instrumental to that end.<sup>a</sup> Nor is the reasoning faculty, which is called mind, the motive principle, for the speculative mind thinks of nothing practical, and does not comment on what is to be avoided or pursued ; but movement is characteristic of one who is either avoiding or pursuing something. Even when the mind speculates on anything of the kind, it does not issue orders to avoid or pursue ; for instance it often reflects that something is fearful or sweet, but gives no orders to fear. It is the heart which produces this movement, and if it is sweet some other part. But when the mind gives any

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καὶ ἐπιτάπποντος τοῦ νοῦ καὶ λεγούσης τῆς διανοίας φεύγειν τι ἡ διώκειν οὐ κινεῖται, ἀλλὰ κατὰ τὴν ἐπιθυμίαν πράττει, οἷον ὁ ἀκρατής. καὶ ὅλως δὲ ὅρῶμεν ὅτι ὁ ἔχων τὴν ἰατρικὴν οὐκ ἴσται, ὡς 5 ἐτέρου τινὸς κυρίου ὄντος τοῦ ποιεῖν κατὰ τὴν ἐπιστήμην, ἀλλ’ οὐ τῆς ἐπιστήμης. ἀλλὰ μὴν οὐδ’ ἡ ὅρεξις ταύτης κυρία τῆς κινήσεως· οἱ γὰρ ἐγκρατεῖς ὀρεγόμενοι καὶ ἐπιθυμοῦντες οὐ πράττουσι ὥν ἔχουσι τὴν ὅρεξιν, ἀλλ’ ἀκολουθοῦντι τῷ νῷ.

10 Χ. Φαίνεται δέ γε δύο ταῦτα κινοῦντα, ἡ ὅρεξις ἡ νοῦς, εἴ τις τὴν φαντασίαν τιθείη ὡς νόησίν τινα· πολλὰ γὰρ παρὰ τὴν ἐπιστήμην ἀκολουθοῦντι ταῖς φαντασίαις, καὶ ἐν τοῖς ἄλλοις ζώοις οὐ νόησις οὐδὲ λογισμός ἐστιν, ἀλλὰ φαντασία. ἄμφω ἄρα ταῦτα κινητικὰ κατὰ τόπον, νοῦς καὶ ὅρεξις. νοῦς δὲ ὁ ἔνεκά του λογιζόμενος καὶ ὁ πρακτικός· 15 διαφέρει δὲ τοῦ θεωρητικοῦ τῷ τέλει. καὶ ἡ ὅρεξις ἔνεκά του πᾶσα· οὖθι γὰρ ἡ ὅρεξις, αὕτη ἀρχὴ τοῦ πρακτικοῦ νοῦ· τὸ δὲ ἔσχατον ἀρχὴ τῆς πράξεως. ὥστε εὐλόγως ταῦτα δύο φαίνεται τὰ κινοῦντα, ὅρεξις καὶ διάνοια πρακτική· τὸ ὀρεκτὸν γὰρ κινεῖ, καὶ διὰ τοῦτο ἡ διάνοια κινεῖ, ὅτι ἀρχὴ 20 αὐτῆς ἐστὶν τὸ ὀρεκτὸν. καὶ ἡ φαντασία δὲ ὅταν κινῇ, οὐ κινεῖ ἄνευ ὀρέξεως. ἐν δή τι τὸ κινοῦν τὸ ὀρεκτόν. εἰ γὰρ δύο, νοῦς καὶ ὅρεξις, ἐκίνουν,

### ON THE SOUL, III. ix.—x.

orders, and reflection suggests avoidance or pursuit, the man does not move, but his action is prompted by desire, as we see in the incontinent man. Speaking generally, we see that the man possessing knowledge of the healing art is not always healing, so that there is some other factor which causes action in accordance with knowledge, and not knowledge itself. Finally, it is not appetency which is responsible for movement ; for the self-controlled, though they may crave and desire, do not do these things for which they have an appetite, but follow their reason.

X. There are clearly, then, two agents which produce movement, appetite and mind, if, that is, one regards imagination as some sort of thinking process ; for men often follow their imaginations contrary to knowledge, and in living creatures other than man there is neither thinking nor calculation, but only imagination. These together, then, mind and appetite, are responsible for movement in space. But the mind in question is that which makes its calculations with an end in view, that is the practical mind : it differs from the speculative mind in that it has an end in view. And every appetite is directed towards an end ; for the thing at which appetite aims is the starting-point of the practical mind ; the last step of the practical mind is the beginning of the action. So that these two, appetite and practical mind, seem reasonably considered as the producers of movement ; for that which is craved for produces movement, and the mind produces movement for this reason, that the thing craved for is its beginning. Whenever imagination produces movement, it does not do so without appetite. And so the main single moving cause seems to be what is desired. If there were

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κατὰ κοινὸν ἄν τι ἐκίνουν εἶδος. νῦν δὲ ὁ μὲν νοῦς οὐ φαίνεται κινῶν ἄνευ ὀρέξεως· ἡ γὰρ βούλησις ὄρεξις· ὅταν δὲ κατὰ τὸν λογισμὸν 25 κινῆται, καὶ κατὰ βούλησιν κινεῖται. ἡ δὲ ὄρεξις κινεῖ παρὰ τὸν λογισμόν· ἡ γὰρ ἐπιθυμία ὄρεξις τις ἐστίν. νοῦς μὲν οὖν πᾶς ὄρθος· ὄρεξις δὲ καὶ φαντασία καὶ ὄρθη καὶ οὐκ ὄρθη. διὸ ἀεὶ κινεῖ μὲν τὸ ὄρεκτόν, ἀλλὰ τοῦτ' ἐστὶν ἡ τὸ ἀγαθὸν ἡ τὸ φαινόμενον ἀγαθόν. οὐ πᾶν δέ, ἀλλὰ τὸ 80 πρακτὸν ἀγαθόν. πρακτὸν δὲ ἐστὶν τὸ ἐνδεχόμενον καὶ ἄλλως ἔχειν.

“Οτι μὲν οὖν ἡ τοιαύτη δύναμις κινεῖ τῆς ψυχῆς ἡ καλουμένη ὄρεξις, φανερόν. τοῖς δὲ διαιροῦσι τὰ 488 b μέρη τῆς ψυχῆς ἔὰν κατὰ τὰς δυνάμεις διαιρῶσι καὶ χωρίζωσι, πάμπολλα γίνεται, θρεπτικόν, αἰσθητικόν, νοητικόν, βουλευτικόν, ἔτι ὄρεκτικόν· ταῦτα γὰρ πλέον διαφέρει ἀλλήλων ἡ τὸ ἐπιθυμητικὸν καὶ θυμικόν. ἐπεὶ δὲ ὄρεξεις γίνονται ἐναντίαι ἀλλήλαις, τοῦτο δὲ συμβαίνει ὅταν ὁ λόγος καὶ ἡ ἐπιθυμία ἐναντίαι ὦσι, γίνεται δὲ ἐν τοῖς χρόνον αἰσθησιν ἔχουσιν (ό μὲν γὰρ νοῦς διὰ τὸ μέλλον ἀνθέλκειν κελεύει, ἡ δὲ ἐπιθυμία διὰ τὸ ἥδη· φαίνεται γὰρ τὸ ἥδη ἥδυν καὶ ἀπλῶς ἥδυν καὶ 10 ἀγαθὸν ἀπλῶς, διὰ τὸ μὴ ὄρᾶν τὸ μέλλον), εἴδει μὲν ἐν ἀν εἴη τὸ κινοῦν τὸ ὄρεκτικόν, γῆ ὄρεκτικόν, πρῶτον δὲ πάντων τὸ ὄρεκτόν (τοῦτο γὰρ κινεῖ οὐ

### ON THE SOUL, III. x.

really two causes, mind as well as appetite, they would produce movement in virtue of a common characteristic. But, as things are, mind is never seen to produce movement without appetite ; for choice is a form of appetite. But when a man moves according to calculation, he also moves according to choice, but appetite produces movement contrary to calculation ; for desire is a form of appetence. Again, mind is always right ; but appetence and imagination may be right or wrong. Consequently that which is desired always produces movement, but this is either good, or what seems to be good ; and not every sort of good, but only practical good. Practical good is that which is capable of being otherwise.

It is clear, then, that the capacity of the soul which is called appetence is what produces movement. Appetence produces movement. But those who divide up the parts of the soul, if they divide and distinguish them according to their functions, have many divisions, nutritive, sensitive, thinking, deliberative and even craving ; for these show more difference between each other than the desiring and the passionate. But cravings are opposite to each other, and this happens wherever reason and desire are contradictory, and this occurs in creatures which are sensitive to time. (For the mind advises us to resist with a view to the future, while desire only looks to the present ; for what is momentarily pleasant seems to be absolutely pleasant and absolutely good, because desire cannot look to the future.) In form, then, the moving cause will be one, that is the appetitive faculty in so far as it is appetitive, and first of all the object craved for (for this, though not itself moving, produces movement,

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κινούμενον τῷ νοηθῆναι ἢ φαντασθῆναι), ἀριθμῷ  
δὲ πλείω τὰ κινοῦντα.

Ἐπειδὴ δ' ἐστὶ τρία, ἐν μὲν τὸ κινοῦν, δεύτερον  
δ' ὡς κινεῖ, τρίτον τὸ κινούμενον· τὸ δὲ κινοῦν  
15 διττόν, τὸ μὲν ἀκίνητον, τὸ δὲ κινοῦν καὶ κινού-  
μενον· ἔστι δὲ τὸ μὲν ἀκίνητον τὸ πρακτὸν ἀγαθόν,  
τὸ δὲ κινοῦν καὶ κινούμενον τὸ ὀρεκτικόν (κινεῖται  
γὰρ τὸ κινούμενον ἢ ὀρέγεται, καὶ ἡ κίνησις ὅρεξίς  
τις ἔστιν ἢ ἐνέργεια), τὸ δὲ κινούμενον τὸ ζῷον·  
ὡς δὲ κινεῖ ὀργάνων ἡ ὅρεξις, ἥδη τοῦτο σωματικόν  
20 ἔστιν· διὸ ἐν τοῖς κοινοῖς σώματος καὶ ψυχῆς ἔργοις  
θεωρητέον περὶ αὐτοῦ. νῦν δὲ ὡς ἐν κεφαλαίῳ  
εἰπεῖν τὸ κινοῦν ὀργανικῶς, ὅπου ἀρχὴ καὶ τελευτὴ  
τὸ αὐτό, οἷον ὁ γιγγλυμός· ἐνταῦθα γὰρ τὸ κυρτὸν  
καὶ κοῖλον τὸ μὲν τελευτὴ τὸ δὲ ἀρχή· διὸ τὸ μὲν  
25 ἡρεμεῖ τὸ δὲ κινεῖται, λόγω μὲν ἔτερα ὅντα, μεγέθει  
δὲ ἀχώριστα· πάντα γὰρ ὄσει καὶ ἔλξει κινεῖται.  
διὸ δεῖ ὄσπερ ἐν κύκλῳ μένειν τι, καὶ ἐντεῦθεν  
ἀρχεοθαι τὴν κίνησιν. ὅλως μὲν οὖν, ὄσπερ  
εἴρηται, ἢ ὀρεκτικὸν τὸ ζῷον, ταύτῃ αὐτοῦ κινη-  
τικόν· ὀρεκτικὸν δὲ οὐκ ἄνευ φαντασίας· φαντασία  
30 δὲ πᾶσα ἡ λογιστικὴ ἢ αἰσθητική· ταύτης μὲν  
οὖν καὶ τὰ ἄλλα ζῷα μετέχει.

XI. Σκεπτέον δὲ καὶ περὶ τῶν ἀτελῶν, τί τὸ  
484 a κινοῦν ἔστιν, οἷς ἀφῇ μόνον ὑπάρχει αἰσθησις,

### ON THE SOUL, III. x.—xi.

by being thought of or imagined), but the actual moving causes are plural.

But there are three things to be considered : first the moving cause, secondly the means by which it produces movement, and thirdly the thing moved. The moving cause has two senses, one unmoved and one producing movement and moving ; but the practical good is unmoved ; while the moving and the moved are the appetite (for that which is moved moves, in so far as there is a craving, and the movement is a form of appetite actualized), but the thing moved is the living creature ; the instrument of moving is the craving, and this is bodily ; so it must be considered among the functions which are common to body and soul. But for the present it is sufficient to summarize by saying that movement by means of instruments is where the beginning and end coincide, as in a ball-and-socket joint. For there the convex surface (the ball) and the concave surface (the socket) are respectively the end and the beginning of the movement ; consequently the latter is at rest while the former moves. Logically they are two different things, but in position inseparable ; for all movement consists of pushing and pulling ; so that as in a wheel one point (the centre) remains fixed, and from that point the movement is initiated. Speaking generally then, as has been said, in so far as the living creature is subject to appetite, it is also subject to movement ; but appetite does not exist without imagination, and all imagination involves either calculation or sensation. This latter all living creatures share.

XI. We must now consider what the moving principle is in the case of those imperfect animals, whose

How movement takes place.

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πότερον ἐνδέχεται φαντασίαν ὑπάρχειν τούτοις, ή οὐ, καὶ ἐπιθυμίαν. φαίνεται γὰρ λύπη καὶ ηδονὴ ἐνοῦσα. εἰ δὲ ταῦτα, καὶ ἐπιθυμίαν ἀνάγκη. φαντασία δὲ πῶς ἂν ἐνείη; ἡ ὥσπερ καὶ κινεῖται δ ἀορίστως, καὶ ταῦτ' ἔνεστι μέν, ἀορίστως δ' ἔνεστιν. ή μὲν οὖν αἰσθητικὴ φαντασία, ὥσπερ εἴρηται, καὶ ἐν τοῖς ἄλλοις ζῷοις ὑπάρχει, ή δὲ βουλευτικὴ ἐν τοῖς λογιστικοῖς πότερον γὰρ πράξει τόδε ή τόδε, λογισμοῦ ἥδη ἐστὶν ἔργον. καὶ ἀνάγκη ἐνὶ μετρεῶν τὸ μεῖζον γὰρ διώκει. ὥστε 10 δύναται ἐν ἐκ πλειόνων φαντασμάτων ποιεῖν. καὶ αἴτιον τοῦτο τοῦ δόξαν μὴ δοκεῖν ἔχειν, ὅτι τὴν ἐκ συλλογισμοῦ οὐκ ἔχει, αὕτη δὲ ἐκείνην. διὸ τὸ βουλευτικὸν οὐκ ἔχει ή ὅρεξις. νικᾷ δ' ἐνίστε καὶ κινεῖ τὴν βούλησιν ὅτε δ' ἐκείνη ταύτην, ὥσπερ σφαῖρα, ή ὅρεξις τὴν ὅρεξιν, ὅταν ἀκρασία 15 γένηται. φύσει δὲ ἀεὶ ή ἄνω ἀρχικωτέρα καὶ κινεῖ, ὥστε τρεῖς φορὰς ἥδη κινεῖσθαι. τὸ δ' ἐπιστημονικὸν οὐ κινεῖται, ἀλλὰ μένει. ἐπεὶ δ' ή μὲν καθόλου ὑπόληψις καὶ λόγος, ή δὲ τοῦ καθ' ἔκαστα (ή μὲν γὰρ λέγει ὅτι δεῖ τὸν τοιοῦτον τὸ τοιόνδε πράττειν, ή δὲ ὅτι τόδε τὸ νῦν τοιόνδε,

### ON THE SOUL, III. xi.

only sensation is that of touch, and whether it is the lower forms of animal life?

desire. For it is evident that they are liable to pain and pleasure. If they have these they must also have desire. But in what sense could they have imagination? Or, just as they move, but only in an indeterminate fashion, do they also have imagination, but only in an indeterminate fashion? Imagination in the form of sense exists, as we have said, in other animals, but deliberative imagination only in those which can reason; for it is the function of reason to decide whether one shall do this or that, and one must measure by a single standard; for one pursues the greater good. So one can make one mental picture out of a number of images; and the reason why animals are not considered capable of having opinion is that they have not the type of imagination which arises from inference; but the possession of the power of reasoning implies the other. This is why appetite does not imply capacity for deliberation. In fact it sometimes conquers and moves the will. But when one appetite controls another, as one celestial sphere controls another, is the occasion when incontinence occurs. But in nature the upper sphere always asserts the larger measure of control and produces the movement, so that there are three movements combined in one. But the faculty of knowledge does not move but remains still. But there is such a thing as belief in and argument from the universal, and also the belief in and argument from the particular. (The former asserts that a man in such a position should act in such a way, but the latter asserts that this is matter of such a kind and that I am a man in such a position.) It is this

Movement may be complicated by a conflict of impulses.

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434<sup>a</sup> 20 κάγω δὲ τοιόσδε) ἥδη αὕτη κινεῖ ἡ δόξα, οὐχ ἡ καθόλου. ἡ ἄμφω, ἀλλ' ἡ μὲν ἡρεμοῦσα μᾶλλον, ἡ δ' οὕ.

XII. Τὴν μὲν οὖν θρεπτικὴν ψυχὴν ἀνάγκη πᾶν ἔχειν ὅτι περ ἀν ζῆ καὶ ψυχὴν ἔχῃ ἀπὸ γενέσεως μέχρι φθορᾶς· ἀνάγκη γὰρ τὸ γενόμενον αὔξησιν 25 ἔχειν καὶ ἀκμὴν καὶ φθίσιν, ταῦτα δ' ἀνευ τροφῆς ἀδύνατον· ἀνάγκη ἀρα ἐνεῖναι τὴν θρεπτικὴν δύναμιν ἐν πᾶσι τοῖς φυομένοις καὶ φθίνουσιν. αἴσθησιν δ' οὐκ ἀναγκαῖον ἐν ἅπασι τοῖς ζῶσιν· οὔτε γὰρ ὅσων τὸ σῶμα ἀπλοῦν, ἐνδέχεται ἀφῆν 30 ἔχειν, οὔτε ἀνευ ταύτης οἰόν τε οὐθὲν εἶναι ζῶον. οὔτε δὲ ὅσα μὴ δεκτικὰ τῶν εἰδῶν ἀνευ τῆς ὑλῆς. τὸ δὲ ζῶον ἀναγκαῖον αἴσθησιν ἔχειν, εἰ μηθὲν μάτην ποιεῖ ἡ φύσις. ἔνεκά του γὰρ πάντα ὑπάρχει τὰ φύσει, ἡ συμπτώματα ἔσται τῶν ἔνεκά του. εἰ οὖν πᾶν σῶμα πορευτικὸν μὴ ἔχον 434<sup>b</sup> αἴσθησιν, φθείροιτο ἀν καὶ εἰς τέλος οὐκ ἀν ἔλθοι, ὃ ἔστι φύσεως ἔργον· πῶς γὰρ θρέψεται; τοῖς μὲν γὰρ μονίμοις ὑπάρχει τὸ ὅθεν πεφύκασιν. οὐχ οἰόν τε δὲ σῶμα ἔχειν μὲν ψυχὴν καὶ νοῦν κριτικόν, αἴσθησιν δὲ μὴ ἔχειν, μὴ μόνιμον ὅν, γεννητὸν δέ. 5 ἀλλὰ μὴν οὐδὲ ἀγέννητον· διὰ τί γὰρ ἔξει; ἡ γὰρ τῇ ψυχῇ βέλτιον ἡ τῷ σώματι. νῦν δ' οὐδέτερον· ἡ μὲν γὰρ οὐ μᾶλλον νοήσει, τὸ δ' οὐθὲν ἔσται

### ON THE SOUL, III. xl.—xli.

latter opinion which produces movement and not the opinion of the universal. Or else it is both, but the opinion of the universal tends to move less, the other more.

XII. Every living thing must have the nutritive soul that it may live, and have a soul from its birth until its death ; for that which is born must have growth, a highest point of development and decay, and these things are impossible without food. The nutritive capacity must then exist in all things which grow and decay. But sensation is not necessary to all living creatures ; it is not necessary to those which have simple bodies to have a sense of touch, nor without this can any animal exist ; nor need those living things have a sense of touch which are not receptive of forms without matter. But the living animal must have sensation, if it is a fact that nature does nothing in vain. For everything in nature exists for a purpose, except for those accidental properties which subscribe to a purpose. An animal capable of moving from place to place, if it had no sensation, would be destroyed, and would not reach the end which is its natural function ; for how could it be nourished ? Stationary living things can draw their food from the source from which they were born, but it is impossible for the body to possess a soul and a mind capable of judgement without having sensation, if it is not stationary but generated by birth. Nor could it lack sensation even if it is not generated by birth ; for what would be the object of its having it ? If it possessed sensation it would necessarily be the better for it either in soul or in body ; but in our present case it will not benefit in either way ; for the former will not think any better for this reason, and

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μᾶλλον δι' ἐκεῖνο. οὐθὲν ἄρα ἔχει ψυχὴν σῶμα μὴ μόνιμον ἄνευ αἰσθήσεως.

10 'Αλλὰ μὴν εἴγε αἰσθησιν ἔχει, ἀνάγκη τὸ σῶμα εἶναι ἡ ἀπλοῦν ἡ μικτόν. οὐχ οἶόν τε δὲ ἀπλοῦν·

ἀφὴν γὰρ οὐχ ἔξει, ἐστι δὲ ἀνάγκη ταύτην ἔχειν. τοῦτο δὲ ἐκ τῶνδε δῆλον. ἐπεὶ γὰρ τὸ ζῷον σῶμα ἐμψυχόν ἐστι, σῶμα δὲ ἄπαν ἀπτόν, ἀπτὸν δὲ τὸ αἰσθητὸν ἀφῆ, ἀνάγκη καὶ τὸ τοῦ ζῷου σῶμα ἀπτικὸν εἶναι, εἰ μέλλει σώζεσθαι τὸ ζῷον.

15 αἱ γὰρ ἄλλαι αἰσθήσεις δι' ἑτέρων αἰσθάνονται, οἷον ὅσφρησις ὅψις ἀκοή· ἀπτόμενον δέ, εἰ μὴ ἔξει αἰσθησιν, οὐ δυνήσεται τὰ μὲν φεύγειν τὰ δὲ λαβεῖν. εἰ δὲ τοῦτο, ἀδύνατον ἐσται σώζεσθαι τὸ ζῷον. διὸ καὶ ἡ γεῦσίς ἐστιν ὥσπερ ἀφή τις· τροφῆς γάρ ἐστιν, ἡ δὲ τροφὴ τὸ σῶμα τὸ ἀπτόν.

20 ψόφος δὲ καὶ χρῶμα καὶ ὀσμὴ οὐ τρέφει, οὐδὲ ποιεῖ οὕτ' αὐξῆσιν οὕτε φθίσιν. ὥστε καὶ τὴν γεῦσιν ἀνάγκη ἀφὴν εἶναι τινα, διὰ τὸ τοῦ ἀπτοῦ καὶ θρεπτικοῦ αἰσθησιν εἶναι. αὐται μὲν οὖν ἀναγκαῖαι τῷ ζῷῳ, καὶ φανερὸν ὅτι οὐχ οἶόν τε ἄνευ ἀφῆς εἶναι ζῷον.

25 Αἱ δὲ ἄλλαι τοῦ τε εὖ εἴνεκα καὶ γένει ζῷων ἥδη οὐ τῷ τυχόντι, ἄλλὰ τισίν, οἷον τῷ πορευτικῷ ἀνάγκη ὑπάρχειν· εἰ γὰρ μέλλει σώζεσθαι, οὐ μόνον δεῖ ἀπτόμενον αἰσθάνεσθαι ἄλλὰ καὶ ἅποθεν. τοῦτο δ' ἂν εἴη, εἰ διὰ τοῦ μεταξὺ αἰσθητικὸν εἴη

### ON THE SOUL, III. XII.

the latter will be no better for the possession. No body, then, which is not stationary possesses a soul without sensation.

Further, if it does possess sensation, the body must be either simple or compound. But it cannot be simple ; for in that case it will have no sense of touch, and this is indispensable to it. This is obvious from the following considerations. For since the living animal is a body possessing soul, and every body is tangible, and that which is apprehended by touch is the sensible object, it follows that the body of the animal must have the faculty of touch if the animal is to survive. For the other senses perceive through the medium of something else such as smell, vision and hearing ; but the animal when it touches, if it has no sensation, will not be able to avoid some things and seize others. In that case it will be impossible for the animal to survive. And so tasting is a form of touching ; for it belongs to food, but food is a tangible body. Sound, colour and smell supply no food, nor do they produce growth and decay. So that taste must be some form of touch, because it is the perception of what is touched and nutritive. These qualities are then essential to the living animal, and it is obvious that the animal cannot exist without a sense of touch.

But there are other qualities necessary to living <sup>Living</sup> <sub>well.</sub> well, which do not belong to any class of living creatures taken at random, but only to certain ones, as for instance they belong to the animal which is capable of locomotion ; for if it is to survive, not only must it perceive when in contact, but also from a distance. And this will occur only if it exercises its perceptive faculty through a medium in which the

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τῷ ἐκεῖνο μὲν ὑπὸ τοῦ αἰσθητοῦ πάσχειν καὶ  
 80 κινεῖσθαι, αὐτὸ δ' ὑπ' ἐκείνου. ὥσπερ γὰρ τὸ  
 κινοῦν κατὰ τόπον μέχρι του μεταβάλλειν ποιεῖ,  
 καὶ τὸ ὥσαν ἔτερον ποιεῖ ὥστε ὡθεῖν, καὶ ἔστι  
 διὰ μέσου ἡ κύνησις, καὶ δὴ τὸ μὲν πρῶτον κινοῦν  
 ὡθεῖ οὐχ ὡθούμενον, τὸ δ' ἐσχατον μόνον ὡθεῖται  
 485 a οὐκ ὥσαν, τὸ δὲ μέσον ἄμφω, πολλὰ δὲ μέσα,  
 οὕτως ἐπ' ἀλλοιώσεως, πλὴν ὅτι μένοντος ἐν τῷ  
 αὐτῷ τόπῳ ἀλλοιοῦ, οἷον εἰς εἰς κηρὸν βάψιε τις,  
 μέχρι τούτου ἐκινήθη, ἔως ἔβαψεν· λίθος δὲ οὐδέν,  
 ἀλλ' ὅδωρ μέχρι πόρρω. ὁ δ' ἀὴρ ἐπὶ πλεῖστον  
 δικινεῖται καὶ ποιεῖ καὶ πάσχει, ἐὰν μένη καὶ εἰς  
 ἥ. διὸ καὶ περὶ ἀνακλάσεως βέλτιον ἡ τὴν ὅψιν  
 ἔξιοῦσαν κλάσθαι, τὸν ἀέρα πάσχειν ὑπὸ τοῦ  
 σχήματος καὶ χρώματος, μέχρι περ οὐ ἀν εἰς ἥ. ἐπὶ δὲ τοῦ λείου ἐστὶν εἰς· διὸ πάλιν οὗτος τὴν  
 ὅψιν κινεῖ, ὥσπερ ἀν εἰ τὸ ἐν τῷ κηρῷ σημεῖον  
 10 διεδίδοτο μέχρι τοῦ πέρατος.

XIII. "Οτι δ' οὐχ οἶν τε ἀπλοῦν εἶναι τὸ τοῦ  
 ζώου σῶμα, φανερόν, λέγω δ' οἶν πύρινον ἢ  
 ἀέρινον. ἄνευ μὲν γὰρ ἀφῆσι οὐδεμίαν ἐνδέχεται  
 ἄλλην αἰσθησιν ἔχειν· τὸ γὰρ σῶμα ἀπτικὸν τὸ  
 15 ἔμψυχον πᾶν, ὥσπερ εἴρηται. τὰ δὲ ἄλλα ἔξω  
 γῆς αἰσθητήρια μὲν ἀν γένοιτο, πάντα δὲ τῷ δι'  
 ἔτερον αἰσθάνεσθαι ποιεῖ τὴν αἰσθησιν καὶ διὰ τῶν

### ON THE SOUL, III. XII.—XIII.

animal is affected, and is moved by the sensible object, and the sensible object by the medium. For that which produces movement in space causes change up to a certain point, and that which has given a push causes something else to push also, and movement takes place through a medium, and again that which initiates a movement pushes without being pushed, but the last link in the chain is pushed without pushing, but the intermediate link both pushes and is pushed, and there may be many such intermediate links. Exactly the same thing occurs in change of state, except that it suffers change while remaining in the same place, just as if one were to dip something into wax, the movement would occur in the wax just so far as one dipped it. Now stone would not move at all, but water would be affected to a great distance. But it is air that moves, acts, and is acted upon most, if it remains still and is continuous. For that reason in connexion with the reflection of light it is better to suppose, not that the ray leaving the eye is reflected, but rather that the air is affected by the shape and colour, so long as it remains continuous. And it is continuous supposing that it is smooth ; then the air in its turn moves the vision, just as if the impression on the wax had passed right through to the other side.

XIII. It is obvious that the body of the animal cannot consist of a single element such as fire or air. For without a sense of touch it is impossible to have any other sensation ; for every body possessing soul has the faculty of touch, as has been said. Now except for earth, all the other elements could produce sense organs, but all these produce sensation by means of something else, that is through media.

Touch is the  
most  
elementary  
and indis-  
pensable  
soul faculty.

485 a

μεταξύ. ή δ' ἀφή τῷ αὐτῶν ἀπτεσθαί ἐστιν, διὸ καὶ τοῦνομα τοῦτο ἔχει. καίτοι καὶ τὰ ἄλλα αἰσθητήρια ἀφῆ αἰσθάνεται, ἀλλὰ δι' ἔπερον· αὕτη δὲ δοκεῖ μόνη δι' αὐτῆς, ὥστε τῶν μὲν τοιούτων στοιχείων οὐθὲν ἀν εἴη σῶμα τοῦ ζῶου, οὐδὲ δὴ γῆγενον. πάντων γάρ ή ἀφή τῶν ἀπτῶν ἐστὶν ὥσπερ μεσότης, καὶ δεκτικὸν τὸ αἰσθητήριον οὐ μόνον ὅσαι διαφοραὶ γῆς εἰσίν, ἀλλὰ καὶ θερμοῦ καὶ ψυχροῦ καὶ τῶν ἄλλων ἀπτῶν ἀπάντων. καὶ

25 διὰ τοῦτο τοῖς ὀστοῖς καὶ ταῖς θριξὶ καὶ τοῖς

485 b τοιούτοις μορίοις οὐκ αἰσθανόμεθα, ὅτι γῆς ἐστίν.

καὶ τὰ φυτὰ διὰ τοῦτο οὐδεμίαν ἔχει αἰσθησιν, ὅτι γῆς ἐστίν· ἀνευ δὲ ἀφῆς οὐδεμίαν οἰόν τε ἄλλην ὑπάρχειν, τοῦτο δὲ τὸ αἰσθητήριον οὐκ ἐστιν οὔτε γῆς οὔτε ἄλλου τῶν στοιχείων οὐδενός. φανερὸν δ τοίνυν ὅτι ἀνάγκη μόνης ταύτης στερισκόμενα τῆς αἰσθήσεως τὰ ζῶα ἀποθνήσκειν· οὔτε γάρ ταύτην ἔχειν οἰόν τε μὴ ζῶον, οὔτε ζῶον ὃν ἄλλην ἔχειν ἀνάγκη πλὴν ταύτης. καὶ διὰ τοῦτο τὰ μὲν ἄλλα αἰσθητὰ ταῖς ὑπερβολαῖς οὐ διαφθείρει τὸ ζῶον, οἷον χρῶμα καὶ ψόφος καὶ ὀσμή, ἀλλὰ μόνον τὰ αἰσθητήρια, ἀν μὴ κατὰ συμβεβηκός, οἷον ἀν ἄμα τῷ ψόφῳ ὁσις γένηται καὶ πληγή, καὶ ὑπὸ ὀραμάτων καὶ ὀσμῆς ἔτερα κινεῖται, ἀ τῇ ἀφῇ φθείρει. καὶ ὁ χυμὸς δὲ οὐτὶ ἄμα συμβαίνει ἀπτικὸν εἶναι, ταύτη φθείρει. ή δὲ τῶν ἀπτῶν ὑπερβολὴ, οἷον θερμῶν καὶ ψυχρῶν καὶ σκληρῶν, ἀναιρεῖ τὸ ζῶον·

15 παντὸς μὲν γάρ αἰσθητοῦ ὑπερβολὴ ἀναιρεῖ τὸ αἰσθητήριον, ὥστε καὶ τὸ ἀπτὸν τὴν ἀφήν, ταύτη δὲ ὠρισται τὸ ζῆν· ἀνευ γάρ ἀφῆς δέδεικται ὅτι

### ON THE SOUL, III. xiii.

But the sense of touch arises from touching the objects themselves, and that is why it has its name. The other sense organs perceive by touch too, but through a medium. This alone seems to perceive by itself, so that no one of these elements could compose the animal body. Nor could earth. For the touching of all tangible objects is a kind of mean, and the sense organ is receptive not only in as many ways as there are differences of earth, but also of heat, cold, and all other tangible things. For this reason we do not perceive by our bones and hair, and such parts of the body, because they are composed of earth. And for this reason plants have no sensation, because they are composed of earth. But without touch no other sensation can exist, but this sense organ is neither composed of earth, nor of any other of the elements. It is obvious, then, that deprived of this, their only sensation, animals must die ; for it is impossible for anything but an animal to possess this, nor need an animal possess any sense but this. And for this reason the other sensible objects do not destroy the animal by excess, such as colour and sound and smell, but only the sense organs, except incidentally, as for instance when a thrust or blow is delivered at the same time as the sound, and other movements are produced by sight and smell, which destroy by touch. Flavour, again, destroys by contact in so far as the animal happens to be affected by touch. But the excess of tangible objects, such as hot, cold, and hard, destroys the animal ; for excess in any sensible object destroys the sense organ ; so the tangible object destroys touch, and by this living is determined, for it has been admitted that without

485 b

ἀδύνατον εἶναι ζῷον. διὸ ἡ τῶν ἀπτῶν ὑπερβολὴ  
 οὐ μόνον τὸ αἰσθητήριον φθείρει, ἀλλὰ καὶ τὸ  
 ζῷον, ὅτι ἀνάγκη μόνην ἔχειν ταύτην. τὰς δ'  
 20 ἄλλας αἰσθήσεις ἔχει τὸ ζῷον, ὡσπερ εἴρηται, οὐ  
 τοῦ εἶναι ἔνεκα ἄλλὰ τοῦ εὖ, οἷον ὅψιν, ἐπεὶ ἐν  
 ἀέρι καὶ ὕδατι, ὅπως ὁρᾷ, ὅλως δ' ἐπεὶ ἐν διαφανεῖ,  
 γεῦσίν τε διὰ τὸ ήδον καὶ λυπηρόν, ἵνα αἰσθάνηται  
 τὸ ἐν τροφῇ καὶ ἐπιθυμῇ καὶ κινήται, ἀκοὴν  
 25 δὲ ὅπως σημαίνῃ τι αὐτῷ, γλῶτταν δὲ ὅπως  
 σημαίνῃ τι ἔτέρῳ.

### ON THE SOUL, III. xiii.

touch the animal cannot exist. Therefore excess in the objects touched not only destroys the sense organ, but also the animal, because touch is the one sense which the animal must possess. But the animal possesses the other senses, as has been said, not in order that it may exist, but that its existence may be good ; for instance the animal has sight, when it lives in air or water, or generally in a transparent medium, in order that it may see ; and it has taste because of what is sweet and bitter, in order that it may perceive these qualities in food and may desire and be moved ; and hearing that it may interpret something to itself, and tongue that it may interpret something to another.



ON SENSE AND SENSIBLE  
OBJECTS



## INTRODUCTION

THIS treatise is the first of a series known as *Parva Naturalia*, which professes to deal with the special activities of the soul. The *De Sensu* treats of Sense and Sensible Objects, but incompletely, as touch is omitted altogether, and the treatment of hearing is very slight. From the point of view of the modern reader the account is not altogether satisfactory, because Aristotle's Physics and Physiology are very remote from the thought of to-day. But it does not follow that the account he gives is devoid of interest. The first five chapters deal with the senses themselves and the objects of sense. The author attempts to give a real account of the nature of the latter, and although his meaning is often obscure and his Metaphysics quite foreign to our modes of thought, he makes it clear that he regards sensible objects as having a real existence apart from the organs of sense which perceive them.

The last two chapters raise some very interesting questions, although they can hardly be said to answer them satisfactorily. Of these the most important are: "Can there be an imperceptible magnitude?" and "Can two objects of sense be perceived simultaneously?" To both of these questions Aristotle answers No, though with certain qualifications.

## ΠΕΡΙ ΑΙΣΘΗΣΕΩΣ ΚΑΙ ΑΙΣΘΗΤΩΝ

486 a Ι. Ἐπεὶ δὲ περὶ ψυχῆς καθ' αὐτὴν διώρισται καὶ περὶ τῶν δυνάμεων ἔκάστης κατὰ μόριον αὐτῆς, ἔχόμενόν ἐστι ποιήσασθαι τὴν ἐπίσκεψιν περὶ τῶν ζώων καὶ τῶν ζωὴν ἔχόντων ἀπάντων, 5 τίνες εἰσὶν ἴδιαι καὶ τίνες κοιναὶ πράξεις αὐτῶν. τὰ μὲν οὖν εἰρημένα περὶ ψυχῆς ὑποκείσθω, περὶ δὲ τῶν λοιπῶν λέγωμεν, καὶ πρῶτον περὶ τῶν πρώτων. φαίνεται δὲ τὰ μέγιστα, καὶ τὰ κοινὰ καὶ τὰ ἴδια τῶν ζώων, κοινὰ τῆς ψυχῆς ὅντα καὶ τοῦ σώματος, οἷον αἴσθησις καὶ μνήμη καὶ θυμὸς 10 καὶ ἐπιθυμία καὶ ὅλως ὅρεξις, καὶ πρὸς τούτοις ἥδιονή τε καὶ λύπη· καὶ γὰρ ταῦτα σχεδὸν ὑπάρχει πᾶσι τοῖς ζώοις. πρὸς δὲ τούτοις τὰ μὲν πάντων ἐστὶ τῶν μετεχόντων ζωῆς κοινά, τὰ δὲ τῶν ζώων ἐνίοις. τυγχάνουσι δὲ τούτων τὰ μέγιστα τέτταρες οὖσαι συζυγίαι τὸν ἀριθμόν, οἷον 15 ἐγρήγορσις καὶ ὑπνος, καὶ νεότης καὶ γῆρας, καὶ ἀναπνοή καὶ ἐκπνοή, καὶ ζωὴ καὶ θάνατος· περὶ ὅν θεωρητέον, τί τε ἔκαστον αὐτῶν, καὶ διὰ τίνας αἰτίας συμβαίνει.

Φυσικοῦ δὲ καὶ περὶ ὑγιείας καὶ νόσου τὰς πρώτας ἴδειν ἀρχάς· οὔτε γὰρ ὑγίειαν οὔτε νόσον

## ON SENSE AND SENSIBLE OBJECTS

I. Since our account of the soul itself is complete, On subject is the special activities of the soul. and also of the faculties existing in each part of it, our next task is to examine living creatures and all things which have animal life, and to discover what are their peculiar and what are their common activities. All that has already been said about the soul is to be assumed, but let us now discuss the remaining questions, dealing first of all with those which naturally come first. The most important characteristics of animals, both general and special, appear to be those which are common both to soul and body, such as sensation, memory, passion, desire, and appetence generally, and in addition to these pleasure and pain ; for these belong to almost all living creatures. In addition to these some are common to all those creatures that share in animal life, and others are peculiar to certain animals. The most important of these are the four pairs, namely waking and sleep, youth and age, breathing in and out, life and death ; about these we have to consider what each of them is, and what are the reasons for their existence.

It is further the duty of the physical philosopher to Disease and health. reflect on the first principles of disease and health ; for neither health nor disease can be the properties of

## ARISTOTLE

488 a

οῖον τε γίνεσθαι τοῖς ἐστέρημένοις ζωῆς. διὸ  
 20 σχεδὸν τῶν τε περὶ φύσεως οἱ πλεῖστοι καὶ τῶν  
 ἰατρῶν οἱ φιλοσοφωτέρως τὴν τέχνην μετιόντες,  
 488 b οἱ μὲν τελευτῶσιν εἰς τὰ περὶ ἰατρικῆς, οἱ δὲ ἐκ  
 τῶν περὶ φύσεως ἄρχονται περὶ τῆς ἰατρικῆς.

“Οτι δὲ τὰ λεχθέντα κοινὰ τῆς τε ψυχῆς ἐστὶ<sup>a</sup>  
 καὶ τοῦ σώματος, οὐκ ἄδηλον. πάντα γὰρ τὰ  
 μὲν μετ’ αἰσθήσεως συμβαίνει, τὰ δὲ δι’ αἰσθήσεως.  
 5 ἔνια δὲ τὰ μὲν πάθη ταύτης ὄντα τυγχάνει, τὰ δὲ  
 ἔξεις, τὰ δὲ φυλακαὶ καὶ σωτηρίαι, τὰ δὲ φθοραὶ<sup>b</sup>  
 καὶ στερήσεις. ἡ δὲ αἰσθησις ὅτι διὰ σώματος  
 γίνεται τῇ ψυχῇ, δῆλον καὶ διὰ τοῦ λόγου καὶ  
 τοῦ λόγου χωρίς.

‘Αλλὰ περὶ μὲν αἰσθήσεως καὶ τοῦ αἰσθάνεσθαι,  
 τί ἐστι καὶ διὰ τί συμβαίνει τοῖς ζῷοις τοῦτο τὸ  
 10 πάθος, εἴρηται πρότερον ἐν τοῖς περὶ ψυχῆς. τοῖς  
 δὲ ζῷοις, ἢ μὲν ζῶον ἔκαστον, ἀνάγκη ὑπάρχειν  
 αἰσθησιν· τούτῳ γὰρ τὸ ζῶον εἶναι καὶ μὴ ζῶον  
 διορίζομεν. ίδιᾳ δὲ ἡδη καθ’ ἔκαστον ἡ μὲν ἀφὴ  
 καὶ γεῦσις ἀκολουθεῖ πᾶσιν ἔξ ἀνάγκης, ἡ μὲν  
 15 ἀφὴ διὰ τὴν εἴρημένην αὐτίαν ἐν τοῖς περὶ ψυχῆς,  
 ἡ δὲ γεῦσις διὰ τὴν τροφήν· τὸ γὰρ ἡδὺ διακρίνει  
 καὶ τὸ λυπηρὸν αὕτη περὶ τὴν τροφήν, ὥστε τὸ  
 μὲν φεύγειν τὸ δὲ διώκειν, καὶ ὅλως ὁ χυμός ἐστι  
 τοῦ θρεπτικοῦ μορίου πάθος. αἱ δὲ διὰ τῶν ἔξωθεν  
 αἰσθήσεις τοῖς πορευτικοῖς αὐτῶν, οἷον ὄσφρησις  
 20 καὶ ἀκοὴ καὶ ὄψις, πᾶσι μὲν τοῖς ἔχουσι σωτηρίας  
 ἔνεκεν ὑπάρχουσιν, ὅπως διώκωσί τε προαισθανό-  
 μενα τὴν τροφήν καὶ τὰ φαῦλα καὶ τὰ φθαρτικά

<sup>a</sup> 413 b etc.

<sup>b</sup> 484 a, ch. 12.

## ON SENSE AND SENSIBLE OBJECTS, I.

things deprived of life. For this reason most inquirers into nature, and those doctors who pursue their craft with scientific interest, are alike. For the former at the end of their inquiries reach a discussion of medicine, while the latter begin their investigations into medicine with an inquiry into nature.

It is obvious that the characteristics already mentioned belong both to soul and body. For all of them appear either in conjunction with sensation or arise through sensation : some again are affections of sensations and some are regular conditions ; some again tend to guard and preserve life, and others to destroy and extinguish it. That sensation is felt by the soul through the medium of the body is obvious on theoretical grounds and also apart from theory.

However we have already treated of sensation and feeling in our work *On the Soul*,<sup>a</sup> what they are, and why this affection appears among animals. Sensation  
is essential  
to the living  
creature. Living creatures as such must possess sensation. For it is by this that we differentiate between living creatures and those which are not alive ; and in each individual case touch and taste necessarily accompany them all, touch for the reason given in our work *On the Soul*,<sup>b</sup> and taste for the acquisition of food ; for it is taste which discriminates between pleasant and unpleasant in food, so that the one is avoided and the other pursued, and speaking generally flavour is an affection of the nutritive part of the soul. But those sensations which reach animals capable of locomotion through an outside medium, such as smell, hearing and vision, belong to all those that possess them for the sake of safety, in order that they may be aware of their food before they pursue it, and may avoid what is inferior or destructive,

## ARISTOTLE

487 a φεύγωσι, τοῖς δὲ καὶ φρονήσεως τυγχάνουσι τοῦ εὖ ἔνεκα· πολλὰς γὰρ εἰσαγγέλλουσι διαφοράς, ἐξ ὧν ἡ τε τῶν νοητῶν ἐγγίνεται φρόνησις καὶ ἡ τῶν πρακτῶν.

Αὐτῶν δὲ τούτων πρὸς μὲν τὰ ἀναγκαῖα κρείτ-  
5 των ἡ ὄψις καὶ καθ' αὐτήν, πρὸς δὲ νοῦν καὶ κατὰ συμβεβηκός ἡ ἀκοή. διαφορὰς μὲν γὰρ πολλὰς εἰσαγγέλλει καὶ παντοδαπὰς ἡ τῆς ὄψεως δύναμις διὰ τὸ πάντα τὰ σώματα μετέχειν χρώματος, ὥστε καὶ τὰ κοινὰ διὰ ταύτης αἰσθάνεσθαι μάλιστα (λέγω δὲ κοινὰ σχῆμα, μέγεθος, κίνησιν, ἀριθμόν).  
10 ἡ δὲ ἀκοὴ τὰς τοῦ ψόφου διαφορὰς μόνου, ὀλίγοις δὲ καὶ τὰς τῆς φωνῆς. κατὰ συμβεβηκός δὲ πρὸς φρόνησιν ἡ ἀκοὴ πλεῖστον συμβάλλεται μέρος. ὁ γὰρ λόγος αἴτιός ἐστι τῆς μαθήσεως ἀκουστὸς ὧν, οὐ καθ' αὐτὸν ἀλλὰ κατὰ συμβεβηκός. ἐξ ὀνομάτων γὰρ σύγκειται, τῶν δὲ ὀνομάτων ἔκαστον 15 σύμβολόν ἐστιν. διόπερ φρονιμώτεροι τῶν ἐκ γενετῆς ἐστερημένων εἰσὶν ἔκατέρας τῆς αἰσθήσεως οἱ τυφλοὶ τῶν ἐνεῶν καὶ κωφῶν.

II. Περὶ μὲν οὖν τῆς δυνάμεως ἣν ἔχει τῶν αἰσθήσεων ἔκαστη, πρότερον εἴρηται. τοῦ δὲ σώμα-  
20 τος ἐν οἷς ἐγγίγνεσθαι πέφυκεν αἰσθητηρίοις, νῦν<sup>1</sup> μὲν ζητοῦσι κατὰ τὰ στοιχεῖα τῶν σωμάτων· οὐκ εὐποροῦντες δὲ πρὸς τέτταρα πέντε<sup>2</sup> οὖσας συνάγειν, γλίχονται περὶ τῆς πέμπτης. ποιοῦσι δὲ πάντες τὴν ὄψιν πυρὸς διὰ τὸ πάθους τινὸς ἀγνοεῖν τὴν

<sup>1</sup> Κυριοὶ Β.

## ON SENSE AND SENSIBLE OBJECTS, I.—II.

while in the case of those that have thinking power these senses exist for the sake of well-being ; for they give warning of many differences, from which arise understanding both of the objects of thought and of the affairs of practical life.

Of these faculties, for the mere necessities of life Sight and hearing. and in itself, sight is the more important, but for the mind and accidentally hearing is the more important. For the faculty of sight gives warning of many differences of all kinds, because all bodies have a share of colour, so that by this medium the soul perceives most of the common sensibles. (By common I mean such as shape, size, movement and number.) But hearing only records differences of sound, and to a few living creatures differences of voice. Accidentally, then, hearing makes the largest contribution to wisdom. For the spoken word, which is responsible for all instruction, is heard ; but this does not belong to hearing in itself but only accidentally, because speech is composed of words, and each word is a symbol. Consequently, of those who have been deprived of one sense or the other from birth, the blind are more intelligent than the deaf and the dumb.

II. Concerning the capacity which each of these Are the  
senses composed of the  
elements? senses has, we have already spoken. But when they consider in what bodily sense-organs each of these senses naturally develops, modern thinkers seek to refer them to the elements of which the body is composed. But finding it difficult to bring the four elements into harmony with the five senses, they make anxious inquiry about the fifth. They all make vision consist of fire, because they do not understand the reason of one of the peculiarities of

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437 a

αἰτίαν· θλιβομένου γὰρ καὶ κινουμένου τοῦ ὀφ-  
 25 θαλμοῦ φαίνεται πῦρ ἐκλάμπειν· τοῦτο δ' ἐν τῷ  
 σκότει πέφυκε συμβαίνειν, ἢ τῶν βλεφάρων ἐπι-  
 κεκαλυμμένων· γίνεται γὰρ καὶ τότε σκότος. ἔχει  
 δ' ἀπορίαν τοῦτο καὶ ἔτεραν. εἰ γὰρ μὴ ἔστι  
 λανθάνειν αἰσθανόμενον καὶ ὀρῶντα ὀρώμενόν τι,  
 ἀνάγκη ἄρ' αὐτὸν ἑαυτὸν ὄρāν τὸν ὀφθαλμόν. διὰ  
 30 τί οὖν ἡρεμοῦντι τοῦτ' οὐ συμβαίνει; τὰ δ' αἴτια  
 τούτου, καὶ τῆς ἀπορίας καὶ τοῦ δοκεῖν πῦρ εἶναι  
 τὴν ὄψιν, ἐντεῦθεν ληπτέον. τὰ γὰρ λεῖα πέφυκεν  
 ἐν τῷ σκότει λάμπειν, οὐ μέντοι φῶς γε ποιεῖ, τοῦ  
 437 b δ' ὀφθαλμοῦ τὸ καλούμενον μέλαν καὶ μέσον λεῖον  
 φαίνεται. φαίνεται δὲ τοῦτο κινουμένου τοῦ ὄμ-  
 ματος διὰ τὸ συμβαίνειν ὥσπερ δύο γίνεσθαι τὸ  
 ἐν. τοῦτο δ' ἡ ταχυτὴς ποιεῖ τῆς κινήσεως, ὥστε  
 δοκεῖν ἔτερον εἶναι τὸ ὄρων καὶ τὸ ὀρώμενον. διὸ  
 5 καὶ οὐ γίνεται, ἂν μὴ ταχέως καὶ ἐν σκότει τοῦτο  
 συμβῇ· τὸ γὰρ λεῖον ἐν τῷ σκότει πέφυκε λάμπειν,  
 οἷον κεφαλαὶ ἵχθύων τινῶν καὶ δ τῆς σηπίας θολός·  
 καὶ βραδέως μεταβάλλοντος τοῦ ὄμματος οὐ συμ-  
 βαίνει ὥστε δοκεῖν ἄμα ἐν καὶ δύο εἶναι τό θ' ὄρων  
 10 καὶ τὸ ὀρώμενον, ἐκείνως δ' αὐτὸν ὄρᾶ ὁ  
 ὀφθαλμός, ὥσπερ καὶ ἐν τῇ ἀνακλάσει, ἐπεὶ εἴ γε  
 πῦρ ἦν, καθάπερ Ἐμπεδοκλῆς φησὶ καὶ ἐν τῷ  
 Τιμαιῷ γέγραπται, καὶ συνέβαινε τὸ ὄρᾶν ἐξιόντος  
 ὥσπερ ἐκ λαμπτῆρος τοῦ φωτός, διὰ τί οὐ καὶ ἐν  
 τῷ σκότει ἔώρα ἂν ἡ ὄψις; τὸ δ' ἀποσβέννυσθαι

<sup>a</sup> i.e. seeing sparks.

<sup>b</sup> A. appears to be thinking of what we call persistence of vision. If the movement is sufficiently rapid, for instance in a vibrating string, we shall appear to see not one string in successive positions but two strings each stationary in the two extreme positions.

## ON SENSE AND SENSIBLE OBJECTS, II.

vision. When the eye is pressed or rolling, it seems to send forth fire.<sup>a</sup> This may occur in darkness or when the eyes are closed ; in the latter case there is also darkness. But their explanation only raises another difficulty. For unless we suppose that it is possible to perceive and see an object of vision without knowing it, the eye must on this theory see itself. Why then does this not happen when the eye is at rest ? The reason for this and the solution of our difficulty, and the theory that vision is fire, must be found in the following considerations. It is always smooth surfaces that shine in the dark, though they do not create light, and the centre of the eye which men call the "black" of the eye is clearly smooth. But when the eye is moved it is seen because the occurrence is equivalent to making one thing appear two. It is the rapidity of the movement<sup>b</sup> which produces the effect, so that the seeing sense and the object seen appear different. Consequently the phenomenon does not occur, unless it happens quickly and in the dark ; for it is in the dark that a smooth surface appears to shine, for instance the heads of certain fishes, and the dark fluid of the cuttlefish ; when the movement of the eye is slow, it is impossible that the seeing organ and the object seen should appear to be both one and two at the same moment. But in the other case (when the movement is rapid) the eye merely sees itself in the same sense as in reflection ; if the eye were actually fire, as Empedocles says, and as is stated in the *Timaeus*,<sup>c</sup> and if vision occurred when light issued from the eye as from a lantern, why should not vision be equally possible in the dark ? It is quite futile

Difficulties  
of this  
theory.

<sup>a</sup> *Tim.* 45 c.

ARISTOTLE

437 b

15 φάναι ἐν τῷ σκότει ἐξιοῦσαν, ὥσπερ ὁ Τίμαιος λέγει, κενόν ἐστι παντελῶς· τίς γὰρ ἀπόσθεσις φωτός ἐστι; σβέννυται γὰρ ηὐγρῶ ηὐψυχρῶ τὸ θερμὸν καὶ ξηρόν, οἷον δοκεῖ τὸ τὸ ἐν τοῖς ἀνθρακώδεσιν εἶναι πῦρ καὶ ηὐφλόξ, ὡν τῷ φωτὶ οὐδέτερον φαίνεται ὑπάρχον. εἰ δὲ ἄρα ὑπάρχει μὲν 20 ἀλλὰ διὰ τὸ ηρέμα λανθάνει ημᾶς, ἔδει μεθ' ημέραν τε καὶ ἐν τῷ ὕδατι ἀποσθέννυσθαι τὸ φῶς, καὶ ἐν τοῖς πάγοις μᾶλλον γίνεσθαι σκότον· ηὐγῦν φλόξ καὶ τὰ πεπυρωμένα σώματα πάσχει τοῦτο· νῦν δὲ οὐδὲν συμβαίνει τοιοῦτον. Ἐμπεδοκλῆς δὲ ἔοικε 25 νομίζοντι ὅτε μὲν ἐξιόντος τοῦ φωτός, ὥσπερ εἴρηται πρότερον, βλέπειν· λέγει γοῦν οὕτως.

ώσδε δὲ τις πρόδον νοέων ὠπλίσσατο λύχνου, χειμερίην διὰ νύκτα πυρὸς σέλας αἰθομένοιο, ἄμφας παντοίων ἀνέμων λαμπτῆρας ἀμοργούς, οὕτως ἀνέμων μὲν πνεῦμα διασκιδνᾶσιν ἀέντων,

30 φῶς δὲ ἐξώ διαθρῶσκον, ὅσον ταναώτερον ηεν, λάμπεσκεν κατὰ βηλὸν ἀτειρέσιν ἀκτίνεσσιν. ὡς δὲ τότε ἐν μήνυγξιν ἐεργμένον ὡγύγιον πῦρ 488 a λεπτῆσιν ὀθόνησι λοχάζετο κύκλοπα κούρην· αἱ δὲ ὕδατος μὲν βένθος ἀπέστεγον ἀμφινάουτος, πῦρ δὲ ἐξώ διαθρῶσκον, ὅσον ταναώτερον ηεν.

ὅτε μὲν οὖν οὕτως ὄρâν φησίν, ὅτε δὲ ταῖς ἀπορροίαις ταῖς ἀπὸ τῶν ὄρωμένων. Δημόκριτος δὲ ὅτι μὲν ὕδωρ εἶναι φησι, λέγει καλῶς, ὅτι δὲ οὔεται τὸ ὄρâν εἶναι τὴν ἐμφασιν, οὐ καλῶς· τοῦτο μὲν γὰρ συμβαίνει ὅτι τὸ ὅμμα λεῖσον, καὶ ἔστιν οὐκ ἐν ἐκείνῳ ἀλλ' ἐν τῷ ὄρῶντι· ἀνάκλασις γὰρ τὸ πάθος. ἀλλὰ καθόλου περὶ τῶν ἐμφαινομένων καὶ

<sup>a</sup> Tim. 45 B.

## ON SENSE AND SENSIBLE OBJECTS, II.

to say, as the *Timaeus*<sup>a</sup> does, that on its emergence from the eye it is extinguished in the dark ; for what meaning can we attach to this extinguishing of light ? The dry is extinguished by the wet, and the hot by the cold, as we see in the case of fire and flame in coals, but hot and dry are not qualities of light. If they do belong to light, but we do not notice it because they are motionless, the light would be extinguished in the daytime when it rains, and darkness would occur more commonly in frosty weather. Flame and bodies on fire show this phenomenon ; but no such thing occurs in the other case. Em- Empedocles' theory of vision. pedocles seems to imagine that vision takes place when light leaves the eye, as we have said before ; for instance he says :

“ Just as when a man before sallying forth furnishes him with a lamp of gleaming fire in the stormy night, and fits thereto screens to protect it against all winds, which scatter the breath of the breezes as they blow ; and the light leaps out therefrom inasmuch as it spreads further, and shines over his threshold with tireless rays, thus also did he entrap with light webs the primeval fire, even the round pupil of the eye, in a membrane ; and the webs shut out the depth of surrounding water, but the fire leaps out therefrom inasmuch as it spreads further.”

This is the account which he gives of vision at times, but at other times he speaks of emanations from objects seen. Democritus is right when he says that the eye is water, but wrong when he supposes vision to be mere reflection. The reflection visible in the eye occurs because the eye is smooth, and does not exist in the eye, but in the observer ; for the phenomenon is only reflection. But in general the Democritus on vision.

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10 ἀνακλάσεως οὐδέν πω δῆλον ἦν, ὡς ἔοικεν. ἄτοπον  
δὲ καὶ τὸ μὴ ἐπελθεῖν αὐτῷ ἀπορῆσαι διὰ τί ὁ  
ὁφθαλμὸς ὅρᾶ μόνον, τῶν δὲ ἄλλων οὐδέν εὐ  
ἔμφανεται τὰ εἴδωλα. τὸ μὲν οὖν τὴν ὄψιν εἶναι  
ὕδατος ἀληθὲς μέν, οὐ μέντοι συμβαίνει τὸ ὅρᾶν  
15 ἢ ὕδωρ ἀλλ' ἢ διαφανές· ὁ καὶ ἐπὶ τοῦ ἀέρος κοινόν  
ἔστιν. ἀλλ' εὐφυλακτότερον καὶ εὐπιλητότερον τὸ  
ὕδωρ τοῦ ἀέρος· διόπερ ἡ κόρη καὶ τὸ ὅμμα ὕδατός  
ἔστιν. τοῦτο δὲ καὶ ἐπ' αὐτῶν τῶν ἔργων δῆλον·  
φαίνεται γὰρ ὕδωρ τὸ ἐκρέον διαφθειρομένων, καὶ  
ἔν γε τοῖς πάμπαν ἐμβρύοις τῇ ψυχρότητι ὑπερ-  
20 βάλλον καὶ τῇ λαμπρότητι. καὶ τὸ λευκόν τοῦ  
ὅμματος ἐν τοῖς ἔχουσιν αἷμα πῖον καὶ λιπαρόν·  
ὅπερ διὰ τοῦτ' ἔστι, πρὸς τὸ διαμένειν τὸ ὑγρὸν  
ἄπηκτον. καὶ διὰ τοῦτο τοῦ σώματος ἀρριγύτατον  
οὐ ὁφθαλμός ἔστιν· οὐδεὶς γάρ πω τὸ ἐντὸς τῶν  
βλεφάρων ἐρρίγωσεν. τῶν δὲ ἀναίμων σκληρό-  
25 δερμοὶ οἱ ὁφθαλμοί εἰσι, καὶ τοῦτο ποιεῖ τὴν  
σκέπην.

"Ἀλογον δὲ ὅλως τὸ ἐξιόντι τινὶ τὴν ὄψιν ὅρᾶν,  
καὶ ἀποτελεσθαι μέχρι τῶν ἄστρων, ἢ μέχρι τινὸς  
ἐξιοῦσαν συμφύεσθαι, καθάπερ λέγουσί τινες.  
τούτου μὲν γὰρ βέλτιον τὸ ἐν ἀρχῇ συμφύεσθαι τοῦ  
ὅμματος. ἀλλὰ καὶ τοῦτο εὕηθες· τό τε γάρ συμ-  
30 φύεσθαι τί ἔστι φωτὶ πρὸς φῶς; ἢ πῶς οἶον θ'  
488 b ὑπάρχειν; οὐ γὰρ τῷ τυχόντι συμφύεται τὸ τυχόν.  
τό τ' ἐντὸς τῷ ἐκτὸς πῶς; ἢ γὰρ μῆνιγξ μεταξύ  
ἔστιν. περὶ μὲν οὖν τοῦ ἄνευ φωτὸς μὴ ὅρᾶν  
εἴρηται ἐν ἄλλοις· ἀλλ' εἴτε φῶς εἴτ' ἀήρ ἔστι τὸ  
μεταξύ τοῦ ὅρωμένου καὶ τοῦ ὅμματος, ἢ διὰ

## ON SENSE AND SENSIBLE OBJECTS, II.

whole theory of things mirrored and reflected is so far not clear. But it is strange that it never occurred to him to wonder why the eye is the only thing which sees, and why none of the other things in which images appear do so. It is true that the eye consists of water, but its power of vision exists not because it is water, but because it is transparent ; an attribute which it shares with air. But water is more easily controlled and enclosed than air because it is denser. That the pupil and the eye are composed of water is obvious from the following facts ; for when they decay it is water that flows out of them, and this, especially in embryos, is exceedingly cold and clear. And the white of the eye in animals which have blood is fat and oily ; this is so in order that the moisture may remain unfrozen. For this reason the eye is the part of the body least sensitive to cold ; for no one has ever felt cold in the interior of the eye. But the eyes of the bloodless animals have a hard cuticle, and this constitutes a protection.

But in general it is unreasonable to suppose that seeing occurs by something issuing from the eye, and reaching as far as the stars, or issuing to a certain point and there coalescing with the object, as some think. It would be better to suppose that coalescence occurs in the eye to start with. But even this is foolish ; what is the meaning of light coalescing with light ? How could it occur ? For chance coalescence is impossible. And how could the inside coalesce with the outside ? For the membrane is between them. Elsewhere<sup>a</sup> we have discussed the impossibility of vision without light ; but whether light or air is the medium between the sensible object and the eye, the motion through this medium is

Vision as  
an emanation  
from the eye.

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τούτου κίνησίς ἔστιν ἡ ποιοῦσα τὸ ὄρāν. καὶ εὐλόγως τὸ ἐντός ἔστιν ὕδατος· διαφανὲς γὰρ τὸ ὕδωρ. ὄράται δὲ ὥσπερ καὶ ἔξω οὐκ ἄνευ φωτός, οὕτω καὶ ἐντός· διαφανὲς ἄρα δεῖ εἶναι. καὶ ἀνάγκη ὕδωρ εἶναι, ἐπειδὴ οὐκ ἀήρ. οὐ γὰρ ἐπὶ τοῦ ἐσχάτου ὅμματος ἡ ψυχὴ ἡ τῆς ψυχῆς τὸ αἰσθητή-  
10 ριόν ἔστιν, ἀλλὰ δῆλον ὅτι ἐντός· διόπερ ἀνάγκη διαφανὲς εἶναι καὶ δεκτικὸν φωτός τὸ ἐντὸς τοῦ ὅμματος. καὶ τοῦτο καὶ ἐπὶ τῶν συμβαινόντων δῆλον· ἥδη γάρ τισι πληγεῖσιν ἐν πολέμῳ παρὰ τὸν κρόταφον οὕτως ὥστ' ἐκτιμθῆναι τοὺς πόρους τοῦ ὅμματος, ἔδοξε γενέσθαι σκότος ὥσπερ λύχνου  
15 ἀποσβεσθέντος, διὰ τὸ οἷον λαμπτῆρά τινα ἀπο- τιμθῆναι τὸ διαφανές, τὴν καλουμένην κόρην.

“Ωστ’ εἴπερ τούτων τι συμβαίνει, καθάπερ λέγο-  
μεν, φανερὸν ὡς δεῖ τοῦτον τὸν τρόπον ἀποδιδό-  
ναι καὶ προσάπτειν ἔκαστον τῶν αἰσθητηρίων ἐνὶ  
τῶν στοιχείων. τοῦ μὲν ὅμματος τὸ ὄρατικὸν  
20 ὕδατος ὑποληπτέον, ἀέρος δὲ τὸ τῶν ψόφων αἰσ-  
θητικόν, πυρὸς δὲ τὴν ὄσφρησιν. ὃ γὰρ ἐνεργείᾳ ἡ  
ὅσφρησις, τοῦτο δυνάμει τὸ ὄσφραντικόν· τὸ γὰρ  
αἰσθητὸν ἐνεργεῖν ποιεῖ τὴν αἰσθησιν, ὥσθ’ ὑπάρχειν  
ἀνάγκη αὐτὴν δυνάμει πρότερον. ἡ δ’ ὄσμὴ καπ-  
25 νώδης τίς ἔστιν ἀναθυμίασις, ἡ δ’ ἀναθυμίασις ἡ  
καπνώδης ἐκ πυρός. διὸ καὶ τῷ περὶ τὸν ἐγκέ-  
φαλον τόπῳ τὸ τῆς ὄσφρησεως αἰσθητήριόν ἔστιν  
ἴδιον· δυνάμει γὰρ θερμὴ ἡ τοῦ ψυχροῦ ὑλὴ ἔστιν.  
καὶ ἡ τοῦ ὅμματος γένεσις τὸν αὐτὸν ἔχει τρόπον·  
ἀπὸ τοῦ ἐγκεφάλου γὰρ συνέστηκεν· οὗτος γὰρ  
30 ὑγρότατος καὶ ψυχρότατος τῶν ἐν τῷ σώματι  
μορίων ἔστιν. τὸ δ’ ἀπτικὸν γῆς. τὸ δὲ γευστικὸν  
εἰδός τι ἀφῆς ἔστιν. καὶ διὰ τοῦτο πρὸς τῇ καρδίᾳ

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## ON SENSE AND SENSIBLE OBJECTS, II.

what produces vision. And it is natural that what is within should consist of water ; for water is transparent. And just as there is no vision outside without light, so also within, there must be a transparency. And this can only be water because it is not air. For the soul or the sense organ of the soul does not reside in the surface of the eye, but must evidently be within ; consequently the part within the eye must be transparent and receptive of light. This is clear from what actually occurs ; for it is a fact that when in war men have been struck on the temple so as to sever the passages connected with the eye, darkness has fallen on them like the extinguishing of a lamp, because the transparency, called the pupil, has been cut off, as by a lamp screen.

If the facts are as we have described, it is evident that the following is the only method by which we can allot and adapt each of the sense organs to one of the elements. One would have to suppose the seeing part of the eye to be water, that which is perceptive of sound to be air, and smell to be fire. That which is smelling actually is the faculty of smelling potentially ; for the object perceived causes the sense to operate, so that this sense must have existed potentially before. For smell is a kind of smoky vapour, and a smoky vapour arises from fire. Consequently the sense organ of smell is peculiar to the region about the brain ; for matter which is cold is potentially hot. And the genesis of the eye arises in the same way, for it is developed from the brain ; for this is the most moist and coldest of all parts of the body. The faculty of touch then consists of earth ; and taste is a form of touch. For this reason

Senses  
and the  
elements.

# ARISTOTLE

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τὸ αἰσθητήριον αὐτῶν, τῆς τε γεύσεως καὶ τῆς ἀφῆς· ἀντίκειται γὰρ τῷ ἐγκεφάλῳ αὕτῃ, καὶ ἔστι θερμότατον τῷ μορίῳν. καὶ περὶ μὲν τῶν αἰσθητικῶν τοῦ σώματος μορίων ἔστω τοῦτον τὸν τρόπον διωρισμένα.

III. Περὶ δὲ τῶν αἰσθητῶν τῶν καθ' ἔκαστον αἰσθητήριον, οἷον λέγω χρώματος καὶ ψόφου καὶ δσμῆς καὶ χυμοῦ καὶ ἀφῆς, καθόλου μὲν εἴρηται ἐν τοῖς περὶ ψυχῆς, τί τὸ ἔργον αὐτῶν καὶ τί τὸ 10 ἐνεργεῖν καθ' ἔκαστον τῶν αἰσθητηρίων· τί δέ ποτε δεῖ λέγειν διτοῦν αὐτῶν, οἷον τί χρώμα ἢ τί ψόφον ἢ τί δσμὴν ἢ χυμόν, ὅμοίως δὲ καὶ περὶ ἀφῆς, ἐπισκεπτέον, καὶ πρῶτον περὶ χρώματος.

"Ἐστι μὲν οὖν ἔκαστον διχῶς λεγόμενον, τὸ μὲν ἐνεργείᾳ τὸ δὲ δυνάμει. τὸ μὲν οὖν ἐνεργείᾳ 15 χρώμα καὶ ὁ ψόφος πῶς ἔστι τὸ αὐτὸν ἢ ἔτερον ταῖς κατ' ἐνέργειαν αἰσθήσεσιν, οἷον ὄρασει καὶ ἀκούσει, εἴρηται ἐν τοῖς περὶ ψυχῆς· τί δὲ ἔκαστον αὐτῶν ὃν ποιήσει τὴν αἰσθησιν καὶ τὴν ἐνέργειαν, νῦν λέγωμεν. ὥσπερ οὖν εἴρηται περὶ φωτὸς ἐν ἐκείνοις, ὅτι ἔστι χρώμα τοῦ διαφανοῦς κατὰ συμβεβηκός· ὅταν γὰρ ἐνῇ τι πυρῶδες ἐν διαφανεῖ, ἢ μὲν παρουσίᾳ φῶς, ἢ δὲ στέρησίς ἔστι σκότος. ὃ δὲ λέγομεν διαφανές, οὐκ ἔστιν ἴδιον ἀέρος ἢ ὕδατος οὐδὲ ἄλλου τῶν οὕτω λεγομένων σωμάτων, ἀλλά τίς ἔστι κοινὴ φύσις καὶ δύναμις, ἢ χωριστὴ μὲν οὐκ ἔστιν, ἐν τούτοις δὲ ἔστι, καὶ τοῖς ἄλλοις 20 σώμασιν ἐνυπάρχει, τοῖς μὲν μᾶλλον τοῖς δὲ ἡττον. ὥσπερ οὖν καὶ τῶν σωμάτων ἀνάγκη τι εἶναι ἔσχατον, καὶ ταύτης. ἡ μὲν οὖν τοῦ φωτὸς φύσις ἐν ἀορίστῳ τῷ διαφανεῖ ἔστιν· τοῦ δὲ ἐν τοῖς

## ON SENSE AND SENSIBLE OBJECTS, II.—III.

the sense organ both of taste and of touch is near the heart. For the heart is the antithesis of the brain, and is the hottest of all parts of the body. This then completes our account of the parts of the body which have perceptive faculties.

III. The sense organs concerned with each of the sensible objects, I mean with colour, sound, smell, flavour and touch, have been treated generally in the treatise *On the Soul*, where the function of each is explained, and what the activity of each sense organ is in itself; but we have now to consider how we are to describe the essence of each, to answer the question what is sound, or colour, or smell, or flavour, and <sup>Colour.</sup> similarly with regard to touch. Let us deal with colour first.

Each of these terms is used in two senses, one actually and one potentially. We have explained in the treatise *On the Soul* the sense in which actual colour and sound are identical with or different from the actual sensations, that is, seeing or hearing.<sup>a</sup> Now let us consider what there is in each of them which will produce the sensation actually realized. In that treatise we have already said of light, that it is the colour of the transparent accidentally; for whenever there is a fiery quality in the transparency, its presence is light and its absence darkness. What we call transparency is not a quality peculiar to air or water or any other so-called body, but is a common nature and faculty, which is not separable but resides in these bodies and in others, in some to a greater and some to a less extent. Now just as every body must have some limit, so must this. Again it is the nature of light to exist in a limitless transparency;

<sup>a</sup> *De An.* 425 b 26.

ARISTOTLE

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σώμασι διαφανοῦς τὸ ἔσχατον, ὅτι μὲν εἴη ἄν τι,  
δῆλον, ὅτι δὲ τοῦτ' ἔστι τὸ χρῶμα, ἐκ τῶν συμ-  
βαινόντων φανερόν. τὸ γὰρ χρῶμα ἡ ἐν τῷ πέρατι  
ἔστιν ἡ πέρας· διὸ καὶ οἱ Πυθαγόρειοι τὴν ἐπι-  
φάνειαν χροιὰν ἐκάλουν. ἔστι μὲν γὰρ ἐν τῷ τοῦ  
σώματος πέρατι, ἀλλ' οὐ τι τὸ τοῦ σώματος πέρας,  
ἀλλὰ τὴν αὐτὴν φύσιν δεῖ νομίζειν, ἥπερ καὶ ἔξω

439 b χρωματίζεται, ταύτην καὶ ἐντός. φαίνεται δὲ καὶ  
ἀήρ καὶ ὕδωρ χρωματίζομενα· καὶ γὰρ ἡ αὐγὴ  
τοιοῦτόν ἔστω. ἀλλ' ἐκεῖ μὲν διὰ τὸ ἐν ἀορίστῳ  
οὐ τὴν αὐτὴν ἐγγύθεν καὶ προσιοῦσι καὶ πόρρωθεν  
ἢ ἔχει χροιὰν οὐθ' ὁ ἀήρ οὐθ' ἡ θάλαττα· ἐν δὲ τοῖς  
σώμασιν ἔὰν μὴ τὸ περιέχον ποιῆτο μεταβάλλειν,  
ῶρισται καὶ ἡ φαντασία τῆς χρόας. δῆλον ἄρα  
ὅτι τὸ αὐτὸν κάκει κάνθάδε δεκτικὸν τῆς χρόας  
ἔστιν. τὸ ἄρα διαφανὲς καθ' ὅσον ὑπάρχει ἐν τοῖς  
σώμασιν (ὑπάρχει δὲ μᾶλλον καὶ ἡττον ἐν πᾶσι)

10 χρώματος ποιεῖ μετέχειν. ἐπεὶ δ' ἐν πέρατι ἡ  
χρόα, τούτου ἄν ἐν πέρατι εἴη. ὥστε χρῶμα ἄν  
εἴη τὸ τοῦ διαφανοῦς ἐν σώματι ὥρισμένῳ πέρας.  
καὶ αὐτῶν δὲ τῶν διαφανῶν, οἷον ὕδατος καὶ εἴ-  
τι ἄλλο τοιοῦτον, καὶ ὅσοις φαίνεται χρῶμα ἴδιον  
ὑπάρχειν κατὰ τὸ ἔσχατον, δμοίως πᾶσιν ὑπάρχει.  
15 ἔστι μὲν οὖν ἐνεῦναι ἐν τῷ διαφανεῖ τοῦθ' ὅπερ  
καὶ ἐν τῷ ἀέρι ποιεῖ φῶς, ἔστι δὲ μή, ἀλλ' ἔστερήσθαι.

"Ωσπερ οὖν ἐκεῖ τὸ μὲν φῶς τὸ δὲ σκότος, οὕτως  
ἐν τοῖς σώμασιν ἐγγύνεται τὸ λευκόν καὶ τὸ μέλαν.

## ON SENSE AND SENSIBLE OBJECTS, III.

but it is obvious that there must be some limit to the transparency in bodies, and it is plain from the facts that this limit is actually colour ; for colour either has its existence in the limit or else is the limit itself. This is why the Pythagoreans call the visible surface of a body its colour. Colour lies at the limit of the body, but is not its limit ; but it is fair to suggest that the same nature which causes its colour outside, also exists within. Air and water are evidently coloured ; for their brightness is of the nature of colour. But in their case because the colour exists in something which has no limit, air and sea have not the same colour near by and to those who approach them as they have at a distance. But in bodies, unless the surrounding envelope causes a change, even the appearance of the colour is defined. It is obvious then that the same thing must be receptive of the colour, both in the one case and in the other. It is then the transparency in the proportion as it exists in bodies, which causes them to share in colour (and this transparency exists in them all to a greater or less extent). But since colour exists in the limit, it must lie in the limit of transparency. So that colour would prove to be the limit of transparency in a limited body. And in the same way colour is a property both of all transparent objects, such as water and anything of a similar nature, and also of those things in which a special colour seems to exist at the limit. And whatever it is which causes light in air, sometimes seems to exist in the transparency, and at other times seems not to exist, but to have been removed.

Just then as in air we have light and darkness, so in bodies we have white and black. But we must

## ARISTOTLE

439 b

περὶ δὲ τῶν ἄλλων χρωμάτων ἥδη διελομένους  
 20 ποσαχῶς ἐνδέχεται γίγνεσθαι λεκτέον. ἐνδέχεται  
 μὲν γὰρ παρ' ἄλληλα τιθέμενα τὸ λευκὸν καὶ τὸ  
 μέλαν, ὥσθ' ἐκάτερον μὲν εἶναι ἀόρατον διὰ  
 σμικρότητα, τὸ δ' ἐξ ἀμφοῦ ὄρατὸν οὕτω γίγνεσθαι.  
 τοῦτο γὰρ οὕτε λευκὸν οἶον τε φαίνεσθαι οὕτε  
 μέλαν· ἐπεὶ δ' ἀνάγκη μὲν τι ἔχειν χρῶμα, τούτων  
 25 δ' οὐδέτερον δυνατόν, ἀνάγκη μικτόν τι εἶναι καὶ  
 εἰδός τι χρόας ἔτερον. ἔστι μὲν οὖν οὕτως ὑπο-  
 λαβεῖν πλείους εἶναι χρόας παρὰ τὸ λευκὸν καὶ τὸ  
 μέλαν, πολλὰς δὲ τῷ λόγῳ· τρία γὰρ πρὸς δύο,  
 καὶ τρία πρὸς τέτταρα, καὶ κατ' ἄλλους ἀριθμοὺς  
 30 ἔστι παρ' ἄλληλα κεῖσθαι, τὰ δ' ὅλως κατὰ μὲν  
 λόγον μηδένα, καθ' ὑπεροχὴν δέ τινα καὶ ἔλλειψιν  
 ἀσύμμετρον, καὶ τὸν αὐτὸν δὴ τρόπον ἔχειν ταῦτα  
 ταῖς συμφωνίαις· τὰ μὲν γὰρ ἐν ἀριθμοῖς εὐλογί-  
 στοις χρώματα, καθάπερ ἐκεῖ τὰς συμφωνίας, τὰ  
 440 a ἡδιστα τῶν χρωμάτων εἶναι δοκοῦντα, οἷον τὸ  
 ἀλουργὸν καὶ φοινικοῦν καὶ ὀλίγ' ἄπτα τοιαῦτα,  
 δι' ἥνπερ αἴτιαν καὶ αἱ συμφωνίαι ὀλίγαι, τὰ δὲ  
 μὴ ἐν ἀριθμοῖς τάλλα χρώματα, ἥ καὶ πάσας τὰς  
 χρόας ἐν ἀριθμοῖς εἶναι, τὰς μὲν τεταγμένας τὰς  
 δὲ ἀτάκτους, καὶ αὐτὰς ταῦτας, ὅταν μὴ καθαραὶ  
 ὥστι, διὰ τὸ μὴ ἐν ἀριθμοῖς εἶναι τοιαύτας γίγνεσθαι.

Ἐις μὲν οὖν τρόπος τῆς γενέσεως τῶν χρωμάτων  
 οὗτος, εἰς δὲ τὸ φαίνεσθαι δι' ἄλλήλων, οἷον ἐνίστε  
 οἱ γραφῆς ποιοῦσιν, ἐτέραν χρόαν ἐφ' ἐτέραν  
 ἐναργεστέραν ἐπαλείφουσιν, ὥσπερ ὅταν ἐν ὕδατί<sup>10</sup>  
 τι ἥ ἐν ἀέρι βούλωνται ποιῆσαι φαινόμενον, καὶ

## ON SENSE AND SENSIBLE OBJECTS, III.

now speak of colours other than white and black, other than white and black. and explain in how many ways it is possible for them to occur. One possibility is that white and black are put side by side in such a way that each separate colour is invisible because of its smallness, and that what is seen is a compound of the two. This clearly cannot appear as either white or black ; but since it must have some colour, and cannot have either of these, it must evidently be some kind of mixture and some other form of colour. It is thus possible to believe that there are more colours than just white and black, and that their number is due to the proportion of their components ; for they may lie side by side in the ratio of three to two, or three to four, and in other proportions also, and speaking quite generally they may be in no finite numerical relation at all, but may be in asymmetrical excess or defect, and these may act in the same way as when in harmonious proportions. Now colours that depend on calculable numbers, as there are harmonies there, seem to be the most attractive colours, such as purple and red and a few others of a similar kind, but only a few, because there are few simple ratios, and possibly all the other colours are not in numerical ratios ; or again it is possible that all colours are in ratios, but that some are symmetrically arranged and others not, and that these last, whenever they are not simple colours, owe their character to the absence of symmetrical arrangement.

Colours due  
to strips of  
white and  
black in  
different  
proportions.

This is one way in which colours arise, but there is another ; namely when they appear through each other, as sometimes painters produce them, when they smear one colour over another more vivid one, when they want to make a thing appear to be in

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οῖον ὁ ἥλιος καθ' αὐτὸν μὲν λευκὸς φαίνεται, διὰ δ' ἀχλύος καὶ καπνοῦ φοινικοῦς. πολλαὶ δὲ καὶ οὕτως ἔσονται χρόαι τὸν αὐτὸν τρόπον τῷ πρότερον εἰρημένῳ· λόγος γὰρ ἀν εἴη τις τῶν ἐπιπολῆς πρὸς 15 τὰ ἐν βάθει, τὰ δὲ καὶ ὅλας οὐκ ἐν λόγῳ.

Τὸ μὲν οὖν, ὥσπερ καὶ οἱ ἀρχαῖοι, λέγειν ἀπορροίας εἶναι τὰς χροίας καὶ ὀρᾶσθαι διὰ τοιαύτην αἰτίαν ἀτοπον· πάντας γὰρ δι' ἀφῆς ἀναγκαῖον αὐτοῖς ποιεῖν τὴν αἰσθησιν, ὥστ' εὐθὺς κρείττον φάναι τῷ κινεῖσθαι τὸ μεταξὺ τῆς αἰσθήσεως ὑπὸ 20 τοῦ αἰσθητοῦ γίνεσθαι τὴν αἰσθησιν, ἀφῆ καὶ μὴ ταῖς ἀπορροίαις. ἐπὶ μὲν οὖν τῶν παρ' ἄλληλα κειμένων ἀνάγκη ὥσπερ καὶ μέγεθος λαμβάνειν ἀόρατον, οὕτω καὶ χρόνον ἀναίσθητον, ἵνα λάθωσιν αἱ κινήσεις ἀφικνούμεναι καὶ ἐν δοκῇ εἶναι διὰ τὸ ἄμα φαίνεσθαι. ἐνταῦθα δὲ οὐδεμίᾳ ἀνάγκη, ἀλλὰ 25 τὸ ἐπιπολῆς χρῶμα ἀκίνητον ὃν καὶ κινούμενον ὑπὸ τοῦ ὑποκειμένου οὐχ ὅμοίαν ποιήσει τὴν κίνησιν. διὸ καὶ ἔτερον φαίνεται καὶ οὕτε λευκὸν οὕτε μέλαν. ὥστ' εἰ μὴ ἐνδέχεται μηδὲν εἶναι μέγεθος ἀόρατον, ἀλλὰ πᾶν ἐκ τινος ἀποστήματος ὁρατόν, καὶ αὕτη τις ἀν εἴη χρωμάτων μίξις. κάκενώς δ' οὐδὲν κωλύει φαίνεσθαι τινα χρόαι 30 κοινὴν τοῖς πόρρωθεν· ὅτι γὰρ οὐκ ἔστιν οὐδὲν μέγεθος ἀόρατον, ἐν τοῖς ὑστερον ἐπισκεπτέον.

440 b Εἰ δ' ἔστι μίξις τῶν σωμάτων μὴ μόνον τὸν τρόπον τοῦτον ὅνπερ οἴονται τινες, παρ' ἄλληλα τῶν ἐλαχίστων τιθεμένων, ἀδήλων δ' ἡμῖν διὰ τὴν

## ON SENSE AND SENSIBLE OBJECTS, III.

water or in air ; just as the sun appears white when seen directly, but red when viewed through mist and smoke. And in this way there will be many colours in the same way as we have described. For there will be some definite relation between the superimposed colours and those below, and others again will not be in finite ratio.

But to say, as the old philosophers did, that colours are emanations from objects and are visible on this account is unreasonable ; for in that case they would all have to produce sensation by means of touch, so that it would be better to say at once that sensation is caused because the sensible object sets in motion the medium of the sensation, that is by touch and not by emanations. But on the supposition that they lie side by side, just as their size is invisible, so also the time must be imperceptible, for the arrival of the movement at the eye to escape notice and to appear one, because they are seen simultaneously. In the other case it is not necessary, but the colour of the upper layer will not produce the same movement when unmoved and when moved by the layer beneath. For this reason it appears different, and neither white nor black. So that if it is impossible for any magnitude to be unseen, but if on the other hand every magnitude is visible from some distance, then this would be some blending of colour. In that case there is nothing to prevent any colour from appearing to come from a distance ; later on we must examine the statement that no magnitude can be invisible.

But if a mingling of bodies occurs, it is not merely *Mixture*. in the way in which some people think, when very small coloured objects are placed side by side, which

Colours as  
emanations  
from  
objects.

## ARISTOTLE

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αἰσθησιν, ἀλλ' ὅλως πάντῃ πάντως, ὥσπερ ἐν τοῖς περὶ μίξεως εἴρηται καθόλου περὶ πάντων. ἐκείνως μὲν γὰρ μίγνυται ταῦτα μόνον ὅσα ἐνδέχεται διελεῖν εἰς τὰ ἐλάχιστα, καθάπερ ἀνθρώπους ὑπους ἢ τὰ σπέρματα· τῶν μὲν γὰρ ἀνθρώπων ἀνθρωπος ἐλάχιστος, τῶν δ' ὑππων ὑπος· ὥστε τῇ τούτων παρ' ἄλληλα θέσει τὸ πλῆθος μέμικται τῶν συναμφοτέρων· ἀνθρωπον δὲ ἔνα ἐνὶ ὑπψῳ οὐ λέγομεν μεμῖχθαι. ὅσα δὲ μὴ διαιρεῖται εἰς τὸ ἐλάχιστον, τούτων οὐκ ἐνδέχεται μίξιν γενέσθαι τὸν τρόπον τοῦτον ἀλλὰ τῷ πάντῃ μεμῖχθαι, ἀπέρ καὶ μάλιστα μίγνυσθαι πέφυκεν. πῶς δὲ τοῦτο γίγνεσθαι δυνατόν, ἐν τοῖς περὶ μίξεως εἴρηται πρότερον. ἀλλ' ὅτι ἀνάγκη μιγνυμένων καὶ τὰς χρόας μίγνυσθαι, δῆλον, καὶ ταύτην τὴν αἰτίαν εἶναι κυρίαν τοῦ πολλὰς εἶναι χροίας, ἀλλὰ μὴ τὴν ἐπιπόλασιν μηδὲ τὴν παρ' ἄλληλα θέσιν· οὐ γὰρ πόρρωθεν μὲν ἐγγύθεν δ' οὐ φαίνεται μία χρόα τῶν μεμιγμένων, ἀλλὰ πάντοθεν. πολλαὶ δ' ἔσονται χρόαι διὰ τὸ κατὰ πολλοὺς λόγους ἐνδέχεσθαι μίγνυσθαι ἀλλήλοις τὰ μιγνύμενα, καὶ τὰ μὲν ἐν ἀριθμοῖς τὰ δὲ καθ' ὑπεροχὴν μόνον. καὶ τὰλλα δὴ τὸν αὐτὸν τρόπον ὅνπερ ἐπὶ τῶν παρ' ἄλληλα τιθεμένων χρωμάτων ἢ ἐπιπολῆς, ἐνδέχεται λέγειν καὶ περὶ τῶν μιγνυμένων· διὰ τίνα δ' αἰτίαν εἴδη τῶν χρωμάτων ἔστιν ὡρισμένα καὶ οὐκ ἀπειρα, καὶ χυμῶν καὶ ψόφων, ὕστερον ἔροῦμεν.

IV. Τί μὲν οὖν ἔστι χρῶμα καὶ διὰ τίν' αἰτίαν πολλαὶ χροιαί εἰσιν, εἴρηται περὶ δὲ ψόφου καὶ φωνῆς εἴρηται πρότερον ἐν τοῖς περὶ ψυχῆς· περὶ

## ON SENSE AND SENSIBLE OBJECTS. III.—IV.

are not obvious to the sense, but generally everywhere and in every way, as has been said in our discussion of mixtures in general.<sup>a</sup> In that case mixture is only possible in the case of those things which can be divided into the infinitely small, such as men, horses or seeds; for man is the smallest unit of men, and a horse of horses; so that by the placing of these side by side, the whole number becomes a mixture of both; but we cannot speak of one man being mixed with one horse. But with things which are not divided into their smallest units there can be no mixture in this sense, but only a complete mingling, which is the most natural sense of mixture. How this can occur has been discussed previously in our discussion of mixture.<sup>a</sup> But it is clear that colours must be mixed when the substances in which they occur are mixed, and that is the real reason why there are many colours; it is not due either to overlaying or to placing side by side; for it is not that from a distance and not from near by there appears to be one colour from the mixture, but from all distances. But there will be many colours, because it is possible for the mixed element to be combined in various ratios, some being numerical and some merely an excess of one over another. In the case of mixtures all that can be said of colours put side by side or overlaid applies; but why the possible forms of colour are limited and not unlimited, which is also true of flavours and sounds, we will discuss later on.

IV. We have now explained what colour is, and why there are many colours. We have previously discussed sound and voice in our treatise *On the* smell and flavour.

<sup>a</sup> So far as is known this does not refer to any special treatise.

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440<sup>b</sup> δὲ ὁσμῆς καὶ χυμοῦ νῦν λεκτέον. σχεδὸν γάρ  
 30 ἔστι τὸ αὐτὸ πάθος, οὐκ ἐν τοῖς αὐτοῖς δ’ ἔστιν  
 ἐκάτεροι αὐτῶν. ἐναργέστερον δ’ ἔστιν ἡμῖν τὸ  
 τῶν χυμῶν γένος ἢ τὸ τῆς ὁσμῆς. τούτου δ’  
 441<sup>a</sup> αἴτιον δτι χειρίστην ἔχομεν τῶν ἄλλων ζώων τὴν  
 ὅσφρησιν καὶ τῶν ἐν ἡμῖν αὐτοῖς αἰσθήσεων, τὴν  
 δ’ ἀφῆν ἀκριβεστάτην τῶν ἄλλων ζώων. ἢ δὲ  
 γεῦσις ἀφή τις ἔστιν.

‘Η μὲν οὖν τοῦ ὕδατος φύσις βούλεται ἄχυμος  
 5 εἶναι· ἀνάγκη δ’ ἢ ἐν αὐτῷ τὸ ὕδωρ ἔχειν τὰ  
 γένη τῶν χυμῶν ἀναίσθητα διὰ μικρότητα, καθάπερ  
 Ἐμπεδοκλῆς φησίν, ἢ ὑλην τοιαύτην ἐνεῖναι οἷον  
 πανσπερμίαν χυμῶν, καὶ ἅπαντα μὲν ἐξ ὕδατος  
 γίγνεσθαι, ἄλλα δ’ ἐξ ἄλλου μέρους, ἢ μηδεμίαν  
 10 ἔχοντος διαφορὰν τοῦ ὕδατος τὸ ποιοῦν αἴτιον  
 εἶναι, οἷον εἰ τὸ θερμὸν καὶ τὸν ἥλιον φαίη τις.  
 τούτων δ’, ὡς μὲν Ἐμπεδοκλῆς λέγει, λίαν εὐ-  
 σύνοπτον τὸ ψεῦδος· ὅρῶμεν γάρ μεταβάλλοντας  
 ὑπὸ τοῦ θερμοῦ τοὺς χυμοὺς ἀφαιρουμένων τῶν  
 περικαρπίων εἰς τὸν ἥλιον καὶ πυρουμένων, ὡς  
 οὐ τῷ ἐκ τοῦ ὕδατος ἐλκειν τοιούτους γινομένους,  
 15 ἀλλ’ ἐν αὐτῷ τῷ περικαρπίῳ μεταβάλλοντας, καὶ  
 ἔξικμαζομένους δὲ καὶ κειμένους, διὰ τὸν χρόνον,  
 αὐστηροὺς ἐκ γλυκέων καὶ πικροὺς καὶ παντο-  
 δαποὺς γινομένους, καὶ ἐψομένους, εἰς πάντα τὰ  
 γένη τῶν χυμῶν ὡς εἰπεῖν μεταβάλλοντας. ὅμοίως  
 δὲ καὶ τὸ πανσπερμίας εἶναι τὸ ὕδωρ ὑλην ἀδύνα-  
 20 τον· ἐκ τοῦ αὐτοῦ γάρ ὅρῶμεν ὡς<sup>1</sup> τροφῆς γινο-

<sup>1</sup> ἐκ τῆς αὐτῆς ins. B.

## ON SENSE AND SENSIBLE OBJECTS, iv.

*Soul.*<sup>a</sup> We have now to consider smell and flavour. These two are almost the same affection, though they do not occur in the same circumstances. The class of flavours is more easily defined than that of smells. The reason for this is that our sense of smell is inferior to that of all other living creatures, and also inferior to all the other senses we possess, but our sense of touch is more accurate than that of any other living creature. Taste is a form of touch.

Now it is the nature of water to be tasteless ; <sup>Theories of taste.</sup> there are therefore three possibilities : (1) Water may possess within itself all kinds of flavours, which are imperceptible because of their small quantity, as Empedocles suggests. (2) Water may contain matter of such a kind as to be the seed of all flavours, that is to say that all flavours arise from water, some from one part and some from another. (3) Without water having any effect on it at all, that which acts on it may be the cause, as for instance one might suggest heat or the sun as the cause. Now of these <sup>(1) Em-</sup> <sup>(2) Water is not the origin of all flavours.</sup> three theories, the first—that of Empedocles—is palpably false ; for we find flavours changing under the influence of heat, when seed pods are detached from the trees and scorched in the sun, so that flavours have not become what they are by extraction from water, but have changed in the seed pod itself, and by evaporation and lying still, in time, have changed from sweet to harsh, and bitter and all other kinds, and by being baked have changed, so to speak, into all kinds of flavours. In the same way, that water should be the material of all the origin of flavours is impossible ; for one notices different kinds of flavours arising from the same water, considered as food. The

<sup>a</sup> *De An.* 419 b, 420 a.

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441 <sup>a</sup> μένους ἔτέρους χυμούς. λείπεται δὴ τῷ πάσχειν τι τὸ ὕδωρ μεταβάλλειν. ὅτι μὲν τούννυν οὐχ ὑπὸ τῆς τοῦ θερμοῦ δυνάμεως λαμβάνει ταύτην τὴν δύναμιν ἢν καλοῦμεν χυμόν, φανερόν· λεπτότατον γὰρ τῶν πάντων ὑγρῶν τὸ ὕδωρ ἔστι, καὶ αὐτοῦ τοῦ ἐλαίου. ἀλλ’ ἐπεκτείνεται ἐπὶ πλεῖον τοῦ 25 ὕδατος τὸ ἔλαιον διὰ τὴν γλισχρότητα. τὸ δὲ ὕδωρ φαθυρόν ἔστι· διὸ καὶ χαλεπώτερον φυλάξαι ἐν τῇ χειρὶ ὕδωρ ἢ ἔλαιον. ἐπεὶ δὲ θερμαινόμενον οὐδέν φαίνεται παχυνόμενον τὸ ὕδωρ αὐτὸ μόνον, δῆλον ὅτι ἔτέρα τις ἀν εἴη αἰτία· οἱ γὰρ χυμοὶ πάντες πάχος ἔχουσι μᾶλλον· τὸ δὲ θερμὸν συν- 30 αἴτιον. φαίνονται δὲ οἱ χυμοὶ ὅσοιπερ καὶ ἐν τοῖς 441 <sup>b</sup> περικαρπίοις, οὗτοι ὑπάρχοντες καὶ ἐν τῇ γῇ. διὸ καὶ πολλοί φασι τῶν ἀρχαίων φυσιολόγων τοιοῦτον εἶναι τὸ ὕδωρ δι’ οἵας ἀν γῆς πορεύηται. καὶ τοῦτο δῆλόν ἔστιν ἐπὶ τῶν ἀλμυρῶν ὑδάτων μάλιστα· οἱ γὰρ ἄλες γῆς τι εἰδός εἰσιν. καὶ τὰ διὰ τῆς 5 τέφρας διηθούμενα πικρᾶς οὔσης πικρὸν ποιεῖ τὸν χυμόν. εἰσὶ τε κρῆναι πολλαὶ αἱ μὲν πικραί, αἱ δὲ δέξεῖαι, αἱ δὲ παντοδαποὺς ἔχουσαι χυμοὺς ἄλλους. διὸ<sup>1</sup> εὐλόγως δὲ ἐν τοῖς φυομένοις τὸ τῶν χυμῶν γίνεται γένος μάλιστα. πάσχειν γὰρ πέφυκε τὸ ὑγρόν, ὥσπερ καὶ τάλλα, ὑπὸ τοῦ ἐναντίου· 10 ἐναντίον δὲ τὸ ξηρόν. διὸ καὶ ὑπὸ τοῦ πυρὸς πάσχει τι· ξηρὰ γὰρ ἡ τοῦ πυρὸς φύσις. ἀλλ’ ἴδιον τοῦ πυρὸς τὸ θερμόν ἔστι, γῆς δὲ τὸ ξηρόν, ὥσπερ εἴρηται ἐν τοῖς περὶ στοιχείων. οἱ μὲν οὖν πῦρ καὶ ἡ γῆ, οὐδέν πέφυκε ποιεῖν ἢ πάσχειν, οὐδὲ ἄλλο οὐδέν· οἱ δὲ ὑπάρχει ἐναντιότης ἐν 15 ἐκάστῳ, ταύτη πάντα καὶ ποιοῦσι καὶ πάσχουσιν. ὥσπερ οὖν οἱ ἐναποπλύνοντες ἐν τῷ ὑγρῷ τὰ

## ON SENSE AND SENSIBLE OBJECTS, iv.

alternative solution is that the water changes by (8) Water is being affected in some way. Now it is clear that it <sup>affected in some way.</sup> does not acquire the faculty which we call taste from the power of heat; for water is the lightest of all liquids, lighter even than oil. But oil will spread over a larger surface than water because of its viscosity. But water does not cohere so closely; consequently it is more difficult to hold water in the hand than oil. But since water by itself when heated shows no sign of thickening, it is clear that there must be some other reason; for all flavours show density; and heat is a contributory cause. All the flavours which exist in seed pods also exist in the earth. Consequently some of the old philosophers stated that water draws its character from the earth through which it passes. This is obvious in the case of brackish water; for salt is a form of earth. Water which has percolated through ashes which are bitter has a bitter flavour. But of the many water fountains some are bitter, some sharp, and others have different kinds of flavours. But the class of flavours is most obvious in plants, and this is natural. For "wet," like everything else, is naturally affected by its opposite; and its opposite is "dry." This is why it is affected to some extent by fire; for the nature of fire is dry. But the special quality of fire is heat, and of earth dryness, as has been said in our discussion of the elements.<sup>a</sup> Neither fire nor earth is likely to <sup>How the water is affected.</sup> produce or suffer an effect *qua* fire or *qua* earth; but all effect is produced and suffered, in so far as some contrariety exists in each. So just as those who wash off colours or flavours in liquid cause the water to

<sup>a</sup> *De Gen. et Corr.* 329 a.

<sup>1</sup> διδ om. B.

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141 b

χρώματα καὶ τοὺς χυμοὺς τοιοῦτον ἔχειν ποιοῦσι τὸ ὕδωρ, οὕτω καὶ ἡ φύσις τὸ ξηρὸν καὶ τὸ γεῶδες, καὶ διὰ τοῦ ξηροῦ καὶ γεώδους διηθοῦσα καὶ κινοῦσα τῷ θερμῷ ποιόν τι τὸ ὑγρὸν παρασκευάζει. καὶ ἔστι τοῦτο χυμὸς τὸ γιγνόμενον 20 ὑπὸ τοῦ εἰρημένου ξηροῦ πάθος ἐν τῷ ὑγρῷ τῆς γεύσεως τῆς κατὰ δύναμιν ἀλλοιωτικὸν εἰς ἐνέργειαν· ἄγει γὰρ τὸ αἰσθητικὸν εἰς τοῦτο δυνάμει προϋπάρχον· οὐ γὰρ κατὰ τὸ μανθάνειν ἀλλὰ κατὰ τὸ θεωρεῖν ἔστι τὸ αἰσθάνεσθαι.

“Οτι δ’ οὐ παντὸς ξηροῦ ἀλλὰ τοῦ τροφίμου οἱ 25 χυμοὶ ἡ πάθος εἰσὶν ἡ στέρησις, δεῖ λαβεῖν ἐντεῦθεν, ὅτι οὕτε τὸ ξηρὸν ἄνευ τοῦ ὑγροῦ οὕτε τὸ ὑγρὸν ἄνευ τοῦ ξηροῦ· τροφὴ γὰρ οὐδὲν αὐτῶν τοῖς ζῷοις, ἀλλὰ τὸ μεμιγμένον. καὶ ἔστι τῆς προσφερομένης τροφῆς τοῖς ζῷοις τὰ μὲν ἀπτὰ τῶν αἰσθητῶν αὐξῆσιν ποιοῦντα καὶ φθίσιν· τούτων 30 μὲν γὰρ αἴτιον ἡ θερμὸν καὶ ψυχρὸν τὸ προσφερό-  
142 a μενον· ταῦτα γὰρ ποιεῖ καὶ αὐξῆσιν καὶ φθίσιν· τρέφει δὲ ἡ γευστὸν τὸ προσφερόμενον· πάντα γὰρ τρέφεται τῷ γλυκεῖ, ἡ ἀπλῶς ἡ μεμιγμένως. δεῖ μὲν οὖν διορίζειν περὶ τούτων ἐν τοῖς περὶ γενέσεως, νῦν δὲ ὅσον ἀναγκαῖον ἀψισθαι αὐτῶν. 5 τὸ γὰρ θερμὸν αὐξάνει καὶ δημιουργεῖ τὴν τροφήν, καὶ τὸ μὲν κοῦφον ἔλκει, τὸ δὲ ἀλμυρὸν καὶ πικρὸν καταλείπει διὰ βάρος. ὃ δὴ ἐν τοῖς ἔξω σώμασι ποιεῖ τὸ ἔξω θερμόν, τοῦτο ἐν τῇ φύσει τῶν ζῴων καὶ φυτῶν· διὸ τρέφεται τῷ γλυκεῖ. συμμιγνύνται δὲ οἱ ἄλλοι χυμοὶ εἰς τὴν τροφὴν τὸν αὐτὸν τρό-  
10 πον τῷ ἀλμυρῷ καὶ ὀξεῖ, ἀντὶ ήδύσματος. ταῦτα

<sup>a</sup> Cf. *De An.* 417 b 19.

## ON SENSE AND SENSIBLE OBJECTS, IV.

assume these colours or flavours, so also nature treats what is dry and earthy, and causing water to percolate through what is dry and earthy, and moving it by heat, causes the liquid to assume some character. And this affection produced by the dry, as explained, being washed in the moist, transforms potential taste into actual taste, which is flavour. For it brings the capacity for sensation to actuality ; for sensation is analogous not to the acquisition of knowledge, but to the exercise of it.<sup>a</sup>

The flavours however are not the affection nor the absence of every dry thing, but only of dry food, which one can deduce from the fact that there is no dry without wet, nor wet without dry ; for neither of these is adequate as food for living creatures, but a mixture of the two. But of the food offered to animals which is perceptible, it is the tangible parts that cause growth and decay ; and the food offered is responsible for these, *qua* hot and cold ; for these things cause both growth and decay ; but the food offered nourishes because it is tasted ; for everything is nourished by the sweet, either isolated or in combination. The details of this must be discussed in the treatise *On Generation*,<sup>b</sup> but for the moment can only be referred to as far as is essential. For heat increases and fashions the food, and extracts from it what is light, leaving behind what is harsh and bitter owing to its weight. The functions performed by external heat in external bodies is performed by their natural heat in animals and plants ; therefore they are nourished by what is sweet. But all the other flavours are mixed with food in the same way as the harsh and acid, for the purpose of seasoning. These

<sup>a</sup> *De Gen. et Corr.* i. 5, 350-352.

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442 <sup>α</sup> δὲ διὰ τὸ ἀντισπᾶν τῷ λίαν τρόφιμον εἶναι τὸ γλυκὺ καὶ ἐπιπολαστικόν.

“Ωσπερ δὲ τὰ χρώματα ἐκ λευκοῦ καὶ μέλανος μίξεώς ἐστιν, οὕτως οἱ χυμοὶ ἐκ γλυκέος καὶ πικροῦ. καὶ κατὰ λόγον δὴ τῷ μᾶλλον καὶ ἡττον  
15 ἔκαστοι εἰσιν, εἴτε κατ’ ἀριθμούς τινας τῆς μίξεως καὶ κινήσεις, εἴτε καὶ ἀορίστως. οἱ δὲ τὴν ἡδοιὴν ποιοῦντες μιγνύμενοι, οὗτοι ἐν ἀριθμοῖς. μόνος μὲν οὖν λιπαρὸς δὲ τοῦ γλυκέος ἐστὶ χυμός, τὸ δὲ ἀλμυρὸν καὶ πικρὸν σχεδὸν τὸ αὐτό, δὲ δὲ αὐστηρὸς καὶ δριμὺς καὶ στρυφνὸς καὶ ὀξὺς ἀνὰ μέσον.

20 Σχεδὸν γὰρ ἵσα καὶ τὰ τῶν χυμῶν εἴδη καὶ τὰ τῶν χρωμάτων ἐστίν. ἐπτὰ γὰρ ἀμφοτέρων εἴδη, ἃν τις τιθῇ, ὥσπερ εὔλογον, τὸ φαιὸν μέλαν τι εἶναι· λείπεται γὰρ τὸ ξανθὸν μὲν τοῦ λευκοῦ εἶναι ὥσπερ τὸ λιπαρὸν τοῦ γλυκέος, τὸ φοινικοῦ δὲ καὶ ἀλουργὸν καὶ πράσινον καὶ κυανοῦν μεταξὺ 25 τοῦ λευκοῦ καὶ μέλανος, τὰ δὲ ἄλλα μικτὰ ἐκ τούτων. καὶ ὥσπερ τὸ μέλαν στέρησις ἐν τῷ διαφανεῖ τοῦ λευκοῦ, οὕτω τὸ ἀλμυρὸν καὶ πικρὸν τοῦ γλυκέος ἐν τῷ τροφίμῳ ὑγρῷ. διὸ καὶ ἡ τέφρα τῶν κατακαομένων πικρὰ πάντων· ἔξ-  
ίκμασται γὰρ τὸ πότιμον ἔξ αὐτῶν.

30 Δημόκριτος δὲ καὶ οἱ πλεῖστοι τῶν φυσιολόγων, ὅσοι λέγουσι περὶ αἰσθήσεως, ἀτοπώτατον τι  
442 <sup>β</sup> ποιοῦσιν· πάντα γὰρ τὰ αἰσθητὰ ἀπτὰ ποιοῦσιν. καίτοι εἰ οὕτω τοῦτο ἔχει, δῆλον ὡς καὶ τῶν ἄλλων αἰσθήσεων ἔκάστη ἀφή τις ἐστίν· τοῦτο δὲ ὅτι ἀδύνατον, οὐ χαλεπὸν συνιδεῖν. ἔτι δὲ τοῖς κοινοῖς  
5 τῶν αἰσθήσεων πασῶν χρῶνται ὡς ἴδιοις· μέγεθος γὰρ καὶ σχῆμα καὶ τὸ τραχὺ καὶ τὸ λεῖον, ἔτι  
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are required to counteract the excessive sweetness of food, which would lie undigested in the stomach.

Just then as colours are a mingling of white and black, so flavours are a mixing of sweet and bitter. Flavours  
and colours  
are ana-  
logous. And each pair, in some greater or smaller ratio, is either with definite numerical values and movements in the mixture, or without definite limits. But those which when mingled give pleasure are all in numerical ratios. Only the flavour of the sweet is rich, and the brackish is almost the same as the bitter, but the harsh, pungent, astringent and sharp are intermediate.

The kinds of flavour are almost the same as those of colours. For there are seven forms of each, if one regards grey, as is natural, as a variant of black. It remains to consider yellow as a variant of white, just as we regard rich as a variant of sweet, then red, scarlet, purple, green and blue are colours intermediate between white and black, and the rest are a mixture of these. And just as black is an absence of white in the transparent medium, so brackish and bitter is an absence of sweet in moist food. This is why the ash of everything burned is bitter; for the drinkable moisture has been evaporated from them.

But Democritus and most of the physical philosophers who treat of sensation produce a most unreasonable hypothesis; for they make all sensible objects objects of touch. And yet it is obvious that, if this be so, each of the other senses is a kind of touch. Now it is not difficult to see that this is impossible. Again they treat of objects perceived, which are common to all the senses, as if they were peculiar to one; for size, shape, rough and smooth,

Some  
thinkers  
refer all  
senses to  
touch.

<sup>1</sup> ἀριθμοῖς μένον. ὁ μὲν οὖν λιπαρὸς τοῦ κτλ. B.

δὲ τὸ ὁξὺ καὶ τὸ ἀμβλὺ τὸ ἐν τοῖς ὅγκοις κοινὰ τῶν αἰσθήσεών ἐστιν, εἰ δὲ μὴ πασῶν, ἀλλ’ ὅψεώς γε καὶ ἀφῆς. διὸ καὶ περὶ μὲν τούτων ἀπατῶνται, περὶ δὲ τῶν ιδίων οὐκ ἀπατῶνται, οἷον ὅψις περὶ 10 χρώματος καὶ ἀκοὴ περὶ ψόφων. οἵ δὲ τὰ ὅδια εἰς ταῦτα ἀνάγουσιν, ὥσπερ Δημόκριτος· τὸ γὰρ λευκὸν καὶ τὸ μέλαν τὸ μὲν τραχύ φησιν εἶναι τὸ δὲ λεῖον, εἰς δὲ τὰ σχήματα ἀνάγει τοὺς χυμούς. καίτοι ἡ οὐδεμιᾶς ἡ μᾶλλον τῆς ὅψεως τὰ κοινὰ γνωρίζειν. εἰ δ’ ἄρα τῆς γεύσεως μᾶλλον, τὰ 15 γοῦν ἐλάχιστα τῆς ἀκριβεστάτης ἐστὶν αἰσθήσεως διακρίνειν περὶ ἔκαστον γένος, ὥστε ἔχρην τὴν γεύσιν καὶ τῶν ἄλλων κοινῶν αἰσθάνεσθαι μάλιστα καὶ τῶν σχημάτων εἶναι κριτικωτάτην. ἔτι τὰ μὲν αἰσθητὰ πάντα ἔχει ἐναντίωσιν, οἷον ἐν χρώματι τῷ μέλαινι τὸ λευκὸν καὶ ἐν χυμοῖς τῷ γλυκεῖ 20 τὸ πικρόν· σχῆμα δὲ σχήματι οὐ δοκεῖ εἶναι ἐναντίον· τίνι γὰρ τῶν πολυγάνων τὸ<sup>1</sup> περιφερὲς ἐναντίον; ἔτι ἀπείρων ὅντων τῶν σχημάτων ἀναγκαῖον καὶ τοὺς χυμούς εἶναι ἀπείρους· διὰ τὸ γὰρ ὃ μὲν ἀν ποιήσειν αἰσθησιν, ὃ δ’ οὐκ ἀν ποιήσειν; καὶ περὶ μὲν τοῦ γευστοῦ καὶ χυμοῦ 25 εἴρηται· τὰ γὰρ ἄλλα πάθη τῶν χυμῶν οὔκειαν ἔχει τὴν σκέψιν ἐν τῇ φυσιολογίᾳ τῇ περὶ τῶν φυτῶν.

V. Τὸν αὐτὸν δὲ τρόπον δεῖ νοῆσαι καὶ περὶ τὰς ὁσμάς· ὅπερ γὰρ ποιεῖ ἐν τῷ ὑγρῷ τὸ ξηρόν, τοῦτο ποιεῖ ἐν ἄλλῳ γένει τὸ ἔγχυμον ὑγρόν, ἐν 30 ἀέρι καὶ ὕδατι ὁμοίως. κοινὸν δὲ κατὰ τούτων νῦν μὲν λέγομεν τὸ διαφανές, ἔστι δ’ ὁσφραντὸν οὐχ ἢ διαφανές, ἀλλ’ ἢ πλυντικὸν ἢ ρύπτικὸν ἔγχυμον

<sup>1</sup> τὸ ομ. B.

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besides sharp and blunt, as found in solid bodies, are common, if not to all the senses, at least to sight and touch. So the senses are liable to error in dealing with common sensibles, but they are not mistaken about the objects of special senses ; for instance vision is not in error about colour, nor hearing about sound. But these thinkers attribute special objects to general senses, as Democritus does. For he says that white and black are rough and smooth respectively, and he refers flavours to shapes. And yet surely it is not the function of any one sense or rather only of sight to recognize common sensibles. If we attribute such a function to taste, seeing that it is the mark of the most discriminating sense to recognize the smallest in each class, taste ought to have been most capable of perceiving shapes. Again sensible objects show pairs of opposites, for instance black and white in colours, and bitter and sweet in flavours. But no figure appears opposite to any other ; in what sense is a sphere opposite to a polygon ? Again, as figures are infinite in number, flavours would necessarily be also infinite ; for why should one flavour produce sensation and not another ? This finishes our discussion of taste and flavour ; the other affections of flavour have their proper place of inquiry in the *Natural History of Plants*.<sup>a</sup>

V. Now we must consider smelling in the same smell. way ; for the effect which the dry produces in the wet is also produced by liquid flavour in another class, both in air and in water. In these transparence is a common property, but the object is not smelt because it is transparent, but because it is capable of washing or cleansing the moistened dryness ; for

<sup>a</sup> No such treatise by Aristotle has come down to us.

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448 a

ξηρότητος· οὐ γὰρ μόνον ἐν ἀέρι ἀλλὰ καὶ ἐν ὕδατι τὸ τῆς ὁσφρήσεως ἐστιν. δῆλον δ' ἐπὶ τῶν ἰχθύων καὶ τῶν ὀστρακοδέρμων· φαίνονται γὰρ ὁσφραινό-<sup>5</sup> μενα οὕτε ἀέρος ὅντος ἐν τῷ ὕδατι (ἐπιπολάζει γὰρ ὁ ἀήρ, ὅταν ἐγγένηται) οὕτ' αὐτὰ ἀναπνέοντα. εἰ οὖν τις θείη καὶ τὸν ἀέρα καὶ τὸ ὕδωρ ἄμφω ὑγρά, εἴη ἀνήρ ἡ ἐν ὑγρῷ τοῦ ἐγχύμου ξηροῦ φύσις ὁσμή, καὶ ὁσφραντὸν τὸ τοιοῦτον. ὅτι δ' ἀπ' ἐγχύμου<sup>1</sup> ἐστὶ τὸ πάθος, δῆλον ἐκ τῶν ἐχόντων καὶ μὴ<sup>10</sup> ἐχόντων ὁσμήν· τά τε γὰρ στοιχεῖα ἄοσμα, οἷον πῦρ ἀήρ ὕδωρ γῆ, διὰ τὸ τά τε ξηρὰ αὐτῶν καὶ τὰ ὑγρὰ ἄχυμα εἶναι, ἐὰν μή τι μιγνύμενον ποιῇ. διὸ καὶ ἡ θάλαττα ἔχει ὁσμήν· ἔχει γὰρ χυμὸν καὶ ξηρό-<sup>15</sup> τητα. καὶ ἄλες μᾶλλον λίτρους ὁσμώδεις· δηλοῖ δὲ τὸ ἐξικμαζόμενον ἐξ αὐτῶν ἔλαιον· τὸ δὲ λίτρον γῆς ἐστὶ μᾶλλον. ἔτι λίθος μὲν ἄοσμον, ἄχυμον γάρ, τὰ δὲ ξύλα ὁσμώδη, ἔγχυμα γάρ· καὶ τούτων τὰ ὕδατώδη ἥττον. ἔτι τῶν μεταλλευομένων χρυσὸς ἄοσμον, ἄχυμον γάρ, ὁ δὲ χαλκὸς καὶ ὁ σίδηρος ὁσμώδη. ὅταν δ' ἐκκαυθῇ τὸ ὑγρόν, ἄοσμότεραι αἱ<sup>20</sup> σκωρίαι γίγνονται πάντων. ἄργυρος δὲ καὶ κατ-<sup>τίτερος</sup> τῶν μὲν μᾶλλον ὁσμώδη τῶν δ' ἥττον· ὕδατώδη γάρ.

Δοκεῖ δ' ἐνίοις ἡ καπνώδης ἀναθυμίασις εἶναι ὁσμή, οὖσα κοινὴ γῆς τε καὶ ἀέρος. καὶ πάντες ἐπιφέρονται ἐπὶ τοῦτο περὶ ὁσμῆς· διὸ καὶ Ἡρά-<sup>25</sup> κλεῖτος οὕτως εἴρηκεν, ὡς εἰ πάντα τὰ ὅντα καπ-

<sup>1</sup> οὐπαν χυμοῦ B.

<sup>a</sup> This is very doubtful, although fishes have an olfactory nerve.

## ON SENSE AND SENSIBLE OBJECTS, v.

this phenomenon of smelling occurs not only in air, but also in water. This is obvious in the case of fishes and hard-shelled creatures ; for they evidently have the power of smelling,<sup>a</sup> though there is no air in water (for whenever it is generated in water it rises to the surface), nor do such creatures inhale. If one were to assume that water and air are both moist, the characteristic of flavoured dryness in the wet would be smell, and anything of this kind would be an object smelt. That the affection we call smell is based on flavour is obvious from a consideration of those things which have, and those which have not smell. The elements are scentless, such as fire, air, water and earth, because both those which are dry and those which are wet have no flavour, unless something is mixed with them. This is the reason why the sea has a smell ; for it possesses both flavour and dryness. Salt has more smell than sodium carbonate : the oil which exudes from the former proves this ; but sodium carbonate belongs more to earth. Stone again has no smell because it has no taste, but woods have a smell because they have also taste ; and wet woods have less taste than dry. In the case of the metals gold has no smell because it has no taste, but bronze and iron have smell. But when the moisture is burned out of them, the slag of all of them has less smell. But silver and tin have more smell than gold, and less than bronze and iron ; for they contain water.

Some people think that smell is a smoky vapour, The nature of smell. which is partly earth and partly air. Everyone in fact inclines to this view about smell : it is with this idea that Heraclitus has said that, if everything that exists became smoke, the nose would be the

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443 a

㉙ ιὸς γένοιτο, ρῦνες ἀν διαγνοῖεν. ἐπὶ δὲ τὴν ὁσμὴν πάντες ἐπιφέρονται οἱ μὲν ὡς ἀτμίδα, οἱ δὲ ὡς ἀναθυμίασιν, οἱ δὲ ὡς ἄμφω ταῦτα. ἔστι δὲ η μὲν ἀτμὶς ὑγρότης τις, η δὲ καπνώδης ἀναθυμίασις, ὥσπερ εἴρηται, κοινὸν ἀέρος καὶ γῆς· καὶ συνισταται ἐκ μὲν ἐκείνης ὕδωρ, ἐκ δὲ ταύτης γῆς τι εἶδος. 30 ἀλλ’ οὐδέτερον τούτων ἔοικεν· η μὲν γὰρ ἀτμὶς ἔστιν ὕδατος, η δὲ καπνώδης ἀναθυμίασις ἀδύνατος ἐν ὕδατι γενέσθαι. δσμᾶται δὲ καὶ τὰ ἐν τῷ ὕδατι, 443 b ὥσπερ εἴρηται πρότερον. ἔτι η ἀναθυμίασις ὁμοίως λέγεται ταῖς ἀπορροάις. εἰ οὖν μηδὲ ἐκείνη καλῶς, οὐδὲ αὕτη καλῶς.

“Οτι μὲν οὖν ἐνδέχεται ἀπολαύειν τὸ ὑγρὸν καὶ τὸ ἐν τῷ πνεύματι καὶ τὸ ἐν τῷ ὕδατι καὶ πάσχειν τι 5 ὑπὸ τῆς ἐγχύμου ξηρότητος, οὐκ ἀδηλον· καὶ γὰρ δ ἀὴρ ὑγρὸν τὴν φύσιν ἔστιν. ὅτι δὲ ὁμοίως ἐν τοῖς ὑγροῖς ποιεῖ καὶ ἐν τῷ ἀέρι οἷον ἀποπλυνόμενον τὸ ξηρόν, φανερόν. ἔτι δεῖ ἀνάλογον εἶναι τὰς δσμὰς τοῖς χυμοῖς. ἀλλὰ μὴν τοῦτο γε ἐπ’ ἐνίων συμβέβηκεν· καὶ γὰρ δριμεῖαι καὶ γλυκεῖαι εἰσιν 10 δσμαὶ καὶ αὐστηραὶ καὶ στρυφναὶ καὶ λιπαραί, καὶ τοῖς πικροῖς τὰς σαπρὰς ἀν τις ἀνάλογον εἴποι. διὸ ὥσπερ ἐκεῖνα δυσκατάποτα, τὰ σαπρὰ δυσανάπνευστά ἔστιν. δῆλον ἄρα ὅτι ὅπερ ἐν τῷ ὕδατι δ χυμός, τοῦτ’ ἐν τῷ ἀέρι καὶ ὕδατι η ὁσμὴ· καὶ διὰ 15 τοῦτο τὸ ψυχρὸν καὶ η πῆξις καὶ τοὺς χυμοὺς ἀμβλύνει καὶ τὰς δσμὰς ἀφανίζει· τὸ γὰρ θερμὸν τὸ κινοῦν καὶ δημιουργοῦν ἀφανίζουσιν η ψύξις καὶ η πῆξις.

Εἴδη δὲ τοῦ δσφραντοῦ δύο ἔστιν· οὐ γὰρ ὥσπερ τινές φασιν, οὐκ ἔστιν εἴδη τοῦ δσφραντοῦ, ἀλλ’ ἔστιν. διοριστέον δὲ πῶς ἔστι καὶ πῶς οὐκ ἔστιν· τὸ μὲν γὰρ ἔστι κατὰ τοὺς χυμοὺς τεταγμένον

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organ to perceive it. The general attitude to smell includes those who regard it as steam, those who regard it as smoke and those who regard it as a mixture of the two. Steam is merely moisture, but smoky vapour, as has been said, is a mixture of air and earth : from the first water only is formed, but from the latter some sort of earth. But probably smell is neither of these ; for steam consists of water, and smoky vapour cannot exist in water at all. But things in water have a sense of smell, as has been said before. Further the smoky vapour theory is like the theory of emanations. If the latter is unsound, so also is the former.

It is obvious that it is possible that the moisture both in air and in water absorbs the nature of and is affected by tastable dryness ; for air is by nature moist. It is obvious then that it produces in the wet, as in air, the effect of washing something dry. And smells must then be analogous to flavours. Moreover this certainly happens in some cases : for smells like flavours are pungent, sweet, harsh, astringent and rich, and one could call the fetid analogous to the bitter. So as these flavours are unpleasant to drink, so are the fetid unpleasant to inhale. It is clear then that smell in air and in water is the same thing as flavour in water alone. This is why cold and freezing blunts flavours, and causes smells to disappear ; for cold and freezing counteracts the heat which sets in motion and produces flavour.

But there are two kinds of objects smelt ; for it is untrue to say, as some do, that there are no different kinds of object smelt, for there are. But we must define in what sense there are, and in what sense there are not (kinds of smells). There is one kind of odour

443 b  
 20 αὐτῶν, ὥσπερ εἴπομεν, καὶ τὸ ήδυν καὶ τὸ λυπηρὸν  
 κατὰ συμβεβηκὸς ἔχουσιν· διὰ γὰρ τὸ τοῦ θρεπτικοῦ  
 πάθη εἶναι, ἐπιθυμούντων μὲν ηδεῖαι αἱ ὀσμαὶ  
 τούτων εἰσὶ, πεπληρωμένοις δὲ καὶ μηδὲν δεομένοις  
 οὐχ ηδεῖαι, οὐδὲ ὄσοις μὴ καὶ ή τροφὴ ή ἔχουσα  
 25 τὰς ὀσμὰς ηδεῖαι, οὐδὲ τούτοις. ὥστε αὗται μέν,  
 καθάπερ εἴπομεν, κατὰ συμβεβηκὸς ἔχουσι τὸ ήδυν  
 καὶ λυπηρόν, διὸ καὶ πάντων εἰσὶ κοιναὶ τῶν ζώων·  
 αἱ δὲ καθ' αὐτὰς ηδεῖαι τῶν ὀσμῶν εἰσὶν, οἷον αἱ  
 30 τῶν ἀνθῶν· οὐδὲν γὰρ μᾶλλον οὐδὲ ήττον πρὸς τὴν  
 τροφὴν παρακαλοῦσιν, οὐδὲ συμβάλλεται πρὸς  
 ἐπιθυμίαν οὐδέν, ἀλλὰ τούναντίον μᾶλλον· ἀλλοθὲς  
 γὰρ ὅπερ Εὐριπίδην σκώπτων εἶπε Στράτης,  
 “ὅταν φακῆν ἔψητε, μὴ πιχεῦν<sup>1</sup> μύρον.” οἱ δὲ νῦν  
 444 a μιγγούντες εἰς τὰ πόματα τὰς τοιαύτας δυνάμεις  
 βιάζονται τῇ συνηθείᾳ τὴν ήδονήν, ἔως ἂν ἐκ δύ<sup>1</sup>  
 αἰσθήσεων γένηται τὸ ήδυν ὡς ἐν καὶ ἀπὸ μᾶς.  
 τοῦτο μὲν οὖν τὸ ὀσφραντὸν ἴδιον ἀνθρώπου ἐστίν,  
 5 ή δὲ κατὰ τοὺς χυμοὺς τεταγμένη καὶ τῶν ἀλλων  
 ζώων, ὥσπερ εἴρηται πρότερον· κάκεύνων μέν, διὰ  
 τὸ κατὰ συμβεβηκὸς ἔχειν τὸ ήδυν, διγήρηται τὰ  
 εἴδη κατὰ τοὺς χυμούς, ταύτης δ' οὐκέτι, διὰ τὸ  
 τὴν φύσιν αὐτῆς εἶναι καθ' αὐτὴν ηδεῖαι ή λυπηράν.  
 Αἵτιον δὲ τοῦ ἴδιον εἶναι ἀνθρώπου τὴν τοιαύτην  
 ὀσμὴν διὰ τὴν ψύξιν τὴν περὶ τὸν ἐγκέφαλον.  
 10 ψυχροῦν γὰρ ὄντος τὴν φύσιν τοῦ ἐγκεφάλου, καὶ  
 τοῦ αἷματος τοῦ περὶ αὐτὸν ἐν τοῖς φλεβίοις ὄντος  
 λεπτοῦ μὲν καὶ καθαροῦ, εὐψύκτου δέ (διὸ καὶ ή  
 τῆς τροφῆς ἀναθυμίασις ψυχομένη διὰ τὸν τόπον τὰ  
 νοσηματικὰ ῥεύματα ποιεῖ), τοῦς ἀνθρώπους πρὸς

<sup>1</sup> ἐπιχεῦν B.

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which may be placed in the same category as flavours, as we have said, and to these the terms sweet and bitter belong incidentally ; for because they are affections of the nutritive faculty, these smells are pleasant when animals desire them, but when they are sated and do not need them they are not pleasant, nor is the smell pleasant to those animals to whom the food having the smell is unpleasant. So that these possess the qualities of sweetness or the reverse only incidentally, and in this way are common to all living creatures. Some smells are pleasant in themselves, for instance the smells of flowers ; for they do not act as an invitation to food either to a greater or a less extent, nor do they contribute anything to desire, but rather the opposite ; for what Strattis said in caricaturing Euripides is true, " When you make soup do not pour perfume over it." But those who mix flavours of this kind into beverages only force our enjoyment by habit, until pleasure arises from two senses as if it were a single pleasure from one. The pleasure derived from this kind of smell is peculiar to man, but that which is associated with flavours is shared by all other animals, as has been said before : the latter, because their sweetness is incidental, can be divided into classes, according to flavours, but the former cannot, because the sweetness, or the reverse, is part of its own nature in itself.

The reason why the former sense of smell is peculiar to man is due to the coldness which exists in the region of the brain. For the brain is naturally cold, and the blood in the veins surrounding it is light and pure, but easily cooled. (This is why the flavour arising from food, when it becomes cool, produces colds in the neighbourhood of the brain.) Man then

The function  
of the  
sense of  
smell.

444 a

15 βοήθειαν ὑγιείας γέγονε τὸ τοιοῦτον εἶδος τῆς ὁσμῆς· οὐδέν γὰρ ἄλλο ἔργον ἔστιν αὐτῆς ἢ τοῦτο. τοῦτο δὲ ποιεῖ φανερῶς· ἡ μὲν γὰρ τροφὴ ἡδεῖα οὖσα, καὶ ἡ ἔξηρα καὶ ἡ ὑγρά, πολλάκις νοσώδης ἔστιν, ἡ δ' ἀπὸ τῆς ὁσμῆς τῆς καθ' αὐτὴν εὐώδους ὅπωσοῦν ἔχουσιν ὀφέλιμος ὡς εἰπεῖν ἀεί. καὶ διὰ 20 τοῦτο γίνεται διὰ τῆς ἀναπνοῆς, οὐ πᾶσιν ἀλλὰ τοῖς ἀνθρώποις καὶ τῶν ἐναίμων οίνον τοῖς τετράποσι καὶ ὅσα μετέχει μᾶλλον τῆς τοῦ ἀέρος φύσεως· ἀναφερομένων γὰρ τῶν ὁσμῶν πρὸς τὸν ἐγκέφαλον διὰ τὴν ἐν αὐταῖς τῆς θερμότητος κουφότητα, ὑγιεινοτέρως ἔχει τὰ περὶ τὸν τόπον τοῦτον· ἡ γὰρ 25 τῆς ὁσμῆς δύναμις θερμὴ τὴν φύσιν ἔστιν.

Κατακέχρηται δ' ἡ φύσις τῇ ἀναπνοῇ ἐπὶ δύο, ὡς ἔργω μὲν ἐπὶ τὴν εἰς τὸν θώρακα βοήθειαν, ὡς παρέργω δ' ἐπὶ τὴν ὁσμήν· ἀναπνέοντος γὰρ ὥσπερ ἐκ παρόδου ποιεῖται διὰ τῶν μυκτήρων τὴν κίνησιν. ἔδιον δὲ τῆς τοῦ ἀνθρώπου φύσεώς ἔστι τὸ τῆς 30 ὁσμῆς τῆς τοιαύτης γένος διὰ τὸ πλεῖστον ἐγκέφαλον καὶ ὑγρότατον ἔχειν τῶν ζώων ὡς κατὰ μέγεθος· διὰ γὰρ τοῦτο καὶ μόνον ὡς εἰπεῖν αἰσθάνεται τῶν ζώων ἀνθρωπος καὶ χαίρει ταῖς τῶν ἀνθῶν καὶ ταῖς τῶν τοιούτων ὁσμαῖς· σύμμετρος 444 b γὰρ αὐτῶν ἡ θερμότης καὶ ἡ κίνησις πρὸς τὴν ὑπερβολὴν τῆς ἐν τῷ τόπῳ ὑγρότητος καὶ ψυχρότητος ἔστιν. τοῖς δ' ἄλλοις ὅσα πλεύμονα ἔχει διὰ τὸ ἀναπνεῖν τοῦ ἐτέρου γένους τῆς ὁσμῆς τὴν αἰσθησιν ἀποδέδωκεν ἡ φύσις, ὅπως μὴ δύο αἰσθητά τήρια ποιῆι. ἀπόχρηγ γάρ, ἐπείπερ καὶ ὡς ἀναπνέοντιν, ὥσπερ τοῖς ἀνθρώποις ἀμφοτέρων τῶν ὁσφραντῶν, τούτοις τῶν ἐτέρων μόνων ὑπάρχουσα

## ON SENSE AND SENSIBLE OBJECTS, v.

possesses this kind of smell for the benefit of his health ; for smell has no other function except this. And it obviously performs this function ; for food which is sweet, both dry and moist, is often unhealthy, whereas that which has a smell which is in itself pleasant is, generally speaking, beneficial to persons in any state of health. And for this reason it is conveyed by inhalation, not to everything, but to men and to the warm-blooded animals such as the four-footed beasts and those which have a larger share in the nature of air ; for as the smells reach the brain because of the lightness of the heat contained in them, the parts of the body near the brain are the healthier for these smells ; for the faculty of smell is naturally hot.

Nature employs respiration for two purposes, first, <sup>Smell and breathing</sup> and as its main function, for a protection to the throat, and in a secondary sense for the purpose of smell : for when a living creature inhales smell, it enters through the movement of the nostrils as though from a side entrance. Smell of this type is peculiar to man, because he has the largest and moistest brain in proportion to his size of all animals ; and it is for this reason too that of all animals man alone is conscious of and enjoys the smell of flowers and such things ; for the heat and movement produced by these balances excess of wetness and coldness in the region of the body which apprehends them. But nature has allotted perception of the second class of smell to all the other animals which have lungs through respiration, to avoid making two separate sense organs ; for it is sufficient, since they breathe in this way, that man should have perception of both classes of things smelt, while animals should

η αἰσθησις. τὰ δὲ μὴ ἀναπνέοντα, ὅτι μὲν ἔχει  
 αἰσθησιν τοῦ ὀσφραντοῦ, φανερόν· καὶ γὰρ ἵχθυες  
 καὶ τὸ τῶν ἐντόμων γένος πᾶν ἀκριβῶς καὶ πόρρω-  
 10 θεν αἰσθάνεται, διὰ τὸ θρεπτικὸν εἶδος τῆς ὁσμῆς,  
 ἀπέχοντα πολὺ τῆς οἰκείας τροφῆς, οἷον αἱ τε  
 μέλισται ποιοῦσι πρὸς τὸ μέλι καὶ τὸ τῶν μικρῶν  
 μυρμήκων γένος, οὓς καλοῦσί τινες κνίπας, καὶ  
 τῶν θαλαττίων αἱ πορφύραι, καὶ πολλὰ τῶν ἄλλων  
 τῶν τοιούτων ζώων ὁξέως αἰσθάνεται τῆς τροφῆς  
 15 διὰ τὴν ὁσμήν. ὅτῳ δὲ αἰσθάνεται, οὐχ ὁμοίως  
 φανερόν. διὸ κανὸν ἀπορήσειέ τις τίνι αἰσθάνονται  
 τῆς ὁσμῆς, εἴπερ ἀναπνέουσι μὲν γίνεται τὸ ὁσμᾶ-  
 σθαι μοναχῶς· τοῦτο γὰρ φαίνεται ἐπὶ τῶν ἀνα-  
 πνεόντων συμβαῖνον πάντων, ἐκείνων δ' οὐθὲν ἀνα-  
 πνεῖ αἰσθάνεται μέντοι, εἰ μὴ τις παρὰ τὰς  
 20 πέντε αἰσθήσεις ἔτέρα. τοῦτο δ' ἀδύνατον· τοῦ  
 γὰρ ὀσφραντοῦ ὄσφρησις, ἐκεῖνα δὲ τούτου αἰσθά-  
 νεται,<sup>1</sup> ἀλλ' οὐ τὸν αὐτὸν ἵσως τρόπον, ἀλλὰ τοῖς  
 μὲν ἀναπνέουσι τὸ πνεῦμα ἀφαιρεῖ τὸ ἐπικείμενον  
 ὥσπερ πῶμά τι (διὸ οὐκ αἰσθάνεται μὴ ἀναπνέοντα),  
 τοῖς δὲ μὴ ἀναπνέοντιν ἀφήρηται τοῦτο, καθάπερ  
 25 ἐπὶ τῶν ὀφθαλμῶν τὰ μὲν ἔχει βλέφαρα τῶν ζώων,  
 ὧν μὴ ἀνακαλυφθέντων οὐ δύναται ὄρᾶν, τὰ δὲ  
 σκληρόφθαλμα οὐκ ἔχει, διόπερ οὐ προσδεῖται  
 οὐδενὸς τοῦ ἀνακαλύψοντος, ἀλλ' ὄρᾳ ἐκ τοῦ δυνα-  
 τοῦ ὄρᾶν αὐτῷ εὐθύς. ὁμοίως δὲ καὶ τῶν ἄλλων  
 ζώων διτοῦν οὐδὲν δυσχεραίνει τῶν καθ' αὐτὰ δυσω-  
 30 δῶν τὴν ὁσμήν, ἃν μὴ τι τύχῃ φθαρτικὸν ὅν. ὑπὸ  
 τούτων δ' ὁμοίως φθείρεται καθάπερ καὶ οἱ ἄνθρω-  
 ποι ὑπὸ τῆς τῶν ἀνθράκων ἀτμίδος καρηβαροῦσι  
 καὶ φθείρονται πολλάκις· οὕτως ὑπὸ τῆς τοῦ θείου

<sup>1</sup> αἰσθάνονται Β.

## ON SENSE AND SENSIBLE OBJECTS, v.

only perceive one. But it is clear that animals which do not breathe have perception of a scented object ; for fishes and the whole class of insects have a very accurate perception even at a distance, owing to the nutritive kind of smell, even when they are at a great distance from their proper food. For instance, bees show it about honey, and the class of small ants which some call *aphis*, and among marine animals the murex, and many other similar creatures have a keen perception of their food by its smell. But the organ whereby they have this perception is not so certain. So one might be in considerable doubt with what organ they apprehend smell, if smell can only exist when animals inhale ; that this occurs with all animals that breathe is obvious, but perhaps, since none of those under discussion breathes and yet can smell, there is another sense besides the accepted five. But this is impossible ; for a perception of odour is a sense of smell, and these animals do perceive it, but perhaps not in the same way ; but, in the case of animals which breathe, the breath removes something which lies on the organ like a kind of lid (and so they do not perceive smell unless they breathe), but in the case of non-breathing animals this is removed, just as is true of the eyes. Some animals have eyelids, and cannot see when these are shut, but the hard-eyed animals have no eyelids, and so do not need anything to uncover the eyes, but can see directly as soon as the object is within visible distance. Similarly in the case of other animals none of the essentially evil-smelling things offend them, unless they happen to be destructive. By these they are destroyed exactly in the same way as men get headaches, and are often even killed, by the gas arising from coals ; so the

smelling  
without  
breathing.

445 α δυνάμεως καὶ τῶν ἀσφαλτωδῶν φθείρεται τᾶλλα  
 ζῷα, καὶ φεύγει διὰ τὸ πάθος. αὐτῆς δὲ καθ'  
 αὐτὴν τῆς δυσωδίας οὐδὲν φροντίζουσιν, καίτοι  
 πολλὰ τῶν φυομένων δυσώδεις ἔχει τὰς ὀσμάς, ἐὰν  
 μή τι συμβάλληται πρὸς τὴν γεῦσιν ἢ τὴν ἔδωδὴν  
 δ αὐτοῖς. ἔουκε δ' ἡ αἰσθησις ἢ τοῦ ὀσφραίνεσθαι  
 περιττῶν οὐσῶν τῶν αἰσθήσεων καὶ τοῦ ἀριθμοῦ  
 ἔχοντος μέσον τοῦ περιττοῦ καὶ αὐτὴ μέση εἶναι  
 τῶν τε ἀπτικῶν, οἷον ἀφῆς καὶ γεύσεως καὶ τῶν δι'  
 ἄλλου αἰσθητικῶν, οἷον ὅψεως καὶ ἀκοῆς. διὸ καὶ  
 τὸ ὀσφραντὸν τῶν θρεπτικῶν ἔστι πάθος τι (ταῦτα  
 10 δ' ἐν τῷ ἀπτῷ γένει), καὶ τοῦ ἀκουστοῦ δὲ καὶ τοῦ  
 ὄρατοῦ, διὸ καὶ ἐν ἀέρι καὶ ἐν ὕδατι ὀσμῶνται.  
 ὥστ' ἔστι τὸ ὀσφραντὸν κοινόν τι τούτων ἀμφοτέ-  
 ρων, ὃ καὶ τῷ ἀπτῷ ὑπάρχει καὶ τῷ ἀκουστῷ καὶ  
 τῷ διαφανεῖ. διὸ εὐλόγως παρείκασται ἔηρότητος  
 ἐν ὑγρῷ καὶ χυτῷ οἷον βαφῆ τις εἶναι καὶ πλύσις.  
 15 πῶς μὲν οὖν εἴδη δεῖ λέγειν καὶ πῶς οὐ δεῖ τοῦ  
 ὀσφραντοῦ, ἐπὶ τοσοῦτον εἰρήσθω.

“Ο δὲ λέγουσί τινες τῶν Πυθαγορείων, οὐκ ἔστιν  
 εὐλογον· τρέφεσθαι γάρ φασιν ἔνια ζῷα ταῦς ὀσμαῖς.  
 πρῶτον μὲν γάρ ὄρῶμεν ὅτι τὴν τροφὴν δεῖ εἶναι  
 σύνθετον· καὶ γάρ τὰ τρεφόμενα οὐχ ἀπλά ἔστιν,  
 20 διὸ καὶ περιττώματα γίνεται τῆς τροφῆς, ἢ ἐν  
 αὐτοῖς ἡ ἔξω, ὥσπερ τοῖς φυτοῖς. ἔτι δ' οὐδὲ τὸ  
 ὕδωρ ἔθέλει αὐτὸ μόνον ἄμικτον δν τρέφειν· σω-  
 ματῶδες γάρ τι δεῖ εἶναι τὸ συστησόμενον. ἔτι  
 πολὺ ἥπτον εὐλογον τὸν ἀέρα σωματοῦσθαι. πρὸς  
 δὲ τούτοις, ὅτι πᾶσν ἔστι τοῖς ζῷοις τόπος δεκτικὸς  
 25 τῆς τροφῆς, ἔξ οὖ ἔλκον λαμβάνει τὸ σῶμα· τοῦ δ'  
 ὀσφραντοῦ ἐν τῇ κεφαλῇ τὸ αἰσθητήριον, καὶ μετὰ

## ON SENSE AND SENSIBLE OBJECTS, v.

other animals are destroyed by the power of sulphur and bitumen, and avoid such things because they affect them. But they care nothing for the unpleasant smell in itself (and yet many plants have offensive smells), if they do not contribute anything to their taste or food. As the number of the senses is odd, and an odd number always has a unit for its middle term, the sense of smell would seem to be the middle term of the senses of touch—I mean touch and taste on the one hand and on the other the senses which perceive through a medium, that is vision and hearing. So the object of smell is an affection of substances used for food (for these belong to the class of tangible objects), and also an affection of what is heard and seen. Consequently smell occurs in air and water. So smell is common to both these, that is, it belongs to touch and also to hearing and the transparent ; so it is a reasonable conjecture that it is a dipping or washing of the dry in the wet and liquid. Let this be a sufficient account of the extent to which we can and cannot describe the forms of smell.

But the theory advanced by some of the Pythagoreans is not reasonable ; for they say that some animals are nourished by smells. For first of all we see that food must be composite ; for the animals nourished are not simple, and for this reason there is waste matter left over from food either in the bodies themselves or outside as in plants ; even water cannot serve for food, if it is unmixed ; for there must be something corporeal to make it cohere. It is even less probable that air can be made corporeal. In addition to this, it is evident that all animals possess a region which receives the food, from which the body draws it. Now the sense organ of smell lies in

The supposed nutritive function of smell.

445 a

πνευματώδους εἰσέρχεται ἀναθυμιάσεως, ὥστ' εἰς τὸν ἀναπνευστικὸν βαδίζοι ἀν τόπον. ὅτι μὲν οὖν οὐ συμβάλλεται εἰς τροφὴν τὸ δσφραντόν, ἢ δσφραντόν, δῆλον. ὅτι μέντοι εἰς ὑγίειαν, καὶ ἐκ τῆς 30 αἰσθήσεως καὶ ἐκ τῶν εἰρημένων φανερόν, ὥστε ὅπερ ὁ χυμὸς ἐν τῷ θρεπτικῷ καὶ πρὸς τὰ τρεφό-

446 b μενα, τοῦτο ἔστι πρὸς ὑγίειαν τὸ δσφραντόν. καθ' ἔκαστον μὲν οὖν αἰσθητήριον διωρίσθω τὸν τρόπον τοῦτον.

VI. Ἀπορήσειε δ' ἀν τις, εἰ πᾶν σῶμα εἰς ἄπειρον διαιρεῖται, ἀρα καὶ τὰ παθήματα τὰ αἰσθητά, 5 οἷον χρῶμα καὶ χυμὸς καὶ δσμὴ καὶ βάρος καὶ ψόφος καὶ ψυχρὸν καὶ θερμὸν καὶ κοῦφον καὶ σκληρὸν καὶ μαλακόν; ἢ ἀδύνατον ποιητικὸν γάρ ἔστιν ἔκαστον αὐτῶν τῆς αἰσθήσεως· τῷ δύνασθαι γὰρ κινεῖν αὐτὴν λέγεται πάντα. ὥστ' ἀνάγκη τήν τε αἰσθησιν εἰς ἄπειρα διαιρεῖσθαι καὶ πᾶν εἶναι 10 μέγεθος αἰσθητόν· ἀδύνατον γάρ λευκὸν μὲν ὄραν, μὴ ποσὸν δέ. εἰ γὰρ μὴ οὕτως, ἐνδέχοιτ' ἀν εἶναι τι σῶμα μηδὲν ἔχον χρῶμα μηδὲ βάρος μηδ' ἄλλο τι τοιοῦτον πάθος. ὥστ' οὐδὲ αἰσθητὸν ὅλως· ταῦτα γὰρ τὰ αἰσθητά. τὸ ἄρ' αἰσθητὸν ἔσται συγκείμενον οὐκέτι αἰσθητῶν. ἀλλ' ἀναγκαῖον οὐ 15 γὰρ δὴ ἔκ γε τῶν μαθηματικῶν. ἔτι τίνι κρινοῦμεν ταῦτα ἢ γνωσόμεθα; ἢ τῷ νῷ; ἀλλ' οὐ νοητά, οὐδὲ νοεῖ ὁ νοῦς τὰ ἐκτὸς μὴ μετ' αἰσθήσεως ὅντα. ἀμα δ' εἰ ταῦτ' ἔχει οὕτως, ἔοικε μαρτυρεῖν τοῖς τὰ

## ON SENSE AND SENSIBLE OBJECTS, v.—vi.

the head, and smell enters at the same time as a vapour inhaled with the breath, so that it must go to some place which the breath reaches. So it is obvious that smell *qua* smell does not contribute to food ; but it is equally clear, both from our own sensation and from what we have already said, that it does contribute to health, so that the function performed by flavour in nutrition and for what is nourished, is performed by smell for health in general. Let this then suffice for an account of each sense organ.

VI. A difficulty might arise as to whether, if every body is susceptible of infinite division, the attributes perceived are also so susceptible, I mean colour, flavour, smell, weight, sound, as well as cold and hot, light, hard and soft. Perhaps this is impossible ; for each of these produces sensation ; in fact they all derive their names from their capacity to effect this impulse. Then on the above assumption sensation must be capable of infinite division, and every magnitude must be perceptible ; for it is impossible to see "white" without a magnitude which is white. Otherwise it would be possible for a body to exist which had neither colour nor weight, nor any other attribute. But in this case it could not be perceptible at all ; for things perceptible are those enumerated above. In this case every perceptible body will consist of imperceptible parts. But its parts must be perceptible ; for they cannot consist of mathematical abstractions. Again, by what faculty should we judge or recognize these ? By the mind ? But they are not apprehended by the mind, nor does the mind recognize any external objects, except those which are combined with sensation. At the same time, if this is true, it favours the assumption of those who

Can sensa-  
tion be  
infinitely  
divided ?

If so, what  
is the  
meaning  
of an  
impercept-  
ible part ?

445 b

ἄπομα ποιοῦσι μεγέθη· οὕτω γάρ ἀν λύοιτο ὁ λόγος.

20 ἀλλ' ἀδύνατα· εἴρηται δὲ περὶ αὐτῶν ἐν τοῖς λόγοις τοῖς περὶ κινήσεως. περὶ δὲ τῆς λύσεως αὐτῶν ἄμα δῆλον ἔσται καὶ διὰ τί πεπέρανται τὰ εἴδη καὶ χρώματος καὶ χυμοῦ καὶ φθόγγων καὶ τῶν ἄλλων αἰσθητῶν. ὅν μὲν γάρ ἔστιν ἔσχατα, ἀνάγκη πεπεράνθαι τὰ ἐντός· τὰ δὲ ἐναντία ἔσχατα. πᾶν 25 δὲ τὸ αἰσθητὸν ἔχει ἐναντίωσιν, οἷον ἐν χρώματι τὸ λευκὸν καὶ τὸ μέλαν, ἐν χυμῷ γλυκὺν καὶ πικρόν· καὶ ἐν τοῖς ἄλλοις δὴ πᾶσιν ἔστιν ἔσχατα τὰ ἐναντία. τὸ μὲν οὖν συνεχὲς εἰς ἅπειρα τέμνεται ἄνισα, εἰς δὲ ἵσα πεπερασμένα· τὸ δὲ μὴ καθ' αὐτὸν συνεχὲς εἰς πεπερασμένα εἴδη. ἐπεὶ οὖν τὰ 30 μὲν πάθη ὡς εἴδη λεκτέον, ὑπάρχει δὲ συνέχεια ἀεὶ ἐν τούτοις, ληπτέον ὅτι τὸ δυνάμει καὶ τὸ ἐνεργείᾳ ἔτερον· καὶ διὰ τοῦτο τὸ μυριοστημόριον 446 a λανθάνει τῆς κέγχρου δρωμένης, καίτοι ἡ ὅψις ἐπελήλυθεν, καὶ ὁ ἐν τῇ διέσει φθόγγος λανθάνει, καίτοι συνεχοῦς ὄντος ἀκούει τοῦ μέλους παντός. τὸ δὲ διάστημα τὸ τοῦ μεταξὺ πρὸς τοὺς ἔσχάτους λανθάνει. ὅμοίως δὲ καὶ ἐν τοῖς ἄλλοις αἰσθητοῖς, τὰ μικρὰ πάμπαν· δυνάμει γάρ ὄφρατά, ἐνεργείᾳ δ' οὐ, ὅταν μὴ χωρὶς <sup>1</sup>· καὶ γάρ ἐνυπάρχει δυνάμει ἡ ποδιαία τῇ δίποδι, ἐνεργείᾳ δὲ ἡδη διαιρεθεῖσα. χωριζόμεναι δ' αἱ τηλικαῦται ὑπεροχαὶ εὐλόγως μὲν ἀν καὶ διαλύοντο εἰς τὰ περιέχοντα, ὕσπερ 10 καὶ ἀκαριαῖος χυμὸς εἰς τὴν θάλατταν ἐκχυθεῖσ. οὐ μὴν ἀλλ' ἐπειδὴ οὐδὲ ἡ τῆς αἰσθήσεως ὑπεροχὴ

<sup>1</sup> χωρισθῆ B.

a What we call the *Physics*.

## ON SENSE AND SENSIBLE OBJECTS, VI.

support the theory of atoms ; for our difficulty might be solved on these lines ; the theory has been discussed in the treatise on movement.<sup>a</sup> The solution of these questions will make it clear why the types of colour, flavour, sounds, and other sensible objects are limited ; for where there are limits, the intermediate stages must be limited ; but the opposites are extremes. But every sensible object involves an opposition, for instance in colour white and black, in flavour sweet and bitter ; and in all other sensible objects opposites are the extremes. Now what is continuous can be divided into an infinite number of unequal parts, but into a limited number of equal parts ; but that which is not in itself continuous can be divided into a limited number of kinds. Since then the attributes in question may be spoken of as kinds, and continuity is one of their natural characteristics, one must consider the difference between the potential and the actual ; it is for this reason, when a grain of millet is looked at, that the ten-thousandth part of the grain cannot be seen, and yet vision has covered it all, and the quarter-tone cannot be recognized, although one can hear the whole tune as continuous. But the interval between the extremes is not recognized. The same thing is true of all very small quantities in the other sensible objects ; potentially they are seen but not actually, unless they are isolated from the whole. Potentially the one-foot length exists in the two-foot length, but actually only when separated from it. But it is only natural that increments of this kind should be merged in their environment, just as an evanescent flavour when poured into the sea. But it is important to realize that the increment of sense is not perceptible by

Very small parts must be potentially if not actually perceptible.

## ARISTOTLE

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καθ' αυτὴν αἰσθητὴ οὐδὲ χωριστή (δυνάμει γάρ ἐνυπάρχει ἐν τῇ ἀκριβεστέρᾳ ἡ ὑπεροχή), οὐδὲ τὸ τηλικοῦτον αἰσθητὸν χωριστὸν ἔσται ἐνεργείᾳ αἰσθέσθαι, ἀλλ' ὅμως ἔσται αἰσθητόν· δυνάμει τε

15 γάρ ἔστιν ἥδη, καὶ ἐνεργείᾳ ἔσται προσγενόμενον.

ὅτι μὲν οὖν ἔνια μεγέθη καὶ πάθη λανθάνει, καὶ διὰ τῶν αἰτίαν, καὶ πῶς αἰσθητὰ καὶ πῶς οὕ, εἴρηται. ὅταν δὲ δὴ ἐνυπάρχοντα οὕτω πως ἄττα ἥ ὥστε καὶ ἐνεργείᾳ αἰσθητὰ εἶναι, καὶ μὴ μόνον ἐν τῷ ὅλῳ ἀλλὰ καὶ χωρὶς ἥ πεπερασμένα, ἀνάγκη 20 εἶναι τὸν ἀριθμὸν καὶ χρώματα καὶ χυμοὺς καὶ φθόγγους.

’Απορήσειε δ' ἀν τις, ἀρ' ἀφικνοῦνται ἥ τὰ αἰσθητὰ ἥ αἱ κινήσεις αἱ ἀπὸ τῶν αἰσθητῶν, ὅποτέρως ποτὲ γίνεται ἡ αἰσθησις, ὅταν ἐνεργῶσιν, εἰς τὸ μέσον πρῶτον, οἷον ἥ τε ὀσμὴ φαίνεται ποιοῦσα καὶ ὁ ψόφος· πρότερον γάρ ὁ ἐγγὺς αἰσθάνεται τῆς 25 ὀσμῆς, καὶ ὁ ψόφος ὕστερον ἀφικνεῖται τῆς πληγῆς.

ἀρ' οὖν οὕτω καὶ τὸ ὄρώμενον καὶ τὸ φῶς; καθάπερ καὶ Ἐμπεδοκλῆς φησὶν ἀφικνεῖσθαι πρότερον τὸ ἀπὸ τοῦ ἥλιου φῶς εἰς τὸ μεταξὺ πρὸς τὴν ὄψιν ἥ ἐπὶ τὴν γῆν. δόξειε δ' ἀν εὐλόγως τοῦτο συμβαίνειν· τὸ γάρ κινούμενον κινεῖται ποθέν

30 ποι, ὥστ' ἀνάγκη εἶναι τινα καὶ χρόνον ἐν φι κινεῖται

446 b

ἐκ θατέρου πρὸς θάτερον· ὁ δὲ χρόνος πᾶς διαιρετός, ὥστε ἥν ὅτε οὕπω ἐωράτο ἀλλ' ἔτ' ἐφέρετο ἡ ἀκτὶς ἐν τῷ μεταξύ. καὶ εἰ ἀπαν ἄμα ἀκούει

## ON SENSE AND SENSIBLE OBJECTS, vi.

itself, or in isolation (for this movement has only potential existence in more distinguishable sense perception), nor will it be possible actually to perceive a sensible object of this kind when it is separated from the whole, yet it is a sensible object; for it is so potentially, and will become so actually when joined to the whole. We have then stated that some magnitudes and some attributes escape us; we have explained the reason for this, and the sense in which they are sensible objects, and the sense in which they are not. But since some of these exist in such a way that they become actually perceptible, and have a determinate existence not merely in the whole, but even in isolation, it follows that colours, flavours and sounds must be limited in number.

There is a further question to be considered: do these sensible objects, or the movements arising from them (in whichever way sensation arises), come first to a mid-point when they become actual, as smell and sound seem to do? For the man nearer to it is the first to perceive the smell, and the sound of the blow reaches us after the blow has been struck. Is the same thing true of the object seen and the light? Empedocles for instance states that the light from the sun reaches an intermediate point, before it reaches the vision, or the earth. This sounds a probable account of what happens; for that which is moved is moved from some source, and in some direction, so that some interval of time must elapse in which the movement takes place from the one point to the other. But all time is divisible, so that an interval existed during which the light was not yet seen, but the ray was still moving in the intermediate space. And even supposing that "hearing" and "having

Does a  
perceptible  
object  
become first  
potentially  
and then  
actually  
perceptible?

## ARISTOTLE

448 b

καὶ ἀκήκοε καὶ ὅλως αἰσθάνεται καὶ ἥσθηται, καὶ μή ἔστι γένεσις αὐτῶν, ἀλλ' εἰσὶν ἄνευ τοῦ γίνεσθαι ὁ ὅμως οὐδὲν ἥττον, ὥσπερ ὁ ψόφος ἥδη γεγενημένης τῆς πληγῆς οὕπω πρὸς τῇ ἀκοῇ. δηλοῖ δὲ τοῦτο καὶ ἡ τῶν γραμμάτων μετασχημάτισις, ὡς γιγνομένης τῆς φορᾶς ἐν τῷ μεταξύ· οὐ γὰρ τὸ λεχθὲν φαίνονται ἀκηκοότες διὰ τὸ μετασχηματίζεσθαι φερόμενον τὸν ἀέρα. ἀρ' οὖν οὕτω καὶ τὸ χρῶμα 10 καὶ τὸ φῶς; οὐ γὰρ δὴ τῷ πῶς ἔχειν τὸ μὲν ὄρα τὸ δ' ὄραται, ὥσπερ ἵσα ἔστιν· οὐθὲν γὰρ ἔδει που ἐκάτερον εἶναι· τοῖς γὰρ ἵσοις γινομένοις οὐδὲν διαφέρει ἡ ἐγγὺς ἡ πόρρω ἀλλήλων εἶναι. ἡ περὶ μὲν τὸν ψόφον καὶ τὴν ὀσμὴν τοῦτο συμβαίνειν εὔλογον· ὥσπερ γὰρ ὁ ἀήρ καὶ τὸ ὕδωρ, συνεχῆ 15 μέν, ἀλλ' ὁ ὅμως μεμέρισται ἀμφοτέρων ἡ κύνησις. διὸ καὶ ἔστι μὲν ὡς τὸ αὐτὸ ἀκούει ὁ πρῶτος καὶ δὲ στερος καὶ ὀσφραίνεται, ἔστι δ' ὡς οὕ. δοκεῖ δέ τισιν εἶναι ἀπορία καὶ περὶ τούτων· ἀδύνατον γάρ φασί τινες ἄλλον ἄλλω τὸ αὐτὸ ἀκούειν ἡ ὄραν 20 καὶ ὀσφραίνεσθαι· οὐ γὰρ οἶον τ' εἶναι πολλοὺς καὶ χωρὶς ὅντας ἀκούειν ἡ ὀσφραίνεσθαι· τὸ γὰρ ἐν χωρὶς ἀν αὐτὸ αὐτοῦ εἶναι. ἡ τοῦ μὲν κινήσαντος πρῶτον, οἶον τῆς κώδωνος ἡ λιβανωτοῦ ἡ πυρός, τοῦ αὐτοῦ καὶ ἐνὸς ἀριθμῷ αἰσθάνονται πάντες, τοῦ δὲ δὴ ιδίου ἐτέρου ἀριθμῷ, εἴδει δὲ τοῦ αὐτοῦ, διὸ ἄμα πολλοὶ ὄρωσι καὶ ὀσμῶνται

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<sup>a</sup> A. is thinking of a word incorrectly heard. He supposes that the air through which the word is transmitted takes a definite "shape." When this "shape" is altered the word reaches the listener incorrectly.

## ON SENSE AND SENSIBLE OBJECTS, vi.

heard," "feeling" and "having felt" are simultaneous, and involve no process of becoming, but exist without any such process, nevertheless the interval still exists, just as sound has not yet reached our ear, although the blow causing it has been struck. The alteration in the letters of a word as heard proves that some movement takes place in the intervening space;<sup>a</sup> for the reason why the listener does not hear what is said, is that air in moving towards him has undergone some change. Is the same thing true of colour and light? For it is not true that the one sees, and the other is seen, just because the two are in a certain condition, as if they were equal; for in that case there would be no need for each of them to be in some particular place; for when things are identical it makes no difference whether they are near to or far from one another. Now it is reasonable to suppose that the same thing happens with sound and smell; for just as their media, air and water, are continuous, so are they, and yet the movement of both is divided into parts. And so there is a sense in which the first and last hear and smell the same thing, and also a sense in which they do not. But some find a further difficulty in this; for they say that it is impossible for one person to hear, or see, or smell the same thing as another; for they argue that it is impossible for many people who are apart from one another to hear or smell the same thing; for in that case one thing would be apart from itself. The cause of the original movement such as the bell, or the incense, or the fire, which all perceive is the same and numerically one, but each perceives a quality which is different numerically though the same in form, for many see, smell, or hear it at the same time. These

In what  
sense can  
two persons  
perceive the  
same thing?

## ARISTOTLE

446 <sup>b</sup>  
<sup>25</sup> καὶ ἀκούουσιν. ἔστι δὲ οὔτε σώματα ταῦτα, ἀλλὰ πάθος καὶ κίνησίς τις (οὐ γάρ ἀν τοῦτο συνέβαινεν), οὔτ' ἄνευ σώματος.

Περὶ δὲ τοῦ φωτὸς ἄλλος λόγος· τῷ εἶναι γάρ τι φῶς ἔστιν, ἄλλ' οὐ κίνησίς τις. ὅλως δὲ οὐδὲ ὅμοίως ἐπὶ τε ἄλλοιώσεως ἔχει καὶ φορᾶς· αἱ μὲν <sup>30</sup> γάρ φοραὶ εὐλόγως εἰς τὸ μεταξὺ πρῶτον ἀφ-  
<sup>447 <sup>a</sup></sup> ικνοῦνται (δοκεῖ δὲ ὁ ψόφος εἶναι φερομένου τιὸς κίνησις), ὅσα δὲ ἄλλοιοῦνται, οὐκέτι ὅμοίως· ἐν-  
 δέχεται γάρ ἀθρόον ἄλλοιοῦσθαι, καὶ μὴ τὸ ἥμισυ πρότερον, οἷον τὸ ὕδωρ ἄμα πᾶν πήγυνυσθαι. οὐ μὴν ἄλλ' ἀν ἥ πολὺ τὸ θερμαινόμενον ἢ πηγινύ-  
<sup>5</sup> μενον, τὸ ἔχόμενον ὑπὸ τοῦ ἔχομένου πάσχει, τὸ δὲ πρῶτον ὑπ' αὐτοῦ τοῦ ἄλλοιοῦντος μεταβάλλει, καὶ οὐκ ἀνάγκη ἄμα ἄλλοιοῦσθαι καὶ ἀθρόον. ἦν δὲ ἀν καὶ τὸ γενέσθαι ὥσπερ ἡ ὀσμὴ, εἰ ἐν ὑγρῷ ἥμεν καὶ πορρωτέρω ἔτι πρὶν θιγεῖν αὐτοῦ ἥσθανό-  
 μεθα. εὐλόγως δὲ ὅν ἔστι μεταξὺ τοῦ αἰσθητηρίου,  
<sup>10</sup> οὐχ ἄμα πάντα πάσχει, πλὴν ἐπὶ τοῦ φωτὸς διὰ τὸ εἴρημένον. διὰ τὸ αὐτὸ δὲ καὶ ἐπὶ τοῦ ὁρᾶν· τὸ γάρ φῶς ποιεῖ τὸ ὁρᾶν.

VII. "Εστι δέ τις ἀπορία καὶ ἄλλη τοιάδε περὶ αἰσθήσεως, πότερον ἐνδέχεται δυοῖν<sup>1</sup> ἄμα αἰσθάνε-  
 σθαι ἐν τῷ αὐτῷ καὶ ἀτόμῳ χρόνῳ, ἢ οὐ, εἰ δὴ <sup>15</sup> ἀεὶ ἡ μείζων κίνησις τὴν ἐλάττω ἐκκρούει· διὸ ἐπιφερομένων ἐπὶ τὰ ὅμματα οὐκ αἰσθάνονται, ἐὰν τύχωσι αφόδρα τι ἐννοοῦντες ἢ φοβούμενοι ἢ ἀκούοντες πολὺν ψόφον. τοῦτο δὴ ὑποκείσθω, καὶ ὅτι ἐκάστου μᾶλλον ἔστιν αἰσθάνεσθαι ἀπλοῦ

<sup>1</sup> διεῖν B.

## ON SENSE AND SENSIBLE OBJECTS, VI.—VII.

are not bodies, but are an affection or movement of some kind (for otherwise it would not occur), though not apart from a body.

The position with regard to light is different ; for light is an existing thing, and is not a movement. Generally speaking, change of state and travel in space are different ; for spatial movements naturally travel first in the intervening space (and sound appears to be the movement of something travelling), but with things which change their state the position is not the same ; for it is possible that such change of state should occur in a thing all at once, and not in half first ; for instance, water may all freeze at one time. It must, however, be admitted that when much of it grows hot or freezes, each part is affected by the next, and the first part owes its change to that which produces the change, and it need not change all at the same time together. Tasting indeed would be like smelling, if we lived in water, and perceived at a distance before making contact. But naturally those senses which act through a medium are not all affected simultaneously, except in the case of light for the reason given, and for the same reason it is true of seeing, for light causes seeing.

VII. There is a further question about sensation, whether it is possible to perceive two things in one and the same indivisible time or not ; or in other words, does the greater movement eliminate the lesser ? For men do not see things impinging on their eyes, if they happen to be concentrating on some thought, or in a state of fear, or listening to a loud noise. Let this be granted, and also that it is more possible to perceive each individual thing when simple, than when mixed with another. For instance

Can two things be perceived simultaneously?

447 <sup>a</sup> ὅντος ἡ κεκραμένου, οἷον οὗνοι ἀκράτου ἡ κεκρα-  
 20 μένου, καὶ μέλιτος, καὶ χρόας, καὶ τῆς νήτης μόνης  
 ἡ ἐν τῷ διὰ πασῶν, διὰ τὸ ἀφανίζειν ἄλληλα.  
 τοῦτο δὲ ποιεῖ ἐξ ὧν ἐν τι γίνεται. εἰ δὴ ἡ μείζων  
 τὴν ἐλάττω κίνησιν ἐκκρούει, ἀνάγκη, ἂν ἄμα  
 ὥσι, καὶ αὐτὴν ἥττον αἰσθητὴν εἶναι ἡ εἰ μόνη  
 ἥν· ἀφαιρεῖται γάρ τι ἡ ἐλάττων μιγνυμένη, εἴπερ  
 25 ἄπαντα τὰ ἀπλᾶ μᾶλλον αἰσθητά ἔστιν. ἐὰν ἄρα  
 ἵσαι ὥσιν ἔτεραι σῦσαι, οὐδετέρας ἔσται αἰσθησις·  
 ἀφανιεῖ γάρ ἡ ἔτέρα δόμοίως τὴν ἔτέραν. ἀπλῆς  
 δ' οὐκ ἔστιν αἰσθάνεσθαι. ὥστε ἡ οὐδεμία ἔσται  
 αἰσθησις ἡ ἄλλη ἐξ ἀμφοῖν. ὅπερ καὶ γίνεσθαι  
 δοκεῖ ἐκ τῶν κερανυμένων ἐν φῶ ἀν μιχθῶσιν.  
 ἐπεὶ οὖν ἐκ μὲν ἐνίων γίνεται τι, ἐκ δ' ἐνίων οὐ  
 30 γίνεται, τοιαῦτα δὲ τὰ υφ' ἔτέραν αἰσθησιν.  
 447 <sup>b</sup> (μίγνυνται γὰρ ὧν τὰ ἔσχατα ἐναντία<sup>1</sup>. οὐκ ἔστι δ'  
 ἐκ λευκοῦ καὶ ὁξέος ἐν γενέσθαι ἄλλ' ἡ κατὰ  
 συμβεβηκός, ἄλλ' οὐχ ὡς ἐξ ὁξέος καὶ βαρέος  
 συμφωνία) οὐκ ἄρα οὐδ' αἰσθάνεσθαι ἐνδέχεται  
 αὐτῶν ἄμα. ἵσαι μὲν γὰρ οὖσαι αἱ κινήσεις ἀφα-  
 5 νιοῦσιν ἄλλήλας, ἐπεὶ μία οὐ γίνεται ἐξ αὐτῶν.  
 ἐὰν δ' ἄνισοι, ἡ κρείττων αἰσθησιν ἐμποιήσει, ἐπεὶ  
 μᾶλλον ἄμα δυοῖν<sup>2</sup> αἰσθοιτ' ἀν ἡ ψυχὴ τῇ μιᾷ  
 αἰσθήσει ὧν μία αἰσθησις, οἷον ὁξέος καὶ βαρέος·

<sup>1</sup> ἐν B.<sup>2</sup> δυεῖν B.

## ON SENSE AND SENSIBLE OBJECTS, VII.

it is easier to taste pure wine than wine mixed with water, and so also with honey, or with colour ; and the lowest of the strings is easier to hear by itself than when mixed with the octave, because the different notes neutralize each other. This always happens with individual things out of which one whole is formed. If then the greater movement eliminates the less, it follows that, if they occur together, the greater must be less perceptible than if it occurs alone ; for the lesser when mixed with it subtracts something, since all simple things are more perceptible. If then the different movements are exactly equal, there can be no perception of either ; for each will similarly efface the other. But it is impossible in this case to perceive either in its simple form. So that either there is no perception at all, or else there is perception of something formed from the two and different from either. This result seems actually to occur when two things are mixed in whatever way they are combined. From some things, then, one whole is produced, from others it is not, and to the latter class belong all such things as come under different senses (for amalgamation can only take place with things whose extremes are contraries ; so no single whole can be formed from white and sharp, except incidentally, for there is no harmony possible, as with high and low) ; and so it is impossible also to perceive these together. The movements, if equal, will efface each other, when one impulse does not arise from them. But if they are not equal the greater will provoke sensation, since the soul would be more likely to perceive two things at the same time with one sense perception, if the things both belong to the same sense perception,

## ARISTOTLE

447 b

μᾶλλον γὰρ ἄμα ἡ κίνησις τῆς μιᾶς ταύτης ἡ τοῦ δυοῦ, οἷον ὅψεως καὶ ἀκοῆς.

10 Τῇ μιᾷ δὲ ἄμα δυοῖν οὐκ ἔστιν αἰσθάνεσθαι ἀν μὴ μιχθῆ· τὸ γὰρ μῆγμα ἐν βούλεται εἶναι, τοῦ δὲ ἐνὸς μία αἰσθησις, ἡ δὲ μία ἄμα αὐτῆς. ὥστ' ἐξ ἀνάγκης τῶν μεμιγμένων ἄμα αἰσθάνεται, ὅτι μιᾷ αἰσθήσει κατ' ἐνέργειαν αἰσθάνεται· ἐνὸς μὲν γὰρ ἀριθμῷ ἡ κατ' ἐνέργειαν μία, εἴδει δὲ ἡ κατὰ 15 δύναμιν μία. καὶ εἰ μία τοίνυν ἡ αἰσθησις ἡ κατ' ἐνέργειαν, ἐν ἐκεῖνα ἐρεῖ. μεμῖχθαι ἄρα ἀνάγκη αὐτά. ὅταν ἄρα μὴ ἡ μεμιγμένα, δύο ἔσονται αἰσθήσεις αἱ κατ' ἐνέργειαν. ἀλλὰ κατὰ μίαν δύναμιν καὶ ἀτομον χρόνον μίαν ἀνάγκη εἶναι τὴν ἐνέργειαν· μιᾶς γὰρ εἰσάπαξ μία κίνησις καὶ 20 χρῆσις, μία δὲ ἡ δύναμις. οὐκ ἄρα ἐνδέχεται δυοῖν ἄμα αἰσθάνεσθαι τῇ μιᾷ αἰσθήσει. ἀλλὰ μὴν εἰ τὰ ὑπὸ τὴν αὐτὴν αἰσθησιν ἄμα ἀδύνατον, ἐὰν ἡ δύο, δῆλον ὅτι ἥττον ἔτι τὰ κατὰ δύο αἰσθήσεις ἐνδέχεται ἄμα αἰσθάνεσθαι, οἷον λευκὸν καὶ γλυκύ. φαίνεται γὰρ τὸ μὲν τῷ ἀριθμῷ ἐν ἡ ψυχὴ οὐδενὶ 25 ἐτέρῳ λέγειν ἀλλ' ἡ τῷ ἄμα, τὸ δὲ τῷ εἴδει ἐν τῇ κρινούσῃ αἰσθήσει καὶ τῷ τρόπῳ. λέγω δὲ τοῦτο, ὅτι ἵσως τὸ λευκὸν καὶ τὸ μέλαν, ἐτερον τῷ εἴδει ὅν, ἡ αὐτὴ κρίνει, καὶ τὸ γλυκὺ καὶ τὸ

<sup>a</sup> A. seems to mean this. If you look at (e.g.) two white objects and are conscious of them as two white objects you are receiving not one impression, but two, and therefore cannot receive both with one sense faculty simultaneously. If the two white objects give only a general impression of white (*i.e.* specifically or as a class), then your sense faculty may be one, but it is only potential and not actualized.

## ON SENSE AND SENSIBLE OBJECTS, VII.

such as high and low ; for the simultaneous movement of this one sensation is greater than it would be in the case of two, such as vision and hearing.

But it is not possible to perceive two objects with one sense, unless they are amalgamated ; for the amalgamation tends to make one whole, and there is one sensation of the unit, and this one sensation of course coincides with itself. So that there is necessarily simultaneous perception of the objects amalgamated, because the soul actually perceives with one sensation ; for the sensation which is actually a unit is of something numerically also a unit, but, of an object one only in species, the faculty is only potentially a unit.<sup>a</sup> Whereas if the faculty is actually one, it will call its objects one. And so they must be amalgamated. When they are not amalgamated, the actual sensations will be two. But in the case of a single faculty in an indivisible moment of time, the activity must be single ; for the movement and employment of one faculty at a single instant implies that the activity is one, and the faculty in this case is only one. It is not then possible to perceive two objects with a single sensation. Moreover if it is impossible to perceive two things at the same moment which fall under the same sense, it is clear that it is still more impossible to perceive simultaneously two things which fall under two senses, such as white and sweet. For the soul cannot refer to what is numerically one in any way except simultaneously, but that which is specifically one, it refers to with discriminating sense and method. I mean this : that probably the same sense pronounces judgment on white and black, which are specifically different, and on sweet and bitter ; the same sense

Two objects  
cannot be  
seen as two  
with one  
sense.

## ARISTOTLE

447<sup>b</sup> πικρόν, ἡ αὐτὴ μὲν ἔαυτῆ, ἐκείνης δ' ἄλλη, ἀλλ' ἔτέρως ἐκάτερον τῶν ἐναντίων, ὡς δ' αὕτως ἔαυταις  
80 τὰ σύστοιχα, οἷον ὡς ἡ γεῦσις τὸ γλυκύ, οὕτως  
448<sup>a</sup> ἡ ὄψις τὸ λευκόν· ὡς δ' αὕτη τὸ μέλαν, οὕτως  
ἐκείνη τὸ πικρόν.

"Επι εἰ αἱ τῶν ἐναντίων κινήσεις ἐναντίαι, ἄμα δὲ τὰ ἐναντία ἐν τῷ αὐτῷ καὶ ἀτόμῳ οὐκ ἐνδέχεται ὑπάρχειν, ὑπὸ δὲ τὴν αἰσθησιν τὴν μίαν ἐναντία  
6 ἐστίν, οἷον γλυκὺ πικρῷ, τούτων οὐκ ἀν ἐνδέχοιτο αἰσθάνεσθαι ἄμα. ὅμοίως δὲ δῆλον ὅτι οὐδὲ τὰ μὴ ἐναντία· τὰ μὲν γὰρ τοῦ λευκοῦ τὰ δὲ τοῦ μέλανός ἐστιν, καὶ ἐν τοῖς ἄλλοις ὅμοίως, οἷον τῶν χυμῶν οἱ μὲν τοῦ γλυκέος οἱ δὲ τοῦ πικροῦ. οὐδὲ τὰ μεμιγμένα ἄμα (λόγοι γάρ εἰσιν ἀντι-  
10 κειμένων, οἷον τὸ διὰ πασῶν καὶ τὸ διὰ πέντε), ἀν μὴ ὡς ἐν αἰσθάνηται. οὕτως δ' εἰς λόγος ὁ τῶν ἄκρων γίνεται, ἄλλως δ' οὐ. ἐσται γὰρ ἄμα ὁ μὲν πολλοῦ πρὸς δλίγον ἢ περιττοῦ πρὸς ἄρτιον, ὁ δὲ δλίγον πρὸς πολὺ ἢ ἄρτιον πρὸς περιττόν. εἰ οὖν πλεῖον ἔτι ἀπέχει ἄλλήλων καὶ διαφέρει τὰ  
15 συστοίχως μὲν λεγόμενα ἐν ἄλλῳ δὲ γένει τῶν ἐν τῷ αὐτῷ γένει (λέγω δ' οἷον τὸ γλυκύ καὶ τὸ λευκόν καλῶ σύστοιχα, γένει δὲ ἔτερα· τὸ γλυκύ δὲ τοῦ μέλανος πλεῖον ἔτι τῷ εἴδει διαφέρει ἢ τὸ λευκόν), ἔτι ἀν ἥττον ἄμα ἐνδέχοιτο αὐτὰ αἰσθά-

## ON SENSE AND SENSIBLE OBJECTS, VII.

that is in itself, but different from that which judges white and black ; each differs from itself in its method of perceiving opposites, but each acts in the same way in its method of perceiving corresponding qualities ; for instance vision apprehends white in the same way as taste apprehends sweet ; and as the former apprehends black, so the latter apprehends bitter.

Moreover, if the movements produced by opposite objects are opposite, and it is not possible that opposites should reside in what is the same and indivisible, and if opposites fall under one sense, such as sweet and bitter, it would not be possible to perceive these opposites simultaneously. In the same way clearly things which are not opposite cannot be simultaneously perceived ; for instance some colours belong to white and some to black, and similarly other sensible objects, for instance some flavours belong to sweet and some to bitter. Nor can amalgamated objects be simultaneously perceived (for they are ratios of opposites, such as the whole octave or the fifth), unless they are perceived as one. For in this sense the ratio of extreme sounds becomes one, but in no other sense ; for we shall have the ratio of many to few, and odd to even, and on the other hand few to many and even to odd. If then the objects which I call corresponding stand further apart from each other, and are more different in other classes than those in the same class (I call sweet and white corresponding, though different in class ; and in specific form sweet differs from black even more than white does), it would be even less possible to perceive these (e.g. sweet and white) simultaneously than things belonging to the same class (e.g. white

Simultane-  
ous per-  
ception of  
two sens-  
ible is  
impossible.

## ARISTOTLE

448 a

νεσθαι ἢ τὰ τῷ γένει ταῦτα. ὥστ' εἰ μὴ ταῦτα,  
οὐδὲ ἐκεῖνα.

20 "Ο δὲ λέγουσί τινες τῶν περὶ τὰς συμφωνίας,  
ὅτι οὐχ ἄμα μὲν ἀφικνοῦνται οἱ ψόφοι, φαίνονται  
δέ, καὶ λανθάνει, ὅταν ὁ χρόνος ἥ ἀναίσθητος,  
πότερον ὄρθως λέγεται ἢ οὕ; τάχα γὰρ ἀν φαίη  
τις καὶ νῦν παρὰ τοῦτο δοκεῖν ἄμα ὄρâν καὶ  
ἀκούειν, ὅτι οἱ μεταξὺ χρόνοι λανθάνουσιν. ἢ  
25 τοῦτ' οὐκ ἀληθές, οὐδὲ ἐνδέχεται χρόνον εἶναι  
ἀναίσθητον οὐδένα οὐδὲ λανθάνειν, ἀλλὰ παντὸς  
ἐνδέχεται αἰσθάνεσθαι. εἰ γὰρ ὅτε αὐτὸς αὐτοῦ  
τις αἰσθάνεται ἢ ἄλλου ἐν συνεχεῖ χρόνῳ, μὴ  
30 ἐνδέχεται τότε λανθάνειν ὅτι ἐστίν, ἐστι δέ τις ἐν  
τῷ συνεχεῖ καὶ τοσοῦτος ὅσος ὄλως ἀναίσθητός  
ἐστι, δῆλον ὅτι τότε λανθάνοι ἀν εἰ ἐστιν αὐτὸς  
448 b αὐτόν, καὶ εἰ ὄρâ, καὶ οὐκ αἰσθάνεται· καὶ εἰ  
αἰσθάνεται ἔτι, οὐκ ἀν εἴη οὕτε χρόνος οὕτε  
πρᾶγμα οὐδὲν ὁ αἰσθάνεται ἢ ἐν ᾧ, εἰ μὴ οὕτως,  
ὅτι ἐν τούτου τινὶ ἢ ὅτι τούτου τι ὄρâ, εἴπερ  
ἐστι τι μέγεθος καὶ χρόνου καὶ πράγματος ἀν-  
5 αἰσθητον ὄλως διὰ μικρότητα· εἰ γὰρ τὴν ὄλην  
ὄρâ, καὶ αἰσθάνεται τὸν αὐτὸν συνεχῶς χρόνον, οὐ  
τῶν νῦν τούτων τινί. ἀφηρήσθω ἡ τὸ ΓΒ, ἐν ᾧ  
οὐκ ἥσθανετο. οὐκοῦν ἐν ταύτης τινὶ ἢ ταύτης τι,  
ῶσπερ τὴν γῆν ὄρâ ὄλην, ὅτι τοδὶ αὐτῆς, καὶ ἐν  
τῷ ἐνιαυτῷ βαδίζει, ὅτι ἐν τῷδε τῷ μέρει αὐτοῦ.  
10 ἀλλὰ μὴν ἐν τῷ ΒΓ οὐδὲν αἰσθάνεται. τῷ ἄρα

<sup>a</sup> This is intended to be a *reductio ad absurdum*.

## ON SENSE AND SENSIBLE OBJECTS, VII.

and black). So that if the latter is impossible, the former is certainly so.

Now for the point which some raise about concords ; they say that sounds do not arrive simultaneously, but only seem to do so, and deceive us, when the interval of time is imperceptible. Are they right or not ? One might perhaps say at once that we only suppose that we see and hear simultaneously, because the intervening time is not noticeable. Probably this is untrue, and it is impossible for any time to be imperceptible and be unnoticed, but one must be conscious of every such interval. For when a man perceives himself or anything else in continuous time, it is impossible for him to be unaware of his existence, and if again in continuous time there can be time of such short duration as to be imperceptible, it is clear that, in the case supposed, man would be unaware of his existence and, if he saw, would not be aware that he was seeing ; and, if he were aware, there would be neither time nor any object of which he was aware, except in the sense that he sees in some fraction of time, or sees some fraction of the object ; if, that is, there exists any magnitude either of time or object which is imperceptible owing to its smallness ; for if he sees a whole line and perceives the same time continuously, he does not see some fraction of this. Suppose from the whole line AB a part CB cut off, being a time in which he perceives nothing. In that case he perceives either in a fraction of time, or a fraction of the line, in the sense that he may see the whole world in that he sees part of it, or walks over it for a year, because he walks for part of a year.<sup>a</sup> But by our assumption during the part BC he sees nothing. In that case he is said to

How this applies to musical harmonies.

ARISTOTLE

448 b

ἐν τούτου τινὶ τοῦ ΑΒ αἰσθάνεσθαι λέγεται τοῦ  
ὅλου αἰσθάνεσθαι καὶ τὴν ὅλην. ὁ δὲ αὐτὸς λόγος  
καὶ ἐπὶ τῆς ΑΓ· ἀεὶ γὰρ ἐν τινὶ καὶ τινός, ὅλου  
δὲ οὐκ ἔστιν αἰσθάνεσθαι. ἀπαντα μὲν οὖν αἰσθητά  
ἔστιν, ἀλλ’ οὐ φαίνεται ὅσα ἔστιν· τοῦ γὰρ ἡλίου  
15 τὸ μέγεθος ὄρφι καὶ τὸ τετράπηχυ πόρρωθεν, ἀλλ’  
οὐ φαίνεται ὅσον, ἀλλ’ ἐνίστε ἀδιαιρετον, ὄρφι δὲ  
οὐκ ἀδιαιρετον. ἡ δὲ αἰτία εἴρηται ἐν τοῖς ἔμ-  
προσθεν περὶ τούτου. ὅτι μὲν οὖν οὐθεὶς ἔστι  
χρόνος ἀναίσθητος, ἐκ τούτων φανερόν.

Περὶ δὲ τῆς πρότερον λεχθείσης ἀπορίας σκε-  
πτέον, πότερον ἐνδέχεται ἀμα πλειόνων αἰσθάνεσθαι  
ἢ οὐκ ἐνδέχεται. τὸ δὲ ἀμα λέγω ἐν ἐνὶ καὶ  
20 ἀτόμῳ χρόνῳ πρὸς ἄλληλα. πρῶτον μὲν οὖν ἀρ  
ῶδ’ ἐνδέχεται, ἀμα μέν, ἐτέρῳ δὲ τῆς ψυχῆς  
αἰσθάνεσθαι, καὶ οὐ τῷ ἀτόμῳ, οὕτω δὲ ἀτόμῳ  
ὡς παντὶ ὅντι συνεχεῖ; ἢ ὅτι πρῶτον μὲν τὰ  
κατὰ τὴν μίαν αἰσθησιν, οἷον λέγω ὅψιν, εἰ ἔσται  
ἄλλῳ αἰσθανομένῃ ἄλλου καὶ ἄλλου χρώματος,  
25 πλείω τε μέρη ἔξει εἴδει ταῦτα; καὶ γὰρ ἡ  
αἰσθάνεται, ἐν τῷ αὐτῷ γένει ἔστιν. εἰ δὲ ὅτι  
ὡς δύο ὅμματα φαίη τις, οὐδὲν κωλύει, οὕτω καὶ  
ἐν τῇ ψυχῇ, ὅτι ἵσως ἐκ μὲν τούτων ἐν τι γίνεται  
καὶ μία ἡ ἐνέργεια αὐτῶν· ἐκεῖ δέ, εἰ μὲν ἐν τὸ  
ἔξ ἀμφοῖν, ἐκεῖνο τὸ αἰσθανόμενον ἔσται, εἰ δὲ

<sup>a</sup> Cf. 445 b 11.

## ON SENSE AND SENSIBLE OBJECTS, VII.

see the whole line AB in the whole time, because he sees a part of it in a part of the time. The same argument applies to the part AC ; for it will be found that one always perceives a part in a part of the time, and that one can never perceive the whole. Therefore everything can be perceived, but the magnitude does not present itself to our senses ; for instance one sees a magnitude such as that of the sun, or a four-foot rod at a distance, but one does not see what size it is ; indeed it sometimes seems an indivisible whole, but what we see is not really indivisible. The reason for this has been given in our previous words on the subject.<sup>a</sup> It is clear then from this that there is no such thing as imperceptible time.

But in regard to the difficulty mentioned before we must consider whether it is possible or impossible to perceive more than one thing at once. By "at once" I mean in a time which is one and indivisible for different things in relation to each other. In the first place is it possible to perceive two things at once, but with a different part of the soul, that is not really in indivisible time, but only indivisible in the sense of being continuous ? Or does this imply in the first place that in one sense, for instance sight, if it shall be capable of perceiving one colour with one part and one with another, the soul will possess a number of parts specifically different ? For the objects which it perceives are in the same class. If one were to urge, that just as there are two eyes, so there is nothing to prevent there being two identical parts in the soul, we should answer that probably one unit is made up of the two eyes, and in actual operation they are one ; in that case, I mean, if one seeing organ is composed of the two, that organ will be the

A further discussion of simultaneous perception.

Has the soul separate parts?

## ARISTOTLE

448 **β**

50 χωρίς, οὐχ ὁμοίως ἔξει. ἔτι αἰσθήσεις αἱ αὐταὶ 449 αἱ πλείους ἔσονται, ὥσπερ εἴ τις ἐπιστήμας διαφόρους φαίη· οὕτε γὰρ ἡ ἐνέργεια ἄνευ τῆς καθ' αὐτὴν ἔσται δυνάμεως, οὕτ' ἄνευ ταύτης ἔσται αἰσθησις.

Εἰ δὲ τούτων ἐν ἐνὶ καὶ ἀτόμῳ αἰσθάνεται, δῆλον ὅτι καὶ τῶν ἄλλων μᾶλλον γὰρ ἐνεδέχετο 5 τούτων ἄμα πλειόνων ἡ τῶν τῷ γένει ἐτέρων. εἰ δὲ δὴ ἄλλῳ μὲν γλυκέος ἄλλῳ δὲ λευκοῦ αἰσθάνεται ἡ ψυχὴ μέρει, ἥτοι τὸ ἐκ τούτων ἐν τί ἔστιν ἡ οὐχ ἐν. ἀλλ' ἀνάγκη ἐν· ἐν γάρ τι τὸ αἰσθητικόν ἔστι μέρος. τίνος οὖν ἐκεῖνο ἐνός; οὐδὲν γὰρ ἐκ τούτων ἐν. ἀνάγκη ἄρα ἐν τι εἶναι τῆς ψυχῆς, φῶτα αἰσθάνεται, καθάπερ εἴρη- 10 ται πρότερον, ἄλλο δὲ γένος δι' ἄλλου. μέρ' οὖν ἥ μὲν ἀδιαιρετόν ἔστι κατ' ἐνέργειαν, ἐν τί ἔστι τὸ αἰσθητικὸν γλυκέος καὶ λευκοῦ, ὅταν δὲ διαιρετὸν γένηται κατ' ἐνέργειαν, ἔτερον; ἡ ὥσπερ ἐπὶ τῶν πραγμάτων αὐτῶν ἐνδέχεται, οὕτω καὶ ἐπὶ τῆς ψυχῆς. τὸ γὰρ αὐτὸ καὶ ἐν ἀριθμῷ 15 λευκὸν καὶ γλυκύ ἔστι, καὶ ἄλλα πολλά, εἰ μὴ χωριστὰ τὰ πάθη ἄλλήλων, ἄλλα τὸ εἶναι ἔτερον ἐκάστω. ὁμοίως τοίνυν θετέον καὶ ἐπὶ τῆς ψυχῆς τὸ αὐτὸ καὶ ἐν εἶναι ἀριθμῷ τὸ αἰσθητικὸν πάντων, τῷ μέντοι εἶναι ἔτερον καὶ ἔτερον τῶν μὲν γένει

## ON SENSE AND SENSIBLE OBJECTS, VII.

percipient, but if they act separately the case will be different. Moreover the same senses will then become plural, just as one might speak of different branches of knowledge. For no actualization can occur without each having its own potentiality, nor will there be any perception without this.

But if the soul perceives these things in one in-<sup>This theory</sup> <sup>is unsound.</sup> divisible time, it is clear that it does so in all other cases ; for it would be more possible for it to perceive several of these simultaneously than things different in class. If then it is true that the soul perceives sweet with one part and white with another part, then either the result formed of these is one, or it is not. But it must be one ; for the perceptive faculty is a unit. Which one object, then, does that one faculty perceive ? For surely no one object can be composed of these. There must then be one part of the soul with which it perceives everything, as has been said before, but another, a different one, through which it perceives different objects. In so far, then, as it is indivisible in operation, there must be some one faculty perceptive of sweet and white, but, when in actual operation it is divisible, the faculties are different. As this is possible in objects of sense the same thing can be true of the soul. For the same thing which is numerically one may be both white and sweet and have many other qualities as well, if the attributes are not separated from each other, but their essential existence is different in each case. So we must suppose the same thing to be true of the soul, and that the faculty which perceives everything is one and the same numerically, but that its essential existence is different in perceiving things different sometimes in genus and sometimes in species. So

## ARISTOTLE

449 a

τῶν δὲ εἴδει. ὥστε καὶ αἰσθάνοιτ' ἀν ἄμα τῷ  
20 αὐτῷ καὶ ἐνί, λόγω δ' οὐ τῷ αὐτῷ.

“Οτι δὲ τὸ αἰσθητὸν πᾶν ἔστι μέγεθος καὶ οὐκ  
ἔστιν ἀδιαιρέτον αἰσθητόν, δῆλον. ἔστι γὰρ ὅθεν  
μὲν οὐκ ἀν ὀφθείη, ἅπειρον τὸ ἀπόστημα, ὅθεν  
δὲ ὅράται, πεπερασμένον. δμοίως δὲ καὶ τὸ  
δσφραντὸν καὶ ἀκουστὸν καὶ ὅσων μὴ αὐτῶν ἀπτό-  
25 μενοι αἰσθάνονται. ἔστι δέ τι ἔσχατον τοῦ ἀποστή-  
ματος ὅθεν οὐχ ὅράται, καὶ πρῶτον ὅθεν ὅράται.  
τοῦτο δὴ ἀνάγκη ἀδιαιρέτον εἶναι, οὐδὲν μὲν τῷ  
ἐπέκεινα οὐκ ἐνδέχεται αἰσθάνεσθαι ὅντος, ἐν δὲ  
τῷ ἐπὶ ταδὶ ἀνάγκη αἰσθάνεσθαι. εἰ δῆ τι ἔστιν  
ἀδιαιρέτον αἰσθητόν, ὅταν τεθῇ ἐπὶ τῷ ἔσχάτῳ  
80 ὅθεν ἔστιν ὕστατον μὲν οὐκ αἰσθητὸν πρῶτον δ'  
αἰσθητόν, ἄμα συμβήσεται ὅρατὸν εἶναι καὶ ἀόρατον.  
τοῦτο δ' ἀδύνατον.

449 b Περὶ μὲν οὖν τῶν αἰσθητηρίων καὶ τῶν αἰσθητῶν  
τίνα τρόπον ἔχει καὶ κοινῇ καὶ καθ' ἔκαστον  
αἰσθητήριον εἴρηται· τῶν δὲ λοιπῶν πρῶτον  
σκεπτέον περὶ μνήμης καὶ τοῦ μνημονεύειν.

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<sup>a</sup> The modern definition of a point, which “ has no magnitude,” really solves Aristotle's difficulty; for no sensible

## ON SENSE AND SENSIBLE OBJECTS, VII.

that it would always perceive with one and the same part, but theoretically not the same.

It is of course clear that every sensible object is a <sup>Every</sup> <sup>sensible</sup> <sup>object is a</sup> magnitude, and that no sensible object is indivisible. The distance at which an object cannot be seen is infinite, but the interval over which it can be seen is limited. This is also true of the object of smell and hearing, and all the other objects which we perceive without contact. But there is an extreme point of the interval at which it is not seen, and a first point at which it is seen. This point must necessarily be indivisible, the point beyond which it is impossible to see anything, and within which one must be able to see it. If, then, any sensible object is indivisible, when it is placed at the limiting point, that is the last point at which it cannot be seen and the first at which it can be seen, it will be both visible and invisible at the same time ; which is impossible.<sup>a</sup>

Concerning the sense organs and objects of sense, their character in general and in relation to each sense organ, we have concluded our discussion. Of the remaining subjects we must first consider memory and remembering.

object, which by implication has magnitude, can be "placed at a point."



ON MEMORY AND  
RECOLLECTION



## INTRODUCTION

THIS short treatise is perhaps of higher value than the preceding. In places its obscurity has been made worse by errors in the manuscripts, and some passages are not satisfactorily elucidated. But it contains some noteworthy ideas. The distinction drawn between memory and recollection is on the whole valid, and from it follows directly the assertion that, whereas memory is shared by all the animal kingdom, recollection is the exclusive prerogative of man. In the second chapter Aristotle outlines what we call the Association of Ideas, and, although it is in his description of the process by which recollection recovers the past that the greatest obscurity prevails, it is clear that his general theory of that process is very near to modern views on the subject.

## ΠΕΡΙ ΜΝΗΜΗΣ ΚΑΙ ΑΝΑΜΝΗΣΕΩΣ

449 <sup>b</sup>

I. Περὶ μνήμης καὶ τοῦ μνημονεύειν λεκτέον  
ἢ τί ἔστι, καὶ διὰ τίν' αἰτίαν γίγνεται, καὶ τίνι τῶν  
τῆς ψυχῆς μορίων συμβαίνει τοῦτο τὸ πάθος καὶ  
τὸ ἀναμνησκεσθαι· οὐ γάρ οἱ αὐτοὶ εἰσὶ μνημο-  
νικοὶ καὶ ἀναμνηστικοί, ἀλλ' ὡς ἐπὶ τὸ πολὺ<sup>10</sup>  
μνημονικώτεροι μὲν οἱ βραδεῖς, ἀναμνηστικώτεροι  
δὲ οἱ ταχεῖς καὶ εὐμαθεῖς.

Πρῶτον μὲν οὖν ληπτέον ποῖά ἔστι τὰ μνημο-  
νευτά· πολλάκις γάρ ἐξαπατᾷ τοῦτο. οὕτε γάρ  
τὸ μέλλον ἐνδέχεται μνημονεύειν, ἀλλ' ἔστι δοξα-  
στὸν καὶ ἐλπιστόν (εἴη δ' ἀν καὶ ἐπιστήμη τις  
ἐλπιστική, καθάπερ τινές φασι τὴν μαντικήν),  
οὕτε τοῦ παρόντος, ἀλλ' αἰσθησις· ταύτῃ γάρ οὕτε  
τὸ μέλλον οὕτε τὸ γενόμενον γνωρίζομεν, ἀλλὰ τὸ  
15 παρὸν μόνον. ἡ δὲ μνήμη τοῦ γενομένου· τὸ δὲ  
παρὸν ὅτε πάρεστιν, οἷον τοδὶ τὸ λευκὸν ὅτε ὅρφ,  
οὐδεὶς ἀν φαίη μνημονεύειν, οὐδὲ τὸ θεωρούμενον,  
ὅτε θεωρῶν τυγχάνει καὶ ἐννοῶν· ἀλλὰ τὸ μὲν  
αἰσθάνεσθαι φησι, τὸ δ' ἐπίστασθαι μόνον· ὅταν

## ON MEMORY AND RECOLLECTION

I. Our task is now to discuss memory and remembering : what it is, why it occurs and to what part of the soul this affection and that of recollection belongs. Men who have good memories are not the same as those who are good at recollecting, in fact generally speaking the slow-witted have better memories, but the quick-witted and those who learn easily are better at recollecting.

Now our first subject for consideration is the nature of things remembered ; for this is a frequent source of error. It is impossible to remember the future ; that is expecting or hoping. (There might perhaps be a science of expectation as some say there is of prophecy.) Nor has it to do with the present : this is perception ; for we do not have knowledge either of the future or the past by perception, but only of the present. Memory then is of the past ; no one could claim to remember the present while it is present. For instance one cannot remember a particular white object while one is looking at it, nor can one remember a subject of theoretical speculation while one happens to be speculating and thinking about it. The former one claims to perceive and the latter merely to know. But when one has known

What can  
be remembered ?

ARISTOTLE

440 b δ' ἄνευ τῶν ἐνεργειῶν ἔχη τὴν ἐπιστήμην καὶ  
 20 τὴν αἰσθησιν, οὕτω μέμνηται τὰς τοῦ τριγώνου  
 ὅτι δύο ὄρθαις ἴσαι, τὸ μὲν ὅτι ἔμαθεν ἢ ἐθεώρησεν,  
 τὸ δὲ ὅτι ἥκουσεν ἢ εἶδεν ἢ ὅ τι τοιοῦτον· ἀεὶ<sup>1</sup>  
 γὰρ ὅταν ἐνεργῇ κατὰ τὸ μνημονεύειν, οὕτως ἐν  
 τῇ ψυχῇ λέγει, ὅτι πρότερον τοῦτο ἥκουσεν ἢ  
 ἥπθετο ἢ ἐνόησεν.

"Εστι μὲν οὖν ἡ μνήμη οὕτε αἰσθησις οὕτε  
 25 ὑπόληψις, ἀλλὰ τούτων τινὸς ἔξις ἢ πάθος, ὅταν  
 γένηται χρόνος. τοῦ δὲ νῦν ἐν τῷ νῦν οὐκ ἔστι  
 μνήμη, καθάπερ εἴρηται καὶ πρότερον, ἀλλὰ τοῦ  
 μὲν παρόντος αἰσθησις, τοῦ δὲ μέλλοντος ἐλπίς,  
 τοῦ δὲ γενομένου μνήμη. διὸ μετὰ χρόνου πᾶσα  
 μνήμη. ὥσθ' ὅσα χρόνου αἰσθάνεται, ταῦτα μόνα  
 30 τῶν ζώων μνημονεύει, καὶ τούτῳ φίλοι αἰσθάνεται.

‘Επεὶ δὲ περὶ φαντασίας εἴρηται πρότερον ἐν  
 τοῖς περὶ ψυχῆς, καὶ νοεῖν οὐκ ἔστιν ἄνευ φαν-  
 450 a τάσματος· συμβαίνει γὰρ τὸ αὐτὸ πάθος ἐν τῷ  
 νοεῖν ὅπερ καὶ ἐν τῷ διαγράφειν· ἐκεῖ τε γὰρ οὐθὲν  
 προσχρώμενοι τῷ τὸ ποσὸν ὥρισμένον εἶναι τὸ  
 τριγώνου, ὅμως γράφομεν ὥρισμένον κατὰ τὸ  
 ποσόν· καὶ ὁ νοῶν ὡσαύτως, κανὸν μὴ ποσὸν νοῆι,  
 τίθεται πρὸ δύματων ποσόν, νοεῖ δ' οὐχ ἢ ποσόν.  
 5 ἄν δ' ἡ φύσις ἢ τῶν ποσῶν, ἀόριστον δέ, τίθεται  
 μὲν ποσὸν ὥρισμένον, νοεῖ δ' ἢ ποσὸν μόνον. διὰ  
 τίνα μὲν οὖν αἰτίαν οὐκ ἐνδέχεται νοεῖν οὐδὲν ἄνευ  
 τοῦ συνεχοῦς, οὐδ' ἄνευ χρόνου τὰ μὴ ἐν χρόνῳ

<sup>a</sup> *De An. iii. 7, etc.*

## ON MEMORY AND RECOLLECTION, 1.

ledge or sensation without the exercise of these activities, then one remembers : for instance one knows that the angles of a triangle are together equal to two right angles, a fact which one has learned or thought out, or one feels something which one has heard or seen or something of the kind ; for when a man is exerting his memory he always says in his mind that he has heard, or felt, or thought this before.

Memory, then, is neither sensation nor supposition, but is a condition or attribute of one of these, when time has elapsed. There can be no memory of something now present at the present time, as has been said, but sensation refers to what is present, expectation to what is future, and memory to what is past. All memory, then, implies lapse of time. So that only those living creatures which are conscious of time can be said to remember, and they do so with that part which is conscious of time.

As has been said before in my treatise *On the Soul*<sup>a</sup> about imagination, it is impossible even to think without a mental picture. The same process occurs in thinking as in drawing a diagram ; for in this case although we make no use of the fact that the magnitude of a triangle is a finite quantity, yet we draw it as having a finite magnitude. In the same way the man who is thinking, though he may not be thinking of a finite magnitude, still puts a finite magnitude before his eyes, though he does not think of it as such. And even if its nature is that of a magnitude, but an unlimited one, he still puts before him a finite magnitude, but thinks of it as a magnitude without limit. The reason why it is impossible to think of anything without continuity, or to think of things which have no time except in terms of time,

## ARISTOTLE

450 a

όντα, ἄλλος λόγος. μέγεθος δ' ἀναγκαῖον γνωρί-  
 10 ζειν καὶ κύνησιν φὶ καὶ χρόνον, καὶ τὸ φάντασμα  
 τῆς κοινῆς αἰσθήσεως πάθος ἔστιν. ὥστε φανερὸν  
 ὅτι τῷ πρώτῳ αἰσθητικῷ τούτων ἡ γνῶσις ἔστιν.  
 ἡ δὲ μνήμη καὶ ἡ τῶν νοητῶν οὐκ ἄνευ φαν-  
 τάσματός ἔστιν. ὥστε τοῦ νοουμένου κατὰ συμ-  
 βεβηκὸς ἀν εἴη, καθ' αὐτὸ δὲ τοῦ πρώτου αἰσθη-  
 15 τικοῦ. διὸ καὶ ἔτεροις τισὶν ὑπάρχει τῶν ζώων,  
 καὶ οὐ μόνον ἀνθρώποις καὶ τοῖς ἔχουσι δόξαν ἡ  
 φρόνησιν. εἰ δὲ τῶν νοητικῶν τι μορίων ἦν, οὐκ  
 ἀν ὑπῆρχε πολλοῖς τῶν ἄλλων ζώων, ἵσως δ'  
 οὐδεὶν τῶν θινητῶν, ἐπεὶ οὐδὲ νῦν πᾶσι διὰ τὸ μὴ  
 πάντα χρόνου αἰσθησιν ἔχειν· ἀεὶ γὰρ ὅταν ἐνεργῇ  
 20 τῇ μνήμῃ, καθάπερ καὶ πρότερον εἴπομεν, ὅτι εἶδε  
 τοῦτο ἡ ἡκουσειν ἡ ἔμαθε, προσαισθάνεται ὅτι  
 πρότερον· τὸ δὲ πρότερον καὶ ὕστερον ἐν χρόνῳ  
 ἔστιν.

Τίνος μὲν οὖν τῶν τῆς ψυχῆς ἔστιν ἡ μνήμη,  
 φανερόν, ὅτι οὕπερ καὶ ἡ φαντασία· καὶ ἔστι  
 μνημονευτὰ καθ' αὐτὰ μὲν ὅσα ἔστιν φανταστά,  
 25 κατὰ συμβεβηκὸς δὲ ὅσα μὴ ἄνευ φαντασίας.  
 ἀπορήσειε δ' ἀν τις πῶς ποτὲ τοῦ μὲν πάθους  
 παρόντος τοῦ δὲ πράγματος ἀπόντος μνημονεύεται  
 τὸ μὴ παρόν. δῆλον γὰρ ὅτι δεῖ νοῆσαι τοιοῦτον  
 τὸ γινόμενον διὰ τῆς αἰσθήσεως ἐν τῇ ψυχῇ καὶ  
 τῷ μορίῳ τοῦ σώματος τῷ ἔχοντι αὐτήν, οἷον  
 30 ζωγράφημά τι τὸ πάθος, οὐ φαμὲν τὴν ἔξιν μνήμην

## ON MEMORY AND RECOLLECTION, I.

is another question. But it is essential to think of size and motion in terms of time, and the mental picture is an affection of the general sense. So that it is clear that the knowledge of these things belongs to the first perceptive faculty. But memory and the knowledge of things thought cannot exist without a mental picture. So that they would seem to belong incidentally to the thinking faculty, but in themselves to the first sense perception. This is why memory exists in some animals, and not exclusively in man and those who are capable of opinion and thought. But if memory belonged purely to the intellectual faculty, it would not exist, as it does, in many other animals; perhaps it would not exist even in any human being, since even as it is it does not occur in all because they have not all a consciousness of time; for, as we said before, whenever a man exercises his memory, to recall that he has seen, heard or learned something, he always has the additional consciousness that he has heard it before; now "before" and "after" relate to time.

It is, then, obvious that memory refers to that part of the soul to which imagination refers; all things which are mental pictures are in themselves subjects of memory, and those which cannot exist apart from imagination are only incidentally subjects of memory. A difficulty may arise as to how one can remember something which is not present; that is, the affection of the mind being present, but its object absent. For it is obvious that one must consider such a thing which occurs in the soul by means of the sense perception, and in that part of the body which contains the soul, as a kind of painted portrait—an affection, the lasting state of which we describe as memory; for the move-

Memory and  
imagination.

## ARISTOTLE

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εἶναι· ἡ γὰρ γνωμένη κίνησις ἐνσημαίνεται οἶνον τύπον τινὰ τοῦ αἰσθήματος, καθάπερ οἱ σφραγιζό-  
450 b μενοι τοῖς δακτυλίοις. διὸ καὶ τοῖς μὲν ἐν κινήσει πολλῇ διὰ πάθος ἡ δι’ ἡλικίαν οὖσιν οὐ γίνεται μυήμη, καθάπερ ἂν εἰς ὕδωρ ρέον ἐμπιπτούσης τῆς κινήσεως καὶ τῆς σφραγίδος· τοῖς δὲ διὰ τὸ φήγεσθαι, καθάπερ τὰ παλαιὰ τῶν οἰκοδομημάτων,  
5 καὶ διὰ σκληρότητα τοῦ δεχομένου τὸ πάθος οὐκ ἐγγίνεται ὁ τύπος. διόπερ οὖτε σφόδρα νέοι καὶ οἱ γέροντες ἀμυήμονές εἰσιν· ρέουσι γὰρ οἱ μὲν διὰ τὴν αὔξησιν, οἱ δὲ διὰ τὴν φθίσιν. ὅμοιῶς δὲ καὶ οἱ λίαν ταχεῖς καὶ οἱ λίαν βραδεῖς οὐδέτεροι φαίνονται μυήμονες· οἱ μὲν γάρ εἰσιν ὑγρότεροι τοῦ  
10 δέοντος, οἱ δὲ σκληρότεροι· τοῖς μὲν οὖν οὐ μένει τὸ φάντασμα ἐν τῇ φυχῇ, τῶν δ’ οὐχ ἄπτεται.

’Αλλ’ εἰ δὴ τοιοῦτόν ἐστι τὸ συμβαῖνον περὶ τὴν μυήμην, πότερον τοῦτο μυημονεύει τὸ πάθος, ἡ ἐκεῖνο ἀφ’ οὐ ἐγένετο; εἰ μὲν γὰρ τοῦτο, τῶν ἀπόντων οὐδὲν ἂν μυημονεύοιμεν· εἰ δ’ ἐκεῖνο,  
15 πῶς αἰσθανόμενοι τούτου μυημονεύομεν, οὐ μὴ αἰσθανόμεθα, τὸ ἀπόν; εἴ τ’ ἐστὶν ὅμοιον ὥσπερ τύπος ἡ γραφὴ ἐν ἡμῖν, τούτου αὐτοῦ ἡ αἴσθησις διὰ τί ἂν εἴη μυήμη ἔτέρου, ἀλλ’ οὐκ αὐτοῦ τούτου; ὁ γὰρ ἐνεργῶν τῇ μυήμῃ θεωρεῖ τὸ πάθος τοῦτο καὶ αἰσθάνεται τούτου. πῶς οὖν τὸ μὴ παρὸν μυημονεύει; εἴη γὰρ ἂν καὶ ὅρâν τὸ μὴ παρὸν 20 καὶ ἀκούειν. ἡ ἐστιν ὡς ἐνδέχεται καὶ συμβαίνει τοῦτο; οἶνον γὰρ τὸ ἐν τῷ πίνακι γεγραμμένον καὶ ζῷόν ἐστι καὶ εἰκών, καὶ τὸ αὐτὸ καὶ ἐν τοῦτ’ ἐστὶν ἄμφω, τὸ μέντοι εἶναι οὐ ταῦτὸν ἀμ-

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ment produced implies some impression of sense movement, just as when men seal with signet rings. For this reason some men in the presence of considerable stimulus have no memory owing to disease or age, just as if a stimulus or a seal were impressed on flowing water. With them the design makes no impression because they are worn down, like old walls in buildings, or because of the hardness of that which is to receive the impression. For this reason the very young and the old have poor memories ; they are in a state of flux, the young because of their growth, the old because of their decay. For a similar reason neither the very quick nor the very slow appear to have good memories ; the former are moister than they should be, and the latter harder ; with the former the picture has no permanence, with the latter it makes no impression.

If this is a true picture of what occurs with memory, is what one remembers the present effect, or the original from which it arose ? If the former, then we could not remember anything in its absence ; if the latter, how can we remember by perceiving that which we do not perceive—the absent ? If the effect on us is the same as with an impression or a painting, why is the perception of this memory of something else and not of itself ? For the man while exercising his memory considers and perceives this affection. How, then, does he remember that which is not present ? For this would imply that it is possible to see and hear what is not present. Surely this is both possible and does actually occur. For just as the portrait painted on the panel is both a picture and a portrait, and both these are one and the same thing, yet the actual existence of the two is not the same thing, and it is

What does  
one actually  
remember?

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φοῖν, καὶ ἔστι θεωρεῖν καὶ ὡς ζῷον καὶ ὡς εἰκόνα,  
οὕτω καὶ τὸ ἐν ἡμῖν φάντασμα δεῖ ὑπολαβεῖν καὶ  
25 αὐτό τι καθ' αὐτὸ οἶναι θεώρημα καὶ ἄλλου φάν-  
τασμα. οὐ μὲν οὖν καθ' αὐτό, θεώρημα η̄ φάντασμά  
ἔστιν, οὐ δ' ἄλλου, οἶον εἰκών καὶ μνημόνευμα.  
ῶστε καὶ ὅταν ἐνεργῇ η̄ κύνησις αὐτοῦ, ἀν μέν, οὐ  
καθ' αὐτό ἔστι, ταύτη αἰσθηται η̄ ψυχὴ αὐτοῦ,  
οἶον νόημά τι η̄ φάντασμα φαίνεται ἐπελθεῖν· ἀν  
30 δ' οὐ η̄ ἄλλου, ὥσπερ ἐν τῇ γραφῇ ὡς εἰκόνα θεωρεῖ,  
καὶ μὴ ἔωρακώς τὸν Κορίσκον ὡς Κορίσκου·  
ἐνταῦθά τε ἄλλο τὸ πάθος τῆς θεωρίας ταύτης καὶ  
451 a ὅταν ὡς ζῷον γεγραμμένον θεωρῇ, ἐν τε τῇ ψυχῇ  
τὸ μὲν γίνεται ὥσπερ νόημα μόνον, τὸ δ' ὡς ἐκεῖ  
ὅτι εἰκών, μνημόνευμα. καὶ διὰ τοῦτο ἐνίστι' οὐκ  
ἴσμεν, ἐγγινομένων ἡμῖν ἐν τῇ ψυχῇ τοιούτων  
κινήσεων ἀπὸ τοῦ αἰσθέσθαι πρότερον, εἰ κατὰ  
τὸ ἡσθῆσθαι συμβαίνει, καὶ εἰ ἔστι μνήμη η̄ οὐ  
5 διστάζομεν· ὅτε δὲ συμβαίνει ἐννοῆσαι καὶ ἀνα-  
μησθῆναι ὅτι ἡκούσαμέν τι πρότερον η̄ εἴδομεν.  
τοῦτο δὲ συμβαίνει, ὅταν θεωρῶν ὡς αὐτὸ μετα-  
βάλλῃ καὶ θεωρῇ ὡς ἄλλου. γίνεται δὲ καὶ  
τούναντίον, οἶον συνέβη Ἀντιφέροντι τῷ Ὡρείτῃ  
10 καὶ ἄλλοις ἐξισταμένοις· τὰ γὰρ φαντάσματα  
ἔλεγον ὡς γενόμενα καὶ ὡς μνημονεύοντες. τοῦτο  
δὲ γίνεται, ὅταν τις τὴν μὴ εἰκόνα ὡς εἰκόνα  
θεωρῇ. αἱ δὲ μελέται τὴν μνήμην σώζουσι τῷ

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possible to think of it both as a living original and as a portrait, so in the same way we must regard the mental picture within us both as a thing for consideration in itself and as a mental picture of something else. In so far as we consider it in itself, it is a subject of consideration or a mental picture, but in so far as we consider it as a portrait of something else, we are thinking of it as an image and an object of memory. So that when the stimulus is operative, if it is considered in itself, the soul perceives it in this way, and it appears as a subject of thought, or a mental picture ; but if it is considered as a portrait of another, just as one regards a figure in a picture as a portrait, and though one does not see Coriscus, one looks at it as a portrait of Coriscus. In the latter case the feeling aroused by looking at it in this way is not the same as when one considers it as a painted picture ; the former exists in the soul merely as an object of thought, but the latter, inasmuch as it is there a picture, is a subject of memory. And for this reason sometimes we do not know, when such stimuli in our soul originally arise from sense perception, whether it occurs because we have perceived, and we are in doubt whether it is memory or not. But sometimes it happens that we reflect and remember that we have heard or seen this something before. Now this occurs whenever we first think of it as itself, and then change and think of it as referring to something else. The opposite also occurs, as happened to Antipheron of Oreus, and other lunatics ; for they spoke of their mental pictures as if they had actually taken place, and as if they actually remembered them. Now this happens when one regards as a portrait what is not a portrait ; but practice preserves

## ARISTOTLE

451 a ἐπαναμιμνήσκειν· τοῦτο δ' ἔστιν οὐδὲν ἔτερον ἢ τὸ θεωρεῖν πολλάκις ὡς εἰκόνα καὶ μὴ ὡς καθ' αὐτό.

15 Τί μὲν οὖν ἔστι μνήμη καὶ τὸ μνημονεύειν, εἴρηται, ὅτι φαιτάσματος, ὡς εἰκόνος οὖθις φάντασμα, ἔξις, καὶ τόνος μορίου τῶν ἐν ἡμῖν, ὅτι τοῦ πρώτου αἰσθητικοῦ, καὶ φῶν χρόνου αἰσθανόμεθα.

II. Περὶ δὲ τοῦ ἀναμιμνήσκεσθαι λοιπὸν εἰπεῖν. πρῶτον μὲν οὖν ὅσα ἐν τοῖς ἐπιχειρηματικοῖς 20 λόγοις ἔστιν ἀληθῆ, δεῖ τίθεσθαι ὡς ὑπάρχοντα. οὕτε γὰρ μνήμης ἔστιν ἀνάληψις ἡ ἀνάμνησις οὕτε λῆψις· ὅταν γὰρ τὸ πρῶτον ἢ μάθη ἢ πάθη, οὕτι ἀναλαμβάνει μνήμην οὐδεμίαν (οὐδεμία γὰρ προγέγονεν) οὕτι<sup>3</sup> ἐξ ἀρχῆς λαμβάνει· ὅταν δὲ ἐγγένηται ἡ ἔξις καὶ τὸ πάθος, τότε ἡ μνήμη ἔστιν. ὥστε 25 μετὰ τοῦ πάθους ἐγγινομένου οὐκ ἐγγίνεται. ἔτι δ' ὅτε τὸ πρῶτον ἐγγέγονε τῷ ἀτόμῳ καὶ ἐσχάτῳ, τὸ μὲν πάθος ἐνυπάρχει ἥδη τῷ παθόντι καὶ ἡ ἐπιστήμη, εἰ δεῖ καλεῖν ἐπιστήμην τὴν ἔξιν ἢ τὸ πάθος (οὐθὲν δὲ κωλύει κατὰ συμβεβηκός καὶ μνημονεύειν ἔνια ὥν ἐπιστάμεθα)· τὸ δὲ μνημονεύειν 30 καθ' αὐτὸν οὐχ ὑπάρχει πρὸν χρονισθῆναι· μνημονεύει γὰρ νῦν ὃ εἶδεν ἢ ἐπαθε πρότερον, οὐχ ὃ νῦν ἐπαθε, νῦν μνημονεύει. ἔτι δὲ φανερὸν ὅτι μνημονεύειν ἔστι μὴ νῦν ἀναμνησθέντα, ἀλλ' ἐξ ἀρχῆς

<sup>a</sup> This does not appear to refer to any extant treatise.

<sup>b</sup> A. here rejects Plato's identification of "learning" with "recollection."

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the memory by the process of recollection. This is nothing but the repeated contemplation of an object as an image, and not as existent in itself.

We have then explained what memory and remembering is, that it is a condition of mental picture, as of a portrait of which it is the mental picture, and to what part of us it belongs, that it belongs to primary sensation, and to that part with which we are conscious of time.

II. It remains to speak about recollecting. But Recollection first of all what has been said in our dialectical and Memory. treatise <sup>a</sup> is true, and must be regarded as proved. For recollection is neither the recovery nor the acquisition of memory ; for when one first learns or receives a sense impression, one does not recover any memory <sup>b</sup> (for none has gone before), nor does one acquire memory from this first impression ; but when the condition (*i.e.* the learning) or the affection (*i.e.* the sense impression) has already been received, then there is memory ; so that memory does not arise at the same time as the reception of the affection. Moreover, at the time when memory exists for the first time in the indivisible and ultimate sense organ, the affection already exists in the affected, and so does the knowledge, if one can call the state or the affection knowledge (for there is nothing to prevent our remembering incidentally some of the things we know) ; but memory in itself does not arise until time has elapsed ; for one remembers in the present what one saw or suffered in the past ; one does not remember in the present what one experiences in the present. Moreover it is evident that it is possible to remember things which are not recalled at the moment, but which one has perceived or suffered all

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αἰσθόμενον ἢ παθόντα. ἀλλ' ὅταν ἀναλαμβάνῃ ἦν πρότερον εἶχεν ἐπιστήμην ἢ αἴσθησιν ἢ οὖν ποτὲ τὴν ἔξιν ἐλέγομεν μνήμην, τοῦτ' ἐστὶ καὶ τότε τὸ ὁ ἀναμιμνήσκεσθαι τῶν εἰρημένων τι. τὸ δὲ μνημονεύειν συμβαίνει, καὶ μνήμη ἀκολουθεῖ. οὐδὲ δὴ ταῦτα ἀπλῶς, ἐὰν ἐμπροσθεν ὑπάρξαντα πάλιν ἐγγένηται, ἀλλ' ἐστιν ὡς, ἐστι δὲ ὡς οὐ. διὸ γὰρ μαθεῖν καὶ εὑρεῖν ἐνδέχεται τὸν αὐτὸν τὸ αὐτό. δεῖ οὖν διαφέρειν τὸ ἀναμιμνήσκεσθαι τούτων, καὶ 10 ἐνούσης πλείονος ἀρχῆς ἢ ἐξ ἣς μανθάνουσιν ἀναμιμνήσκεσθαι.

Συμβαίνουσι δ' αἱ ἀναμνήσεις, ἐπειδὴ πέφυκεν ἡ κίνησις ἦδε γενέσθαι μετὰ τήνδε· εἰ μὲν ἐξ ἀνάγκης, δῆλον ὡς ὅταν ἐκείνη κινηθῇ, τήνδε κινηθήσεται· εἰ δὲ μὴ ἐξ ἀνάγκης ἀλλ' ἐθει, ὡς ἐπὶ τὸ πολὺ κινηθήσεται. συμβαίνει δ' ἐνίους ἄπαξ 15 ἐθισθῆναι μᾶλλον ἢ ἄλλους πολλάκις κινουμένους· διὸ ἔνια ἄπαξ ἵδοντες μᾶλλον μνημονεύομεν ἢ ἔτερα πολλάκις. ὅταν οὖν ἀναμιμνησκώμεθα, κινούμεθα τῶν προτέρων τινὰ κινήσεων, ἔως ἂν κινηθῶμεν μεθ' ἣν ἐκείνη εἴωθεν. διὸ καὶ τὸ ἐφεξῆς θηρεύομεν νοήσαντες ἀπὸ τοῦ νῦν ἢ ἄλλου 20 τινός, καὶ ἀφ' ὅμοίου ἢ ἐναντίου ἢ τοῦ σύνεγγυς. διὰ τοῦτο γίνεται ἡ ἀνάμνησις· αἱ γὰρ κινήσεις τούτων τῶν μὲν αἱ αὐταί, τῶν δὲ ἄμα, τῶν δὲ

<sup>a</sup> i.e. although memory does not imply recollection.

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along. But when one recovers knowledge or sensation which one had before, or recovers that the condition of which we have previously called memory, at that moment this may be called recollection, and is followed by the things we have mentioned. Yet "the process of recollection implies memory, and is followed by memory. Nor is it true merely to say that things previously existing arise again, but in one sense this is true, in another not. For it is possible for the same man to learn and discover the same thing twice ; now recollection must differ from this, and to remember must imply some impulse beyond that from which they learn in the first instance.

Acts of recollection occur when one impulse naturally succeeds another : now if this order occurs of necessity, it is plain that when one impulse is produced the next will be produced also ; but if the order is not inevitable, but only usual, the second movement will normally follow. But it happens that with some persons the habit is more effectively formed from one impulse than with others, from receiving the impulse many times ; and so we have a better recollection of some things, that we have seen once, than of others, that we have seen many times. When, then, we recollect, we are moved by one of our former impulses, until at last we are moved by that after which this impulse usually occurs. This is why, starting in thought from a present incident, we follow the trail in order, beginning from something similar, or contrary, or closely connected. In this way recollection arises ; for the impulses of these starting-points are sometimes identical with what we seek, sometimes occurred simultaneously, and sometimes actually

The process  
of recollec-  
tion.

ARISTOTLE

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μέρος ᔁχουσιν, ὥστε τὸ λοιπὸν μικρὸν ὁ ἐκινήθη μετ' ἐκεῖνο.

Ζητοῦσι μὲν οὖν οὕτω, καὶ μὴ ζητοῦντες δ' οὕτως ἀναμιμηγόσκονται, ὅταν μεθ' ἐτέραν κίνησιν ἐκείνη γένηται· ὡς δὲ τὰ πολλὰ ἐτέρων γενομένων κινήσεων οἷων εἴπομεν, ἐγένετο ἐκείνη. οὐδὲν δὲ δεῖ σκοπεῖν τὰ πόρρω, πῶς μεμνήμεθα, ἀλλὰ τὰ σύνεγγυς· δῆλον γὰρ ὅτι ὁ αὐτός ἐστι τρόπος, λέγω δὲ τὸ ἐφεξῆς, οὐ προζητήσας οὐδὲ ἀναμνησθείς. τῷ γὰρ ἔθει ἀκολουθοῦσιν αἱ κινήσεις ἀλλή-  
80 λαις, ἦδε μετὰ τήνδε. καὶ ὅταν τούννυν ἀναμιμη-  
σκεσθαι βούληται, τοῦτο ποιήσει· ζητήσει λαβεῖν ἀρχὴν κινήσεως, μεθ' ἦν ἐκείνη ἔσται. διὸ τάχιστα  
452 <sup>a</sup> καὶ κάλλιστα γίνονται ἀπ' ἀρχῆς αἱ ἀναμνήσεις·  
ώς γὰρ ᔁχουσι τὰ πράγματα πρὸς ἄλληλα τῷ  
ἐφεξῆς, οὕτω καὶ αἱ κινήσεις. καὶ ἔστιν εὔμνη-  
μόνευτα ὅσα τάξιν τινὰ ᔁχει, ὥσπερ τὰ μαθήματα·  
τὰ δὲ φαῦλα<sup>1</sup> χαλεπῶς. καὶ τούτῳ διαφέρει τὸ  
δ ἀναμιμησκεσθαι τοῦ πάλιν μανθάνειν, ὅτι δυνή-  
σεται πως δι' αὐτοῦ κινηθῆναι ἐπὶ τὸ μετὰ τὴν  
ἀρχὴν. ὅταν δὲ μή, ἀλλὰ δι' ἄλλου, οὐκέτι  
μέμνηται.

Πολλάκις δ' ἦδη μὲν ἀδυνατεῖ ἀναμνησθῆναι,  
ζητεῖν δὲ δύναται καὶ εὐρίσκει. τοῦτο δὲ γίνεται  
κινοῦντι πολλά, ἔως ἂν τοιαύτην κινήσῃ κίνησιν ἥ

<sup>1</sup> φαῦλως καὶ B.

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form a part of what we seek, so that the portion which was stimulated after that is only a small one.

This is the way in which men seek to evoke recollection, and the way in which they recollect, even if they do not try to, when one impulse occurs after another ; but generally speaking it is when other impulses, such as we have mentioned, have been aroused that the particular impulse arises. There is no need to consider how we remember far off events, but we may confine ourselves to near ones ; for it is clear that the method is the same in both cases, I mean by a chain of succession, without previous search or recollection. For the impulses follow each other by custom, one after another. When a man wishes to recall anything, this will be his method : he will try to find a starting-point for the impulse, after which the one he seeks will appear. This is why recollections which have a beginning to start from are always achieved soonest and most successfully ; for just as the objects are related to each other in an order of succession, so are the impulses. Those subjects which possess an orderly arrangement are the easiest to remember, like mathematical problems ; others are inferior and are recovered with difficulty. It is in this that the difference between recollecting and learning afresh lies, that he will be able in some way to move on by his own effort to what succeeds the starting-point. But when this is impossible, and it can only proceed through another agency, there is no memory.

It often happens that a man cannot recall at the moment, but can search for what he wants and find it. This occurs when a man initiates many impulses, until at last he initiates that which the object of his

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10 ἀκολουθήσει τὸ πρᾶγμα. τὸ γὰρ μεμνῆσθαι ἔστι τὸ  
 ἐνεῖναι δυνάμει τὴν κινοῦσαν· τοῦτο δέ, ὥστ' ἔξ  
 αὐτοῦ καὶ ὡν ἔχει κινήσεων κινηθῆναι, ὥσπερ  
 εἴρηται. δεῖ δὲ λαβέσθαι ἀρχῆς. διὸ ἀπὸ τόπων  
 δοκοῦσιν ἀναμιμνήσκεσθαι ἐνίστε. τὸ δ' αἴτιον ὅτι  
 ταχὺ ἀπ' ἄλλου ἐπ' ἄλλο ἔρχονται, οἷον ἀπὸ γάλα-  
 κτος ἐπὶ λευκόν, ἀπὸ λευκοῦ δ' ἐπ' ἀέρα, καὶ ἀπὸ  
 15 τούτου ἐφ' ὑγρόν, ἀφ' οὗ ἐμνήσθη μετοπώρου, ταύ-  
 την ἐπιζητῶν τὴν ὥραν. ἔσικε δὴ καθόλου ἀρχὴ  
 καὶ τὸ μέσον πάντων· εἰ γὰρ μὴ πρότερον, ὅταν  
 ἐπὶ τοῦτο ἔλθῃ, μνησθήσεται, ἢ οὐκέτ' οὐδὲ ἄλλο-  
 θεν, οἷον εἴ τις νοήσειεν ἐφ' ὧν ΑΒΓΔΕΖΗΘ·  
 20 εἰ γὰρ μὴ ἐπὶ τοῦ Ε μέμνηται, ἐπὶ τοῦ Θ<sup>1</sup> ἐμνήσθη·  
 ἐντεῦθεν γὰρ ἐπ' ἄμφω κινηθῆναι ἐνδέχεται, καὶ  
 ἐπὶ τὸ Δ καὶ ἐπὶ τὸ Ζ.<sup>2</sup> εἰ δὲ μὴ τούτων τι ἐπιζη-  
 τεῖ, ἐπὶ τὸ Γ ἐλθὼν μνησθήσεται, εἰ τὸ Η ἢ τὸ Ζ  
 ἐπιζητεῖ. εἰ δὲ μή, ἐπὶ τὸ Α· καὶ οὕτως ἀεί. τοῦ  
 δ' ἀπὸ τοῦ αὐτοῦ ἐνίστε μὲν μνησθῆναι ἐνίστε δὲ  
 25 μή, αἴτιον ὅτι ἐπὶ πλείω ἐνδέχεται κινηθῆναι ἀπὸ  
 τῆς αὐτῆς ἀρχῆς, οἷον ἀπὸ τοῦ Γ ἐπὶ τὸ Ζ ἢ τὸ Δ.

'Εὰν οὖν μή διὰ παλαιοῦ κινῆται, ἐπὶ τὸ συνηθέ-  
 στερον κινεῖται· ὥσπερ γὰρ φύσις ἥδη τὸ ἔθος.

<sup>1</sup> ΕΘ Bekk.

<sup>2</sup> Ε Bekk.

<sup>a</sup> This difficult passage, as it stands in Bekker's text, seems untranslatable. The smallest change which will give a meaning to it is to read Η instead of ΕΗ, which has the authority of one ms., and to read Φ instead of Ε, which has no ms. authority, but is the suggestion of Mr. W. D. Ross. These alterations have been adopted. To assist the illustration the Greek letters have been transliterated as the first eight of the English alphabet.

<sup>b</sup> It may be possible to travel from Α to Η, when it is  
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search will follow. For remembering really depends upon the potential existence of the stimulating cause ; and there is this also that, as has been said, it arises from the man himself, and the stimuli which he has. But he must seize hold of the starting-point. For this reason some use loci for the purpose of recollecting. The reason for this is that men pass rapidly from one step to the next ; for instance from milk to white, from white to air, from air to damp : after which one recollects autumn, supposing that one is trying to recollect that season. Generally speaking the middle point seems to be a good point to start from ; for one will recollect when one comes to this point, if not before, or else one will not recollect from any other. For instance,<sup>a</sup> suppose one were thinking of a series, which may be represented by the letters ABCDEFGH ; if one does not recall what is wanted at E, yet one does at H ; (the reason for the failure at E is that) from that point it is possible to travel in either direction, that is either towards D or towards F. Supposing one is seeking for either G or F, one will recollect on arriving at C, if one wants G or F. If not then on arrival at A.<sup>b</sup> Success is always achieved in this way. Sometimes it is possible to recall what we seek and sometimes not ; the reason being that it is possible to travel from the same starting-point in more than one direction ; for instance from C we may go direct to F or only to D.

If one is not moving along an old path, one tends to change one's movement to a more usual one ; for custom is second nature. We remember quickly on

not possible to travel from C to H, because, as is said above, the essential to success is the seizing on the right point from which to start.

452 a διὸ ἀ πολλάκις ἐννοοῦμεν, ταχὺ ἀναμιμνησκόμεθα.  
 30 ὥσπερ γὰρ φύσει τόδε μετὰ τόδε ἐστίν, οὕτω καὶ  
 ἐνεργείᾳ· τὸ δὲ πολλάκις φύσιν ποιεῖ. ἐπεὶ δ'  
 452 b ὥσπερ ἐν τοῖς φύσει γίνεται, καὶ παρὰ φύσιν καὶ  
 ἀπὸ τύχης, ἔτι μᾶλλον ἐν τοῖς δι’ ἔθος, οἷς ἡ φύσις  
 γε μὴ ὅμοίως ὑπάρχει· ὥστε κινηθῆναι ἐνίστε κάκεῖ  
 καὶ ἄλλως, ἄλλως τε καὶ ὅταν ἀφέλκη ἐκεῖθεν  
 5 αὐτόσε πη. διὰ τοῦτο καὶ ὅταν δέῃ ὄνομα μνη-  
 μονεῦσαι, παρόμοιον μέν, εἰς δ’ ἐκεῖνο σολοικίζομεν.  
 τὸ μὲν οὖν ἀναμιμνήσκεσθαι τοῦτον συμβαίνει τὸν  
 τρόπον.

Τὸ δὲ μέγιστον, γνωρίζειν δεῖ τὸν χρόνον, ἡ  
 μέτρῳ ἡ ἀορίστως. ἔστω δέ τι ὁ κρίνει τὸν πλείω  
 καὶ ἐλάττω· εὔλογον δ’ ὥσπερ τὰ μεγέθη· νοεῖ γὰρ  
 10 τὰ μεγάλα καὶ πόρρω οὐ τῷ ἀποτείνειν ἐκεῖ τὴν  
 διάνοιαν, ὥσπερ τὴν ὄψιν φασί τινες (καὶ γὰρ μὴ  
 ὅντων ὅμοίως νοήσει), ἀλλὰ τῇ ἀνάλογον κινήσει·  
 ἔστι γὰρ ἐν αὐτῇ τὰ ὅμοια σχήματα καὶ κινήσεις.  
 τίνι οὖν διοίσει, ὅταν τὰ μείζω νοῆῃ,<sup>1</sup> ὅτι ἐκεῖνα νοεῖ,  
 ἡ τὰ ἐλάττω; πάντα γὰρ τὰ ἐντὸς ἐλάττω, ὥσπερ  
 15 ἀνάλογον καὶ τὰ ἐκτός. ἔστι δ’ ἵσως ὥσπερ καὶ  
 τοῖς εἰδεσιν ἀνάλογον λαβεῖν ἄλλο ἐν αὐτῷ, οὕτω  
 καὶ τοῖς ἀποστήμασιν. ὥσπερ οὖν εἰ τὴν ΑΒΒΕ  
 κινεῖται, ποιεῖ τὴν Γ<sup>2</sup>Δ· ἀνάλογον γὰρ ἡ ΑΓ καὶ  
 ἡ ΓΔ. τί οὖν μᾶλλον τὴν ΓΔ ἡ τὴν ΖΗ ποιεῖ;

<sup>1</sup> νοῆῃ ἡ θτι Β.

<sup>2</sup> Α Δ Bekk.

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the lines on which our thought travels frequently ; for as in nature one thing follows another, so also in the exercise of a function ; and the repeated action makes it natural. But since just as in purely natural phenomena some things occur contrary to nature, and owing to chance, so still more in matters of habit, to which the term "natural" does not belong in the same sense ; so that in that region also things sometimes fall out otherwise, especially when something tends to divert the mind from one direction, and turn it in towards itself. This is why when one needs to remember a name, one remembers one like it, but fails to get the one we want. Recollection then occurs in this way.

But the most important factor in recollection is the <sup>Time is an</sup> time, either exactly or vaguely. Let it be granted <sup>important</sup> factor. that one possesses a faculty by which to distinguish lesser and greater time ; it is natural to suppose that we can distinguish these as we distinguish magnitudes. For the mind does not think of large things at a distance by stretching out to them, as some think that vision operates (for the mind will think of them equally easily if they are not there), but one thinks of them by a mental impulse ; for there are similar figures and movements in the mind. How then, when the mind thinks of bigger things, will it differ in thinking of them from when it thinks of smaller things ? For all things inside are smaller, and in a sense proportionate to those outside. Perhaps, then, just as we suppose that there is something in man corresponding to figures, we may assume that there is something similarly corresponding in distances. If, then, the mind thinks of the ratio AB : BE, it knows CD ; for AC and CD are in the same ratio as AB : BE. But

452 b

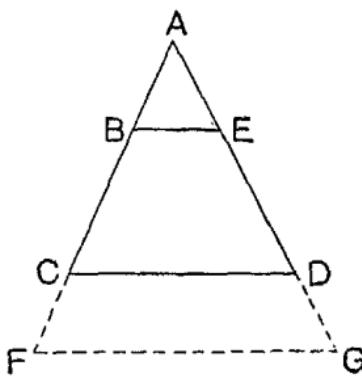
20 ἢ ὡς ἡ ΑΓ πρὸς τὴν ΑΒ ἔχει, οὕτως ἡ τὸ Θ πρὸς τὴν Γ<sup>1</sup> ἔχει. ταύτας οὖν ἀμά κινεῖται. ἂν δὲ τὴν ΖΗ βούληται νοῆσαι, τὴν μὲν ΒΕ ὅμοιῶς νοεῖ, ἀντὶ δὲ τῶν ΘΙ τὰς ΚΛ νοεῖ. αὗται γὰρ ἔχουσιν ὡς ΖΑ πρὸς ΒΑ.

"Οταν οὖν ἀμά ἡ τε τοῦ πράγματος γίνηται κίνησις καὶ ἡ τοῦ χρόνου, τότε τῇ μνήμῃ ἐνεργεῖ.

25 ἂν δ' οἴηται μὴ ποιῶν, οἴεται μνημονεύειν· οὐθὲν γὰρ κωλύει διαφευσθῆναι τια καὶ δοκεῖν μνημονεύειν μὴ μνημονεύοντα. ἐνεργοῦντα δὲ τῇ μνήμῃ μὴ οἴεσθαι ἀλλὰ λανθάνειν μεμνημένον οὐκ ἔστι· τοῦτο γὰρ ἦν αὐτὸ τὸ μεμνῆσθαι. ἀλλ' ἐὰν ἡ τοῦ πράγματος γένηται χωρὶς τῆς τοῦ χρόνου ἡ αὕτη ἐκείνης, οὐ μέμνηται.

30 'Η δὲ τοῦ χρόνου διττή ἔστιν· ὅτε μὲν γὰρ μέτρῳ 453 a οὐ μέμνηται αὐτό, οἷον ὅτι τρίτην ἡμέραν ὁδήποτε ἐποίησεν, ὅτε δὲ καὶ μέτρῳ ἀλλὰ μέμνηται καὶ ἐὰν μὴ μέτρῳ. εἰώθασι δὲ λέγειν ὅτι μέμνηται μέν, πότε μέντοι οὐκ ἴσασιν, ὅταν τοῦ πότε μὴ γνωρίζωσι τὸ ποσὸν μέτρῳ.

<sup>1</sup> M. Bekk.



<sup>a</sup> If this figure represents A.'s train of thought his argument is as follows. If a man thinks of the ratio  $AB : BE$ , he can pass directly to the ratio  $AC : CD$ , for by the figure given he knows the ratio  $AC : AB$ , which we may call  $H : I$ . But to proceed to  $AF : FG$  he would first have to determine the ratio  $K : L$ , that is the ratio  $FA : BA$ , which he does not know, because it is "outside."

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why then does thinking AB : BE produce CD rather than FG? Surely because AC has the same ratio to AB as H to I. And so the impulses to these movements are simultaneous. If then he wants to think FG, he thinks BE in the same way, but instead of HI, he thinks KL; for this has the same ratio as FA to BA.<sup>a</sup>

When the impulse of the fact and that of time occur simultaneously, then one actually remembers. But if a man imagines that these movements occur when they do not, then he imagines that he remembers; for there is nothing to prevent a man from being deceived about it, and from supposing that he remembers when he does not. But when a man actually remembers he cannot suppose that he does not, and remember without being aware of it; for recollection involves consciousness of it. But if the movement producing the object takes place apart from the time or the movement produces the time without the object, one fails to remember.

But the movement producing the time is a double one; at times one remembers a fact without an exact time, for instance that one did so and so the day before yesterday, but sometimes one knows it with an exact time; but it is still an act of memory, even if it does not connect with an exact time. Men are accustomed to say that they remember an occurrence, but that they do not remember when it occurred, when they cannot recognize exact limits to the time.

Recollection may be accurate except for time.

"Οτι μὲν οὖν οἵ αὐτοὶ μημονικοὶ καὶ ἀνα-  
μνηστικοί, ἐν τοῖς πρότερον εἴρηται. διαφέρει δὲ  
τοῦ μημονεύειν τὸ ἀναμιμνήσκεσθαι οὐ μόνον κατὰ  
τὸν χρόνον, ἀλλ' ὅτι τοῦ μὲν μημονεύειν καὶ τῶν  
ἄλλων ζώων μετέχει πολλά, τοῦ δ' ἀναμιμνήσκε-  
σθαι οὐδὲν ὡς εἰπεῖν τῶν γνωριζομένων ζώων, πλὴν  
ἄνθρωπος. αἴτιον δ' ὅτι τὸ ἀναμιμνήσκεσθαι ἔστιν  
οἶνον συλλογισμός τις. ὅτι γὰρ πρότερον εἶδεν ἡ  
ἡγουσεν ἡ τι τοιοῦτον ἔπαθε, συλλογίζεται ὁ ἀνα-  
10 μιμηστικόμενος, καὶ ἔστιν οἶνον ζήτησίς τις. τοῦτο  
δ' οἶς καὶ τὸ βουλευτικὸν ὑπάρχει, φύσει μόνοις  
συμβέβηκεν· καὶ γὰρ τὸ βουλεύεσθαι συλλογισμός  
τίς ἔστιν.

"Οτι δ' ἔστι σωματικόν τι τὸ πάθος καὶ ἡ ἀνά-  
μνησις ζήτησις ἐν τοιούτῳ φαντάσματος, σημεῖον τὸ  
παρενοχλεῖν ἐνίους, ἐπειδὰν μὴ δύνωνται ἀναμη-  
15 σθῆναι, καὶ πάνυ ἐπέχοντες τὴν διάνοιαν, καὶ οὐκέτ'  
ἐπιχειροῦντας ἀναμιμνήσκεσθαι οὐδὲν ἥττον, καὶ  
μάλιστα τοὺς μελαγχολικούς· τούτους γὰρ φαντά-  
σματα κινεῖ μάλιστα. αἴτιον δὲ τοῦ μὴ ἐπ' αὐτοῖς  
εἶναι τὸ ἀναμιμνήσκεσθαι, ὅτι καθάπερ τοῖς βάλ-  
λουσιν οὐκέτι ἐπ' αὐτοῖς τὸ στῆσαι, οὕτω καὶ  
20 ὁ ἀναμιμηστικόμενος καὶ θηρεύων σωματικόν τι  
κινεῖ, ἐν ᾧ τὸ πάθος. μάλιστα δ' ἐνοχλοῦνται οἱς  
ἄν ὑγρότης τύχῃ ὑπάρχουσα περὶ τὸν αἰσθητικὸν  
τόπον· οὐ γὰρ ῥᾳδίως παύεται κινηθεῖσα, ἔως ἂν  
ἐπέλθῃ τὸ ζητούμενον καὶ εὐθυπορήσῃ ἡ κίνησις.  
διὸ καὶ ὅργαι καὶ φόβοι, ὅταν τι κινήσωσιν, ἀντι-  
25 κινούντων πάλιν τούτων οὐ καθίστανται, ἀλλ' ἐπὶ  
τὸ αὐτὸν ἀντικινοῦσιν. καὶ ἔοικε τὸ πάθος τοῖς

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We have laid it down before that those who have good memories are not the same as those who recall quickly. Recollecting differs from memory not merely in the matter of time, but also because many other living creatures share in memory, but none of the known so-called animals can recollect except man. This is because recollecting implies a process of reasoning ; for when a man is recollecting he reasons that he has seen or heard or experienced something of the sort before, and the process is a kind of search. This power can only belong by nature to such animals as have a power of deliberation ; and deliberation is a process of reasoning.

Memory and  
recollection  
further  
disting-  
guished.

But the fact that the experience is in some sense bodily, and that recollection is the search for a mental picture in a body, is proved by the annoyance which some men show when they cannot remember, and because they are none the less perturbed in mind even when they have abandoned the attempt to recollect, and especially those of morbid temperament ; for these are specially moved by mental pictures. But the reason why the recollecting does not lie in their power is, just as when men have thrown a stone they cannot stop it, so also the man who is employed in recollecting and search sets up a bodily movement in which the effect takes place. And most disturbed are those who have moisture in the region of their sense perception ; for the movement initiated does not readily stop, until it arrives at the object sought, and the mind again travels on a straight course. For this reason too outbursts of temper or fear, when they have once produced an impulse, do not cease even when the subjects of them set up counter movements, but they themselves produce counter reaction. And

Recollection  
has bodily  
reactions.

## ARISTOTLE

458 a ὄνόμασι καὶ μέλεσι καὶ λόγοις, ὅταν διὰ στόματος  
 80 γένηται τι αὐτῶν σφόδρα· παυσαμένοις γὰρ καὶ οὐ  
 βουλομένοις ἐπέρχεται πάλιν ἥδειν ἢ λέγειν.

458 b Εἰσὶ δὲ καὶ οἱ τὰ ἄνω μείζω ἔχοντες καὶ οἱ νανώ-  
 βάρος ἔχειν ἐπὶ τῷ αἰσθητικῷ, καὶ μήτ' ἐξ ἀρχῆς  
 τὰς κινήσεις δύνασθαι ἐμμένειν ἀλλὰ διαλύεσθαι,  
 μήτ' ἐν τῷ ἀναμιμνήσκεσθαι ρᾳδίως εὐθυπορεῖν.  
 5 οἱ δὲ πάμπαν νέοι καὶ λίαν γέροντες ἀμυήμονες διὰ  
 τὴν κύνησιν· οἱ μὲν γὰρ ἐν φθίσει, οἱ δ' ἐν αὐξήσει  
 πολλῇ εἰσίν· ἔτι δὲ τά γε παιδία καὶ νανώδη ἐστὶ  
 μέχρι πόρρω τῆς ἡλικίας.

Περὶ μὲν οὖν μυῆμης καὶ τοῦ μυημονεύειν, τίς ἡ  
 φύσις αὐτῶν καὶ τίνι τῶν τῆς ψυχῆς μυημονεύει τὰ  
 10 ζῷα, καὶ περὶ τοῦ ἀναμιμνήσκεσθαι, τί ἐστι καὶ  
 πῶς γίνεται καὶ διὰ τίν' αἰτίαν, εἴρηται.

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the same experience occurs with names, tunes and words, when once they have passed through the mouth emphatically ; for even though they check them, and quite against their will, they sing or say the same thing again and again.

Those who have specially large upper parts and dwarfs have less good memories than their opposites, Reasons for good and bad memories. because they carry a great weight on their organ of perception, and the movements which begin from the starting-point cannot keep to it, but stray from it, and do not easily travel in a straight course in their recollecting. The very young and the very old have inferior memories because they are in a state of transition ; for the latter are in a state of rapid decay, and the former in a state of rapid growth ; small children moreover are dwarfed, until they reach mature age.

This concludes our account of memory and remembering, describing its nature and that part of the soul with which living creatures remember. Also what recollecting is, and how it occurs, and for what reason.



# ON SLEEP AND WAKING

## INTRODUCTION

ARISTOTLE's treatment of this subject is full of interest for the modern reader. After some preliminary considerations on the subject he decides that sleep is really a physical phenomenon, in that it means that the sense organs temporarily cease to function, though he is careful to explain that it is not entirely physical, as a body without a soul could not feel. He is interested in the fact that in sleep it is not one or more senses which cease to function but all of them, and therefore decides that it is the "common sense" which is affected.

He then turns to the physiological explanation of the phenomenon we know as sleep. This subject is obscure to-day. Physiologists are sure that somehow the flow of blood to the nerve centres of the brain is checked, and that in consequence these nerve centres receive a reduced supply of oxygen. This shortage of oxygen produces an anaesthesia. Further than this modern physiology is not prepared to go, and it is quite uncertain why or how the flow of blood to the nerve centres of the brain is effected.

What is surprising about Aristotle's physiology is not that he knows so little but that he knows so much. He is quite clear that sleep has some connexion with the blood stream, and some of his statements about the movement of the blood seem to

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foreshadow a theory of the circulation which was not understood until Harvey's discoveries at the beginning of the seventeenth century.

It is also most interesting to find that he regards sleep as part of Nature's admirable design to secure the health of the body, and is true to his principle that all natural functions are part of an ordered scheme of things.

## ΠΕΡΙ ΥΠΝΟΥ ΚΑΙ ΕΓΡΗΓΟΡΣΕΩΣ

453 b

I. Περὶ δὲ ὑπνου καὶ ἐγρηγόρσεως σκεπτέον, τίνα τε τυγχάνει ὅντα, καὶ πότερον ἵδια τῆς ψυχῆς ἢ τοῦ σώματος ἢ κοινά, καὶν ἢ κοινά, τίνος μορίου τῆς ψυχῆς ἢ τοῦ σώματος· καὶ διὰ τίν' αἰτίαν ὑπάρχει τοῖς ζώοις· καὶ πότερον ἄπαντα κεκοινώνηκεν αὐτῶν ἀμφοτέρων, ἢ τὰ μὲν ὑπνου τὰ δὲ θατέρου μόνον, ἢ τὰ μὲν οὐδετέρου τὰ δ' ἀμφοτέρων· πρὸς δὲ τούτοις τί ἔστι τὸ ἐνύπνιον, καὶ διὰ τίν' αἰτίαν οἱ καθεύδοντες ὅτε μὲν ὀνειρώττουσιν ὅτε δ' οὐ· ἢ συμβαίνει μὲν ἀεὶ τοῖς καθεύδονσιν ἐνυπνιάζειν, 20 ἀλλ' οὐ μνημονεύουσιν· καὶ εἰ τοῦτο γίνεται, διὰ τίνα αἰτίαν γίνεται· καὶ πότερον ἐνδέχεται τὰ μέλλοντα προορᾶν, ἢ οὐκ ἐνδέχεται καὶ τίνα τρόπον, εἰ ἐνδέχεται· καὶ πότερον τὰ μέλλοντα ὑπὸ ἀνθρώπου πράσσεσθαι μόνον, ἢ καὶ ὅν τὸ δαιμόνιον ἔχει τὴν αἰτίαν καὶ φύσει γίνεται ἢ ἀπὸ ταύτομάτου.  
25 Πρῶτον μὲν οὖν τοῦτό γε φανερόν, ὅτι τῷ αὐτῷ τοῦ ζώου ἢ τε ἐγρήγορσις ὑπάρχει καὶ δὲ ὑπνος· ἀντίκεινται γάρ, καὶ φαίνεται στέρησίς τις δὲ ὑπνος τῆς ἐγρηγόρσεως· ἀεὶ γάρ τὰ ἐναντία καὶ ἐπὶ τῶν ἀλλων καὶ ἐν τοῖς φυσικοῖς ἐν τῷ αὐτῷ δεικτικῷ

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I. We have now to consider questions concerning sleep and wakefulness. What are they? Are they peculiar to the soul or to the body, or do they belong to both? If they belong to both, to which part of the soul or body do they belong? Why are they characteristic of living creatures? Do all living creatures share in both, or do some have sleep only, and some wakefulness only, or do some have neither and some both? Furthermore what is a dream, and why do men when asleep sometimes dream and sometimes not? Or do sleepers always dream, but sometimes do not remember their dreams? If the latter is true, why does it occur? Is it possible or impossible to foresee the future? If it is possible, in what way? Again, if it is possible, does it apply to actions which man will do, or can it include those done by a god, and those which occur in the ordinary course of nature, or those which happen without outside causation?

To begin with, this is at any rate obvious, that sleep and wakefulness belong to the same part of the living creature; for they are contraries, and sleep appears to be in a sense only a negation of wakefulness; for contraries both in other cases and in natural science evidently occur in the same recipient,

453 <sup>ν</sup> φαίνεται γυνόμενα καὶ τοῦ αὐτοῦ ὅντα πάθη, λέγω  
 80 δ' οἶον ὑγίεια καὶ νόσος, καὶ κάλλος καὶ αἰσχος, καὶ  
 ἴσχυς καὶ ἀσθένεια, καὶ ὄψις καὶ τυφλότης, καὶ  
 454 <sup>α</sup> ἀκοὴ καὶ κωφότης. ἔτι δὲ καὶ ἐκ τῶνδε δῆλον.  
 φὰ γὰρ τὸν ἐγρηγορότα γνωρίζομεν, τούτῳ καὶ  
 τὸν ὑποοῦντα· τὸν γὰρ αἰσθανόμενον ἐγρηγορέναι  
 νομίζομεν καὶ τὸν ἐγρηγορότα πάντα ἡ τῶν ἔξωθέν  
 τινος αἰσθάνεσθαι ἡ τῶν ἐν αὐτῷ κινήσεων. εἰ  
 5 τοίνυν τὸ ἐγρηγορέναι ἐν μηδενὶ ἄλλῳ ἐστὶν ἡ  
 τῷ αἰσθάνεσθαι, δῆλον ὅτι φπερ αἰσθάνεται, τούτῳ  
 καὶ ἐγρήγορε τὰ ἐγρηγορότα καὶ καθεύδει τὰ καθ-  
 εύδοντα.

Ἐπεὶ δ' οὔτε τῆς ψυχῆς ἴδιον τὸ αἰσθάνεσθαι οὔτε  
 τοῦ σώματος (οὐ γὰρ ἡ δύναμις, τούτου καὶ ἡ  
 ἐνέργεια· ἡ δὲ λεγομένη αἴσθησις, ὡς ἐνέργεια,  
 10 κίνησίς τις διὰ τοῦ σώματος τῆς ψυχῆς ἐστί),  
 φανερὸν ὡς οὔτε τῆς ψυχῆς τὸ πάθος ἴδιον, οὔτ'  
 ἀψυχον σῶμα δυνατὸν αἰσθάνεσθαι.

Διωρισμένων δὲ πρότερον ἐν ἑτέροις περὶ τῶν  
 λεγομένων ὡς μορίων τῆς ψυχῆς, καὶ τοῦ μὲν  
 θρεπτικοῦ χωριζομένου τῶν ἄλλων ἐν τοῖς ἔχουσι  
 σώμασι ζωῆν, τῶν δὲ ἄλλων οὐδενὸς ἄνευ τούτου,  
 15 δῆλον ὡς ὅσα μὲν αὐξήσεως καὶ φθίσεως μετέχει  
 μόνον τῶν ζώντων, ὅτι τούτοις οὐχ ὑπάρχει ὑπνος  
 οὐδὲ ἐγρήγορσις, οἷον τοῖς φυτοῖς· οὐ γὰρ ἔχουσι τὸ  
 αἰσθητικὸν μόριον, οὔτ' εἰ χωριστόν ἐστιν οὔτ' εἰ  
 μὴ χωριστόν· τῇ γὰρ δυνάμει καὶ τῷ εἶναι χωριστόν  
 ἐστιν.

20 ‘Ομοίως δὲ καὶ ὅτι οὐδέν ἐστιν ὁ ἀεὶ ἐγρήγορεν  
 ἡ ἀεὶ καθεύδει, ἄλλὰ τοῖς αὐτοῖς ὑπάρχει τῶν ζώων

<sup>a</sup> 482 a 15, etc.

## ON SLEEP AND WAKING, I.

and are affections of the same subject ; such, I mean, as health and disease, beauty and ugliness, strength and weakness, sight and blindness, hearing and deafness. And the same point is clear from the following facts. We recognize the man awake by the same signs as the man asleep ; for we reckon that the man who is conscious of sensation is awake, and that every man who is awake is conscious either of some movement outside himself, or of one inside himself. If then wakefulness cannot exist in any case apart from sensation, it is clear that what is awake is so in respect of its consciousness, and what is asleep is asleep in respect of its consciousness.

But since sensation does not belong specifically either to soul or body (for actuality belongs to that part to which potentiality belongs ; but the sensation in question, as an actuality, is a movement of the soul through the vehicle of the body), it is clear that the affection (sleep) is not peculiar to the soul, while on the other hand a body without a soul could not feel.

Both belong to soul and body.

Elsewhere<sup>a</sup> we have previously classified the so-called parts of the soul, the nutritive part being separate from the others in those bodies which have life, but none of the others existing without this. It is therefore clear that those living creatures which have no characteristics except growth and decay, such as plants, cannot have either sleep or wakefulness. For they do not possess the necessary perceptive part, whether this is separable or inseparable ; for this perceptive part is separable both potentially and actually.

Similarly it is obvious that there is nothing which is either awake or asleep permanently, but both these

454 a

ἀμφότερα τὰ πάθη ταῦτα· οὗτε γάρ εἴ τι ἐστι  
 ζῷον μὴ<sup>1</sup> ἔχον αἰσθησιν, τοῦτον ἐνδέχεται οὗτε  
 καθεύδειν οὔτ' ἐγρηγορέναι· ἅμφω γάρ ἐστι τὰ  
 πάθη ταῦτα περὶ αἰσθησιν τοῦ πρώτου αἰσθητικοῦ.  
 οὐκ ἐνδέχεται δὲ οὐδὲ θάτερον τούτων ἀεὶ ὑπάρχειν  
 25 τῷ αὐτῷ, οἷον ἀεί τι γένος ζῷων καθεύδειν η̄ ἀεί  
 τι ἐγρηγορέναι. ἔτι δέσων ἐστί τι ἔργον κατὰ  
 φύσιν, ὅταν ὑπερβάλλῃ τὸν χρόνον ω̄ δύναται χρόνω  
 τι ποιεῖν, ἀνάγκη ἀδυνατεῖν, οἷον τὰ ὅμματα ὅρωντα  
 καὶ παύεσθαι τοῦτο ποιοῦντα, ὅμοίως δὲ καὶ χεῖρα  
 40 καὶ ἄλλο πᾶν οὖθις ἐστί τι ἔργον. εἰ δή τινός ἐστιν  
 ἔργον τὸ αἰσθάνεσθαι, καὶ τοῦτο ἀν ὑπερβάλλῃ  
 δόσον ἦν χρόνον δυνάμειν αἰσθάνεσθαι συνεχῶς,  
 ἀδυνατήσει καὶ οὐκέτι τοῦτο ποιήσει. εἰ τοίνυν τὸ  
 454 b ἐγρηγορέναι τούτῳ<sup>2</sup> ὥρισται τῷ λελύσθαι τὴν  
 αἰσθησιν, τῶν δὲ ἐναντίων τὸ μὲν ἀνάγκη παρεῖναι  
 τὸ δὲ οὖ, τὸ δὲ ἐγρηγορέναι τῷ καθεύδειν ἐναντίον,  
 καὶ ἀναγκαῖον παντὶ θάτερον ὑπάρχειν, ἀναγκαῖον  
 ἀν εἴη καθεύδειν. εἰ οὖν τὸ τοιοῦτον πάθος ὑπνος,  
 5 τοῦτο δὲ ἐστὶν ἀδυναμία δῑ ὑπερβολὴν τοῦ ἐγρηγο-  
 ρέναι, η̄ δὲ τοῦ ἐγρηγορέναι ὑπερβολὴ δτὲ μὲν  
 νοσώδης δτὲ δὲ ἀνευ νόσου γίνεται, ὥστε καὶ η̄  
 ἀδυναμία καὶ η̄ διάλυσις ὥσαύτως ἐσται, ἀνάγκη  
 πᾶν τὸ ἐγρηγορὸς ἐνδέχεσθαι καθεύδειν· ἀδύνατον  
 γάρ ἀεὶ ἐνεργεῖν. ὅμοίως δὲ οὐδὲ καθεύδειν οὐδὲν  
 10 ἀεὶ ἐνδέχεται. οὐ γάρ ὑπνος τι τοῦ αἰσθητικοῦ  
 μορίου ἐστίν, οἷον δεσμὸς καὶ ἀκινησία τις, ὥστε

<sup>1</sup> μὴ om. B.<sup>2</sup> τούτῳ om. B.

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affections are the properties of the same animals ; Neither condition can be permanent. for if there is any animal having no sense consciousness, it cannot be either asleep or awake ; for both these affections are concerned with the sensation of the first sense perception. Nor can either sleep or wakefulness be a permanent attribute of the same animal : for instance no species of animal can be permanently asleep or permanently awake. For in the case of all the parts possessing any function, Sleep is logically necessary. when they have passed the time in which they are able to perform their function, they must become impotent ; for instance the eyes seeing must also cease to function, and similarly the hand, and any other part which has a function. If then sensation is a function of any part, and if this goes beyond the time when it is capable of having continuous sensation, it will become impotent, and cease to perform its function. If then loss of consciousness marks the limit of wakefulness, and if one of two opposites must be present and the other not, and further if it is admitted that wakefulness is the opposite of being asleep, and if one of the two opposites must exist in any given case, then sleep must be a necessity. If sleep is an affection of such a kind, I mean if it is a state of impotence due to excess of wakefulness, and excess of wakefulness regularly occurs sometimes as the result of disease, and sometimes when there is no disease, so that impotence and failure of sensation also sometimes are and sometimes are not due to disease, everything which is awake must be capable of sleep ; for it cannot be permanently active. Similarly nothing can be permanently asleep. For sleep is characteristic of the sensitive part of us, a kind of fetter, or immobility, whence it follows that

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ἀνάγκη πᾶν τὸ καθεῦδον ἔχειν τὸ αἰσθητικὸν μόριον. αἰσθητικὸν δὲ τὸ δυνατὸν αἰσθάνεσθαι κατ' ἐνέργειαν· ἐνεργεῖν δὲ τῇ αἰσθήσει κυρίως καὶ ἀπλῶς ἀδύνατον καθεῦδον ἄμα· διὸ ἀναγκαῖον ὑπονού πάντα ἐγερτὸν εἶναι.

15 Τὰ μὲν οὖν ἄλλα σχεδὸν πάντα δῆλα κοινωνοῦνθ' ὑπονού, καὶ πλωτὰ καὶ πτηνὰ καὶ πεζά· καὶ γὰρ τὰ τῶν ἵχθυών γένη πάντα καὶ τὰ τῶν μαλακίων ὅπται καθεύδοντα, καὶ τὰλλα πάνθ' ὅσπατερ ἔχει ὀφθαλμούς· καὶ γὰρ τὰ σκληρόφθαλμα φανερὰ καὶ τὰ ἔντομα κοιμώμενα· βραχύνπνα δὲ τὰ τοιαῦτα 20 πάντα, διὸ καὶ λάθοι ἀν τινα πολλάκις πότερον μετέχουσι τοῦ καθεύδειν η̄ οὕ. τῶν δ' ὀστρακοδέρμων κατὰ μὲν τὴν αἰσθησιν οὐδέ πω γέγονε φανερὸν εὶ καθεύδουσιν· εὶ δέ τῷ πιθανὸς ὁ λεχθεὶς λόγος, τούτῳ πεισθήσεται.

“Οτι μὲν οὖν ὑπονού κοινωνεῖ τὰ ζῶα πάντα, 25 φανερὸν ἐκ τούτων· τῷ γὰρ αἰσθησιν ἔχειν ὅρισται τὸ ζῶον, τῆς δ' αἰσθήσεως τρόπον τινὰ τὴν μὲν ἀκινησίαν καὶ οἰον δεσμὸν τὸν ὑπονού εἶναί φαμεν, τὴν δὲ λύσιν καὶ τὴν ἀνεσιν ἐγρήγορσιν. τῶν δὲ φυτῶν οὐδὲν οἶόν τε κοινωνεῖν οὐδετέρου τούτων τῶν παθημάτων. ἀνευ μὲν γὰρ αἰσθήσεως οὐχ ὑπάρχει οὕθ' ὑπνος οὕτ' ἐγρήγορσις· οἰς δ' αἰσθησις ὑπάρχει, καὶ τὸ λυπεῖσθαι καὶ τὸ χαίρειν· οἰς δὲ ταῦτα, καὶ ἐπιθυμία. τοῦς δὲ φυτοῖς οὐδὲν ὑπάρχει τούτων. σημεῖον δ' ὅτι καὶ τὸ ἔργον τὸ αὐτοῦ 455 a ποιεῖ τὸ θρεπτικὸν μόριον ἐν τῷ καθεύδειν μᾶλλον η̄ ἐν τῷ ἐγρηγορέναι· τρέφεται γὰρ καὶ αὐξάνεται τότε μᾶλλον, ὡς οὐδὲν προσδεόμενα πρὸς ταῦτα τῆς αἰσθήσεως.

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everything which sleeps must possess this sensitive part. But a sensitive part is that which is capable of active sensation ; but sense activity in a complete and simple sense is impossible simultaneously with sleep ; so that sleep must be able to be aroused.

Practically all other animals share in sleep, in the sea, the air and on the land ; for all classes of fishes and the mollusca as well have been observed asleep, and all other animals which have eyes ; for it is clear that the hard-eyed animals and insects sleep ; these creatures only sleep for a short time, so that one might often doubt whether they share in sleep or not. In the case of the testacea no direct observation has yet proved whether they sleep or not. But if the foregoing argument appeals to anyone, he will be convinced that they do.

Therefore that all animals share in sleep is obvious from the following considerations. The animal kingdom is defined by the possession of sensation, but we say that sleep is characteristic of sensation, a sort of immobility or fettering, and that the release or removal of this is wakefulness. But none of the plants can share in either of these affections, for neither sleep nor wakefulness is possible without sensation. But creatures possessing sensation also are capable of grief and joy ; and those which have these must also possess desire. But none of these are possessed by plants. Evidence of this is afforded by the fact that the nutritive faculty (in animals) exercises its function more in sleep than in wakefulness ; for at that time it absorbs more nourishment and grows more rapidly, because it does not require consciousness for these two purposes.

*Living things which sleep.*

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II. Διὰ τί δὲ καθεύδει καὶ ἐγρήγορε, καὶ διὰ ποίαν τιν' αἰσθησιν ἡ ποίας, εἰ διὰ πλείους, σκεπτέον. ἐπεὶ δ' ἔνια μὲν τῶν ζώων ἔχει τὰς αἰσθήσεις πάσας, ἔνια δ' οὐκ ἔχει,<sup>1</sup> οἷον ὄψιν, τὴν δ' ἀφήνει τὴν γεῦσιν ἅπαντ' ἔχει, πλὴν εἴ τι τῶν ζώων ἀτελέσ (εἴρηται δὲ περὶ αὐτῶν ἐν τοῖς περὶ ψυχῆς), ἀδύνατον δ' ἐστὶν ἀπλῶς ὅποιανοῦν αἰσθησιν αἰτούσηθαι τὸ καθεύδον ζῷον, φανερὸν ὅτι πᾶσιν ἀναγκαῖον ὑπάρχειν ταῦτὸ πάθος ἐν τῷ καλουμένῳ ὕπνῳ· εἰ γάρ τῇ μὲν τῇ δὲ μῆ, ταύτῃ καθεύδον αἰσθήσεται, τοῦτο δ' ἀδύνατον.

Ἐπεὶ δ' ὑπάρχει καθ' ἔκάστην αἰσθησιν τὸ μέν τι ἴδιον τὸ δέ τι κοινόν, ἴδιον μὲν οἷον τῇ ὄψει τὸ δρᾶν, τῇ δ' ἀκοῇ τὸ ἀκούειν, ταῖς δ' ἄλλαις κατὰ τὸν αὐτὸν τρόπον· ἔστι δέ τις καὶ κοινὴ δύναμις ἀκολουθοῦσα πάσαις, ἡ καὶ ὅτι δρᾶ καὶ ἀκούει<sup>2</sup> αἰσθάνεται· οὐ γάρ δὴ τῇ γε ὄψει δρᾶ ὅτι δρᾶ· καὶ κρίνει δὴ καὶ δύναται κρίνειν ὅτι ἔτερα τὰ γλυκέα τῶν λευκῶν, οὕτε γεύσει οὕτε ὄψει οὕτε ἀμφοῖν, ἀλλά τινι κοινῷ μορίῳ τῶν αἰσθητηρίων ἀπάντων. ἔστι μὲν γάρ μία αἰσθησις, καὶ τὸ κύριον αἰσθητήριον ἔν· τὸ δ' εἶναι αἰσθήσει τοῦ γένους ἔκάστου ἔτερον, οἷον ψόφου καὶ χρώματος. τοῦτο δ' ἄμα τῷ ἀπτικῷ μάλισθ' ὑπάρχει· (τοῦτο μὲν γάρ χωρίζεται τῶν ἄλλων αἰσθητηρίων, τὰ δ' ἄλλα τούτου ἀχώριστα. εἴρηται δὲ περὶ αὐτῶν ἐν τοῖς περὶ ψυχῆς θεωρήμασιν.) φανερὸν τοίνυν ὅτι

<sup>1</sup> ἔχουσι B.<sup>2</sup> ἀκούει καὶ B.

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II. We must now turn to the question why a creature sleeps or is awake, and owing to what sense or senses (if there be more than one). Since some living creatures have all the senses and some have not (for instance some have not sight), but all have touch and taste, unless they are imperfect (a question which has been discussed in the treatise *On the Soul*<sup>a</sup>), and since it is impossible, strictly speaking, for the sleeping animal to have any sensation at all, it is evident that all are affected by the same condition in the state known as sleep ; for if the condition affects one sense and not another, then there will be sensation with the latter sense while asleep, and this is impossible.

But every sense has both a special function of its own and one shared by other senses : the special function for instance of sight is seeing, and of audition hearing, and similarly with the other senses : but there is also a common function which accompanies them all, whereby one is conscious that one sees and hears : for it is not by sight that one is aware that one sees. And one judges and is capable of judging that sweet is different from white ; but this is not by taste, nor by sight, nor by a combination of the two, but by some part which is common to all the sense organs ; for there is one sensation, and one paramount sense organ ; but the actual sense which apprehends each class is differentiated, for instance in the case of sound and colour. This is most conspicuous in the case of touch ; (for this is separable from the other sense organs, but the others are inseparable from it. We have discussed this in our considerations *On the Soul*). It is clear then that wakefulness and sleep are an affection of this

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τούτου ἔστι πάθος ἢ ἐγρήγορσις καὶ ὁ ὕπνος. διὸ καὶ πᾶσιν ὑπάρχει τοῖς ζώοις· καὶ γὰρ ἡ ἀφὴ μόνη πᾶσιν. εἰ γὰρ τῷ πάσας τι πεπονθέναι τὰς αἰσθήσεις ἐγίνετο τὸ καθεύδειν, ἀτοπον εἰς αἷς οὕτ' 30 ἀνάγκη οὕτε δυνατὸν τρόπον τινὰ ἐνεργεῖν ἄμα, ταύτας ἀναγκαῖον ἀργεῖν ἄμα καὶ ἀκινητίζειν· τούναντίον γὰρ εὐλογώτερον συνέβαινεν ἂν αὐταῖς τὸ μὴ ἄμα ἡρεμεῖν. ὡς δὲ νῦν λέγομεν, εὐλόγως ἔχει καὶ περὶ τούτων· τοῦ γὰρ κυρίου τῶν ἄλλων πάντων αἰσθητηρίου καὶ πρὸς ὃ συντείνει τάλλα, 455 b πεπονθότος τι συμπάσχειν ἀναγκαῖον καὶ τὰ λοιπὰ πάντα, ἐκείνων δέ τινος ἀδυνατοῦντος οὐκ ἀνάγκη τοῦτ' ἀδυνατεῖν.

Φανερὸν δ' ἐκ πολλῶν ὅτι οὐκ ἐν τῷ τὰς αἰσθήσεις ἀργεῖν καὶ μὴ χρῆσθαι αὐταῖς ὁ ὕπνος, οὐδὲ ἐν τῷ μὴ δύνασθαι αἰσθάνεσθαι. καὶ γὰρ ἐν ταῖς λιποψυχίαις τοιοῦτον συμβαίνει· ἀδυναμία γὰρ αἰσθήσεων ἡ λιποψυχία. γίνονται δὲ καὶ ἔκνοιαί τινες τοιαῦται. ἔτι δ' οἱ τὰς ἐν τῷ αὐχένι φλέβας καταλαμβανόμενοι ἀναίσθητοι γίνονται. ἀλλ' ὅταν ἡ ἀδυναμία τῆς χρήσεως μήτ' ἐν τῷ τυχόντι αἰσθητηρίῳ μήτε δι' ἣν ἔτυχεν αἰτίαν, 10 ἀλλὰ καθάπερ εἴρηται νῦν, ἐν τῷ πρώτῳ φιλοσόφῳ αἰσθάνεται πάντων· ὅταν μὲν γὰρ τοῦτ' ἀδυνατήσῃ, ἀνάγκη καὶ τοῖς αἰσθητηρίοις πᾶσιν ἀδυνατεῖν αἰσθέσθαι· ὅταν δ' ἐκείνων τι, οὐκ ἀνάγκη τούτῳ.

Δι' ἣν δ' αἰτίαν συμβαίνει τὸ καθεύδειν, καὶ ποιόν τι τὸ πάθος ἔστι, λεκτέον. (ἐπεὶ δὲ τρόποι 15 πλείους τῆς αἰτίας καὶ γὰρ τὸ τίνος ἔνεκα, καὶ

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common sense. For this reason they are attributes of all living creatures ; for touch alone is common to all such creatures. For if sleep were due to an affection of all the senses, it would be strange if those senses which need not, or cannot act simultaneously in any way, should necessarily be inoperative and immobile simultaneously ; the direct opposite would be more probable—that they should not all rest simultaneously. But the account we now give is a rational explanation of them also. For when that sense organ which is master of them all, and to which all the rest contribute, is affected in any way, all the others must be affected too, but it is not necessary that when any one of them is impotent that this master sense should also be impotent.

Sleep is an affection of the common sense."

It is clear for many reasons that the essential factor of sleep is not the fact that the senses are inoperative and out of use, nor that it is impossible to have any sensation. For this happens in fainting ; for fainting is the impotence of the senses. Some forms of derangement belong to the same class. Again those who have the veins in the neck pressed also become unconscious. But sleep is when the incapacity for use occurs not in any chance sense organ, nor through any accidental cause, but, as we have just explained, when it happens to the first sense faculty by which one perceives all things ; when this becomes impotent, it must clearly be impossible to receive impressions from any of the sense organs ; but when any other of the sense faculties suffers impotence it need not apply to this one.

Now we have to consider the cause of sleep, and The cause of sleep. what sort of affection it is. (But there are many sorts of cause—the final cause, the cause in the sense

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ὅθεν ἡ ἀρχὴ τῆς κινήσεως, καὶ τὴν ὕλην καὶ τὸν λόγον αἴτιον εἶναι φαμεν,) πρῶτον μὲν οὖν ἐπειδὴ λέγομεν τὴν φύσιν ἔνεκά του ποιεῦν, τοῦτο δ' ἀγαθόν τι, τὴν δ' ἀνάπαυσιν παντὶ τῷ πεφυκότι κινεῖσθαι, μὴ δυναμένῳ δ' ἀεὶ καὶ συνεχῶς κινεῖσθαι μεθ' ἥδονῆς ἀναγκαῖον εἶναι καὶ ὡφέλιμον, τῷ δ' ὑπνῷ αὐτῇ τῇ ἀληθείᾳ<sup>1</sup> προσάπτουσι τὴν μεταφορὰν ταύτην ὡς ἀναπαύσει ὄντι· ὥστε σωτηρίας ἔνεκα τῶν ζώων ὑπάρχει. ἡ δ' ἐγρήγορσις τέλος· τὸ γὰρ αἰσθάνεσθαι καὶ τὸ φρονεῖν πᾶσι τέλος οὓς ὑπάρχει θάτερον αὐτῶν· βέλτιστα γὰρ ταῦτα, τὸ δὲ τέλος 25 βέλτιστον. ὥστε ἀναγκαῖον ἔκαστῳ τῶν ζώων ὑπάρχειν τὸν ὑπνον. λέγω δ' ἐξ ὑποθέσεως τὴν ἀνάγκην, ὅτι εἰ ζῶον ἔσται ἔχον τὴν αὐτοῦ φύσιν, ἐξ ἀνάγκης τιν' ὑπάρχειν αὐτῷ δεῖ, καὶ τούτων ὑπαρχόντων ἔτερα ὑπάρχειν.

"Ἐπι δὲ ποίας κινήσεως καὶ πράξεως ἐν τοῖς 30 σώμασι γιγνομένης συμβαίνει τό τε ἐγρηγορέναι καὶ τὸ καθεύδειν τοῖς ζώοις, μετὰ ταῦτα λεκτέον. τοῖς μὲν οὖν ἄλλοις ζώοις καθάπερ τοῖς ἐναίμοις ὑποληπτέον εἶναι τὰ αἴτια τοῦ πάθους, ἡ ταῦτα ἡ τὰ ἀνάλογον, τοῖς δ' ἐναίμοις ἄπερ τοῖς ἀνθρώποις· ὥστ' ἐκ τούτων πάντα θεωρητέον.

456 a "Οτι μὲν οὖν ἡ τῆς αἰσθήσεως ἀρχὴ γίνεται ἀπὸ τοῦ αὐτοῦ μέρους τοῖς ζώοις ἀφ' οὐπερ καὶ ἡ τῆς κινήσεως, διώρισται πρότερον ἐν ἔτέροις. αὐτῇ δ' ἔστι τριῶν διωρισμένων τόπων ὁ μέσος κεφαλῆς καὶ τῆς κάτω κοιλίας. τοῖς μὲν οὖν ἐναίμοις τοῦτ' ἔστι τὸ περὶ τὴν καρδίαν μέρος· πάντα γὰρ τὰ

<sup>1</sup> δι' αὐτὴν τὴν ἀλήθειαν B.

<sup>a</sup> The three positions are the head, the heart and the stomach. Cf. *De Part. An.* 656 b 5.

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of the origin of the movement, the material cause and the formal cause.) First of all then, when we say that nature makes a thing with an end in view, and this end is some good, and that to everything which naturally moves, but cannot move always and continuously, rest must be combined with pleasure and be beneficial, we are applying a metaphor to sleep which contains the real truth, when we call it rest; for it exists for the sake of the preservation of the living creature. But the state of wakefulness is its end; for perception and thinking are the proper end of all creatures which have either of these capacities; for they are the highest good, and the end is the highest good. So that sleep is essential to every kind of living creature. I use the word essential on the assumption that if a living creature is to realize its own nature certain characteristics must belong to it essentially, and if these do belong to it others will do so also.

Next we have to say what kind of movement and action it is which takes place in the body when sleep and wakefulness occur in animals. We must assume that the reasons of the affection in other animals are the same as, or analogous to, those operative in animals having blood, and the same in men as in these; the whole speculation will depend on this assumption.

*The nature  
of sleep and  
wakeful-  
ness.*

In another place it has been laid down that the first principle of sensation arises from the same part among living creatures as the first principle of movement. It lies in one of three definite positions between the head and the lower part of the stomach.<sup>a</sup> In the cases of animals with blood this is the region about the heart; for all animals having blood possess

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ἔναιμα καρδίαν ἔχει, καὶ ἡ ἀρχὴ τῆς κινήσεως καὶ τῆς αἰσθήσεως τῆς κυρίας ἐντεῦθέν ἐστιν. τῆς μὲν οὖν κινήσεως φανερὸν ὅτι καὶ ἡ τοῦ πνεύματος ἀρχὴ καὶ ὅλως ἡ τῆς καταψύξεως ἐστιν ἐνταῦθα, καὶ τὸ ἀναπνεῖν τε καὶ τὸ ὑγρῷ καταψύχεσθαι πρός 10 γε σωτηρίαν τοῦ ἐν τούτῳ τῷ μορίῳ θερμοῦ ἡ φύσις πεπόρικεν. ρήθησεται δὲ περὶ αὐτῆς ὕστερον καθ' αὐτήν. τοῖς δ' ἀναίμοις καὶ τοῖς ἐντόμοις καὶ μὴ δεχομένοις πνεῦμα ἐν τῷ ἀνάλογον τὸ σύμφυτον πνεῦμα ἀναφυσώμενον καὶ συνιζάνον φαίνεται. δῆλον δὲ τοῦτο ἐπὶ τῶν ὀλοπτέρων, οἷον σφηκῶν 15 καὶ μελισσῶν, καὶ ἐν ταῖς μυίαις καὶ ὅσα τοιαῦτα. ἐπεὶ δὲ κινεῖν μέν τι ἡ ποιεῖν ἄνευ ἴσχύος ἀδύνατον, ἴσχὺν δὲ ποιεῖν ἡ τοῦ πνεύματος κάθεξις, τοῖς μὲν εἰσφερομένοις ἡ θύραθεν, τοῖς δὲ μὴ ἀναπνέουσιν ἡ σύμφυτος. διὸ καὶ βομβοῦντα φαίνεται τὰ πτερωτά, ὅταν κινήται, τῇ τρίψει τοῦ πνεύματος προσπίπτοντος πρὸς τὸ ὑπόζωμα τῶν ὀλοπτέρων. 20 κινεῖται δὲ πᾶν αἰσθήσεώς των γινομένης, ἡ οἰκείας ἡ ἀλλοτρίας, ἐν τῷ πρώτῳ αἰσθητηρίῳ. εἰ δ' ἐστὶν ὁ ὑπνος καὶ ἡ ἐγρήγορσις πάθη τοῦ μορίου τούτου, ἐν ᾧ μὲν τόπῳ καὶ ἐν ᾧ μορίῳ πρώτῳ γίνεται ὁ ὑπνος καὶ ἡ ἐγρήγορσις, φανερόν. 25 Κινοῦνται δ' ἔνιοι καθεύδοντες καὶ ποιοῦσι πολλὰ ἐγρηγορικά, οὐ μέντοι ἄνευ φαντάσματος καὶ αἰσθήσεώς των· τὸ γὰρ ἐνύπνιον ἐστιν αἴσθημα τρόπον τινά. λεκτέον δὲ περὶ αὐτῶν ὕστερον. διότι δὲ τὰ μὲν ἐνύπνια μνημονεύουσιν ἐγερθέντες,

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a heart, and the first principle of movement and master sensation lies there. In the case of movement it is clear that the first principle of breathing, and generally speaking of cooling, is in the heart, and that nature has supplied both breathing and the power of cooling by moisture with a view to the preservation of the heat in that part. We shall discuss this in detail later on. In the case of bloodless animals, insects and those which do not breathe, the breath inherent in them is seen to rise and subside in the part which corresponds to the heart in other animals. This is obvious in the case of the insects with undivided wings, such as wasps and bees, and among flies, and similar creatures. But it is impossible to make any movement, or do any action, without strength, and the holding of the breath produces strength (breath from the outside in the case of animals which inhale, and implanted within in the case of those which do not). This is evidently the reason why winged creatures buzz when they move, when the air impinges with a rubbing movement on the diaphragm of the whole-winged insects. When any movement takes place sensation occurs, either its own or another's, in the first sense organ. But if sleep and wakefulness are affections of this part of the body, it is clear in what place, and in what part of the body sleep and wakefulness first occur.

Some people move when they are asleep, and perform the actions of wakefulness, but not without some mental image and some consciousness ; for a dream is in a way a form of sensation. We must discuss this subject later. Why men remember their dreams after they have been awakened, and yet fail

Dreams  
in sleep.

ARISTOTLE

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τὰς δ' ἐγρηγορικὰς πράξεις οὐ μιημονεύουσιν, ἐν τοῖς προβληματικοῖς εἴρηται.

30

III. Ἐχόμενοι δὲ τῶν εἰρημένων ἐστὶν ἐπελθεῖν τύνων γνομένων καὶ πόθεν ἡ ἀρχὴ τοῦ πάθους γίγνεται, τοῦ τ' ἐγρηγορέναι καὶ τοῦ καθεύδειν. φαινερὸν δὴ ὅτι ἐπεὶ ἀναγκαῖον τῷ ζῷῳ, ὅταν αἰσθησιν ἔχῃ, τότε πρῶτον τροφήν τε λαμβάνειν καὶ αὔξησιν, τροφὴ δ' ἐστὶ πάσιν ἡ ἐσχάτη τοῖς μὲν

35

ἐναίμοις ἡ τοῦ αἷματος φύσις τοῖς δ' ἀναίμοις τὸ ἀνάλογον, τόπος δὲ τοῦ αἷματος αἱ φλέβες, τούτων δ' ἀρχὴ ἡ καρδία· φαινερὸν δὲ τὸ λεχθὲν ἐκ τῶν ἀνατομῶν. τῆς μὲν οὖν θύραθεν τροφῆς εἰσιούσης εἰς τοὺς δεκτικοὺς τόπους γίνεται ἡ ἀναθυμίασις εἰς τὰς φλέβας, ἐκεῖ δὲ μεταβάλλουσα ἐξαιματοῦται καὶ πορεύεται ἐπὶ τὴν ἀρχήν. εἴρηται δὲ περὶ τούτων ἐν τοῖς περὶ τροφῆς· νῦν δ' ἀναληπτέον ὑπὲρ αὐτῶν τούτου χαριν, ὅπως τὰς ἀρχὰς τῆς κινήσεως θεωρήσωμεν, καὶ τί πάσχοντος τοῦ μορίου τοῦ αἰσθητικοῦ συμβαίνει ἡ ἐγρήγορσις καὶ δὲ πνοσ. οὐ γάρ ἐστιν δὲ πνοσ ἡτισοῦν ἀδυναμία

10

τοῦ αἰσθητικοῦ, καθάπερ εἴρηται· καὶ γὰρ ἔκνοια καὶ πνιγμός τις καὶ λιποψυχία ποιεῖ τὴν τοιαύτην ἀδυναμίαν. ηδὴ δὲ γεγένηται τισι καὶ φαντασίᾳ λιποψυχήσασιν ἴσχυρῶς. τοῦτο μὲν οὖν ἔχει τινὰ ἀπορίαν· εἰ γὰρ ἐνδέχεται καταδαρθεῖν τὸν λιποψυχήσαντα, ἐνδέχοιτ' ἀν ἐνύπνιον εἶναι καὶ τὸ φάντασμα. πολλὰ δ' ἐστὶν ἀ λέγουσιν οἱ σφόδρα λιποψυχήσαντες καὶ δόξαντες τεθνάναι· περὶ ὧν τὸν αὐτὸν λόγον ὑποληπτέον εἶναι πάντων.

Αλλὰ γὰρ ὥσπερ εἴπομεν, οὐκ ἐστιν δὲ πνοσ ἀδυναμία πᾶσα τοῦ αἰσθητικοῦ, ἀλλ' ἐκ τῆς περὶ τὴν τροφήν ἀναθυμιάσεως γίνεται τὸ πάθος τοῦτο.

## ON SLEEP AND WAKING, II.—III.

to remember actions done in the waking state, has been discussed in our treatise on *Problems*.

III. Next in order we must discuss certain happenings, and whence the beginning of the affection known as waking and sleeping takes its rise. It is clear that the living creature absorbs food, and grows when it is necessary, when it has sensation. The nature of the blood is the final cause of nourishment in animals that have blood, and whatever corresponds to it in bloodless animals. The situation of the blood is the veins, and the fount is the heart. This is clear from the study of anatomy. When food enters from without into the place designed to receive it, an evaporation takes place into the veins, and changing there becomes blood and flows out again and returns to its source. This question has been discussed in the treatise on *Food*. Now we must resume the question with a view to considering the first principle of the movement, and in what way the sensitive part is affected, when wakefulness and sleep occur. For sleep cannot be defined as any impotence of the sensitive faculty, as has been said; for such impotence is produced by unconsciousness, throttling and faintness. Now even those in a dead faint may have some mental picture present. This then involves a difficulty; if it were possible that the man in a faint could be said to be asleep, the mental picture might be called a dream. Again, those in a dead faint, even when they are thought to be dead, say many things; and the same explanation, one would suppose, applies to them all.

But as we have said, sleep is not every impotence of the sensitive faculty, but the one that arises from the evaporation due to food; for that which is vapor-

The physical explanation of sleep.

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20 ἀναγκαῖον γὰρ τὸ ἀναθυμιώμενον μέχρι του ὡθεῖσθαι, εἴτ' ἀντιστρέφειν καὶ μεταβάλλειν καθάπερ εὔριπον. τὸ δὲ θερμὸν ἐκάστου τῶν ζῷων πρὸς τὸ ἄνω πέφυκε φέρεσθαι· ὅταν γ' ἐν τοῖς ἄνω τόποις γένηται, ἀθρόον πάλιν ἀντιστρέφει καὶ καταφέρεται.

25 διὸ μάλιστα γίνονται ὕπνοι ἀπὸ τῆς τροφῆς· ἀθρόον γὰρ πολὺ τό τε ὑγρὸν καὶ τὸ σωματῶδες ἀναφέρεται. ιστάμενον μὲν οὖν βαρύνει καὶ ποιεῖ νυστάζειν· ὅταν δὲ ρέψῃ κάτω καὶ ἀντιστρέψῃ ἀπώσῃ τὸ θερμόν, τότε γίνεται ὁ ὕπνος καὶ τὸ ζῷον καθεύδει. σημεῖον δὲ τούτων καὶ τὰ ὑπνωτικά·

30 πάντα γὰρ καρηβαρίαν ποιεῖ, καὶ τὰ ποτὰ καὶ τὰ βρωτά, μήκων, μανδραγόρας, οἶνος, αἴραι. καὶ καταφερόμενοι καὶ νυστάζοντες τοῦτο δοκοῦντι πάσχειν, καὶ ἀδυνατοῦσιν αἴρειν τὴν κεφαλὴν καὶ τὰ βλέφαρα. καὶ μετὰ τὰ σῆτα μάλιστα τοιοῦτος ὁ ὕπνος· πολλὴ γὰρ ἡ ἀπὸ τῶν σιτίων ἀναθυμίασις.

35 ἔτι δ' ἐκ κόπων ἐνίων· ὁ μὲν γὰρ κόπος συντηκτικόν, τὸ δὲ σύντηγμα γίνεται ὥσπερ τροφὴ ἀ-

457 a πεπτος, ἀν μὴ ψυχρὸν ἦ. καὶ νόσοι δέ τινες ταῦτο τοῦτο ποιοῦσιν, ὅσαι ἀπὸ περιττώματος ὑγροῦ καὶ θερμοῦ, οἷον συμβαίνει τοῖς πυρέττουσι καὶ ἐν τοῖς ληθάργοις. ἔτι δ' ἡ πρώτη ἡλικία· τὰ γὰρ παιδία  
b καθεύδει σφόδρα διὰ τὸ τὴν τροφὴν ἄνω φέρεσθαι πᾶσαν. σημεῖον δὲ τὸ ὑπερβάλλειν τὸ μέγεθος τῶν ἄνω πρὸς τὰ κάτω κατὰ τὴν πρώτην ἡλικίαν, διὰ τὸ ἐπὶ ταῦτα γίνεσθαι τὴν αὔξησιν. διὰ ταῦτην δὲ τὴν αἰτίαν καὶ ἐπιληπτικὰ γίνεται· ὅμοιον γὰρ ὁ ὕπνος ἐπιλήψει, καὶ ἔστι τρόπον τινὰ ὁ ὕπνος

10 ἐπιληψις. διὸ καὶ συμβαίνει πολλοῖς ἡ ἀρχὴ τούτου τοῦ πάθους καθεύδοντιν, καὶ καθεύδοντες μὲν ἀλίσκονται, ἐγρηγορότες δ' οὖ· ὅταν γὰρ πολὺ

## ON SLEEP AND WAKING, III.

ized must be pushed on to a point, and then turn back, and change like water in a narrow channel. But in every animal the heat tends to rise ; when it reaches the upper parts, it collects, reverses its direction and is carried down. So sleepiness mostly occurs after food. For then both liquid and solid are collected in greatest quantity and carried up. During the time that it is stationary it is heavy and makes one nod : when the balance is shifted downwards, and reversing direction it drives out the heat, then sleep occurs, and the living creature sleeps. Narcotics prove this ; for they all produce a heavy head, both liquid and solid, such as poppy, mandragora, wine and darnel. When men are heavy and nod, they seem to suffer this affection, and cannot raise their heads or eyelids. Sleep of this kind occurs most often after food ; for the vapour arising from food is considerable. But it sometimes arises from fatigue ; for fatigue produces solution, and the solution is so to speak undigested, unless it is cold. Certain diseases produce the same result, such as arise from an excess of moisture and heat, as is the case with the feverish and comatose. The same thing is true of early childhood ; for children sleep a great deal, because all the food is borne upwards. The greater size of the upper parts in comparison with the lower in early youth proves this, and is due to the fact that growth is greatest in the upward direction. It is for this reason too that epilepsy occurs ; for sleep like epilepsy seizes one, and in a sense sleep is a seizure. Consequently in many cases epilepsy begins in sleep, and there are men who are seized with it when asleep, but not when awake. For the breath

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φέρηται τὸ πνεῦμα ἄνω, καταβαῖνον πάλιν τὰς φλέβας δύκοι, καὶ συνθλίβει τὸν πόρον δι' οὗ ἡ ἀιαπιοὴ γίνεται. διὸ τοῖς παιδίοις οὐ συμφέρουσιν 15 οἱ οἶνοι, οὐδὲ ταῖς τίτθαις (διαφέρει γάρ ἵσως οὐδὲν αὐτὰ πίνειν ἢ τὰς τίτθας), ἀλλὰ δεῖ πίνειν ὑδαρῆ καὶ ὀλίγον· πνευματῶδες γάρ ὁ οἶνος, καὶ τούτου μᾶλλον ὁ μέλας. οὕτω δὲ τὰ ἄνω πλήρη τῆς τροφῆς τοῖς παιδίοις, ὥστε πέντε μηνῶν οὐδὲν στρέφουσι τὸν αὐχένα· ὥσπερ γάρ τοῖς σφόδρα μεθύουσιν, ὑγρότης 20 ἀιαφέρεται πολλή. εὔλογον δὲ τοῦτο εἶναι τὸ πάθος αἴτιον καὶ τοῦ ἡρεμεῖν ἐν ταῖς μήτραις τὰ ἔμβρυα τὸ πρῶτον. καὶ τὸ ὅλον δὲ φίλυπποι οἱ ἀδηλό-φλεβοι καὶ οἱ νανώδεις καὶ οἱ μεγαλοκέφαλοι· τῶν μὲν γάρ αἱ φλέβες στεναῖ, ὥστ' οὐ ράδιον διαρρεῦν 25 κατιὸν τὸ ὑγρόν, τοῖς δὲ νανώδεσι καὶ μεγαλοκεφάλοις ἡ ἄνω ὁρμὴ πολλὴ καὶ ἀναθυμίασις. οἱ δὲ φλεβώδεις οὐχ ὑπνωτικοὶ δι' εὔροιαν τῶν φλεβῶν, ἀν μή τι ἄλλο πάθος ἔχωσιν ὑπεναντίον. οὐδὲν δὲ μελαγχολικοί· κατέψυκται γάρ ὁ εἴσω τόπος, ὥστ' οὐ γίνεται πλῆθος αὐτοῖς ἀναθυμιάσεως. διὰ τοῦτο 30 γάρ καὶ βρωτικοὶ σκληροὶ ὄντες· ὥσπερ γάρ οὐδὲν ἀπολελαυκότα διάκειται τὰ σώματα αὐτοῖς. ἡ δὲ μέλαινα χολὴ φύσει ψυχρὰ οὖσα καὶ τὸν θρεπτικὸν τόπον ψυχρὸν ποιεῖ καὶ τάλλα μόρια, ὅπου ἀν ὑπάρχῃ δυνάμει τὸ τοιοῦτον περίττωμα.

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"Ωστε φανερὸν ἐκ τῶν εἰρημένων ὅτι ὁ ὑπνος ἐστὶ σύνοδός τις τοῦ θερμοῦ εἴσω καὶ ἀντιπερί-στασις φυσικὴ διὰ τὴν εἰρημένην αἰτίαν. διὸ πολλὴ ἡ κίνησις τοῦ ὑπνοῦντος. ὅθεν δὲ ἐκλείπει, κατα-

## ON SLEEP AND WAKING, III.

when it has passed upwards strongly, then again descends, and swells the veins and chokes the passage through which respiration passes. This is why wine is not good for infants, nor for wet nurses (perhaps it makes no difference whether the infants or their nurses drink it), but they should drink watery things, and not in large quantities ; for wine is windy and the darker wine most markedly so. The upper parts of infants are so full of food that for five months they do not even bend their necks ; for as in the case of the very drunk, much moisture is carried upwards. Probably this is why the embryo lies quiet in the womb at first. Generally speaking, those with invisible veins, dwarfs, and those with big heads are most addicted to sleep ; for their veins are narrow, so that the moisture in its descent cannot easily flow through, and with dwarfs and the big-headed the upward movement and the rising vapour are considerable. But those with marked veins are not much given to sleep owing to the easy flow in the veins, unless of course they have any counteracting malady. Nor are the melancholic inclined to sleep much ; for the region within is chilled, so that there is not much rising vapour in their case. For this reason also they are inclined to eat much though they are spare ; for their condition of body is such as not to profit by their food. Black bile also being by nature cold makes the nutritive and other parts cold, wherever there is potentially an excess of this kind.

So that it is obvious from what has been said that <sup>Heat as a factor.</sup> sleep is in a sense a meeting-place of the internal heat, and a natural reaction of the parts for the reason we have given. Therefore the movement of the sleeper is considerable. But when the heat fails he

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ψύχεται, καὶ διὰ ψύξιν καταπίπτει τὰ βλέφαρα.  
 καὶ τὰ μὲν ἄνω κατέψυκται καὶ τὰ ἔξω, τὰ δὲ ἐντὸς  
 καὶ τὰ κάτω θερμά, οἷον τὰ περὶ τοὺς πόδας καὶ  
 τὰ εἶσω.

Καίτοι τις ἀπορήσειεν ἄν, ὅτι μετὰ τὰ σιτία  
 ἵσχυρότατος δὲ ὑπνος γίνεται, καὶ ἔστιν ὑπνωτικὰ  
 σῖνος καὶ ἄλλα θερμότητας ἔχοντα τοιαύτας. ἔστι  
 δὲ οὐκ εὔλογοι τὸν μὲν ὑπνον εἶναι κατάψυξιν, τὰ  
 δὲ αἴτια τοῦ καθεύδειν θερμά. πότερον οὖν τοῦτο  
 συμβαίνει ὅτι ὥσπερ ἡ κοιλία κενὴ μὲν οὖσα θερμή  
 ἔστιν, ἡ δὲ πλήρωσις αὐτὴν καταψύχει διὰ τὴν  
 κίνησιν, οὕτω καὶ οἱ ἐν τῇ κεφαλῇ πόροι καὶ τόποι  
 καταψύχονται ἀναφερομένης τῆς ἀναθυμιάσεως; ἡ  
 δὲ ὥσπερ τοὺς προσχεομένους τὸ θερμὸν ἔξαίφνης  
 φρίκη γίνεται, κάκει ἀνιόντος τοῦ θερμοῦ ἀθροι-  
 ζόμενον τὸ ψυχρὸν καταψύχει, καὶ τὸ κατὰ φύσιν  
 θερμὸν ποιεῖ ἔξαδυνατεῖν καὶ ὑποχωρεῖν; ἔτι δὲ  
 πολλῆς ἐμπιπτούσης τροφῆς, ἣν ἀνάγει τὸ θερμόν,  
 ὥσπερ τὸ πῦρ ἐπιτιθεμένων τῶν ξύλων, κατα-  
 ψύχεται, ἔως ἂν καταπεφθῇ.

Γίνεται γὰρ δὲ ὑπνος, ὥσπερ εἴρηται, τοῦ σωμα-  
 τώδους ἀναφερομένου ὑπὸ τοῦ θερμοῦ διὰ τῶν φλε-  
 βῶν πρὸς τὴν κεφαλήν. ὅταν δὲ μηκέτι δύνηται,  
 ἀλλὰ τῷ πλήθει ὑπερβάλλῃ τὸ ἀναχθέν, πάλιν ἀντα-  
 ωθεῖται καὶ κάτω ῥεῖ. διὸ καταπίπουσί τε ὑπο-  
 σπωμένου τοῦ θερμοῦ τοῦ ἀνάγοντος οἱ ἀνθρωποι  
 (μόνον γὰρ ὅρθὸν τῶν ζώων), καὶ ἐπιπεσὸν μὲν  
 ἔκνοιαν ποιεῖ, ὕστερον δὲ φαντασίαν. ἡ αἱ μὲν τοῦ  
 λεγόμεναι λύσεις ἐνδεχόμεναι μέν εἰσι τοῦ γίνεσθαι  
 τὴν κατάψυξιν· οὐ μὴν ἀλλὰ κύριος γένεται τὸ πόσος  
 δὲ περὶ τὸν ἐγκέφαλον, ὥσπερ ἐν ἄλλοις εἴρηται.  
 πάντων δὲ ἔστι τῶν ἐν τῷ σώματι ψυχρότατον δὲ

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grows cold, and owing to this chilling his eyelids fall. The parts above and outside grow cold, but the parts below and within grow hot, such as the parts about the feet and those inside the body.

Yet one might see some difficulty in the fact that sleep becomes deepest after food, and that wine and other things which are naturally heating tend to produce sleep. It does not seem logical that sleep should be a chilling, while the causes of sleep are hot. Is it possible that just as the stomach is hot when empty, but the filling of it chills it because of the movement, so also the passages and region of the head grow cold when the vapour arises? Or is it similar to the condition of those over whom hot water is poured, who first of all shiver; so in this case as the heat rises the accumulated cold chills it, and makes what is naturally hot impotent and withdraw? But when much food is introduced which the heat draws up, just like fire when logs are put on it, it is chilled until it is digested.

For sleep comes, as has been said, when the bodily part is carried upwards by the heat through the veins to the head. But when this is no longer possible, but that which is carried upwards becomes excessive in amount, it is moved in the contrary direction and flows downwards. And so when the heat, which is the agent of rising, is withdrawn men fall down (for they alone of living creatures are erect), and the falling down produces loss of consciousness, and afterwards imagination. Or perhaps the suggested solutions are possible accounts of the chilling; but all the same the region about the brain has the mastery, as has been said in another connexion. But the brain is the coldest of all parts of the body, and, in

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έγκεφαλος, τοῖς δὲ μὴ ἔχουσι τὸ ἀνάλογον τούτῳ  
μόριον. ὥσπερ οὖν τὸ ἀπατμίζον ὑγρὸν ὑπὸ τῆς  
τοῦ ἡλίου θερμότητος, ὅταν ἔλθῃ εἰς τὸν ἄνω τόπον,  
διὰ τὴν ψυχρότητα αὐτοῦ καταψύχεται καὶ συστάνεται

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καταφέρεται γειόμενον πάλιν ὅδωρ, οὕτως ἐν τῇ  
ἀναφορᾷ τοῦ θερμοῦ τῇ πρὸς τὸν ἔγκεφαλον ἡ μὲν  
περιττωματικὴ ἀναθυμίασις εἰς φλέγμα συνέρχεται  
(διὸ καὶ οἱ κατάρροι φαίνονται γιγνόμενοι ἐκ τῆς  
ι κεφαλῆς), ἡ δὲ τρόφιμος καὶ μὴ οσπάδης κατα-  
φέρεται συνισταμένη καὶ καταψύχει τὸ θερμόν.  
πρὸς δὲ τὸ καταψύχεσθαι καὶ μὴ δέχεσθαι ῥαδίως  
τὴν ἀναθυμίασιν συμβάλλεται καὶ ἡ λεπτότης καὶ  
ἡ στενότης τῶν περὶ τὸν ἔγκεφαλον φλεβῶν. τῆς  
μὲν οὖν καταψύξεως τοῦτ' ἔστιν αἴτιον, καίπερ  
τῆς ἀναθυμίασεως ὑπερβαλλούσης τῇ θερμότητι.

Ἐγείρεται δ', ὅταν πεφθῇ καὶ κρατήσῃ ἡ συν-  
εωσμένη θερμότης ἐν δλίγῳ πολλῇ ἐκ τοῦ περι-  
εστῶτος, καὶ διακριθῇ τὸ τε σωματωδέστρον αἷμα  
καὶ τὸ καθαρώτατον. ἔστι δὲ λεπτότατον μὲν αἷμα  
καὶ καθαρώτατον τὸ ἐν τῇ κεφαλῇ, παχύτατον δὲ  
καὶ θολερώτατον τὸ ἐν τοῖς κάτω μέρεσιν. παντὸς  
δὲ τοῦ αἵματος ἀρχή, ὥσπερ εἴρηται καὶ ἐνταῦθα καὶ  
ἐν ἄλλοις, ἡ καρδία. τῶν δ' ἐν τῇ καρδίᾳ ἐκατέρας  
τῆς θαλάμης κοινὴ ἡ μέση· ἐκείνων δ' ἐκατέρα  
δέχεται ἐξ ἐκατέρας τῆς φλεβός, τῆς τε μεγάλης  
καλουμένης καὶ τῆς ἀορτῆς· ἐν δὲ τῇ μέσῃ γίνεται  
ἡ διάκρισις. ἀλλὰ τὸ μὲν διορίζειν περὶ τούτων  
ἐπέρων ἔστι λόγων οἰκειότερον. διὰ δὲ τὸ γίνεσθαι  
ἀδιακριτώτερον τὸ αἷμα μετὰ τὴν τῆς τροφῆς  
προσφορὰν ὁ ὑπνος γίνεται, ἔως ἂν διακριθῇ  
τοῦ αἵματος τὸ μὲν καθαρώτερον εἰς τὰ ἄνω,  
τὸ δὲ θολερώτερον εἰς τὰ κάτω· ὅταν δὲ τοῦτο

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those which have none, whatever part corresponds to the brain. Just as that which exhales water under the heat of the sun, when it reaches the upper region chills because of its coldness, and after condensing becomes water again, and is carried down, so in the rising of heat to the brain, the excessive rise of vapour collects into phlegm (and so colds seem to arise from the head), and the healthy and not detrimental evaporation is collected and carried down and chills the hot. The lightness and narrowness of the veins about the brain contribute to the chilling process and the reluctance to receive the rising vapour easily. This is the cause of the chilling, although the rising vapour is excessively hot.

Awakening occurs when digestion is complete ; the *Awakening*. heat previously collected in large quantity in a small space from its environment becomes more powerful and the more corporcal is separated from the pure blood. The blood in the head is the lightest and purest, that in the lower parts of the body is thickest and most dense. But the fount of all blood, as has been said in this treatise and in others, is the heart ; and of the parts of the heart the middle connects with each ventricle ; for each of them receives blood from each vein, that which is called the "great vein" and the aorta ; and the separation happens in the middle. A more exact definition about these things is more proper to another subject. But sleep occurs because the blood is not so divided after the absorption of food, until the purer part of the blood is divided in the upper parts, and the thicker into the lower ;

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συμβῆ, ἐγείρονται ἀπολυθέντα τοῦ ἐκ τῆς τροφῆς  
βάρους.

Τί μὲν οὖν τὸ αἴτιον τοῦ καθεύδειν, εἴρηται, ὅτι ἡ  
ὑπὸ τοῦ σωματώδους τοῦ ἀναφερομένου ὑπὸ τοῦ  
συμφύτου θερμοῦ ἀντιπερίστασις ἀθρόως ἐπὶ τὸ  
πρώτον αἰσθητήριον· καὶ τί ἐστιν ὁ ὑπνος, ὅτι τοῦ  
πρώτου αἰσθητηρίου κατάληψις πρὸς τὸ μὴ δύνα-  
σθαι ἐνεργεῖν, ἐξ ἀνάγκης μὲν γινόμενος (οὐ γὰρ  
ἐνδέχεται ζῶον εἶναι μὴ συμβαινόντων τῶν ἀπ-  
εργαζομένων αὐτό), ἐνεκα δὲ σωτηρίας· σώζει γὰρ  
ἡ ἀνάπαυσις.

## ON SLEEP AND WAKING, III.

when this happens the parts awake, because they are separated from the heaviness of food.

We have thus explained the reason of sleep, that summary. it is the reaction by the bodily part which is carried upwards by its natural heat to the first sense organ ; as for what sleep is we have shown that it is a paralysis of the first sense organ to prevent it from functioning, and is a necessary process (for the animal could not exist unless something was present to fulfil its nature), that is for its preservation ; for rest preserves it.



# ON DREAMS



## INTRODUCTION

THIS subject is nearly as obscure to us as it was to Aristotle. In the present treatise the handling of the subject is full of interest, and contains some suggestions of real value. Aristotle first decides that our dreams are not directly due to perception, for by hypothesis our senses are all asleep. Yet he feels that they must have some connexion with perception, and that they imply the same sort of "imagination" as we employ in memory. He finds them analogous to the phenomenon we know as "persistence of vision," whereby we can still see an image (or seem to do so) which has actually passed from our sight. So he regards dreams as a kind of persistence of sense impressions received while awake. Their distortion he thinks similar to the distortion caused by rough water to a visual image.

## ΠΕΡΙ ΕΝΤΠΝΙΩΝ

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I. Μετὰ δὲ ταῦτα περὶ ἐνυπνίωι<sup>1</sup> ζητητέον, καὶ 458 b πρῶτον τίνι τῶν τῆς ψυχῆς φαίνεται, καὶ πότερον τοῦ νοητικοῦ τὸ πάθος ἐστὶ τοῦτο ἢ τοῦ αἰσθητικοῦ· τούτοις γὰρ μόνοις τῶν ἐν ἡμῖν γνωρίζομέν τι.

Εἰ δὲ χρῆσις ὅψεως ὄρασις καὶ ἀκοῆς τὸ ἀκούειν καὶ ὅλως αἰσθήσεως τὸ αἰσθάνεσθαι, κοινὰ δ' ἐστὶ τῶν αἰσθήσεων οἷον σχῆμα καὶ μέγεθος καὶ κίνησις καὶ τᾶλλα τὰ τυιαῦτα, ἵδια δ' οἷον χρῶμα φόφος χυμός, ἀδυνατεῖ δὲ πάντα μύοντα καὶ καθεύδοντα ὄραν, ὅμοίως δὲ καὶ ἐπὶ καὶ λοιπῶν, δῆλον ὅτι οὐκ αἰσθανόμεθα οὐδὲν ἐν τοῖς ὕπνοις. οὐκ ἄρα γε τῇ αἰσθήσει τὸ ἐνύπνιον αἰσθανόμεθα.

10 Αλλὰ μὴν οὐδὲ τῇ δόξῃ. οὐ γὰρ μόνον τὸ προσιόν φαμεν ἄνθρωπον ἢ ἵππον εἶναι, ἀλλὰ καὶ λευκὸν ἢ καλόν· ὃν ἡ δόξα ἀνευ αἰσθήσεως οὐδὲν ἀν φήσειεν, οὕτ' ἀληθῶς οὔτε ψευδῶς. ἐν δὲ τοῖς ὕπνοις συμβαίνει τὴν ψυχὴν τοῦτο ποιεῖν· ὅμοίως γὰρ ὅτι 15 ἄνθρωπος καὶ ὅτι λευκὸς ὁ προσιὼν δοκοῦμεν ὄραν. ἔτι παρὰ τὸ ἐνύπνιον ἐννοοῦμεν ἄλλο τι, καθάπερ

<sup>1</sup> ἐνυπνίου B.

## ON DREAMS

I. Now our inquiry is concerned with dreams, and in the first place to what faculty of the soul they belong, and whether the affection belongs to the thinking or to the feeling part; for it is only by one of these faculties within us that we can attain knowledge.

Now if the employment of vision is seeing, and of hearing audition, and of feeling generally is sensation, and if again the perception of some things such as form, size, movement and other such things is shared by the senses, while others such as colour, sound and taste belong to special senses; if again everything that has its eyes shut and is asleep is incapable of seeing, and similarly with the other senses, it is clear that we have no perception in dreams at all. Therefore we do not see our dreams by perception.

Nor is it by opinion. For we do not merely say <sup>nor opinion.</sup> that the thing approaching is a man or a horse, but also that it is white or handsome; but on these points opinion could not pronounce, either truly or falsely, without perception. Yet the soul does these things in sleep; for we seem to see that the approaching object is a man, and also that he is white. Moreover in a dream we have some other concept, just as

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εἰ τῷ ἐγρηγορέναι αἰσθαιόμενοί τι περὶ οὗ γὰρ αἰσθαιόμεθα, πολλάκις καὶ διανοούμεθά τι. οὕτω καὶ ἐν τοῖς ὕπιοις παρὰ τὰ φαντάσματα ἐνίστε ἄλλα ἐννοοῦμεν, φανείη δ' ἄν τω τοῦτο, εἴ τις προσ-  
20 ἔχοι τὸν νοῦν καὶ πειρῶτο μνημονεύειν ἀναστάς. ηδη δέ τινες καὶ ἐωράκασιν ἐνύπνια τοιαῦτα σίσιν οἱ δοκοῦντες κατὰ τὸ μνημονικὸν παράγγελμα τίθεσθαι τὰ προβαλλόμενα· συμβαίνει γὰρ αὐτοῖς πολλάκις ἄλλο τι παρὰ τὸ ἐνύπνιον τίθεσθαι πρὸ δύματων εἰς τὸν τόπον φάντασμα. ὥστε δῆλον ὅτι  
25 οὕτε ἐνύπνιον πᾶν τὸ ἐν ὕπνῳ φάντασμα, καὶ ὅτι δὲ ἐννοοῦμεν τῇ δόξῃ δοξάζομεν.

Δῆλον δὲ περὶ τούτων ἀπάντων τό γε τοσοῦτον, ὅτι τῷ αὐτῷ φῷ καὶ ἐγρηγορότες ἐν ταῖς νόσοις ἀπατώμεθα, ὅτι τοῦτ' αὐτὸν καὶ ἐν τῷ ὕπνῳ ποιεῖ τὸ πάθος. καὶ ὑγιαίνουσι δὲ καὶ εἰδόσιν δύμας δὲ ἡλιος ποδιαῖος εἶναι δοκεῖ. ἄλλ' εἴτε δὴ ταῦτὸν  
30 εἴθ' ἔτερον τὸ φανταστικὸν τῆς ψυχῆς καὶ τὸ αἰσθητικόν, οὐδὲν ἥπτον οὐ γίνεται ἄνευ τοῦ ὄραν καὶ αἰσθάνεσθαι τι· τὸ γὰρ παρορᾶν καὶ παρ-  
ακούειν ὄρῶντος ἀληθέσ· τι καὶ ἀκούοντος, οὐ μέν-  
τοι τοῦτο δὲ οἰεται. ἐν δὲ τῷ ὕπνῳ ὑπόκειται μη-  
459 a δὲν ὄραν μηδὲ ἀκούειν μηδὲ ὄλως αἰσθάνεσθαι. ἀρ' οὖν τὸ μὲν μηδὲν ὄραν ἀληθέσ, τὸ δὲ μηδὲν πάσχειν τὴν αἰσθησιν οὐκ ἀληθέσ, ἄλλ' ἐνδέχεται καὶ τὴν ὅψιν πάσχειν τι καὶ τὰς ἄλλας αἰσθήσεις, ἔκαστον δὲ τούτων ὥσπερ ἐγρηγορότος προσβάλλει μέν πως τῇ αἰσθήσει, οὐχ οὕτω δὲ ὥσπερ ἐγρηγορότος·

## ON DREAMS, I.

if we perceived something while awake ; for we often have some thoughts about what we perceive. And so in sleep we sometimes have other thoughts beyond the mental pictures. This will become obvious to anyone if he reflects on it, and tries to remember his dream when he has awakened. Indeed some men have seen dreams of such a kind, for instance, those who seem to arrange what is put forward according to some principle of memorizing ; it often happens that these put some mental picture before their eyes beyond the dream itself. It is then clear that a dream does not consist entirely of a mental picture seen in sleep, but that we also form opinions as to what we think.

On the whole question this much at any rate is clear, that we are deceived precisely in the same part in which we are deceived in illness when awake ; that it is this part which causes the experience in sleep also. The sun appears to measure a foot across to men who are in health, and know its real measurement. But whether the part of the soul which constructs mental pictures is the same as the part which perceives them or not, in any case it does not occur without some vision and perception ; for to see and hear incorrectly is the property of one who sees and hears something real, but not what he thinks. But in sleep it is an axiom that one sees nothing, nor does one hear, nor has one any perception at all. Then "seeing nothing" is true, but that the senses experience nothing is not true, but it is possible that the sight and the other senses do experience something, but that each of them contributes to the sensation as they do in the case of a man awake, but not in the same way as when a man is awake. And in the one

*Yet some form of perception is necessary.*

450 a

καὶ ὅτε μὲν ἡ δόξα λέγει ὅτι φεῦδος τὸ ὅρώμενον,  
ῶσπερ ἐγρηγορόσιν, ὅτε δὲ κατέχεται καὶ ἀκο-  
λουθεῖ τῷ φαντάσματι.

"Οτι μὲν οὖν οὐκ ἔστι τοῦ δοξάζοντος οὐδὲ τοῦ  
διανοούμενον τὸ πάθος τοῦτο ὃ καλοῦμεν ἐνυπνιά-  
10 ζειν φανερόν. ἀλλ' οὐδὲ τοῦ αἰσθανομένου ἀπλῶς·  
ὅρâν γὰρ ἀν ἦν καὶ ἀκούειν ἀπλῶς. ἀλλὰ πῶς  
δὴ καὶ τίνα τρόπον, ἐπισκεπτέον. ὑποκείσθω δ',  
ὅπερ ἔστι καὶ φανερόν, ὅτι τοῦ αἰσθητικοῦ τὸ  
πάθος, εἴπερ καὶ ὁ ὑπνος· οὐ γὰρ ἀλλω μέν τινι  
τῶν ζώων ὑπάρχει ὁ ὑπνος, ἀλλω δὲ τὸ ἐνυπνιάζειν,  
15 ἀλλὰ τῷ αὐτῷ. ἐπεὶ δὲ περὶ φαντασίας ἐν τοῖς  
περὶ ψυχῆς εἴρηται, καὶ ἔστι μὲν τὸ αὐτὸ τῷ  
αἰσθητικῷ τὸ φανταστικόν, τὸ δὲ εἰναι φανταστι-  
κῷ καὶ αἰσθητικῷ ἔτερον, ἔστι δὲ φαντασία ἡ  
ὑπὸ τῆς κατ' ἐνέργειαν αἰσθήσεως γινομένη κίνησις,  
τὸ δὲ ἐνύπνιον φάντασμά τι φαίνεται εἶναι (τὸ γὰρ  
20 ἐν ὑπνῷ φάντασμα ἐνύπνιον λέγομεν, εἴθ' ἀπλῶς  
εἴτε τρόπον τινὰ γινόμενον), φανερὸν ὅτι τοῦ  
αἰσθητικοῦ μέν ἔστι τὸ ἐνυπνιάζειν, τούτου δὲ οὐ τὸ  
φανταστικόν.

II. Τί δ' ἔστι τὸ ἐνύπνιον καὶ πῶς γίνεται, ἐκ  
τῶν περὶ τὸν ὑπνον συμβαινόντων μάλιστ' ἀν  
25 θεωρήσαιμεν. τὰ γὰρ αἰσθητὰ καθ' ἔκαστον  
αἰσθητήριον ἡμῖν ἐμποιοῦσιν αἰσθησιν, καὶ τὸ  
γινόμενον ὑπ' αὐτῶν πάθος οὐ μόνον ἐνυπάρχει ἐν  
τοῖς αἰσθητήριοις ἐνεργουσῶν τῶν αἰσθήσεων, ἀλλὰ  
καὶ ἀπελθουσῶν.

Παραπλήσιον γὰρ τὸ πάθος ἐπί τε τούτων καὶ

<sup>a</sup> *De An. 429 a 1.*

## ON DREAMS, I.—II.

case opinion states that what is seen is false, as happens with those awake, in the other opinion is fettered, and follows the mental picture.

Now it is clear that the experience which we call *dreaming* is not proper to the part of us which is forming an opinion, nor to the part which thinks. Nor does it entirely belong to the feeling part ; for in that case a man (in a dream) would merely see and hear. But we must consider how and in what way this comes about. Let us first lay down what is quite obvious, that it is an experience of the sensitive faculty just as sleep is ; for we do not find that sleep is the characteristic of one living creature and dreaming of another, but both are found in the same animal. But when we discussed imagination in the treatise *On the Soul*,<sup>a</sup> it was agreed that the faculty forming mental pictures was the same as the sensitive faculty, but that the imaginative and sensitive were different in essence. Imagination was agreed to be a movement produced by perception in a state of activity, and the dream seems to be some sort of mental picture (for we call a mental picture appearing in sleep a dream, either simply so, or at any rate in some sense) ; it is clear that dreaming belongs to the sensitive faculty and is related to it in the same way as imagination.

II. What a dream is and how it originates, we can best study from the circumstances which attend sleep. For sensible objects produce sensation in us according to each sense organ, and the affection produced by them not only exists in the sense organs while the senses are in active operation, but continues after these have gone.

The affection in these cases seems to be similar to

ARISTOTLE

459 α

ἐπὶ τῶν φερομένων ἔουκεν εἶναι. καὶ γὰρ ἐπὶ τῶν  
 30 φερομένων τοῦ κινήσαντος οὐκέτι θιγγάνοντος  
 κινεῖται· τὸ γὰρ κινήσαντος ἐκίνησεν ἀέρα τινά, καὶ  
 πάλιν οὗτος κινούμενος ἔτερον. καὶ τοῦτον δὴ  
 τὸν τρόπον, ἔως ἂν στῇ, ποιεῖται τὴν κίνησιν καὶ  
 459 β ἐν ἀέρι καὶ ἐν τοῖς ὑγροῖς.

‘Ομοίως δ’ ὑπολαβεῖν τοῦτο δεῖ καὶ ἐπ’ ἀλ-  
 λοιώσεως· τὸ γὰρ θερμανθὲν ὑπὸ τοῦ θερμοῦ τὸ  
 πλησίον θερμαίνει, καὶ τοῦτο διαδίδωσιν ἔως τῆς  
 ἀρχῆς, ὥστε καὶ ἐν ᾧ τὸ αἰσθάνεσθαι, ἐπειδή ἐστιν  
 5 ἀλλοίωσίς τις ἡ κατ’ ἐνέργειαν αἰσθησις, ἀνάγκη  
 τοῦτο συμβαίνειν. διὸ τὸ πάθος ἐστὶν οὐ μόνον  
 ἐν αἰσθανομένοις τοῖς αἰσθητηρίοις, ἀλλὰ καὶ ἐν  
 πεπαυμένοις, καὶ ἐν βάθει καὶ ἐπιπολῆς. φανερὸν  
 δ’ ὅταν συνεχῶς αἰσθανώμεθά τι μεταφερόντων  
 γὰρ τὴν αἰσθησιν ἀκολουθεῖ τὸ πάθος, οἷον ἐκ  
 10 τοῦ ἥλιου εἰς τὸ σκότος· συμβαίνει γὰρ μηδὲν ὅραν  
 διὰ τὴν ἔτι ὑποῦσαν κίνησιν ἐν τοῖς ὅμμασιν ὑπὸ  
 τοῦ φωτός. κανὸν πρὸς ἐν χρῶμα πολὺν χρόνον  
 βλέψωμεν ἡ λευκὸν ἡ χλωρόν, τοιοῦτον φαίνεται  
 ἐφ’ ὅπερ ἂν τὴν ὄψιν μεταβάλλωμεν. κανὸν πρὸς  
 τὸν ἥλιον βλέψαντες ἡ ἄλλο τι λαμπρὸν μύσωμεν,  
 15 παρατηρήσασι φαίνεται κατ’ εὐθυναρίαν, ἥ συμ-  
 βαίνει τὴν ὄψιν ὅραν, πρῶτον μὲν τοιοῦτον τὴν  
 χρόαν, εἶτα μεταβάλλει εἰς φοινικοῦν κάπειτα  
 πορφυροῦν, ἔως ἂν εἰς τὴν μέλαιναν ἔλθῃ χρόαν  
 καὶ ἀφανισθῇ. καὶ αἱ ἀπὸ τῶν κινουμένων δὲ  
 μεταβάλλουσιν, οἷον ἀπὸ τῶν ποταμῶν, μάλιστα

## ON DREAMS, II.

that observable in projectiles. For in the case of the latter movement continues after the cause of the movement has ceased to touch them ; for the initial cause of the movement imparts motion to a portion of the air which, being moved, again moves another portion. This is the way in which the initial cause of movements continues to produce it both in air and in liquids, until the moving objects come to a standstill.

A mechanical impulse produces an effect which continues after the original impulse has ceased.

One can suppose that something similar takes place in change of state as well ; for that which is heated by the hot in turn heats that which is near it, and this hands on the succession until it reaches the beginning again. So in the case of sensation, since sensation in active operation is a kind of change of state, this must also happen. Consequently this affection exists not merely in the sense organs while they are feeling, but also when they have ceased to do so, both deep down and on the surface. This is clear when we are engaged in continuous perception ; for even when we change <sup>so too with heat</sup> and light. our sensation the affection persists ; for instance, when we turn from sunlight to darkness ; the result is that we see nothing because the movement produced in our eyes by the light still persists. Again if we look for a long time at one colour—say white or green—any object to which we shift our gaze appears to be that colour. And if, after looking at the sun or some other bright object, we shut our eyes, then, if we watch carefully, we shall still see it in the same straight line as we saw it before, first of all with its own proper colour, then it will change to red, and this to purple, until it fades to black and disappears. The same persistence of vision occurs when we turn from moving objects—for instance with rivers, and this is most conspicuous when the

459 b

20 δ' ἀπὸ τῶν τάχιστα ρεόντων φαίνεται γὰρ τὰ  
ἡρεμοῦντα κινούμενα. γύνονται δὲ καὶ ἀπὸ τῶν  
μεγάλων ψόφων δύσκωφοι καὶ ἀπὸ τῶν ἴσχυρῶν  
ὅσμῶν δύσοσμοι, καὶ ἐπὶ τῶν ὅμοιών. ταῦτά γε  
δὴ φανερῶς συμβαίνει τοῦτον τὸν τρόπον.

25 "Οτι δὲ ταχὺ τὰ αἰσθητήρια καὶ μικρᾶς διαφορᾶς  
αἰσθάνεται, σημεῖον τὸ ἐπὶ τῶν ἐνόπτρων γινό-  
μενον· περὶ οὐ καὶ αὐτοῦ ἐπιστήσας σκέψαιτό τις  
ἄν καὶ ἀπορήσειεν. ἄμα δ' ἐξ αὐτοῦ δῆλον ὅτι  
ῶσπερ καὶ ἡ ὄψις πάσχει, οὕτω καὶ ποιεῖ τι. ἐν  
γὰρ τοῖς ἐνόπτροις τοῖς σφόδρα καθαροῖς, ὅταν  
τῶν καταμηνίων τὰς γυναιξὶ γινομένων ἐμ-  
30 βλέψωσιν εἰς τὸ κάτοπτρον, γίνεται τὸ ἐπιπολῆς  
τοῦ ἐνόπτρου οἷον νεφέλη αἰματώδης· κανὸν μὲν  
καινὸν γὰρ τὸ κάτοπτρον, οὐ ράδιον ἐκμάξαι τὴν  
τοιαύτην κηλῖδα, ἐὰν δὲ παλαιόν, ράδον. αἴτιον δ',  
35 480 α ὕσπερ εἴπομεν, ὅτι οὐ μόνον πάσχει τι ἡ ὄψις  
ὑπὸ τοῦ ἀέρος, ἀλλὰ καὶ ποιεῖ τι καὶ κινεῖ, ὕσπερ  
καὶ τὰ λαμπρά· καὶ γὰρ ἡ ὄψις τῶν λαμπρῶν καὶ  
ἐχόντων χρῶμα. τὰ μὲν οὖν ὅμματα εὐλόγιας,  
40 ὅταν γὰρ τὰ καταμήνια, διάκειται, ὕσπερ καὶ ἔτερον  
μέρος ὅτιοῦν· καὶ γὰρ φύσει τυγχάνουσι φλεβώ-  
δεις ὅντες. διὸ γινομένων τῶν καταμηνίων διὰ  
ταραχὴν καὶ φλεγμασίαν αἰματικὴν ἡμῖν μὲν ἡ ἐν  
τοῖς ὅμμασι διαφορὰ ἄδηλος, ἔνεστι δέ (ἡ γὰρ  
50 αὐτὴ φύσις σπέρματος καὶ καταμηνίων), ὁ δ' ἀήρ  
κινεῖται ὑπὸ αὐτῶν, καὶ τὸν ἐπὶ τῶν κατόπτρων  
ἀέρα συνεχῆ ὅντα ποιόν τινα ποιεῖ καὶ τοιοῦτον  
οἷον αὐτὸς πάσχει· ὁ δὲ τοῦ κατόπτρου τὴν ἐπι-  
φάνειαν. ὕσπερ δὲ τῶν ἴματίων τὰ μάλιστα  
καθαρὰ τάχιστα κηλιδοῦται· τὸ γὰρ καθαρὸν ἀκρι-  
βῶς δηλοῦ ὅ τι ἄν δέξηται, καὶ μάλιστα τὰς ἐλα-

## ON DREAMS, II.

objects move rapidly ; for then objects really at rest appear to be moving. So men become deafened by loud noises and lose their sense of smell for strong scents and so on. This obviously happens in the way described.

We can prove that the sense organs have quick Vision affects the object seen. perception of even small differences from what occurs with mirrors ; a subject upon which one might find considerable difficulty, if one considered it by itself. But it is quite clear that, just as vision is affected by an object, so vision produces an effect on an object. *Nam clarissimorum speculorum facies, cum feminae menstruis affectae in speculum introspectiveant, quasi nubes sanguinea videtur : si quidem novum est speculum, macula difficilis est deletu, sin autem vetus, facilis ; propterea quod, ultiote diximus, non modo oculi aere afficiuntur, sed etiam ipsi aera aliquomodo afficiunt et movent, sicut res claras ; oculi enim clara et quae colorem habent vident. Nec mirandum est oculos, cum menstrua incident, ita affectos esse, ut alteram partem ; ii enim natura sunt venosi. Ergo, cum menstrua incident feminis, oculi, scilicet turbati et inflammati, fiunt mutati (menstrua enim eandem habent naturam quam conceptio) quanquam nobis viris non appareat ; qui quidem et commovent et afficiunt si quid aeris circum speculum continetur, quod ipsum similem habet naturam ; et aer ita afficit speculi faciem. Sic etiam vestes mundissimae celerime maculantur ; tabulae enim rasae facillime im-*

480 a

χίστας κινήσεις. ὁ δὲ χαλκὸς διὰ μὲν τὸ λεῖος  
 εἶναι ὅποιασοῦν ἀφῆς μάλιστα αἰσθάνεται (δεῖ δὲ  
 νοῆσαι οἷον τρύφιν οὖσαι τὴν τοῦ ἀέρος ἀφῆν καὶ  
 ὥσπερ ἔκμαξιν καὶ ἀνάπλυσιν), διὰ δὲ τὸ καθαρὸν  
 ἔκδηλος γίνεται ὅπηλικηοῦν οὖσα. τοῦ δὲ μὴ  
 ἔξιεναι ταχέως ἐκ τῶν καινῶν κατόπτρων αἴτιον  
 τὸ καθαρὸν εἶναι καὶ λεῖον· διαδύεται γὰρ διὰ  
 τῶν τοιούτων καὶ εἰς βάθος καὶ πάντη, διὰ μὲν  
 τὸ καθαρὸν εἰς βάθος, διὰ δὲ τὸ λεῖον πάντη. ἐν  
 δὲ τοῖς παλαιοῖς οὐκ ἐμμένει, ὅτι οὐχ ὁμοίως  
 εἰσδύεται ἡ κηλὶς ἀλλ’ ἐπιπολαιότεροι. ὅτι μὲν  
 οὖν καὶ ὑπὸ τῶν μικρῶν διαφορῶν γίνεται κίνησις,  
 καὶ ὅτι ταχεῖα ἡ αἰσθησις, ἔτι δὲ ὅτι οὐ μόνον  
 πάσχει ἀλλὰ καὶ ἀντιποιεῖ τὸ τῶν χρωμάτων  
 αἰσθητήριον, φανερὸν ἐκ τούτων. μαρτυρεῖ δὲ  
 τοῖς εἰρημένοις καὶ τὰ περὶ τοὺς οἴνους καὶ τὴν  
 μυρεψίαν συμβαίνοντα. τό τε γὰρ παρασκευασθὲν  
 ἔλαιον ταχέως λαμβάνει τὰς τῶν πλησίον ὁσμάς,  
 καὶ οἱ οἶνοι τὸ αὐτὸ τοῦτο πάσχουσιν· οὐ γὰρ  
 μόνον τῶν ἐμβαλλομένων ἡ ὑποκιρναμένων, ἀλλὰ  
 καὶ τῶν πλησίον τοῖς ἀγγείοις τιθεμένων ἡ πεφυ-  
 κότων ἀναλαμβάνουσι τὰς ὁσμάς.

480 b Πρὸς δὲ τὴν ἐξ ἀρχῆς σκέψιν ὑποκείσθω ἐν μέν,  
 ὅπερ ἐκ τῶν εἰρημένων φανερόν, ὅτι καὶ ἀπελθόντος  
 τοῦ θύραθεν αἰσθητοῦ ἐμμένει τὰ αἰσθήματα  
 αἰσθητὰ ὄντα, πρὸς δὲ τούτοις ὅτι ῥᾳδίως ἀπατώ-  
 μεθα περὶ τὰς αἰσθήσεις ἐν τοῖς πάθεσιν ὄντες,  
 5 ἄλλοι δ’ ἐν ἄλλοις, οἷον ὁ δειλὸς ἐν φόβῳ, ὁ δ’  
 ἐρωτικὸς ἐν ἔρωτι, ὥστε δοκεῖν ἀπὸ μικρᾶς ὁμοιό-  
 τητος τὸν μὲν τοὺς πολεμίους ὄρâν, τὸν δὲ τὸν  
 ἐρώμενον· καὶ ταῦτα ὅσῳ ἀν ἐμπαθέστερος ἦ,  
 τοσούτῳ ἀπ’ ἐλάσσονος ὁμοιότητος φαίνεται. τὸν

## ON DREAMS, II.

primuntur signa etiam ininuta. Sed aës, quia leve est, si quis quam minime tangit, afficitur (aer autem, ut ita dicam, terere, detergere, lavare videtur), et quia mundum est, non est incertum quo modo tactum sit. Etenim, quod speculum mundum est et leve, non celeriter evanescit species ; percolavit enim penitus, quia mundum est speculum, et passim diffusa est, quia leve. At in veteribus non perstat, quia macula non penitus diffusa est, sed solum in summo speculo restat. All this proves first that movement is produced by minute differences, secondly that perception is very rapid, and thirdly that the sense organ which perceives colours is not only affected by colours, but also in turn affects them. This conclusion is further supported by what occurs with wines and with the preparation of perfumes. For oil which has been prepared quickly takes on the scent of what is near it, and wines are affected in the same way ; for they acquire the smell not merely of what is put into them, and mixed in small quantities with them, but even of that which is placed, or lies in vessels near by.

To return to the starting-point of our inquiry, one fact, which is clear from what we have said, may be laid down—that the object of sense still remains perceptible even after the external object perceived has gone, and moreover that we are easily deceived about our perceptions while we have them, some in some circumstances and others in others ; for instance the coward in his fear, the lover in his love, so that even by a very faint resemblance the coward thinks that he sees his enemy, and the lover the object of his love ; and in proportion as he is more affected, so his imagination is stimulated by a more remote

Persistence  
of vision as  
an explana-  
tion of  
dreams.

480 b

αὐτὸν δὲ τρόπον καὶ ἐν ὀργαῖς καὶ ἐν πάσαις ἐπι-  
 10 θυμίαις εὐαπάτητοι γίνονται πάντες, καὶ μᾶλλον  
 ὅσῳ ἂν μᾶλλον ἐν τοῖς πάθεσιν ὥσιν. διὸ καὶ τοῖς  
 πυρέττουσιν ἐνίστε φαίνεται ζῆται ἐν τοῖς τοίχοις  
 ἀπὸ μικρᾶς ὅμοιότητος τῶν γραμμῶν συντιθεμέ-  
 νων. καὶ ταῦτ' ἐνίστε συνεπιτείνει τοῖς πάθεσιν  
 οὕτως ὥστ' ἐὰν μὲν μὴ σφόδρα κάμνωσι, μὴ  
 15 λανθάνειν ὅτι ψεῦδος, ἐὰν δὲ μεῖζον ἢ τὸ πάθος,  
 καὶ κινεῖσθαι πρὸς αὐτά. αἵτιον δὲ τοῦ συμβαίνειν  
 ταῦτα τὸ μὴ κατὰ τὴν αὐτὴν δύναμιν κρίνειν τό-  
 τε κύριον καὶ φῶτα φαντάσματα γίνεται. τούτου  
 δὲ σημείον ὅτι φαίνεται μὲν ὁ ἥλιος ποδιαῖς,  
 ἀντίφησι δὲ πολλάκις ἔτερόν τι πρὸς τὴν φαντα-  
 20 σίαν. καὶ τῇ ἐπαλλάξει τῶν δακτύλων τὸ ἐν δύο  
 φαίνεται, ἀλλ' ὅμως οὐ φαμεν δύο· κυριωτέρα γὰρ  
 τῆς ἀφῆς ἡ ὄψις. εἰ δ' ἦν ἡ ἀφὴ μόνη, καν-  
 ἐκρύνομεν τὸ ἐν δύο. τοῦ δὲ διεψεῦσθαι αἵτιον  
 ὅτι οὐ μόνον τοῦ αἰσθητοῦ κινουμένου φαίνεται  
 ἀδήποτε, ἀλλὰ καὶ τῆς αἰσθήσεως κινουμένης αὐ-  
 25 τῆς, ἐὰν ὥσαύτως κινήται ὥσπερ καὶ ὑπὸ τοῦ  
 αἰσθητοῦ· λέγω δ' οἶον ἡ γῆ δοκεῖ τοῖς πλέονσι  
 κινεῖσθαι κινουμένης τῆς ὄψεως ὑπὸ ἄλλου.

III. Ἐκ δὴ τούτων φανερὸν ὅτι οὐ μόνον ἐγρηγορό-  
 των αἱ κινήσεις αἱ ἀπὸ τῶν αἰσθημάτων γινόμεναι  
 30 τῶν τε θύραθεν καὶ τῶν ἐκ τοῦ σώματος ἐνυπαρχού-  
 σῶν, ἀλλὰ καὶ ὅταν γένηται τὸ πάθος τοῦτο δικαλεῖ-  
 ται ὑπνος, καὶ μᾶλλον τότε φαίνονται. μεθ' ἡμέραν  
 481 a μὲν γὰρ ἐκκρούονται ἐνεργουσῶν τῶν αἰσθήσεων

## ON DREAMS, II.—III.

resemblance. In the same way in temper and in all forms of desire all are easily deceived, and the more easily, the more they are under the influence in question. So men in fever think that they see animals on the walls from the slight resemblance of lines joined to each other. Sometimes the effect on the emotions is such that, if they are not very ill, they are aware that the impression is false, but, if the malady grows worse, they are moved to believe in what they see. The reason that this occurs is that the controlling power does not judge these things by the same faculty as that by which sense images occur. This is proved by the fact that the sun appears to measure a foot across, but there is some other power which contradicts this impression. So again when the fingers are crossed one object (between them) appears to be two, but yet we deny that there are two; for sight has more authority than touch. But if touch were the only criterion, we should judge the one as two. The cause of this deception is that objects of any kind may appear to us, not only when the object of sense supplies the stimulus, but also when the sense is stimulated by itself, provided that it is stimulated in the same way as by an object of sense; I mean for instance that to those who are sailing past it the land seems to move, though really the eye is being moved by another cause.

III. It is evident from the foregoing that movements arising from the senses, both those which are stimulated from without and those which have their origin within the body, occur not only when we are awake, but also when the affection we call sleep supervenes, and even more at that time. In the daytime these movements are eclipsed when the senses

Explanations by analogy.

461 a

καὶ τῆς διανοίας, καὶ ἀφανίζονται ὥσπερ παρὰ πολὺ πῦρ ἔλαττον καὶ λῦπαι καὶ ἥδοναι μικραὶ παρὰ μεγάλας, παυσαμένων δ' ἐπιπολάζει καὶ τὰ μικρά· νύκτωρ δὲ δι' ἀργίαν τῶν κατὰ μόριον 5 αἰσθήσεων καὶ ἀδυναμίαν τοῦ ἐνεργεῖν, διὰ τὸ ἐκ τῶν ἔξω εἰς τὸ ἐντὸς γίνεσθαι τὴν τοῦ θερμοῦ παλίρροιαν, ἐπὶ τὴν ἀρχὴν τῆς αἰσθήσεως καταφέρονται καὶ γίνονται φανεραὶ καθισταμένης τῆς ταραχῆς. δεῖ δ' ὑπολαβεῖν ὥσπερ τὰς μικρὰς δίνας τὰς ἐν τοῖς ποταμοῖς γινομένας, οὕτω τὴν 10 κύησιν ἐκάστην γίνεσθαι συνεχῶς, πολλάκις μὲν ὅμοίως, πολλάκις δὲ διαλυομένας εἰς ἄλλα σχήματα διὰ τὴν ἀντίκρουσιν. διὸ καὶ μετὰ τὴν τροφὴν καὶ πάμπαν νέοις οὖσιν, οἷον τοῖς παιδίοις, οὐ γίνεται ἐνύπνια· πολλὴ γάρ ή κύησις διὰ τὴν ἀπὸ τῆς τροφῆς θερμότητα. ὥστε καθάπερ ἐν ὑγρῷ, 15 ἐὰν σφόδρα κινή τις, ὅτε μὲν οὐδὲν φαίνεται εἴδωλον δτὲ δὲ φαίνεται μὲν διεστραμμένον δὲ πάμπαν, ὥστε φαίνεσθαι ἄλλοιον ἢ οἶον ἐστιν, ἡρεμήσαντος δὲ καθαρὰ καὶ φανερά, οὕτω καὶ ἐν τῷ καθεύδειν τὰ φαντάσματα καὶ αἱ ὑπόλοιποι κινήσεις αἱ συμβαίνουσαι ἀπὸ τῶν αἰσθημάτων 20 δτὲ μὲν ὑπὸ μείζονος οὕσης τῆς εἰρημένης κινήσεως ἀφανίζονται πάμπαν, ὅτε δὲ τεταραγμέναι φαίνονται αἱ ὄψεις καὶ τερατώδεις καὶ οὐκ ἐρρωμένα τὰ ἐνύπνια, οἷον τοῖς μελαγχολικοῖς καὶ πυρέττουσι καὶ οἰνωμένοις· πάντα γάρ τὰ τοιαῦτα πάθη πνευματώδη ὄντα πολλὴν ποιεῖ κύησιν καὶ ταραχήν. καθισταμένου δὲ καὶ διακρινομένου τοῦ αἵματος ἐν τοῖς ἐναίμοις, σωζομένη τῶν αἰσθημάτων ἡ κύησις ἀφ' ἐκάστου τῶν αἰσθητηρίων ἐρρωμένα τε ποιεῖ τὰ ἐνύπνια, καὶ φαίνεσθαι τι καὶ δοκεῖν

## ON DREAMS, III.

and the mind are active, and are obscured just in the same way as a smaller fire is obscured by a greater, and small pains and pleasures by great ; but when these movements have ceased even the small ones come to the surface ; but at night, because the senses are individually at rest and cannot function, owing to the flow of heat reversing direction and passing from the outside to the inside, they reach the point where sensation begins and becomes noticeable, as the bustle subsides. One may suppose that they are like the eddies which are seen in rivers, each movement taking place continuously, often with unchanging pattern, but often again dividing into other shapes owing to some obstruction. For this reason after food and in the very young such as infants there are no dreams ; for the movement is considerable owing to the heat arising from food ; so in water if one disturbs it violently, sometimes no image appears, and sometimes it appears but is entirely distorted, so that it seems quite different from what it really is, but, when the water is still, it is clear cut and plain ; so also in sleep, some of the visions and other movements that arise from the senses are altogether obscured owing to the greater movement we have mentioned before, and sometimes the visions appear confused and monstrous, and the dreams seem not substantial, as occurs with the melancholic, the feverish and the intoxicated ; for all these affections, being due to breathing, produce much movement and confusion. In the animals that have blood, when the blood is steady and divided into its elements, the movement of the sense organs makes the dreams substantial, and the sleeper imagines that he

481 a

διὰ μὲν τὰ ἀπὸ τῆς ὄψεως καταφερόμενα ὄρᾶν,  
 διὰ δὲ τὰ ἀπὸ τῆς ἀκοῆς ἀκούειν. ὅμοιοτρόπως  
 80 δὲ καὶ ἀπὸ τῶν ἄλλων αἰσθητηρίων· τῷ μὲν γὰρ  
 ἐκεῖθεν ἀφικνεῖσθαι τὴν κίνησιν πρὸς τὴν ἀρχὴν  
 481 b καὶ ἐγρηγορῶς δοκεῖ ὄρᾶν καὶ ἀκούειν καὶ αἰσθά-  
 νεσθαι, καὶ διὰ τὸ τὴν ὄψιν ἐνίστε κινεῖσθαι δοκεῖν  
 οὐ κινουμένην ὄρᾶν φαμέν, καὶ τῷ τὴν ἀφὴν δύο  
 κινήσεις εἰσαγγέλλειν τὸ ἐν δύο δοκεῖν. ὅλως  
 γὰρ τὸ ἀφ' ἐκάστης αἰσθήσεως φησιν ἡ ἀρχή, ἐὰν  
 5 μὴ ἔτέρα κυριωτέρα ἀντιφῆ. φαίνεται μὲν οὖν  
 πάντως, δοκεῖ δὲ οὐ πάντως τὸ φαινόμενον, ἀλλ'  
 ἐὰν τὸ ἐπικρῶν κατέχηται ἢ μὴ κινῆται τὴν  
 οἰκείαν κίνησιν. ὥσπερ δ' εἴπομεν ὅτι ἄλλοι δι'  
 ἄλλο πάθος εὐαπάτητοι, οὕτως ὁ καθεύδων διὰ  
 τὸν ὑπνον καὶ τὸ κινεῖσθαι τὰ αἰσθητήρια καὶ  
 10 τάλλα τὰ συμβαίνοντα περὶ τὴν αἰσθησιν, ὥστε  
 τὸ μικρὰν ἔχον ὅμοιότητα φαίνεται ἐκεῦνο. ὅταν  
 γὰρ καθεύδῃ, κατιόντος τοῦ πλείστου αἷματος ἐπὶ<sup>1</sup>  
 τὴν ἀρχὴν συγκατέρχονται αἱ ἐνοῦσαι κινήσεις, αἱ  
 μὲν δυνάμει αἱ δὲ ἐνεργείᾳ. οὕτω δ' ἔχουσιν ὥστε  
 ἐν τῇ κινήσει τηδὶ οὐδεὶς ἐπιπολάσει ἐξ αὐτοῦ ἡ  
 15 κίνησις, ἀν δ' αὕτη φθαρῇ, οὐδε. καὶ πρὸς ἄλλήλας  
 δ' ἔχουσιν ὥσπερ οἱ πεπλασμένοι βάτραχοι οἱ  
 ἀνιόντες ἐν τῷ ὕδατι τηκομένου τοῦ ἀλόσ. οὕτως  
 ἔνεισι δυνάμει, ἀνειμένου δὲ τοῦ κωλύοντος ἐνερ-  
 γοῦσιν· καὶ λυόμεναι ἐν ὀλίγῳ τῷ λοιπῷ αἷματι  
 τῷ ἐν τοῖς αἰσθητηρίοις κινοῦνται, ἔχουσαι ὅμοιό-

## ON DREAMS, III.

really sees what is carried down by the sense of vision, and that he hears what is carried down by the sense of hearing. The same is true of the other sense organs. Even in the waking state a man's impression that he sees, hears or feels is due to the fact that the movement passes from there to the starting-point ; and because the vision seems at times to be stimulated, though really it is not, we say that we see, and one appears to be two, because the sense of touch reports two stimuli. For, speaking generally, the controlling power affirms the report given by each sense, unless another power still more authoritative contradicts it. In every case the sense impression is there, but the sense impression does not in every case seem true, but only when the judging faculty is subordinated, and is not moving with its proper movement. But just as we have said that some are liable to be deceived by one affection and others by another, so the sleeper is liable to be deceived owing to his sleep, and to the fact that the sense organs and the other things which are connected with sensation are stimulated so that an image which has only a remote resemblance seems to be the object itself. For when a man is asleep, most of the blood sinks to its source, and the movements residing in it, some potential and some actual, travel with it. They are in such a condition, that in this movement one will detach itself and rise to the surface, and if this is destroyed another will do so. Their relation to each other is similar to that of artificial frogs, which rise to the surface of the water, as the salt is dissolved. They thus exist potentially, but only function actually when the preventing cause is removed ; and travelling in the little blood which remains in the sense organs they

## ARISTOTLE

481 b

τηγα ὥσπερ τὰ ἐν τοῖς νέφεσιν, ἢ παρεικάζουσιν  
 ἀνθρώποις καὶ κειταύροις ταχέως μεταβάλλοντα.  
 τούτων δὲ ἔκαστόν ἐστιν, ὥσπερ εἴρηται, ὑπόλειμμα  
 τοῦ ἐν τῇ ἐνεργείᾳ αἰσθήματος· καὶ ἀπελθόντος  
 τοῦ αἰσθήματος τοῦ ἀληθοῦς ἔνεστι, καὶ ἀληθὴς  
 εἰπεῖν ὅτι τοιοῦτον οἶν Κορίσκος, ἀλλ’ οὐ Κορί-  
 σκος. ὅτε δ’ ἥσθάνετο, οὐκ ἔλεγε Κορίσκον τὸ  
 κύριον καὶ τὸ ἐπικρῦνον, ἀλλὰ διὰ τοῦτο ἐκεῖνον  
 Κορίσκον τὸν ἀληθινόν. οὐδὲ καὶ αἰσθανόμενον  
 λέγει τοῦτο, ἐὰν μὴ παντελῶς κατέχηται ὑπὸ τοῦ  
 αἴματος, ὥσπερ μὴ αἰσθανόμενον τοῦτο, κινεῖται  
 ὑπὸ τῶν κινήσεων τῶν ἐν τοῖς αἰσθητηρίοις. καὶ  
 30 δοκεῖ τὸ ὅμοιον αὐτὸν εἶναι ἀληθές. καὶ τοσαύτη  
 τοῦ ὕπνου ἡ δύναμις ὥστε ποιεῖν τοῦτο λανθάνειν.  
 ὥσπερ οὖν εἴ τινα λανθάνοι ὑποβαλλόμενος ὁ  
 482 a δάκτυλος τῷ ὀφθαλμῷ, οὐ μόνον φανεῖται ἀλλὰ  
 καὶ δόξει εἶναι δύο τὸ ἐν, ἂν δὲ μὴ λανθάνῃ,  
 φανεῖται μὲν οὐ δόξει δέ, οὕτω καὶ ἐν τοῖς ὕπνοις,  
 ἐὰν μὲν αἰσθάνηται ὅτι καθεύδει, καὶ τοῦ πάθους  
 ἐν ᾧ ἡ αἰσθησις τοῦ ὑπνωτικοῦ, φαίνεται μέν,  
 5 λέγει δέ τι ἐν αὐτῷ ὅτι φαίνεται μὲν Κορίσκος,  
 οὐκ ἔστι δὲ Κορίσκος (πολλάκις γὰρ καθεύδοντος  
 λέγει τι ἐν τῇ ψυχῇ ὅτι ἐνύπνιον τὸ φανόμενον).  
 ἐὰν δὲ λανθάνῃ ὅτι καθεύδει, οὐδὲν ἀντίφησι τῇ  
 φαντασίᾳ.

“Οτι δ’ ἀληθῆ λέγομεν καὶ εἰσὶν κινήσεις φαντα-  
 στικαὶ ἐν τοῖς αἰσθητηρίοις, δῆλον, ἐάν τις προσ-  
 10 ἔχων πειρᾶται μητημονεύειν ἢ πάσχομεν καταφερό-  
 μενοί τε καὶ ἐγειρόμενοι· ἐνίστε γὰρ τὰ φανόμενα

## ON DREAMS, III.

move, having resemblance in the same way as clouds, which at times are like men, and then with a rapid change are like centaurs. Each of these, as has been said, is what is left of the actual impression ; though the real impression has gone, this still remains, and it is true to say that it is for instance like Coriseus, though it is not Coriseus. When perception was actually taking place the controlling and discriminating sense did not declare it Coriseus, but by this controlling sense said that the genuine Coriseus was that man yonder. That which when actually perceiving it declared to be this, unless entirely controlled by the blood, it now calls it when not actually perceiving it, being stirred by the movements which exist in the sense organs. And so what resembles it seems to be the genuine thing. And the power of sleep is such that it makes one unaware of this. If a man is unaware that a finger is being pressed below his eye, one will not merely seem two, but will carry conviction that it is so, whereas, if he is not unaware, one will still appear two, but will not carry conviction that it is so. Just in the same way in sleep, if a man is aware that he is asleep, and of the condition of a sleeping man's perception, the appearance is there, but he says within himself that there is the appearance of Coriseus, but it is not really Coriseus (for often when a man is asleep he says somewhere in his soul that what appears to him is a dream) ; but if he is unaware that he is asleep there is nothing to contradict the mental picture.

It becomes quite clear that our account is true, and that there are imaginative stimuli in the sense organs, if one tries to remember how we are affected when dropping off to sleep and waking up ; for sometimes

Residual images in the sense organs.

ARISTOTLE

482 a

εἴδωλα καθεύδοντι φωράσει ἐγειρόμενος κινήσεις οὕσας ἐν τοῖς αἰσθητηρίοις· ἐνίοις γὰρ τῶν νεωτέρων καὶ πάμπαιν διαβλέπουσιν, ἐὰν δὲ σκότος, φαίνεται εἴδωλα πολλὰ κινούμενα, ὥστ' ἐγκαλύπτεσθαι 15 πολλάκις φοβουμένους.

Ἐκ δὴ τούτων ἀπάντων δεῖ συλλογίσασθαι ὅτι ἔστι τὸ ἐνύπνιον φάντασμα μέν τι καὶ ἐν ὕπνῳ· τὰ γὰρ ἄρτι λεχθέντα εἴδωλα οὐκ ἔστιν ἐνύπνια, οὐδὲ εἴ τι ἄλλο λελυμένων τῶν αἰσθήσεων φαίνεται· οὐδὲ τὸ ἐν ὕπνῳ φάντασμα πᾶν. πρῶτον μὲν γὰρ 20 ἐνίοις συμβαίνει καὶ αἰσθάνεσθαι πη καὶ ψόφων καὶ φωτὸς καὶ χυμοῦ καὶ ἀφῆς, ἀσθενικῶς μέντοι καὶ οἷον πόρρωθεν· ἥδη γὰρ ἐν τῷ καθεύδειν ὑποβλέποντες, ὁ ἡρέμα ἔώρων φῶς τοῦ λύχνου καθεύδοντες, ὡς ϕόντο, ἐπεγερθέντες εὐθὺς ἐγνώρισαν τὸ τοῦ λύχνου ὅν, καὶ ἀλεκτρυόνων καὶ 25 κυνῶν φωνὴν ἡρέμα ἀκούοντες ἐγερθέντες σαφῶς ἐγνώρισαν. ἔνιοι δὲ καὶ ἀποκρύνονται ἐρωτώμενοι· ἐνδέχεται γὰρ τοῦ ἐγρηγορέναι καὶ καθεύδειν ἀπλῶς θατέρουν ὑπάρχοντος θάτερόν πη ὑπάρχειν. ὅν οὐδὲν ἐνύπνιον φατέον. οὐδὲ ὅσαι δὴ ἐν τῷ ὕπνῳ γίνονται ἀληθεῖς ἔννοιαι παρὰ τὰ φαντάσματα. 30 ἄλλὰ τὸ φάντασμα τὸ ἀπὸ τῆς κινήσεως τῶν αἰσθημάτων, ὅταν ἐν τῷ καθεύδειν δέ, δὲ καθεύδει, τοῦτ' ἔστιν ἐνύπνιον.

“Ηδη δέ τισι συμβέβηκεν ὥστε μηδὲν ἐνύπνιον ἔωρακέναι κατὰ τὸν βίον. σπάνιον μὲν οὖν τὸ 482 b τοιοῦτόν ἔστι, συμβαίνει δέ ὅμως. καὶ τοῖς μὲν ὅλως διετέλεσεν, ἐνίοις δὲ καὶ προελθοῦσι πόρρω

## ON DREAMS, III.

images which appear to one when asleep one will on waking detect to be movements in the sense organs; for to some young people even when their eyes are wide open, if it is dark, many images seem to move, so that they often cover their heads in fright.

One must conclude from all this that a dream is one form of mental image, which occurs in sleep: for the images just referred to are not dreams, nor any other image which appears when the senses are relaxed; nor is every mental picture occurring in sleep a dream. For in the first place some have a certain perception of sounds, and light, and flavour, and touch, but faintly and, as it were, from a distance: for seeing vaguely in their sleep the light of the lamp, as they supposed, which they saw but faintly, they instantly recognize when fairly awake to be really the light of the lamp, and similarly hearing faintly the cocks crowing, or the dogs barking, they recognize them definitely when fully awake. Some (sleepers) again even answer when they are asked a question; for it is quite possible, in the case of being awake and asleep, that when one is present the other is also in a certain sense. But none of these things can be called a dream. Nor can those real thoughts which occur in sleep in connexion with mental pictures. But the mental picture which arises from the movement of the senses when one is asleep, in so far as this condition exists, is a dream.

But it has been the lot of some that they have never seen a dream throughout their life. Such a condition is uncommon, but nevertheless it occurs. With some the condition lasts all through their lives, but with others dreams come to them when they are far ad-

Dreams and  
true  
perception  
in sleep.

## ARISTOTLE

482 b

τῆς ἡλικίας ἐγένετο, πρότερον οὐδὲν ἐνύπνιον ἔωρα-  
κόσιν. τὸ δὲ αἴτιον τοῦ μὴ γένεσθαι παραπλήσιόν  
τι δεῖ νομίζειν, ὅτι οὐδὲ μετὰ τὴν τροφὴν καθ-  
ηπνώσασιν οὐδὲ τοῖς παιδίοις γίνεται ἐνύπνιον.  
ὅσοις γάρ τοῦτον τὸν τρόπον συνέστηκεν ἡ φύσις  
ὡστε πολλὴν προσπίπτειν ἀναθυμίασιν πρὸς τὸν  
ἄνω τόπον, ἡ πάλιν καταφερομένη ποιεῖ πλῆθος  
κινήσεως, εὐλόγως τούτοις οὐδὲν φαίνεται φάν-  
τασμα. προϊούσης δὲ τῆς ἡλικίας οὐδὲν ἄτοπον  
10 φανῆναι ἐνύπνιον· μεταβολῆς γάρ τινος γενομένης  
ἢ καθ' ἡλικίαν ἡ κατὰ πάθος ἀναγκαῖον συμβῆναι  
τὴν ἐναντίωσιν ταύτην.

### ON DREAMS, III.

vanced in life, never having seen one before. One must suppose that the reason of its not occurring is the same as that which accounts for dreams not appearing to those who sleep after food, nor to children. For those whose nature is so constituted that much upward evaporation takes place, which when it descends again produces a considerable movement, naturally see no mental picture. But it is not surprising that dreams appear as their age advances ; for an opposite reaction must occur when a change takes place due to either age or illness.



# ON PROPHECY IN SLEEP



## INTRODUCTION

THE most astonishing thing about this short treatise is the purely modern scientific attitude which Aristotle adopts. All antiquity regarded dreams as analogous to demoniac possession, and therefore to be treated with reverence, and to a great extent worthy of trust. Aristotle prefaces his tract by suggesting that it is wrong either to reject or credulously accept the statement that dreams are of divine origin. He dismisses the majority of dreams as mere coincidences, and in this sense, outside causation ; but he clearly thinks that there is a residue which is capable of explanation, but only by a skilled interpreter.

# ΠΕΡΙ ΤΗΣ ΚΑΘ' ΤΠΝΟΝ ΜΑΝΤΙΚΗΣ

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I. Περὶ δὲ τῆς μαντικῆς τῆς ἐν τοῖς ὕπνοις γινομένης καὶ λεγομένης συμβαίνειν ἀπὸ τῶν ἐνυπνίων, οὔτε καταφρονῆσαι ῥάδιον οὔτε πεισθῆναι. τὸ μὲν 15 γὰρ πάντας ἢ πολλοὺς ὑπολαμβάνειν ἔχειν τι σημειῶδες τὰ ἐνύπνια παρέχεται πίστιν ὡς ἐξ ἐμπειρίας λεγόμενον, καὶ τὸ περὶ ἐνίων εἶναι τὴν μαντικὴν ἐν τοῖς ἐνυπνίοις οὐκ ἄπιστον. ἔχει γάρ τινα λόγον, διὸ καὶ περὶ τῶν ἄλλων ἐνυπνίων δόμοίν τις οἰηθείη. τὸ δὲ μηδεμίαν αἰτίαν 20 εὐλογον δρᾶν, καθ' ἣν ἂν γίνοιτο, τοῦτο διαπιστεῖν ποιεῖν. τό τε γὰρ θεὸν εἶναι τὸν πέμποντα, πρὸς τὴν ἄλλη ἀλογία, καὶ τὸ μὴ τοῖς βελτίστοις καὶ φρονιμωτάτοις ἄλλὰ τοῖς τυχοῦσι πέμπειν ἄτοπον. ἀφαιρεθείσης δὲ τῆς ἀπὸ τοῦ θεοῦ αἰτίας οὐδεμία τῶν ἄλλων εὐλογος εἶναι φαίνεται αἰτία. τὸ γὰρ 25 περὶ τῶν ἐφ' Ἡρακλείας στήλαις ἢ τῶν ἐν Βορυσθένει προορᾶν τινάς, ὑπὲρ τὴν ἡμετέραν εἶναι δόξειν ἂν σύνεσιν εὑρεῖν τούτων τὴν ἀρχήν.

'Ανάγκη δ' οὖν τὰ ἐνύπνια ἢ αἴτια εἶναι ἢ σημεῖα τῶν γιγνομένων ἢ συμπτώματα, ἢ πάντα ἢ ἔνια τούτων ἢ ἐν μόνον. λέγω δ' αἴτιον μὲν οἷον τὴν

## ON PROPHECY IN SLEEP

I. As for prophecy which takes place in sleep and which is said to arise from dreams, it is not a simple matter either to be contemptuous, or to be convinced. The fact that all, or at least many, suppose that dreams have a significance inclines one to believe, as the opinion is quoted as the result of experience, nor is it incredible that on some subjects there should be divination in dreams ; for it has some show of reason, and therefore one might suppose it true of other dreams as well. But the fact that one can see no reasonable cause why it should be so, makes one distrust it ; the idea that it is God who sends it, apart from its improbability on other grounds, is strange, especially as it does not come to the best and wisest, but to any chance persons. But, if we dismiss the theory that it comes from God, there seems no other probable explanation left ; for it seems beyond our understanding to find any reason why anyone should foresee things occurring at the Pillars of Heracles or on the Borysthenes.

Dreams must however be either the causes or signs of events which occur, or else coincidences, either all these, or some, or one only. By the word

Are they significant or mere coincidences?

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σελήνην τοῦ ἐκλείπειν τὸν ἥλιον καὶ τὸν κόπον τοῦ πυρετοῦ, σημεῖον δὲ τῆς ἐκλεύψεως τὸ τὸν ἀστέρα εἰσελθεῖν, τὴν δὲ τραχύτητα τῆς γλώττης τοῦ πυρέττειν, σύμπτωμα δὲ τὸ βαδίζοντος ἐκλείπειν τὸν ἥλιον· οὕτε γὰρ σημεῖον τοῦ ἐκλείπειν τοῦτον ἐστὶν οὕτ’ αἴτιον, οὕθ’ ἡ ἐκλεψίς τοῦ βαδίζειν. διὸ τῶν συμπτωμάτων οὐδὲν οὕτ’ ἀεὶ γίνεται οὕθ’ ὡς ἐπὶ τὸ πολύ. ἀρ’ οὖν ἐστὶ τῶν ἐνυπνίων τὰ μὲν αἴτια, τὰ δὲ σημεῖα, οἷον τῶν περὶ τὸ σῶμα συμβαινόντων; λέγουσι γοῦν καὶ τῶν ιατρῶν οἱ χαρίεντες ὅτι δεῖ σφόδρα προσέχειν τοῖς ἐνυπνίοις· εὐλογον δ’ οὕτως ὑπολαβεῖν καὶ τοῖς μὴ τεχνίταις μέν, σκοπούμενοις δέ τι καὶ φιλοσοφοῦσιν.

Λι γὰρ μεθ’ ἡμέραν γινόμεναι κινήσεις, ἀν μὴ σφόδρα μεγάλαι ὁσι καὶ ἴσχυραί, λανθάνουσι παρὰ μείζους τὰς ἐγρηγορικὰς κινήσεις. ἐν δὲ τῷ καθεύδειν τούναντίον· καὶ γὰρ αἱ μικραὶ μεγάλαι δοκοῦσιν εἶναι. δῆλον δ’ ἐπὶ τῶν συμβαινόντων κατὰ τοὺς ὑπνους πολλάκις· οἴονται γὰρ κεραυνοῦσθαι καὶ βροντᾶσθαι μικρῶν ἥχων ἐν τοῖς ὡσὶ γινομένων, καὶ μέλιτος καὶ γλυκέων χυμῶν ἀπολαύειν ἀκαριαίου φλέγματος καταρρέοντος, καὶ βαδίζειν διὰ πυρὸς καὶ θερμαίνεσθαι σφόδρα μικρᾶς θερμασίας περὶ τινα μέρη γιγνομένης. ἐπεγειρομένοις δὲ ταῦτα φανερὰ τοῦτον ἔχοντα τὸν τρόπον. ὥστ’ ἐπεὶ μικραὶ πάντων αἱ ἀρχαί, δῆλον ὅτι καὶ τῶν νόσων καὶ τῶν ἄλλων παθημάτων τῶν ἐν τοῖς σώμασι μελλόντων γίνεσθαι. φανερὸν οὖν ὅτι ταῦτα ἀναγκαῖον ἐν τοῖς ὑπνοῖς εἶναι καταφανῆ μᾶλλον ἥτις ἐν τῷ ἐγρηγορέναι.

## ON PROPHECY IN SLEEP, 1.

cause I mean in the sense in which the moon is the cause of an eclipse of the sun, or fatigue is the cause of fever ; the fact that a star enters our vision I call significant of the eclipse ; the roughness of the tongue is significant of fever, but the fact that some-one is walking when the sun is eclipsed is a coincidence. For this is neither the cause of, nor significant of the eclipse, any more than the eclipse is the cause or significant of a man walking. So no coincidence occurs invariably or even commonly. Is it true then that some dreams are causes and others significant—of what happens in the body for instance ? Even accomplished physicians say that close attention should be paid to dreams ; and it is natural for those to suppose so, who are not skilled, but who are inquirers and lovers of truth.

Impulses occurring in the daytime, if they are not very great and powerful, pass unnoticed because of greater waking impulses. But in the time of sleep the opposite takes place ; for then small impulses seem to be great. This is clear from what often happens in sleep : men think that it is lightning and thundering, when there are only faint echoes in their ears, and that they are enjoying honey and sweet flavours, when only a drop of phlegm is slipping down (their throats), and that they are walking through fire and are tremendously hot, when there is only a slight heating about certain parts. The true nature of these becomes obvious when they wake up. Since the beginnings of all things are small, obviously the beginnings of diseases and other distempers, which are about to visit the body, must also be small. These then must be more evident in the sleeping than in the waking state.

distortion  
by dreams.

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Αλλὰ μὴν καὶ ἔνια γε τῶν καθ' ὑπνον φαντασμάτων αἴτια εἶναι τῶν οἰκείων ἐκάστῳ πράξεων οὐκ ἄλογον· ὥσπερ γὰρ μέλλοντες πράττειν καὶ ἐν ταῖς 25 πράξειν ὅντες ἡ πεπραχότες πολλάκις εὐθυνούνειρίᾳ τούτοις σύνεσμεν καὶ πράττομεν (αἴτιον δ' ὅτι πρωδοποιημένη τυγχάνει ἡ κίνησις ἀπὸ τῶν μεθ' ἡμέραι ἀρχῶν), οὕτω πάλιν ἀναγκαῖον καὶ τὰς καθ' ὑπνον κινήσεις πολλάκις ἀρχῆν εἶναι τῶν μεθ' ἡμέραν πράξεων διὰ τὸ πρωδοποιηθῆσθαι πάλιν καὶ 80 τούτων τὴν διάνοιαν ἐν τοῖς φαντάσμασι τοῖς νυκτερινοῖς. οὕτω μὲν οὖν ἐνδέχεται τῶν ἐνυπνίων ἔνια καὶ σημεῖα καὶ αἴτια εἶναι.

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Τὰ δὲ πολλὰ συμπτώμασιν ἔοικε, μάλιστα δὲ τά τε ὑπερβατὰ πάντα καὶ διν μὴ ἐν αὐτοῖς ἡ ἀρχὴ οἷον<sup>1</sup> περὶ ναυμαχίας καὶ τῶν πόρρω συμβαινόντων ἐστίν· περὶ γὰρ τούτων τὸν αὐτὸν τρόπον ἔχειν εἰκὸς οἶον ὅταν μεμνημένω τινὶ περὶ τινος τύχῃ 5 τοῦτο γινόμενον· τί γὰρ κωλύει καὶ ἐν τοῖς ὑπνοις οὕτως; μᾶλλον δ' εἰκὸς πολλὰ τοιαῦτα συμβαίνειν. ὥσπερ οὖν οὐδὲ τὸ μνησθῆναι περὶ τοῦδε σημεῖον οὐδὲ αἴτιον τοῦ παραγενέσθαι αὐτόν, οὕτως οὐδὲ ἐκεῖν τοῦ ἀποβῆναι τὸ ἐνύπνιον τῷ ἰδόντι οὕτε σημεῖον οὔτ' αἴτιον, ἀλλὰ σύμπτωμα. διὸ καὶ 10 πολλὰ τῶν ἐνυπνίων οὐκ ἀποβαίνει· τὰ γὰρ συμπτώματα οὔτ' ἀεὶ οὕθ' ὡς ἐπὶ τὸ πολὺ γίνεται.

II. "Ολως δ' ἐπεὶ καὶ τῶν ἄλλων ζώων ὀνειρώτει τινά, θεόπεμπτα μὲν οὖν ἀν εἴη τὰ ἐνύπνια, οὐδὲ γέγονε τούτου χάριν, δαιμόνια μέντοι· ἡ γὰρ 15 φύσις δαιμονία, ἀλλ' οὐ θεία. σημεῖον δέ· πάνυ

<sup>1</sup> ἀλλὰ B.

## ON PROPHECY IN SLEEP, I.—II.

Again it is not unreasonable to suppose that some of the mental pictures which appear in sleep are the causes of the actions associated with them ; for just when you are going to act, or are engaged in some action, or have already completed it, you are often connected with this act and perform it in a vivid dream (the reason being that the impulse arising from the first cause in the daytime has paved the way for it), so conversely impulses in sleep must often be the first cause of actions in the daytime, because the way has been paved for the intention to do these actions in dreams at night. In this way then it is possible for some dreams to be both significant and causes.

They may cause action.

But most of them resemble coincidences, especially those which are extravagant, and which cannot initiate any action, but deal for instance with naval battles and far-off events ; in these cases it seems likely that the process is much the same, as when a man remembers a thing by chance and it occurs. Is there anything to prevent this occurring in sleep ? On the contrary, probably many dreams of this kind occur. Just as recollection was neither significant nor the cause of a man's appearing, so in our case the fact of the dream appearing to the man who saw it was neither significant, nor the cause, but only a coincidence. Consequently not many results come from dreams ; for coincidences do not occur invariably or even generally.

Some dreams are certainly coincidences.

II. Generally speaking, seeing that some of the lower animals also dream, dreams cannot be sent by God, nor is this the cause of their appearance, but they are miraculous ; for human nature is miraculous, though it is not divine. There is proof of this ; for

Normally dreams are not of divine origin.

## ARISTOTLE

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γὰρ εὐτελεῖς ἄνθρωποι προορατικοί εἰσι καὶ εὐθυ-  
όνειροι, ὡς οὐθεοῦ πέμποντος, ἀλλ' ὅσων ὥσπερ ἀν-  
εὶ λάλος ἡ φύσις ἐστὶ καὶ μελαγχολική, παντοδαπὰς  
ὅψεις ὀρῶσιν· διὰ γὰρ τὸ πολλὰ καὶ παντοδαπὰ  
κινεῖσθαι ἐπιτυγχάνουσιν ὅμοιοις θεωρήμασιν, ἐπι-  
20 τυχεῖς ὄντες ἐν τούτοις ὥσπερ ἔνιοι ἀρτιάζοντες<sup>1</sup>.  
ὥσπερ γὰρ καὶ λέγεται “ ἀν πολλὰ βάλλης, ἀλλοτ'  
ἀλλοῖον βαλεῖς ” καὶ ἐπὶ τούτων τοῦτο συμβαίνει.

“Οτι δ' οὐκ ἀποβαίνει πολλὰ τῶν ἐνυπνίων, οὐδὲν  
ἄτοπον· οὐδὲ γὰρ τῶν ἐν τοῖς σώμασι σημείων καὶ  
τῶν οὐρανίων, οἷον τὰ τῶν ὑδάτων καὶ τὰ τῶν  
25 πνευμάτων· ἀν γὰρ ἄλλη κυριωτέρα ταύτης συμβῆ  
κύνησις, ἀφ' ἣς μελλούσης ἐγένετο τὸ σημεῖον, οὐ  
γίνεται. καὶ πολλὰ βουλευθέντα καλῶς τῶν πραχ-  
θῆναι δεόντων διελύθη δι' ἄλλας κυριωτέρας ἀρχάς.  
ὅλως γὰρ οὐ πᾶν γίνεται τὸ μελλῆσαν, οὐδὲ ταύτῳ  
80 τὸ ἐσόμενον καὶ τὸ μέλλον· ἀλλ' ὅμως ἀρχάς τε  
λεκτέον εἶναι, ἀφ' ὃν οὐκ ἐπετελέσθη, καὶ σημεῖα  
πέφυκε ταῦτα τινῶν οὐ γενομένων.

464 a Περὶ δὲ τῶν μὴ τοιαύτας ἔχόντων ἀρχὰς ἐνυπνίων  
οἵας εἴπομεν, ἀλλ' ὑπερορίας ἡ τοῖς χρόνοις ἡ τοῖς  
τόποις ἡ τοῖς μεγέθεσιν, ἡ τούτων μὲν μηδέν, μὴ  
μέντοι γε ἐν αὐτοῖς ἔχόντων τὰς ἀρχὰς τῶν ἴδόντων  
τὸ ἐνύπνιον, εἰ μὴ γίνεται τὸ προορᾶν ἀπὸ συμπτώ-  
5 ματος, τοιόνδ' ἀν εἴη μᾶλλον ἡ ὥσπερ λέγει Δη-  
μόκριτος εἴδωλα καὶ ἀπορροίας αἰτιώμενος. ὥσπερ  
γὰρ ὅταν κινήσῃ τι τὸ ὕδωρ ἡ τὸν ἀέρα, τοῦθ'  
ἔτερον ἐκίνησε, καὶ παυσαμένου ἐκείνου συμβαίνει

<sup>1</sup> ἀρτια μερίζοντες B.

## ON PROPHECY IN SLEEP, II.

some inferior men have prophetic and vivid dreams, so they cannot be sent by God; but men whose nature is garrulous or melancholic see all kinds of visions; because they respond often to any kind of stimulus, they chance upon visions similar to these, lighting upon them in the same way as some men playing odd and even, for as the saying goes: If you cast a die many times you will be sure to cast differently at some time. In the case we are discussing the same thing happens.

But it is in no way surprising that no results follow many dreams; for they do not always follow bodily and heavenly symptoms, as we see in the case of rain and wind; for if another impulse supervenes more powerful than that from which in the future the symptoms arise, there is no result from it. Many things that require doing, though excellently planned, fail owing to more powerful causes. Speaking quite generally not all probabilities occur, nor is that which shall be the same as that which is likely to be; but all the same we must call these beginnings from which no result ensues, and there are genuine symptoms of some things which do not happen.

But dreams which have not beginnings of the kind we have described, but are outside possibility either in time, or place, or size, or they may be none of these but yet of the kind, the beginnings of which those who see the dream cannot control, unless the prediction is purely a coincidence, such dreams seem to have the following explanation rather than that given by Democritus, who attributes them to images and emanations. When anything stirs water or air, this in its turn causes movement, and when the first impulse has ceased, a similar movement still con-

Why dreams  
come to men  
of inferior  
intelligence.

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τὴν τοιωτην κύνησιν προϊέναι μέχρι τινός, τοῦ κινήσαντος οὐ παρόντος, οὕτως οὐδὲν κωλύει 10 κύνησίν τινα καὶ αἴσθησιν ἀφικνεῖσθαι πρὸς τὰς ψυχὰς τὰς ἐνυπνιαζούσας, ἀφ' ὧν ἐκεῖνος τὰ εἴδωλα ποιεῖ καὶ τὰς ἀπορροίας, καὶ ὅπη δὴ ἔτυχεν ἀφικιούμενας μᾶλλον αἴσθητὰς εἶναι νύκτωρ διὰ τὸ μεθ' ἡμέραν φερομένας διαλύεσθαι μᾶλλον (ἀταραχω- 15 δέστερος γὰρ ὁ ἀὴρ τῆς νυκτὸς διὰ τὸ νημεμωτέρας εἶναι τὰς νύκτας), καὶ ἐν τῷ σώματι ποιεῖν αἴσθησιν διὰ τὸν ὕπνον, διὰ τὸ καὶ τῶν μικρῶν κινήσεων τῶν ἐντὸς αἰσθάνεσθαι καθεύδοντας μᾶλλον ἢ ἐγρηγορότας. αὗται δ' αἱ κινήσεις φαντάσματα ποιοῦσιν, ἐξ ὧν προορῶσι τὰ μέλλοντα περὶ τῶν τοιούτων. 20 καὶ διὰ ταῦτα συμβαίνει τὸ πάθος τοῦτο τοῖς τυχοῦσι καὶ οὐ τοῖς φρονιμωτάτοις. μεθ' ἡμέραν τε γὰρ ἐγίνετ' ἄν καὶ τοῖς σοφοῖς, εἰ θεὸς ἢν ὁ πέμπων· οὕτω δὲ εἰκὸς τοὺς τυχόντας προορᾶν· ἢ γὰρ διάνοια τῶν τοιούτων οὐ φροντιστικὴ ἀλλ' ὥσπερ ἔρημος καὶ κενὴ πάντων, καὶ κινηθεῖσα κατὰ τὸ κινοῦν ἄγεται.

25 Καὶ τοῦ ἐνίους τῶν ἐκστατικῶν προορᾶν αἴτιον ὅτι αἱ οἰκεῖαι κινήσεις οὐκ ἐνοχλοῦσιν ἀλλ' ἀπορραπίζονται· τῶν ἔνεικῶν οὖν μάλιστα αἰσθάνονται. τὸ δέ τινας εὐθυνούείρους εἶναι καὶ τὸ τοὺς γνωρίμους περὶ τῶν γνωρίμων μάλιστα προορᾶν συμβαίνει διὰ τὸ μάλιστα τοὺς γνωρίμους ὑπὲρ ἀλλήλων 30 φροντίζειν· ὥσπερ γὰρ πόρρω ὅντων μάλιστα<sup>1</sup> γνωρίζουσι καὶ αἰσθάνονται, οὕτω καὶ τῶν κινήσεων· αἱ γὰρ τῶν γνωρίμων γνωριμώτεραι κινήσεις. οἱ δὲ μελαγχολικοὶ διὰ τὸ σφόδρα, ὥσπερ βάλλοντες

<sup>1</sup> τάχιστα B.

## ON PROPHECY IN SLEEP, II.

tinues up to a point, though the first impulse is over ; just in the same way there is nothing to prevent some movement and perception coming to souls that are asleep, from which Democritus constructs his images and emanations, and however it happens they are more easily perceived by night, because in the day-time they are apt to be borne away and dissipated (for the air is less disturbed at night because the nights are calmer), and they cause sensation in the body owing to sleep, because men are more conscious of small internal movements when asleep than when awake. But these impulses produce mental pictures, from which men predict what will happen about such things. This is why this affection occurs more readily to ordinary men, and not to those who are specially intelligent. If it were God that sent them they would appear by day also, and to the wise ; but, as it is, it is natural that ordinary men should foresee ; for the minds of such men are not given to deep thought, but are empty and vacant of all thoughts, and when once stimulated follow the impulse.

The reason why some whose minds are unstable foresee, is that their own mental impulses do not occlude others, but are driven off by them. So they are most sensitive to outside impulses. For some cases of vivid dreams there are special explanations : for instance when men have visions about their friends, it is because those who are great friends think a good deal about each other : for just as they perceive and recognize each other most often at a distance, so it acts with impulses ; for the impulses of well-known friends are themselves more well known. The melancholic, because of their intense

Some dreams have special causes.

## ARISTOTLE

484 **ν** πόρρωθεν, εὕστοχοί εἰσιν. καὶ διὰ τὸ μεταβλητικὸν ταχὺ τὸ ἔχόμενον φαντάζεται αὐτοῖς· ὥσπερ γὰρ τὰ Φιλαιγίδου ποιῆματα καὶ οἱ ἔμμανεῖς ἔχόμενα τοῦ ὄμοίου λέγουσι καὶ διανοοῦνται, οἷον Ἀφροδίτην, καὶ οὕτω συνείρουσιν εἰς τὸ πρόσω. ἔτι δὲ διὰ τὴν σφοδρότητα οὐκ ἐκρούεται αὐτῶν ἡ κίνησις ὑφ' ἔτέρας κινήσεως.

Τεχνικώτατος δ' ἔστι κριτὴς ἐνυπνίων ὅστις δύναται τὰς ὄμοιότητας θεωρεῖν· τὰς γὰρ εὐθυ-  
ονειρίας κρίνειν παντός ἔστιν. λέγω δὲ τὰς ὄμοιό-  
τητας, ὅτι παραπλήσια συμβαίνει τὰ φαντάσματα τοῖς  
10 ἐν τοῖς ὅρασιν εἰδώλοις, καθάπερ καὶ πρότερον εἴπομεν. ἔκει δέ, ἀν πολλὴ γίνηται ἡ κίνησις, οὐδὲν ὄμοία γίνεται ἡ ἔμφασις καὶ τὰ εἰδώλα τοῖς ἀληθινοῖς. δεινὸς δὴ τὰς ἔμφασεις κρίνειν εἴη ἀν  
οἱ δυνάμενος ταχὺ διαισθάνεσθαι καὶ συνορᾶν τὰ  
διαπεφορημένα καὶ διεστραμμένα τῶν εἰδώλων, ὅτι  
15 ἔστιν ἀνθρώπου ἡ ἵππου ἡ ὀτουδήποτε. κάκει δὴ ὄμοίως τι δύναται τὸ ἐνύπνιον τοῦτο· ἡ γὰρ κίνησις ἐκκόπτει τὴν εὐθυνοειρίαν. τί μὲν οὖν ἔστιν ὅπνος καὶ ἐνύπνιον, καὶ διὰ τίν' αἰτίαν ἐκάτερον αὐτῶν γίνεται, ἔτι δὲ περὶ τῆς ἐκ τῶν ἐνυπνίων μαντικῆς εἴρηται.

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feelings, are (to use a metaphor) good at aiming, as if they were shooting from a distance. And because of their liability to change, the next picture in the series comes rapidly before them ; just as even the insane recite and con over the poems of Philaegidas, such as the Aphrodite, because the ideas are all associated ; so the melancholic pursue a series. Also owing to their intense feeling the one impulse is not violently displaced by another.

But the most skilful judge of dreams is the man who possesses the ability to detect likenesses ; for anyone can judge the vivid dream. By likenesses I mean that the mental pictures are like reflections in water, as we have said before. If there is much movement, the reflection is not like the original, nor the image like the real. Now the man would be indeed a clever interpreter of dreams who could quickly discriminate, and make these scattered and distorted images into a complete picture of a man, say, or a horse or any other object. Now the dream has a somewhat similar power ; for movement destroys the vivid dream. We have then explained what sleep and dreams are, why each of them occurs and also about prophecy from dreams.



ON LENGTH AND  
SHORTNESS OF LIFE



## INTRODUCTION

ARISTOTLE here attempts to decide what factors contribute to short and long life in the animal and plant. He is concerned with the normal life only, quite apart from short life due either to disease or accident.

He first determines a number of conditions which do not affect the question, such as climate, size and so on, and then appears to conclude that the determining factors are warmth and moisture. It does not seem to have occurred to him that as a general rule the longer an organic structure takes to develop, the longer it survives without decay.

In the latter part of this treatise a similar principle is applied. Youth and life are naturally associated with warmth, old age and death with cold. Aristotle therefore concludes that warmth and cold are the causes of the respective states.

There is not very much in this essay to help the modern reader, but it will be noticed that the treatment is almost entirely physiological ; the philosophical side of these questions is neglected.

## ΠΕΡΙ ΜΑΚΡΟΒΙΟΤΗΤΟΣ ΚΑΙ ΒΡΑΧΤΒΙΟΤΗΤΟΣ

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I. Περὶ δὲ τοῦ τὰ μὲν εἶναι μακρόβια τῶν ζώων  
τὰ δὲ βραχύβια, καὶ περὶ ζωῆς ὅλως μήκους καὶ  
βραχύτητος ἐπισκεπτέον τὰς αὐτίας. ἀρχὴ δὲ τῆς  
σκέψεως ἀναγκαία πρῶτον ἐκ τοῦ διαπορῆσαι περὶ  
αὐτῶν. οὐ γάρ ἔστι δῆλον πότερον ἔτερον ἢ τὸ  
αὐτὸν αἴτιον πᾶσι τοῖς ζώοις καὶ φυτοῖς τοῦ τὰ μὲν  
εἶναι μακρόβια τὰ δὲ βραχύβια· καὶ γὰρ τῶν φυτῶν  
τὰ μὲν ἐπέτειον τὰ δὲ πολυχρόνιον ἔχει τὴν ζωήν.  
ἔτι δὲ πότερον ταῦτα μακρόβια καὶ τὴν φύσιν  
ὑγιεινὰ τῶν φύσει συνεστώτων, ἢ κεχώρισται καὶ  
τὸ βραχύβιον καὶ τὸ νοσῶδες, ἢ κατ’ ἐνίας μὲν  
νόσους ἐπαλλάττει τὰ νοσώδη τὴν φύσιν σώματα  
τοῖς βραχυβίοις, κατ’ ἐνίας δ’ οὐδὲν κωλύει νοσώ-  
δεις εἶναι μακροβίους ὄντας.

Περὶ μὲν οὖν ὑπουν καὶ ἐγρηγόρσεως εἴρηται  
πρότερον, περὶ δὲ ζωῆς καὶ θανάτου λεκτέον  
ὕστερον, δμοίως δὲ καὶ περὶ νόσου καὶ ὑγιείας,  
485 <sup>a</sup> ὅσον ἐπιβάλλει τῇ φυσικῇ φιλοσοφίᾳ· νῦν δὲ περὶ  
τῆς αὐτίας τοῦ τὰ μὲν εἶναι μακρόβια τὰ δὲ βραχύ-  
βια, καθάπερ εἴρηται πρότερον, θεωρητέον. ἔστι  
δ’ ἔχοντα τὴν διαφορὰν ταύτην ὅλα τε πρὸς ὅλα

## ON LENGTH AND SHORTNESS OF LIFE

I. Our task is now to consider the reasons why some living creatures are long-lived and others short-lived, and generally to inquire into length and shortness of life. The necessary starting-point of our inquiry is the difficulties that arise on the subject. For it is not clear whether the reason why some animals and plants are long-lived, and others short-lived, is the same in all cases or different. For some plants last only for one year, while others live for a long time. Secondly, are longevity and good health the same thing in the case of all natural structures, or are short life and disease unconnected, or again in some diseases do disease and short life go together, while in others there is nothing to prevent the diseased from being also long-lived?

We have previously discussed sleep and the waking state, and later on we must speak of life and death, and similarly of disease and health, as far as they contribute to physical philosophy. But our present inquiry is concerned with the reasons why some living things live long, and some are short-lived. Now different genera exhibit differences, and also we find

465 a

γένη, καὶ τῶν ὑφ' ἐν εἶδος ἔτερα πρὸς ἔτερα. λέγω  
 5 δὲ κατὰ γένος μὲν διαφέρειν οἷον ἄνθρωπον πρὸς  
 ἵππον (μακροβιώτερον γάρ τὸ τῶν ἀνθρώπων γένος  
 ἢ τὸ τῶν ἵππων), κατ' εἶδος δ' ἄνθρωπον πρὸς  
 ἄνθρωπον· εἰσὶν γάρ καὶ ἄνθρωποι οἱ μὲν μακρόβιοι  
 οἱ δὲ βραχύβιοι ἔτεροι καθ' ἔτέρους τόπους διεστῶ-  
 τες· τὰ μὲν γάρ ἐν τοῖς θερμοῖς τῶν ἔθνῶν μακρο-  
 10 βιώτερα, τὰ δ' ἐν τοῖς ψυχροῖς βραχυβιώτερα.  
 καὶ τῷ τὸν αὐτὸν δὲ τόπον οἰκούντων διαφέρουσιν  
 δόμοις τινὲς ταύτην πρὸς ἀλλήλους τὴν διαφοράν.

II. Δεῖ δὴ λαβεῖν τί τὸ εὑφθαρτον ἐν τοῖς φύσει  
 συνεστῶσι καὶ τί τὸ οὐκ εὑφθαρτον. πῦρ γάρ καὶ  
 15 ὕδωρ καὶ τὰ τούτοις συγγενῆ, οὐκ ἔχοντα τὴν  
 αὐτὴν δύναμιν, τυγχάνει γενέσεως καὶ φθορᾶς  
 αἴτια ἀλλήλοις, ὥστε καὶ τῶν ἀλλων ἔκαστον ἐκ  
 τούτων ὅντα καὶ συνεστῶτα μετέχειν τῆς τούτων  
 φύσεως εὐλογον, ὅσα μὴ συνθέσει ἐκ πολλῶν ἐστόν,  
 οἷον οἰκία. περὶ μὲν οὖν τῶν ἀλλων ἔτερος λόγος·  
 20 εἰσὶν γάρ ἴδιαι φθοραὶ πολλοῖς τῶν ὅντων, οἷον  
 ἐπιστήμη καὶ ὑγιεία καὶ νόσω· ταῦτα γάρ φθείρεται  
 καὶ μὴ φθειρομένων τῶν δεκτικῶν ἀλλὰ σωζομένων,  
 οἷον ἀγνοίας μὲν φθορὰ ἀνάμνησις καὶ μάθησις,  
 ἐπιστήμης δὲ λήθη καὶ ἀπάτη. κατὰ συμβεβηκός  
 25 δ' ἀκολουθοῦσι τοῖς φυσικοῖς αἱ τῶν ἀλλων φθοραί·  
 φθειρομένων γάρ τῶν ζώων φθείρεται καὶ ἡ ἐπι-  
 στήμη καὶ ἡ ὑγιεία ἡ ἐν τοῖς ζώοις.

Διὸ καὶ περὶ ψυχῆς συλλογίσαιτ<sup>3</sup> ἄν τις ἐκ τού-  
 των· εἰ γάρ ἐστι μὴ φύσει ἀλλ' ὥσπερ ἐπιστήμη ἐν  
 ψυχῇ, οὕτω καὶ ψυχὴ ἐν σώματι, εἴη ἄν τις αὐτῆς

## ON LENGTH OF LIFE, I.—II.

differences between individuals included under one species. By differences in genus I mean for instance between man to horse (for the genus man is longer-lived than the genus horse), and by specific difference I mean between man and man ; for some men are long-lived, and some short-lived, varying in different places ; for races living in hot countries live longer than those in cold countries. Some also living in the same place exhibit the same differences among themselves.

II. We must of course consider why among natural objects one is easily destroyed and another is not. For fire, water and other elements akin to them, but not having the same power, are mutually the cause of each other's birth and destruction, so that it is only natural that anything proceeding from or composed of these elements should share in a like character, except for those things which are composed of many elements, such as a house. With regard to all other things it is a different question ; for many existing things such as knowledge and health have their own peculiar sources of destruction ; for these can be destroyed even when what contains them is not destroyed, but continues to exist : for instance learning and recollection destroy ignorance, and forgetfulness and deception destroy knowledge. But the fact that the destruction of other things follows the destruction of natural objects is only accidental, for when living creatures are destroyed, the knowledge and health that is in them are destroyed also.

From these facts one might come to some conclusion about the soul, for if the soul is not by its own nature contained in a body, but only in the way in which knowledge is contained in the soul, it might be

The sources  
of destruction.

ARISTOTLE

465 a

30 καὶ ἄλλη φθορὰ παρὰ τὴν φθορὰν ἦν φθείρεται φθειρομένου τοῦ σώματος. ὥστ' ἐπεὶ οὐ φαίνεται τοιαύτη οὖσα, ἄλλως ἀν ἔχοι πρὸς τὴν τοῦ σώματος κοινωνίαν.

465 b

III. "Ισως δ' ἀν τις ἀπορήσειεν εὐλόγως, ἀρ ἐστιν οὖ ἄφθαρτον ἐσται τὸ φθαρτόν, οἶν τὸ πῦρ ἄνω, οὐ μή ἐστι τὸ ἐναντίον. φθείρεται γὰρ τὰ μὲν ὑπάρχοντα τοῖς ἐναντίοις κατὰ συμβεβηκός, 5 τῷ ἐκεῖνα φθείρεσθαι· ἀναιρεῖται γὰρ τάνατία ὑπ' ἄλλήλων· κατὰ συμβεβηκός δ' οὐθὲν τῶν ἐν ταῖς οὐσίαις ἐναντίων φθείρεται, διὰ τὸ μηθενὸς ὑποκειμένου κατηγορεῖσθαι τὴν οὐσίαν. ὥσθ' φ μή ἐστιν ἐναντίον καὶ ὅπου μή ἐστιν, ἀδύνατον ἀν εἶη φθαρῆναι· τί γὰρ ἐσται τὸ φθεροῦν, εἴπερ ὑπ' ἐν- 10 αντίων μὲν φθείρεσθαι συμβαίνει μόνων, τοῦτο δὲ μὴ ὑπάρχει, ἢ ὅλως ἢ ἐνταῦθα; ἢ τοῦτο τῇ μὲν ἀληθές ἐστι τῇ δ' οὐ· ἀδύνατον γὰρ τῷ ὕλην ἔχοντι μὴ ὑπάρχειν πως τὸ ἐναντίον. πάντῃ μὲν γὰρ ἐνεῖναι τὸ θερμὸν ἢ τὸ εὐθὺν ἐνδέχεται, πᾶν δ' εἶναι ἀδύνατον ἢ θερμὸν ἢ εὐθὺν ἢ λευκόν· ἐσται γὰρ τὰ 15 πάθη κεχωρισμένα. εἰ οὖν, ὅταν ἄμα ἢ τὸ ποιητικὸν καὶ τὸ παθητικόν, ἀεὶ τὸ μὲν ποιεῖ τὸ δὲ πάσχει, ἀδύνατον μὴ μεταβάλλειν. ἔτι καὶ εἰ ἀνάγκη περίττωμα ποιεῖν, τὸ δὲ περίττωμα ἐναντίον· ἔξι ἐναντίου γὰρ ἀεὶ ἢ μεταβολή, τὸ δὲ περίττωμα ὑπόλειμμα τοῦ προτέρου. εἰ δὲ πᾶν 20 ἔξελαύνει τὸ ἐνεργείᾳ ἐναντίον, καν ἐνταῦθ' ἀ-

## ON LENGTH OF LIFE, II.—III.

liable to some other form of destruction beyond that which overtakes it when the body is damaged. Since this is evidently not the case, the association of the soul with the body cannot be like that of knowledge within the soul.

III. A question may here be raised whether there is any place in which the destructible is not destroyed, as is the case with fire in the upper regions, where no opposite exists. For attributes belonging to opposites are destroyed only incidentally, because the opposites in question are destroyed ; for opposites are removed by each other ; but none of the opposites which exist in substances is destroyed incidentally, because substance cannot be an attribute of any subject. It would therefore be impossible for anything to be destroyed which has no opposite, or where its opposite does not exist. For what would there be to destroy it, if things can only be destroyed by their opposites, and if such an opposite does not exist either at all, or at that particular place ? Perhaps this statement is partly true and partly untrue ; for everything which possesses matter must have an opposite in some sense. Qualities such as heat or straightness may exist in any substance, but no substance can consist solely of heat, straightness or whiteness ; for in that case affections could exist in isolation. If then, whenever what acts and what is acted upon exist together, one acts and the other is acted upon, it is impossible that there should be no change. Further if it is necessary that a surplus should be produced, then this surplus is an opposite ; for all change is produced by an opposite, and the surplus is what is left over from the former state. If then all active opposites are driven out, there we should have indestructibility. But yet this

Is inde-  
structibility  
impossible ?

485 b

φθαρτον ἀν εἴη. ή οὖ, ἀλλ' ὑπὸ τοῦ περιέχοντος φθείρεται.

Εἰ μὲν οὖν ἵκανόν, ἐκ τῶν εἰρημένων· εἰ δὲ μή, ὑποθέσθαι δεῖ ὅτι ἔνεστί τι ἐνεργείᾳ ἐναντίον, καὶ περίττωμα γίνεται. διὸ ή ἐλάττων φλὸξ κατακάεται ὑπὸ τῆς πολλῆς κατὰ συμβεβηκός, ὅτι ή τροφὴ 25 ήν ἐκείνη ἐν πολλῷ χρόνῳ ἀναλίσκει τὸν καπνόν, ταύτην ή πολλὴ φλὸξ ταχύ. διὸ πάντα ἀεὶ ἐν κινήσει ἔστι, καὶ γίνεται ή φθείρεται. τὸ δὲ περιέχον ή συμπράττει ή ἀντιπράττει. καὶ διὰ τοῦτο μετατιθέμενα πολυχρονιώτερα μὲν γίνεται καὶ διλιγοχρονιώτερα τῆς φύσεως, ἀīδια δ' οὐδαμοῦ, 50 ὅσοις ἐναντία ἔστιν· εὐθὺς γὰρ ή ὑλη τὸ ἐναντίον ἔχει. ὥστ' εἰ μὲν τοῦ ποῦ, κατὰ τόπον μεταβάλλει, εἰ δὲ τοῦ ποσοῦ, κατ' αὔξησιν καὶ φθίσιν· εἰ δὲ πάθους, ἀλλοιοῦται.

486 a IV. "Εστι δ' οὕτε τὰ μέγιστα ἀφθαρτότερα (ἴππος γὰρ ἀνθρώπου βραχυβιώτερον) οὕτε τὰ μικρά (ἐπέτεια γὰρ τὰ πολλὰ τῶν ἐντόμων) οὕτε τὰ φυτὰ ὄλως τῶν ζώων (ἐπέτεια γὰρ ἔνια τῶν 5 φυτῶν) οὕτε τὰ ἔναιμα (μέλιττα γὰρ πολυχρονιώτερον ἐνίων ἐναίμων) οὕτε τὰ ἔναιμα (τὰ γὰρ μαλάκια ἐπέτεια μέν, ἔναιμα δέ) οὕτε τὰ ἐν τῇ γῇ (καὶ γὰρ φυτὰ ἐπέτειά ἔστι καὶ ζῷα πεζά) οὕτε τὰ ἐν τῇ θαλάττῃ (καὶ γὰρ ἐκεῖ βραχύβια καὶ τὰ ὀστρακηρὰ καὶ τὰ μαλάκια). ὄλως δὲ τὰ μακροβιώτατα ἐν τοῖς φυτοῖς ἔστιν, οἷον ὁ φοῖνιξ· εἰτ' 10 394

## ON LENGTH OF LIFE, III.—IV.

would not be the case ; it would be destroyed by its own envelope.

If we have argued the point sufficiently, then it <sup>Nothing</sup> may stand according to what we have said ; but if <sup>can last</sup> for ever. not, one must assume that there is some active opposite, and that a surplus arises. So the lesser flame is consumed by the greater incidentally, because the nourishment—namely the smoke—which the lesser flame exhausts after a long time, is exhausted rapidly by the greater. So everything is in a state of movement, and is either being born, or is being destroyed. Its envelope either works with it or against it. Changing as everything does for this reason, things may be longer or shorter lived than their own nature allows, but in no case can they be everlasting, if they have opposites ; for their matter at once has an opposite. So that if there is an opposite in position, the change is one of locality, if of quantity, the change takes place by growth and decay ; if the opposite is an affection, a change of state results.

IV. Large things as a class are not less liable to destruction (for a horse does not live as long as a man), <sup>How far is longevity dependent on size?</sup> nor are small things (for most of the insects only live a year), nor the plants as a whole less than the animals (for some plants are annuals), nor those having blood (for the bee lives longer than some full-blooded animals), nor the bloodless (for the mollusca, which are bloodless, only live for a year), nor land creatures (for there are plants and land animals which only live for a year), nor marine creatures (for in the sea the testacea and mollusca are both short-lived). Generally speaking the longest lived are to be found among plants, *e.g.* the date-palm ; secondly, longevity is

## ARISTOTLE

486 a

ἐν τοῖς ἐναίμοις ζώοις μᾶλλον ἢ ἐν τοῖς ἀναίμοις,  
καὶ ἐν τοῖς πεζοῖς ἢ ἐν τοῖς ἐνύδροις. ὥστε καὶ  
συνδυασθέντων ἐν τοῖς ἐναίμοις καὶ πεζοῖς τὰ  
μακροβιώτατα τῶν ζώων ἔστιν, οἷον ἄνθρωπος καὶ  
ἐλέφας. καὶ δὴ καὶ τὰ μείζω ὡς ἐπὶ τὸ πολὺ<sup>15</sup>  
εἰπεῖν τῶν ἐλαττόνων μακροβιώτερα· καὶ γὰρ καὶ  
τοῖς ἄλλοις συμβέβηκε τοῖς μακροβιώτάτοις μέγε-  
θος, ὥσπερ καὶ τοῖς εἰρημένοις.

V. Τὴν δ' αἰτίαν περὶ τούτων ἀπάντων ἐντεῦθεν  
ἄν τις θεωρήσειεν. δεῖ γὰρ λαβεῖν ὅτι τὸ ζῷόν  
ἔστι φύσει ὑγρὸν καὶ θερμόν, καὶ τὸ ζῆν τοιοῦτον,<sup>20</sup>  
τὸ δὲ γῆρας ψυχρὸν καὶ ξηρόν, καὶ τὸ τεθνηκός·  
φαίνεται γὰρ οὕτως. Ὡλη δὲ τῶν σωμάτων τοῖς  
οὖσι ταῦτα, τὸ θερμὸν καὶ τὸ ψυχρόν, καὶ τὸ ξηρόν  
καὶ τὸ ὑγρόν. ἀνάγκη τοίνυν γηράσκοντα ξηραί-  
νεσθαι. διὸ δεῖ μὴ εὐξήραντον εἶναι τὸ ὑγρόν. καὶ  
διὰ τοῦτο τὰ λιπαρὰ ἀσηπτα. αἴτιον δ' ὅτι ἀέρος·<sup>25</sup>  
οὐδ' ἀὴρ πρὸς τὰλλα πῦρ· πῦρ δ' οὐ γίνεται σαπρόν.  
οὐδ' αὖ δὲ λίγον δεῖ εἶναι τὸ ὑγρόν· εὐξήραντον γὰρ  
καὶ τὸ δὲ λίγον. διὸ καὶ τὰ μεγάλα καὶ ζῷα καὶ  
φυτὰ ὡς ὅλως εἰπεῖν μακροβιώτερα, καθάπερ  
ἐλέχθη πρότερον· εὐλογον γὰρ τὰ μείζω πλέον  
ἔχειν ὑγρόν. οὐ μόνον δὲ διὰ τοῦτο μακροβιώτερα·<sup>30</sup>  
δύο γὰρ τὰ αἴτια, τό τε ποσὸν καὶ τὸ ποιόν, ὥστε  
δεῖ μὴ μόνον πλῆθος εἶναι ὑγροῦ, ἀλλὰ τοῦτο καὶ  
θερμόν, ἵνα μήτε εὕπηκτον μήτε εὐξήραντον ἦ.  
καὶ διὰ τοῦτο ἄνθρωπος μακρόβιον μᾶλλον ἐνίων  
μειζόνων· μακροβιώτερα γὰρ τὰ λειπόμενα τῷ<sup>400 b</sup>  
πλήθει τοῦ ὑγροῦ, ἐὰν πλείουν λόγῳ ὑπερέχῃ κατὰ

## ON LENGTH OF LIFE, iv.—v.

commoner among the animals with blood than among those without, and among land animals rather than water animals. Coupling together the two qualities of having blood and living on land, the longest lived of all creatures are the man and the elephant. Speaking generally the larger animals are longer lived than the smaller. For size will be found to belong to the other very long-lived creatures as it does to the two we have mentioned.

V. One might suggest reasons for all these facts as follows. One must admit that the living creature is naturally moist and warm, and that life too is of this nature, whereas old age is cold and dry, and so is a dead body. This is obvious. Now the matter of which bodies are composed among the living consists of hot and cold, dry and moist. But as they grow old they must dry up. So the moist must not be easily dried. For this reason oily things are less liable to decay. The reason for this is that they contain air ; and air bears the same relation to the other elements as fire does ; and fire is not liable to decay. Nor must the moisture exist in small quantity ; for a small quantity is easily dried. For this reason the large creatures—both animals and plants—are generally speaking longer lived, as has been said above ; for the larger animal naturally contains more moisture. But this is not the only reason for their greater longevity ; there are two causes, quantity and quality, so that the moisture must not only be present in quantity, but this must also be hot, in order that it may not easily be either frozen or dried. This is why man is longer lived than some larger creatures ; for those creatures with a smaller quantity of moisture will be longer lived if their excess in

Heat and  
moisture  
as factors  
in the  
problem.

# ARISTOTLE

486 b

τὸ ποιὸν ἢ λείπεται κατὰ τὸ ποσόν. ἔστι δ' ἐνίοις  
μὲν τὸ θερμὸν τὸ λιπαρόν, ὃ ἄμα ποιεῖ τό τε μὴ  
εὐξήραντον καὶ τὸ μὴ εὔψυκτον· ἐνίοις δ' ἄλλον  
ἔχει χυμόν.

5 "Ετι δεῖ τὸ μέλλον εἶναι μὴ εὔφθαρτον μὴ περιτ-  
τωματικὸν εἶναι. ἀναιρεῖ γάρ τὸ τοιοῦτον ἢ νόσῳ  
ἢ φύσει· ἐναντία δ' ἡ τοῦ περιττώματος δύναμις  
καὶ φθαρτικὴ ἡ μὲν τῆς φύσεως ἡ δὲ μορίου. διὸ  
τὰ ὄχευτικὰ καὶ πολύσπερμα γηράσκει ταχύ· τὸ  
γάρ σπέρμα περίπτωμα, καὶ ἔτι ξηραίνει ἀπιόν.  
10 καὶ διὰ τοῦτο ἡμίονος μακροβιώτερος ἵππον καὶ  
ὄνου, ἐξ ὧν ἐγένετο, καὶ τὰ θήλεα τῶν ἀρρένων,  
ἐὰν ὄχευτικὰ ἢ τὰ ἄρρενα· διὸ οἱ στρουθοὶ οἱ ἄρρενες  
βραχυβιώτεροι τῶν θηλειῶν. ἔτι δὲ καὶ ὅσα  
πονητικὰ τῶν ἀρρένων, καὶ διὰ τὸν πόνον γηράσκει  
μᾶλλον· ξηραίνει γάρ ὁ πόνος, τὸ δὲ γῆρας ξηρόν  
15 ἔστιν. φύσει δὲ καὶ ὡς ἐπὶ τὸ πᾶν εἰπεῖν τὰ ἄρρενα  
τῶν θηλειῶν μακροβιώτερα· αἵτιον δ' ὅτι θερμό-  
τερον ζῷον τὸ ἄρρεν ἔστι τοῦ θήλεος. τὰ δ' αὐτὰ  
ἐν τοῖς ἀλεεινοῖς μακροβιώτερά ἔστιν ἢ ἐν τοῖς  
ψυχροῖς τόποις, διὰ τὴν αὐτὴν αἰτίαν δι' ἥνπερ τὰ  
μεῖζω. καὶ μάλιστ' ἐπίδηλον τὸ μέγεθος τῶν τὴν  
20 φύσιν ψυχρῶν ζώων· διὸ οἱ τ' ὄφεις καὶ αἱ σαῦραι  
καὶ τὰ φοιλιδωτὰ μεγάλα ἐν τοῖς θερμοῖς τόποις,  
καὶ ἐν τῇ θαλάττῃ τῇ ἐρυθρᾷ τὰ ὀστρακόδερμα· τῆς  
τε γάρ αὐξήσεως ἡ θερμὴ ὑγρότης αἰτία καὶ τῆς  
ζωῆς. ἐν δὲ τοῖς ψυχροῖς τόποις ὑδατωδέστερον τὸ  
ὑγρὸν τὸ ἐν τοῖς ζώοις ἔστιν· διὸ εὔπηκτον, ὥστε  
25 τὰ μὲν οὐ γίνεται ὅλως τῶν ζώων τῶν ὀλιγαιώμων ἢ  
ἀναίμων ἐν τοῖς πρὸς τὴν ἄρκτον τόποις (οὗτε τὰ  
πεζὰ ἐν τῇ γῇ οὔτε τὰ ἔνυδρα ἐν τῇ θαλάττῃ), τὰ

## ON LENGTH OF LIFE, v.

quality is greater than their defect in quantity. In some again the heat is of a fatty nature, which makes it neither so easily dried nor so easily chilled ; and in others again it has some other flavour.

Moreover that which is intended to resist destruction must not have great waste products. For this produces death either by disease or by nature ; for the power of such waste products is destructive sometimes of the natural life, at other times of part of it. For this reason animals that are salacious and have much seed age quickly ; for the seed is a waste product, and when it goes dryness ensues. This is why the mule is longer lived than the horse and the ass, from which it is born, and the female generally is longer lived than the male, if the male is salacious ; so also the male sparrow lives a shorter time than the female. Further this is true of all males that work hard, and grow old more rapidly because of their toil ; for toil produces dryness, and old age is dry. But naturally, speaking quite generally, the male lives longer than the female ; the reason being that the male is a warmer creature than the female. Animals too are longer lived in hot countries than in cold, for the same reason as that which makes the larger animals longer lived. The size of animals which are naturally cold is quite obvious ; so snakes, lizards, and animals with horny scales are large in hot countries, and so with the crustacea in the Red Sea ; for a warm moisture is the cause of growth as well as of life. But in cold countries the moisture in animals is more watery ; consequently it congeals easily, so that in the northern climes either the animals of little or no blood do not occur at all (neither the animals with feet on land, nor water creatures in the sea), or

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δὲ γίνεται μέν, ἐλάττω δὲ καὶ βραχυβιώτερα· ἀφαιρεῖται γὰρ ὁ πάγος τὴν αὔξησιν.

Τροφὴν δὲ μὴ λαμβάνοντα καὶ τὰ φυτὰ καὶ τὰ 80 ζῷα φθείρονται· συντήκει γὰρ αὐτὰ ἔαυτά· ὥσπερ γὰρ ἡ πολλὴ φλὸξ κατακαίει καὶ φθείρει τὴν ὀλίγην τῷ τὴν τροφὴν ἀναλίσκειν, οὕτω τὸ φυσικὸν θερμὸν τὸ πρῶτον πεπτικὸν ἀναλίσκει τὴν ὑλὴν ἐν ἥ ἐστίν. τὰ δὲ ἔνυδρα τῶν πεζῶν ἥττον μακρόβια οὐχ ὅτι 467 a ὑγρὰ ἀπλῶς, ἀλλ’ ὅτι ὑδατώδη· τὸ δὲ τοιοῦτον ὑγρὸν εὔφθαρτον, ὅτι ψυχρὸν καὶ εὔπηκτον. καὶ τὸ ἄναιμον διὰ τὸ αὐτό, ἐὰν μὴ μεγέθει ἀπαμύηται· οὕτε γὰρ λίπος οὕτε γλυκὺν ἔχει. ἐν γὰρ ζῷῳ τὸ λιπαρὸν γλυκύ· διὸ αἱ μέλιτται μακροβιώτεραι ἔτέρων μειζόνων ζῷων.

VI. Ἐν δὲ τοῖς φυτοῖς ἐστὶ τὰ μακροβιώτατα, καὶ μᾶλλον ἡ ἐν τοῖς ζῷοις, πρῶτον μὲν ὅτι ἥττον ὑδατώδη, ὥστ’ οὐκ εὔπηκτα· εἰτ’ ἔχει λιπαρότητα καὶ γλισχρότητα, καὶ ξηρὰ καὶ γεώδη ὄντα ὅμως 10 οὐκ εὐξήραντον ἔχει τὸ ὑγρόν. περὶ δὲ τοῦ πολυχρόνιον εἶναι τὴν τῶν δένδρων φύσιν δεῖ λαβεῖν τὴν αἰτίαν· ἔχει γὰρ ιδίαν πρὸς τὰ ζῷα, πλὴν πρὸς τὰ ἔντομα. νέα γὰρ ἀεὶ τὰ φυτὰ γίνεται· διὸ πολυχρόνια. ἀεὶ γὰρ ἔτεροι οἱ πτόρθοι, οἱ δὲ γηράσκουσιν. καὶ αἱ ρίζαι ὄμοιώς. ἀλλ’ οὐχ ἄμα, ἀλλ’ 15 ὅτε μὲν μόνον τὸ στέλεχος καὶ οἱ κλάδοι ἀπώλοντο, ἔτεροι δὲ παρεφύησαν· ὅταν δὲ οὕτως ὥσιν, αἱ ρίζαι ἀλλαι ἐκ τοῦ ὑπάρχοντος γίνονται; καὶ οὕτως ἀεὶ διατελεῖ τὸ μὲν φθειρόμενον τὸ δὲ γινόμενον· διὸ καὶ μακρόβια. ἔοικε δὲ τὰ φυτὰ τοῖς ἐντόμοις, ὥσπερ εἴρηται πρότερον· διαιρουμένα γὰρ ζῆ, καὶ

## ON LENGTH OF LIFE, V.—VI.

if they do occur they are smaller and shorter lived ; for the frost checks their growth.

Both plants and animals die if they do not receive nourishment ; for they consume themselves ; for just as a great flame burns up and destroys the small flame by exhausting what feeds it, so the naturally warm, the prime cause of digestion, exhausts the matter in which it resides. Water animals are less long-lived than land animals, not merely because they are moist, but because they are watery : this kind of moisture is easily destroyed, because it is cold and easily congealed. For the same reason the bloodless is easily destroyed, unless it is protected by its size ; for it has neither fat nor sweetness. For in the living creature the fat is sweet ; for this reason bees are longer lived than other larger animals.

VI. Among plants there are some very long-lived, Longevity in plants. even more so than among animals, first because they are less watery, so that the moisture is not readily congealed ; secondly they have oiliness and viscosity, and though dry and earthy, yet have a moisture which is not easily dried. But it is our business to discover the reason of the longevity of the trees ; in relation to living things, except the insects, they have a reason peculiar to themselves. For plants are always being reborn ; that is why they last so long. For some branches are always new, while others grow old. The same is true of their roots. This does not happen at once, but at times the trunk and branches alone are destroyed, and others grow up beside them : when this is so other roots grow from the existing ones, and so the tree continues, part dying and part being born ; hence their long life. But the plants resemble the insects as has been said above ; for they live even

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δύο καὶ πολλὰ γίνεται ἐξ ἑνός. τὰ δ' ἔντομα μέχρι  
 μὲν τοῦ ζῆν ἥλθει, πολὺν δ' οὐ δύναται χρόνον· οὐ  
 γάρ ἔχει ὅργανα, οὐδὲ δύναται ποιεῖν αὐτὰ ἡ ἀρχὴ  
 ἡ ἐν ἐκάστῳ. ἡ δ' ἐν τῷ φυτῷ δύναται· πανταχῇ  
 γάρ ἔχει καὶ ρίζαν καὶ καυλὸν δυνάμει. διὸ ἀπὸ  
 ταύτης ἀεὶ προέρχεται τὸ μὲν νέον τὸ δὲ γηράσκον,  
 25 μικρόν τι διαφέροντα τῷ εἶναι μακρόβια, οὕτως  
 ὥσπερ τὰ ἀποφυτευόμενα. καὶ γάρ ἐν τῇ ἀπο-  
 φυτείᾳ τρόπον τινὰ φαίη ἂν τις ταῦτα συμβαίνειν·  
 μόριον γάρ τι τὸ ἀποφυτευθέν. ἐν μὲν οὖν τῇ  
 ἀποφυτείᾳ χωριζομένων συμβαίνει τοῦτο, ἐκεῖ δὲ  
 διὰ τοῦ συνεχοῦς. αἴτιον δ' ὅτι ἐνυπάρχει πάντῃ ἡ  
 30 ἀρχὴ δυνάμει ἐνοῦσα.

Συμβαίνει δὲ ταῦτο ἐπί τε τῶν ζώων καὶ φυτῶν.  
 ἐν τε γὰρ τοῖς ζώοις τὰ ἄρρενα μακροβιώτερα ὡς  
 ἐπὶ τὸ πολὺ· τούτων δὲ τὰ ἄνω μείζω ἡ τὰ κάτω  
 (νανωδέστερον γὰρ τοῦ θήλεος τὸ ἄρρεν), ἐν δὲ τῷ  
 467 b ἄνω τὸ θερμόν, καὶ τὸ ψυχρὸν ἐν τῷ κάτω· καὶ τῶν  
 φυτῶν τὰ κεφαλοβαρῆ μακροβιώτερα. τοιαῦτα δὲ  
 τὰ μὴ ἐπέτεια ἀλλὰ δεινὸρώδη· τὸ γὰρ ἄνω τοῦ  
 φυτοῦ καὶ κεφαλὴ ἡ ρίζα ἐστί, τὰ δ' ἐπέτεια ἐπὶ  
 τὸ κάτω καὶ τὸν καρπὸν λαμβάνει τὴν αὐξῆσιν.  
 ἀλλὰ περὶ μὲν τούτου καὶ καθ' αὐτὰ ἐν τοῖς περὶ  
 φυτῶν διορισθήσεται· νῦν δὲ περὶ τῶν ἄλλων ζώων  
 εἴρηται τὸ αἴτιον περὶ τε μεγέθους ζωῆς καὶ βραχυ-  
 βιότητος. λοιπὸν δ' ἡμῖν θεωρῆσαι περὶ τε νεότη-  
 τος καὶ γήρως καὶ ζωῆς καὶ θανάτου· τούτων γὰρ  
 διορισθέντων τέλος ἂν ἡ περὶ τῶν ζώων ἔχοι  
 μέθοδος.

<sup>a</sup> This treatise is lost.

## ON LENGTH OF LIFE, vi.

when divided, and two or more are born from one. But the insects (*i.e.* when divided) continue to live, but they cannot do so for long ; for they have not the necessary organs, nor can the vital principle in each section supply them. But in the plant it can ; for the plant possesses potential root and stalk in every part of it. Consequently there is always proceeding from it part which is young and part which is growing old, differing but little in length of life, just like slips that are taken from it. For one might say that this happens in a sense in the taking of slips ; for the slip is part of the plant. But in the taking of slips the phenomenon occurs when they are separated, but in the other case there is continuity. The reason is that the vital principle exists potentially in every part of the plant.

The same thing occurs both in animals and in plants. For in animals the males are longer lived as a general rule ; in their case the upper parts are larger than the lower (for the male is more dwarflike than the female), but the warmth resides in the upper parts, and the coldness in the lower ; and among plants those with the heaviest heads are the longer lived. Of such a nature are those plants which are not annual, but are like trees ; for the root is really the upper part of the plant and the head, but annuals grow downwards and towards the seed. We shall discuss this matter further, as a separate subject in our treatise on plants <sup>a</sup> ; but now as far as animals are concerned we have discussed the reason for their length of life and its short duration. It remains for us to discuss youth and age, life and death ; for when our examination of these subjects is complete, our whole inquiry about living creatures will have reached its end.



ON YOUTH AND OLD AGE  
ON LIFE AND DEATH



## INTRODUCTION

THESE two titles are conventionally attached to the succeeding treatise, but it is by no means certain that they are right. It is quite possible that Aristotle designed a special essay on Youth and Age, which he never wrote, or alternatively that he wrote such an essay which is lost, and that the present work is on Life and Death only.

Aristotle is here dealing only with natural death, and he finds that life and death depend only upon heat, or more strictly upon the alternate heating and cooling required to preserve the correct temperature. Thus this treatise leads naturally to that On Breathing, which performs, according to Aristotle, a most important function in the preservation of temperature.

The whole of this work is somewhat remote from the standpoint of to-day, and will hardly be of much help to the modern reader.

## ΠΕΡΙ ΝΕΟΤΗΤΟΣ ΚΑΙ ΓΗΡΩΣ ΠΕΡΙ ΖΩΗΣ ΚΑΙ ΘΑΝΑΤΟΥ

487 b

10 Ι. Περὶ δὲ νεότητος καὶ γήρως καὶ περὶ ζωῆς  
καὶ θανάτου λεκτέον νῦν· ἀμα δὲ καὶ περὶ ἀναπνοῆς  
ἀναγκαῖον ἵσως τὰς αἰτίας εἰπεῖν· ἐνίοις γὰρ τῶν  
ζῷων διὰ τοῦτο συμβαίνει τὸ ζῆν καὶ τὸ μὴ ζῆν.  
ἔπει δὲ περὶ ψυχῆς ἐν ἑτέροις διώρισται, καὶ δῆλον  
ὅτι οὐχ οἶον τ' εἶναι σῶμα τὴν οὐσίαν αὐτῆς, ἀλλ'  
15 ὅμως ὅτι γ' ἐν τινι τοῦ σώματος ὑπάρχει μορίω,  
φανερόν, καὶ ἐν τούτῳ τινὶ τῶν ἔχοντων δύναμιν ἐν  
τοῖς μορίοις. τὰ μὲν οὖν ἄλλα τῆς ψυχῆς ἢ μόρια  
ἢ δυνάμεις, ὅποτέρως ποτὲ δεῖ καλεῖν, ἀφείσθω  
τὰ νῦν· ὅσα δὲ ζῷα λέγεται καὶ ζῆν, ἐν μὲν τοῖς  
20 ἀμφοτέρων τούτων τετυχηκόσι (λέγω δ' ἀμφοτέρων  
τοῦ τε ζῷον εἶναι καὶ τοῦ ζῆν) ἀνάγκη ταῦτὸν εἶναι  
καὶ ἐν μόριον καθ' ὃ τε ζῆν καὶ καθ' ὃ προσ-  
αγορεύομεν αὐτὸ ζῷον. τὸ μὲν γὰρ ζῷον ἢ ζῷον,  
ἀδύνατον μὴ ζῆν· ἢ δὲ ζῆν, ταύτη ζῷον ὑπάρχειν  
οὐκ ἀναγκαῖον· τὰ γὰρ φυτὰ ζῆν μέν, οὐκ ἔχει δ'  
25 αἰσθησιν, τῷ δ' αἰσθάνεσθαι τὸ ζῷον πρὸς τὸ μὴ  
ζῷον διορίζομεν.

Ἄριθμῷ μὲν οὖν ἀναγκαῖον ἐν εἶναι καὶ τὸ αὐτὸ

τοῦτο τὸ μόριον, τῷ δ' εἶναι πλείω καὶ ἔτερα· οὐ

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## ON YOUTH AND OLD AGE ON LIFE AND DEATH

I. We must now discuss youth and old age, life and death. At the same time we shall also have to describe the reasons for breathing ; for in the case of some animals this constitutes the difference between living and not living. But in another treatise we have laid down definitions about the soul, and it is quite clear that its essence cannot be corporeal, and yet it is equally clear that it resides in some part of a body and that this part is among those which have control. We may now neglect the rest of the parts or functions of the soul, whichever we prefer to call them ; what we call animals and living, in the case of those to which both terms are applicable (by both I mean animal and living) must have one and the same part in virtue of which the creature lives, and we call it an animal. For the animal, in so far as it is such, cannot fail to live, but it need not be an animal because it lives : for plants live, but have no sensation, but it is by sensation that we differentiate the animal from that which is not animal.

Speaking numerically this part must be one and the same thing, but in essence more than one and having differences ; for the fact of being an animal

487 b γὰρ ταῦτὸ τὸ ζώω τε εἶναι καὶ τὸ ζῆν. ἐπεὶ οὖν τῶν ἴδιων αἰσθητηρίων ἔν τι κοινόν ἔστιν αἰσθητήριον, εἰς ὁ τὰς κατ' ἐνέργειαν αἰσθήσεις ἀναγκαῖον 90 ἀπαντᾶν, τοῦτο δ' ἀν εἴη μέσον τοῦ πρόσθεν καλουμένου καὶ ὅπισθεν (έμπροσθεν μὲν γὰρ λέγεται ἐφ' ὁ ἔστιν ἡμῖν ἡ αἰσθησις, ὅπισθεν δὲ τὸ ἀντικείμενον), ἔτι δὲ διηρημένου τοῦ σώματος τῶν μὲν ζώντων πάντων τῷ τ' ἄνω καὶ κάτω (πάντα γὰρ ἔχει τὸ ἄνω καὶ τὸ κάτω, ὥστε καὶ τὰ φυτά), 488 a δῆλον ὅτι τὴν θρεπτικὴν ἀρχὴν ἔχοι ἀν ἐν μέσῳ τούτων· καθ' ὃ μὲν γὰρ εἰσέρχεται μόριον ἡ τροφή, ἄνω καλούμεν, πρὸς αὐτὸν βλέποντες ἀλλ' οὐ πρὸς τὸ περιέχον ὅλον, κάτω δὲ καθ' ὃ τὸ περίττωμα ἀφίσσι τὸ πρῶτον. ἔχει δ' ἐναντίως τοῖς φυτοῖς 5 τοῦτο καὶ τοῖς ζώοις· τῷ μὲν γὰρ ἀνθρώπῳ διὰ τὴν ὀρθότητα μάλιστα ὑπάρχει τοῦτο τῶν ζώων, τὸ ἔχειν τὸ ἄνω μόριον πρὸς τὸ τοῦ παντὸς ἄνω, τοῖς δ' ἄλλοις μεταξύ· τοῖς δὲ φυτοῖς ἀκινήτοις οὖσι καὶ λαμβάνοντις ἐκ τῆς γῆς τὴν τροφὴν ἀναγκαῖον ἀεὶ 10 κάτω τοῦτ' ἔχειν τὸ μόριον. ἀνάλογον γάρ εἰσιν αἱ ρίζαι τοῖς φυτοῖς καὶ τὸ καλούμενον στόμα τοῖς ζώοις, δι' οὐ τὴν τροφὴν τὰ μὲν ἐκ τῆς γῆς λαμβάνει, τὰ δὲ δι' αὐτῶν.

II. Τριῶν δὲ μερῶν ὅντων εἰς ἀ διαιρεῖται πάντα τὰ τέλεια τῶν ζώων, ἐνὸς μὲν ἢ δέχεται τὴν τροφήν, 15 ἐνὸς δ' ἢ τὸ περίττωμα προΐσταται, τρίτου δὲ τοῦ μέσου τούτων, τοῦτο ἐν μὲν τοῖς μεγίστοις τῶν ζώων καλεῖται στῆθος, ἐν δὲ τοῖς ἄλλοις τὸ ἀνάλογον. διήρθρωται δὲ μᾶλλον ἐτέροις ἐτέρων. ὅσα δ' αὐτῶν ἔστι πορευτικά, πρόσκειται καὶ μόρια τὰ

<sup>a</sup> Presumably A. means parasitic plants such as mistletoe.

## ON YOUTH AND OLD AGE, ETC., I.—II.

is not the same thing as living. Since then there is one common sense organ of all the individual sense organs, in which the senses when actualized must meet, this must lie in between the part called "before" and that called "behind." (By "before" I mean that to which sensation leads, and by "behind" its opposite.) Moreover the bodies of all living creatures being divided into "upper" and "lower" (for they all have upper and lower parts like plants), it is clear that it has the nutritive principle in between the two ; the part by which food enters we call the upper part, looking at it by itself, and not considering it in relation to the surrounding universe, but we call the lower part that by which the waste product leaves. This is in a different position in plants and animals ; because of his erect position man of all living creatures has this characteristic most conspicuously, that his upper part is also upper in relation to the whole universe, but in other animals it is midway ; but plants, as they are immovable and take their food from the soil, always have this part below. For the roots in plants correspond to what is called the mouth in animals ; the part, that is, by which some absorb their food from the earth, and others from each other.<sup>a</sup>

II. There are three parts into which all the perfect animals are divided, the first part by which they absorb food, the second by which the waste products are evacuated, and the third between the other two. This latter part is called the chest among the largest of living creatures, and by some comparable name among others : but in some it is more specialized than in others. Those animals which have the power of locomotion have in addition parts designed for that

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πρὸς ταύτην τὴν ὑπηρεσίαν, οἷς τὸ πᾶν οἴσουσι  
 20 κύτος, σκέλη τε καὶ πόδες καὶ τὰ τούτοις ἔχοντα  
 τὴν αὐτὴν δύναμιν. ἀλλ’ ἡ γε τῆς θρεπτικῆς ἀρχῆ  
 ψυχῆς ἐν τῷ μέσῳ τῶν τριῶν μορίων καὶ κατὰ τὴν  
 αἴσθησιν οὖσα φαίνεται καὶ κατὰ τὸν λόγον· πολλὰ  
 γὰρ τῶν ζώων ἀφαιρουμένου ἐκατέρου τῶν μορίων,  
 τῆς τε καλούμενης κεφαλῆς καὶ τοῦ δεκτικοῦ τῆς  
 25 τροφῆς, ζῆ μεθ’ οὖπερ ἀνὴρ ἡ τὸ μέσον. δῆλον δ’  
 ἐπὶ τῶν ἐντόμων, οἷον σφηκῶν τε καὶ μελιττῶν,  
 τοῦτο συμβαῖνον· καὶ τῶν μὴ ἐντόμων δὲ πολλὰ  
 διαιρούμενα δύναται ζῆν διὰ τὸ θρεπτικόν. τὸ δὲ  
 τοιοῦτον μόριον ἐνεργείᾳ μὲν ἔχει ἔν, δυνάμει δὲ  
 πλείω· τὸν αὐτὸν γὰρ συνέστηκε τοῖς φυτοῖς τρό-  
 30 πον· καὶ γὰρ τὰ φυτὰ διαιρούμενα ζῆν χωρίς, καὶ  
 γίνεται πολλὰ ἀπὸ μιᾶς ἀρχῆς δένδρα. δι’ ἣν δ’  
 αἰτίαν τὰ μὲν οὐ δύναται διαιρούμενα ζῆν, τὰ δ’  
 488 b ἀποφυτεύεται τῶν φυτῶν, ἔτερος ἔσται λόγος.

ἀλλ’ ὅμοίως ἔχει κατά γε τοῦτο τά τε φυτὰ καὶ τὸ  
 τῶν ἐντόμων γένος. ἀνάγκη δὲ καὶ τὴν θρεπτικὴν  
 ψυχὴν ἐνεργείᾳ μὲν ἐν τοῖς ἔχουσιν εἶναι μίαν,  
 δυνάμει δὲ πλείους. ὅμοίως δὲ καὶ τὴν αἰσθητικὴν  
 ἀρχὴν· φαίνεται γὰρ ἔχοντα αἴσθησιν τὰ διαιρού-  
 μενα αὐτῶν. ἀλλὰ πρὸς τὸ σώζεσθαι τὴν φύσιν,  
 τὰ μὲν φυτὰ δύναται, ταῦτα δ’ οὐ δύναται διὰ τὸ  
 μὴ ἔχειν ὅργανα πρὸς σωτηρίαν, ἐνδεῖ τ’ εἶναι τὰ  
 μὲν τοῦ ληψομένου τὰ δὲ τοῦ δεξιομένου τὴν τροφήν,  
 τὰ δ’ ἄλλων τε καὶ τούτων ἀμφοτέρων. ἔοικασι  
 10 γὰρ τὰ τοιαῦτα τῶν ζώων πολλοῖς ζώοις συμ-  
 πεφυκόσιν· τὰ δ’ ἄριστα συνεστηκότα τοῦτ’ οὐ  
 πάσχει τῶν ζώων διὰ τὸ εἶναι τὴν φύσιν αὐτῶν ὡς  
 ἐνδέχεται μάλιστα μίαν. διὸ καὶ μικρὰν αἴσθησιν  
 ἔνια ποιεῖ διαιρούμενα τῶν μορίων, ὅτι ἔχει τι

## ON YOUTH AND OLD AGE, ETC., II.

service, whereby they can carry the whole trunk ; these are legs and feet, and parts which perform the same functions as these. But the seat of the nutritive faculty of the soul resides in the middle of the three parts, as is evident from sensation, and is in itself reasonable. For many living creatures, when one of the other two parts is lost, that is to say what are called respectively the head and the food receptacle, contrive to live with the part which is in the middle. This clearly happens with such insects as wasps and bees ; and many animals which are not insects can live when divided by means of their nutritive part. A part of this kind is actually one, but potentially more ; for its composition is similar to that of plants ; for plants when divided can live apart, and many trees can arise from one starting-point. The reason why some cannot live when divided, and other plants can be grown from slips, will be the subject of another discussion. But in this regard plants and the class of insects are alike. So also the nutritive soul must be actually one in those who possess it, but potentially more than one. And the same is true of the sensitive first principle ; for the divided parts do seem to have sensation. But in respect of the preservation of their nature, plants can continue to exist, but insects cannot, because they have not the organs necessary to preservation, and are lacking, sometimes in what is to seize and sometimes in what is to receive food, and some others again in both. Animals of this kind are like many creatures joined in one ; but the best constructed animals do not suffer from this because their nature is one in so far as it can be. Some divided parts show but little sensitive power because they have some

# ARISTOTLE

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ψυχικὸν πάθος· χωριζομένων γὰρ τῶν σπλάγχνων  
ποιεῖται κύνησιν, οἷον καὶ αἱ χελῶναι τῆς καρδίας  
ἀφηρημένης.

III. "Ετι δὲ ἐπί τε τῶν φυτῶν δῆλον καὶ ἐπὶ τῶν  
ζῷων, τῶν μὲν φυτῶν τὴν τ' ἐκ τῶν σπερμάτων  
γένεσιν ἐπισκοποῦσι καὶ τὰς ἐμφυτείας τε καὶ τὰς  
ἀποφυτείας. ἢ τε γὰρ τῶν σπερμάτων γένεσις  
20 συμβαίνει πᾶσιν ἐκ τοῦ μέσου· διθύρων γὰρ ὅντων  
πάντων, ἢ συμπέφυκεν ἔχεται, καὶ τὸ μέσον ἐστὶν  
ἔκατέρου τῶν μορίων· ἐντεῦθεν γὰρ ὅ τε καυλὸς ἐκ-  
φύεται καὶ ἡ ρίζα τῶν φυομένων, ἢ δ' ἀρχὴ τὸ  
μέσον αὐτῶν ἐστίν. ἐν τε ταῖς ἐμφυτείαις καὶ ταῖς  
ἀποφυτείαις μάλιστα τοῦτο συμβαίνει περὶ τοὺς  
25 ὅζους· ἐστι γὰρ ἀρχὴ τις ὁ ὅζος τοῦ κλάδου, ἀμα  
δὲ καὶ μέσον, ὥστε ἡ τοῦτο ἀφαιροῦσιν ἢ εἰς τοῦτο  
ἐμβάλλουσιν, ἵνα ἡ ὁ κλάδος ἢ αἱ ρίζαι ἐκ τούτων  
γίγνωνται, ὡς οὕσης τῆς ἀρχῆς ἐκ τοῦ μέσου καυλοῦ  
καὶ ρίζης.

Καὶ τῶν ζῷων τῶν ἐναίμων ἡ καρδία γίνεται  
πρῶτον. τοῦτο δὲ δῆλον ἐξ ὧν ἐν τοῖς ἐνδεχομένοις  
30 ἔτι γιγνομένοις ἵδεν τεθεωρήκαμεν. ὥστε καὶ ἐν  
τοῖς ἀναίμοις ἀναγκαῖον τὸ ἀνάλογον τῆς καρδίᾳ  
γίνεσθαι πρῶτον. ἡ δὲ καρδία ὅτι ἐστὶν ἀρχὴ τῶν  
φλεβῶν, ἐν τοῖς περὶ τὰ μέρη τῶν ζῷων εἴρηται  
489 a πρότερον· καὶ ὅτι τὸ αἷμα τοῖς ἐναίμοις ἐστὶν τελευ-  
ταία τροφή, ἐξ οὗ γίνεται τὰ μόρια. φανερὸν  
τούννυν ὅτι μίαν μέν τινα ἐργασίαν ἡ τοῦ στόματος  
λειτουργεῖ δύναμις, ἐτέραν δ' ἡ τῆς κοιλίας περὶ  
τὴν τροφήν. ἡ δὲ καρδία κυριωτάτη, καὶ τὸ τέλος  
ἐπιτίθησιν. ὥστ' ἀνάγκη καὶ τῆς αἰσθητικῆς καὶ  
τῆς θρεπτικῆς ψυχῆς ἐν τῇ καρδίᾳ τὴν ἀρχὴν εἶναι  
τοῖς ἐναίμοις· τὰ γὰρ τῶν ἄλλων μορίων ἔργα περὶ

## ON YOUTH AND OLD AGE, ETC., II.—III.

affection of the soul ; for they show movement when their entrails are separated, as tortoises do if their heart is removed.

III. It is moreover quite clear in the case of plants <sup>Grafting</sup> and animals, if we study the origin of plants from seed <sup>plants.</sup> and grafting and slip-taking. For their growth from seed always begins from the middle : for as all seeds have two cells, growth begins at the point where they join, and the part in between belongs to both the cells ; from this part springs both the stem and the root of the plant, but the source of them is in the middle. In grafting and slip-cutting this occurs most about the eyes ; for the eye is the source of the branch, and is also in the middle, so that they either cut this off, or they graft at this point, in order that the branch or the root may spring from that point, as the origin of both stem and root begins in the middle.

Of the animals with blood the heart appears first. <sup>Animals.</sup> This is evident from those which we have examined, whose birth can be watched. So also what corresponds to the heart in bloodless animals must be born first. We have stated previously in our treatise *On the Parts of Animals*<sup>a</sup> that the heart is the source of the veins ; and that, in animals with blood, the blood is the ultimate source of nourishment, from which the parts are developed. Now it is clear that the mouth performs one function and the stomach another in respect of food. But the heart is the supreme power, and contributes the final step. So that, in animals having blood, the source of the sensitive and nutritive soul must lie in the heart ; for the functions of the other parts in respect of food are for

<sup>a</sup> *De Part. An.* iii. 665 b 15.

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τὴν τροφὴν τοῦ ταύτης ἔργου χάριν ἐστί· δεῖ γὰρ τὸ κύριον πρὸς τὸ οὐ ἔνεκα διατελεῖν, ἀλλ’ οὐκ ἐν τοῖς 10 τούτου ἔνεκα, οἷον ἰατρὸς πρὸς τὴν ὑγίειαν. ἀλλὰ μὴν τό γε κύριον τῶν αἰσθήσεων ἐν ταύτῃ τοῖς ἔναιμοις πᾶσιν· ἐν τούτῳ γὰρ ἀναγκαῖον εἶναι τὸ πάντων τῶν αἰσθητηρίων κοινὸν αἰσθητήριον. δύο δὲ φανερῶς ἐνταῦθα συντεινούσας δρῶμεν, τὴν τε γεῦσιν καὶ τὴν ἀφήν, ὥστε καὶ τὰς ἄλλας ἀναγκαῖον· 15 ἐν τούτῳ μὲν γὰρ τοῖς ἄλλοις αἰσθητηρίοις ἐνδέχεται ποιεῖσθαι τὴν κύνησιν, ταῦτα δ’ οὐδὲν συντείνει πρὸς τὸν ἄνω τόπον. χωρὶς δὲ τούτων, εἰ τὸ ζῆν ἐν τούτῳ τῷ μορίᾳ πᾶσίν ἐστι, δῆλον ὅτι καὶ τὴν αἰσθητικὴν ἀρχὴν ἀναγκαῖον· ἢ μὲν γὰρ ζῶον, ταύτη καὶ ζῆν φαμέν, ἢ δ’ αἰσθητικόν, ταύτῃ τὸ 20 σῶμα ζῶον εἶναι λέγομεν. διὰ τί δ’ αἱ μὲν τῶν αἰσθήσεων φανερῶς συντείνουσι πρὸς τὴν καρδίαν, αἱ δὲ εἰσὶν ἐν τῇ κεφαλῇ (διὸ καὶ δοκεῖ τισὶν αἰσθάνεσθαι τὰ ζῶα διὰ τὸν ἐγκεφαλὸν), τὸ αἴτιον τούτων ἐν ἑτέροις εἴρηται χωρίς. κατὰ μὲν οὖν τὰ φαινόμενα δῆλον ἐκ τῶν εἰρημένων ὅτι ἐν τούτῳ τε 25 καὶ ἐν τῷ μέσῳ τοῦ σώματος τῶν τριῶν μορίων ἡ τε τῆς αἰσθητικῆς ἀρχὴ ψυχῆς ἐστὶ καὶ ἡ τῆς αὐξητικῆς καὶ τῆς θρεπτικῆς.

IV. Κατὰ δὲ τὸν λόγον, ὅτι τὴν φύσιν δρῶμεν ἐν πᾶσιν ἐκ τῶν δυνατῶν ποιοῦσαν τὸ κάλλιστον. 30 ἐν τῷ μέσῳ δὲ τῆς οὐσίας τῆς ἀρχῆς οὐσης ἐκατέρας· μάλιστα μὲν ἀποτελεῖ τῶν μορίων ἐκάτερον τὸ αὐτοῦ ἔργον, τό τε κατεργαζόμενον τὴν ἐσχάτην τροφὴν καὶ τὸ δεκτικόν· πρὸς ἐκατέρω γὰρ αὐτῶν οὕτως ἔσται, καὶ ἔστιν ἡ τοῦ τοιούτου μέση χώρα 469 b ἀρχοντος χώρα. ἔτι τὸ χρώμενον καὶ φῶτην,

“ *De Part. An.* 656 b 5.

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the sake of the heart's function ; for the controlling part must lie in what achieves the final aim, not in parts which are subordinate to that aim, like a physician's relation to health. Moreover the controlling power over the senses lies in the heart in all animals having blood ; for in it must lie that sense organ which shares the impressions of all the other sense organs. We can see two that clearly centre in the common sense organ, taste and touch, so that all the others must do so too ; for in this sense organ it is possible for an impulse to be produced in the other sense organs, and these do not reach to the upper part. Apart from this, if life in all creatures lies in this part, it must evidently be the source of sensation ; for we say that anything is alive in so far as it is a living creature, but in so far as it is sensitive we say that it is an animal. Why some of the senses evidently reach out to the heart, and others are in the head (in consequence of which some suppose that animals feel because of their brain), the reason for this has been given separately elsewhere." Judging by appearances it is clear from what we have said that the source of the sensitive, growing and nutritive soul lies here ; that is, in the middle of the three parts of the body.

IV. Judging however by pure reason, it is evident that we see in every case nature produce what is the noblest possible from the available material. As each of the two sources lies in the middle of the whole, each will best perform its own functions, both that which accomplishes the last stage of food, and that which receives it ; this will apply to both cases, and the mid-region of such a faculty will be the region of control. But we must differentiate that which em-

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δεῖ διαφέρειν. ὥσπερ δὲ τὴν δύναμιν, οὕτως ἀν  
ἐιδέχοιτο καὶ τὸν τρόπον, ὥσπερ οἱ τ' αὐλοὶ καὶ  
τὸ κινοῦν τοὺς αὐλούς, ἡ χείρ. εἴπερ οὖν τὸ ζῷον  
οἱ ὥρισται τῷ τὴν αἰσθητικὴν ἔχειν ψυχήν, τοῖς μὲν  
ἐναίμοις ἀναγκαῖον ἐν τῇ καρδίᾳ ταύτην ἔχειν τὴν  
ἀρχήν, τοῖς δ' ἀναίμοις ἐν τῷ ἀνάλογον μορίῳ.

Πάντα δὲ τὰ μόρια καὶ πᾶν τὸ σῶμα τῶν ζώων  
ἔχει τινὰ σύμφυτον θερμότητα φυσικήν· διὸ ζῶντα  
μὲν φαίνεται θερμά, τελευτῶντα δὲ καὶ στερισκό-  
μενα τοῦ ζῆν τούναντίον. ἀναγκαῖον δὴ ταύτης  
τὴν ἀρχὴν τῆς θερμότητος ἐν τῇ καρδίᾳ τοῖς ἐν-  
αίμοις εἶναι, τοῖς δ' ἀναίμοις ἐν τῷ ἀνάλογον· ἐρ-  
γάζεται γὰρ καὶ πέπτει τῷ φυσικῷ θερμῷ τὴν  
τροφὴν πάντα, μάλιστα δὲ τὸ κυριώτατον. διὸ  
τῶν μὲν ἄλλων μορίων ψυχομένων ὑπομένει τὸ  
ζῆν, τοῦ δ' ἐν ταύτῃ φθείρεται πάμπαν, διὰ τὸ  
τὴν ἀρχὴν ἐντεῦθεν τῆς θερμότητος ἡρτῆσθαι  
πᾶσι, καὶ τῆς ψυχῆς ὥσπερ ἐμπεπυρευμένης ἐν  
τοῖς μορίοις τούτοις, τῶν μὲν ἀναίμων ἐν τῷ  
ἀνάλογον, ἐν δὲ τῇ καρδίᾳ τῶν ἐναίμων. ἀνάγκη  
τοίνυν ἄμα τό τε ζῆν ὑπάρχειν καὶ τὴν τοῦ θερμοῦ  
τούτου σωτηρίαν, καὶ τὸν καλούμενον θάνατον εἶναι  
τὴν τούτου φθοράν.

V. Ἀλλὰ μὴν πυρός γε δύο ὅρῶμεν φθοράς,  
μάρανσίν τε καὶ σβέσιν. καλοῦμεν δὲ τὴν μὲν  
ὑφ' αὐτοῦ μάρανσιν, τὴν δ' ὑπὸ τῶν ἐναντίων  
σβέσιν, τὴν μὲν γήρᾳ, τὴν δὲ βίαιον. συμβαίνει  
δ' ἀμφοτέρας διὰ ταύτὸν γίνεσθαι τὰς φθοράς· ὑπο-  
λειπούσης γὰρ τῆς τροφῆς, οὐ δυναμένου λαμ-  
βάνειν τοῦ θερμοῦ τὴν τροφήν, φθορὰ γίνεται τοῦ

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ploys from that which it employs. It should be possible to do this in terms of its function, just as we distinguish flutes and what causes the movement in flutes, that is the hand. Since then the animal is defined by the possession of a sensitive soul, in animals with blood this source must be in the heart, and in bloodless animals in some part corresponding to it.

Now all parts and indeed the whole body of living creatures contain within them some natural heat; so when alive they are felt to be warm, but when dead and deprived of life the opposite of this. Now the source of this warmth must lie in the heart in animals with blood, and in the bloodless in some corresponding part; for everything carries on its function and digests food by means of its natural heat, and this is most true of the part with most control. So when other parts get chilled life remains, but when the region of the heart gets cold, the whole body is destroyed, because the principle of all parts depends entirely on the heat therein, and the soul in these parts is so to speak fired, in animals with blood in the heart, and in the bloodless in what corresponds to the heart. Thus life must depend on the conservation of this heat, and what we know as death is the destruction of this heat.

V. Now we know two ways in which fire is destroyed—by dying out and by extinguishing. By dying out we mean a decay arising from itself, and by an extinguishing a decay caused by opposites: one is death by old age and the other by violence. But both these forms of destruction arise from the same cause; for in both cases fire dies from the failure of what feeds it, that is when it cannot get

Function of  
the heart.

Destruction  
of heat.

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πυρός. τὸ μὲν γὰρ ἐναντίον παῦον τὴν πέψιν κωλύει τρέφεσθαι· ὅτε δὲ μαραίνεσθαι συμβαίνει, πλείονος ἀθροιζομένου θερμοῦ διὰ τὸ μὴ ἀναπνεῖν μηδὲ καταψύχεσθαι· ταχὺ γὰρ καὶ οὕτω καταναλίσκει τὴν τροφὴν πολὺ συναθροιζόμενον τὸ θερμόν, καὶ φθάνει καταναλίσκον πρὶν ἐπιστῆναι τὴν ἀναθυμίασιν. διόπερ οὐ μόνον μαραίνεται τὸ ἔλαττον παρὰ τὸ πλεῖον πῦρ, ἀλλὰ καὶ αὐτὴ καθ' αὐτὴν ἡ 470 a τοῦ λύχνου φλόξ ἐντιθεμένη πλείονι φλογὶ κατακέεται, καθάπερ ὅτιοῦν ἄλλο τῶν καυστῶν. αἴτιον δ' ὅτι τὴν μὲν οὖσαν ἐν τῇ φλογὶ τροφὴν φθάνει λαμβάνουσα ἡ μείζων φλόξ πρὶν ἐπελθεῖν ἐπέραν, τὸ δὲ πῦρ ἀεὶ διατελεῖ γινόμενον καὶ ρέον ὥσπερ ποταμός, ἀλλὰ λανθάνει διὰ τὸ τάχος.

Δῆλον τοίνυν ὡς εἴπερ δεῖ σώζεσθαι τὸ θερμόν (τοῦτο δ' ἀναγκαῖον, εἴπερ μέλλει ζῆν), δεῖ γίνεσθαι τίνα τοῦ θερμοῦ τοῦ ἐν τῇ ἀρχῇ κατάψυξιν. παράδειγμα δὲ τούτου λαβεῖν ἔστι τὸ συμβαῖνον ἐπὶ τῶν καταπνιγομένων ἀνθράκων· ἀν μὲν γὰρ ὥστε 10 περιπεπωμασμένοι τῷ καλούμενῷ πνιγεῖ συνεχῶς, ἀποσβέννυνται ταχέως· ἀν δὲ παρ' ἄλληλά τις ποιῇ πυκνὰ τὴν ἀφαίρεσιν καὶ τὴν ἐπίθεσιν, μένουσι πεπυρωμένοι πολὺν χρόνον. ἡ δ' ἔγκρυψις σώζει τὸ πῦρ· οὕτε γὰρ ἀποπνεῖν κωλύεται διὰ μανότητα τῆς τέφρας, ἀντιφράττει τε τῷ πέριξ ἀερί πρὸς τὸ 15 μὴ σβεννύναι τῷ πλήθει τῆς ἐνυπαρχούσης αὐτῷ θερμότητος. ἀλλὰ περὶ μὲν τῆς αἰτίας ταύτης, ὅτι τὸ ἐναντίον συμβαίνει τῷ ἔγκρυπτομένῳ καὶ καταπνιγομένῳ πυρὶ (τὸ μὲν γὰρ μαραίνεται, τὸ δὲ διαμένει πλείω χρόνον), εἴρηται ἐν τοῖς προβλήμασιν.

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food for the heat. The opposite (extinguishing) prevents the fire from being fed by checking its assimilation ; but when it dies out, it is because too much heat is collected and is due to the fact that there is neither breathing nor cooling ; for in this case the great heat collected quickly uses up the food, and finishes expending it before the vapour rises. Consequently not only does the smaller fire fade out in the presence of a greater one, but the flame of the lamp, when placed in a larger one, is burned up entirely by itself, just like any other combustible. The reason is that the greater flame seizes the food available in the flame before the other can get to it, and the fire continues to grow and flow like a river, but its speed is so great that it is not noticed.

It is obvious therefore that if the heat is to be preserved (and it must be if the creature is to continue to live) there must be some cooling down of the initial heat. We can find an illustration of this in what occurs when coals are damped down. For if they are covered continuously with a lid, which we call a choke, they are very soon quenched ; but if one alternately puts on and takes off the lid many times, they remain alight for a long time. For the masking of a fire preserves it ; for the air is not prevented from getting to it owing to the porous nature of the ashes, and it protects it from the surrounding air, so that it is not extinguished by the quantity of heat enclosed in it. But we have discussed in the *Problems*<sup>a</sup> the reason why the contrary effect occurs in a masked and in a choked fire (that is the latter is quenched, while the former lasts a long time).

<sup>a</sup> The passage in question is not extant.

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VI. Ἐπεὶ δὲ πᾶν ζῶν ἔχει ψυχήν, αὐτὸ δ' οὐκ  
 20 ἄνευ φυσικῆς ὑπάρχει θερμότητος, ὡσπερ εἴπομεν,  
 τοῖς μὲν φυτοῖς ἡ διὰ τῆς τροφῆς καὶ τοῦ περι-  
 ἔχοντος ἵκανὴ γίνεται βοήθεια πρὸς τὴν τοῦ φυσικοῦ  
 θερμοῦ σωτηρίαν. καὶ γὰρ ἡ τροφὴ ποιεῖ κατά-  
 ψυξιν εἰσιοῦσα, καθάπερ καὶ τοῖς ἀνθρώποις τὸ  
 πρῶτον προσενεγκαμένοις· αἱ δὲ νηστεῖαι θερ-  
 25 μαίνουσι καὶ δύφας ποιοῦσιν· ἀκίνητος γὰρ ὡν ὁ  
 ἀὴρ ἀεὶ θερμαίνεται, τῆς δὲ τροφῆς εἰσιούσης  
 καταψύχει κινούμενος, ἔως ἂν λάβῃ τὴν πέψιν.  
 ἐὰν δὲ ἡ τὸ περιέχον ὑπερβάλλη ψυχρότητι διὰ  
 τὴν ὥραν, ἵσχυρῶν γινομένων πάγων, ἔξανανεται,  
 ἡ τοῦ θέρους ἵσχυρὰ συμβαίνῃ καύματα καὶ μὴ  
 30 δύνηται τὸ σπώμενον ἐκ τῆς γῆς ὑγρὸν κατα-  
 ψύχειν, φθείρεται μαρανόμενον τὸ θερμόν, καὶ  
 λέγεται σφακελίζειν καὶ ἀστρόβλητα γίνεσθαι τὰ  
 δένδρα περὶ τοὺς καιροὺς τούτους. διὸ καὶ γένη  
 τινὰ λίθων ταῖς ρίζαις ὑποβάλλουσι καὶ ὕδωρ ἐν  
 470 b ἀγγείοις, ὅπως αἱ ρίζαι ψύχωνται τῶν φυτῶν.  
 τῶν δὲ ζώων ἐπεὶ τὰ μέν ἔστιν ἔνυδρα τὰ δ' ἐν  
 τῷ ἀέρι ποιεῖται τὴν δίαιταν, ἐκ τούτων καὶ διὰ  
 τούτων πορίζεται τὴν κατάψυξιν, τὰ μὲν τῷ ὕδατι  
 τὰ δὲ τῷ ἀέρι. τίνα δὲ τρόπον καὶ πῶς, λεκτέον  
 ἐπιστήσασι τὸν λόγον μᾶλλον.

## ON YOUTH AND OLD AGE, ETC., VI.

VI. But since every living creature has a soul, and heat and cooling in living creatures. no living creature exists without containing natural heat, as we have said, the assistance which plants get through food and their environment is sufficient for the preservation of their natural heat. For the entry of food causes a cooling, just as it does in man when he first admits it; but fasting causes heat and thirst; for the air when it is motionless always grows hot, but, moving as it does when food enters it, it becomes cool, until it is digested. If the environment is excessively cold owing to the season of the year, when hard frosts occur, the plant withers; if on the other hand the summer heat comes and, as the moisture is drawn out of the ground, there can be no cooling, it dies because the heat wastes away, and plants at such seasons are said to be blighted and sun-struck. For this reason men put some kinds of stones under the roots and water in flower pots, that the roots of the plants may be cooled. But in the case of animals, since some live in water and others spend their lives in air, they achieve the cooling from and by these elements—some that is by water and some by air. In what manner and how this occurs can only be described after a closer study of the subject.



# ON RESPIRATION



## INTRODUCTION

IN this account of breathing Aristotle is far more the physiologist than the philosopher, and for this very reason his conclusions are of comparatively small value to us. The science of biochemistry was not born in the days of Aristotle, and without it any account of the physiology of breathing must of necessity be almost valueless to-day.

## ΠΕΡΙ ΑΝΑΠΝΟΗΣ

470 <sup>b</sup> Ι. Περὶ γὰρ ἀναπνοῆς ὀλίγοι μέν τινες τῶν πρότερον φυσικῶν εἰρήκασιν· τίνος μέντοι χάριν ὑπάρχει τοῖς ζῷοις, οἱ μὲν οὐδὲν ἀπεφήναντο, οἱ δὲ εἰρήκασι μέν, οὐ καλῶς δ' εἰρήκασιν ἀλλ' ἀπειροτέρως τῶν συμβαινόντων. ἔτι δὲ πάντα τὰ ζῷά φασιν ἀναπνεῖν· τοῦτο δ' οὐκ ἔστιν ἀληθές. ὥστ' ἀναγκαῖον περὶ τούτων πρῶτον ἐπελθεῖν, ὅπως μὴ δοκῶμεν ἀπόντων κενὴν κατηγορεῖν.

"Οτι μὲν οὖν ὅσα πλεύμονα ἔχει τῶν ζῷων, ἀναπνεῖ πάντα, φανερόν. ἀλλὰ καὶ τούτων αὐτῶν ὅσα μὲν ἄναιμον ἔχει τὸν πλεύμονα καὶ σομφόν,  
15 ἥττον δέονται τῆς ἀναπνοῆς· διὸ πολὺν χρόνον ἐν τοῖς ὕδαισι δύνανται διαμένειν παρὰ τὴν τοῦ σώματος ἴσχύν. τὸν δὲ πλεύμονα σομφὸν ἔχει πάντα τὰ φωτοκοῦντα, οἷον τὸ τῶν βατράχων γένος. ἔτι δὲ αἱ ἔμūδες τε καὶ χελῶναι πολὺν χρόνον μένουσιν  
20 ἐν τοῖς ὑγροῖς· ὁ γὰρ πλεύμων ὀλίγην ἔχει θερμότητα· ὀλίγαιμον γὰρ ἔχουσιν αὐτόν· ἐμφυσώμενος οὖν αὐτὸς τῇ κινήσει καταψύχει καὶ ποιεῖ διαμένειν πολὺν χρόνον. ἐὰν μέντοι βιάζηται τις λίαν κατέχων πολὺν χρόνον, ἀποπνίγονται πάντα· οὐδὲν γὰρ τῶν τοιούτων δέχεται τὸ ὕδωρ ὥσπερ οἱ ἵχθυς. τὰ δ' ἔναιμον ἔχοντα τὸν πλεύμονα

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I. A few natural philosophers have dealt with the question of breathing ; some of them have offered no explanation why this phenomenon occurs in living creatures ; others have discussed it without much insight, and with insufficient experiment on the facts. Again they say that all living creatures breathe ; but this is not true. We must then first approach this question, so that we may not be thought to be passing a baseless censure on men who are not there to defend themselves.

It is of course quite obvious that all living creatures with lungs breathe. Furthermore animals which have a bloodless or spongy lung, need breathing less than the others ; this is why they can remain in water a long time for their bodily strength. All oviparous animals have a porous lung, such as the genus frog. Again both the fresh-water and sea tortoise live in water for a long time ; for the lung contains but little heat, for it contains but little blood ; being inflated by its movement cooling is rapid, and the animal is thus able to remain under water for a long time. But if one forces it by holding it down too long, an animal of this kind is drowned ; for none of these animals can absorb water like the fish. All animals which have a lung containing blood

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πάντα μᾶλλον δεῖται τῆς ἀναπνοῆς διὰ τὸ πλῆθος τῆς θερμότητος· τῶν δ' ἄλλων ὅσα μὴ ἔχει πλεύμονα, οὐδὲν ἀναπνεῖ.

II. Δημόκριτος μὲν οὖν ὁ Ἀρδηρίτης καὶ τινες ἄλλοι τῶν περὶ ἀναπνοῆς εἰρηκότων οὐδὲν περὶ 30 τῶν ἄλλων διωρίκασι ζώων, ἐοίκασι μέντοι λέγειν ὡς πάντων ἀναπνεόντων· Ἀναξαγόρας δὲ καὶ Διογένης, πάντα φάσκοντες ἀναπνεῖν, περὶ τῶν ἵχθυών καὶ τῶν ὀστρείων λέγοντι τίνα τρόπον ἀναπνέουσιν. καὶ φησιν Ἀναξαγόρας μέν, ὅταν 471 a ἀφῶσι τὸ ὕδωρ διὰ τῶν βραγχίων, τὸν ἐν τῷ στόματι γίνομενον ἀέρα ἔλκοντας ἀναπνεῖν τοὺς ἵχθυς· οὐ γὰρ εἶναι κενὸν οὐδέν· Διογένης δ' ὅταν ἀφῶσι τὸ ὕδωρ διὰ τῶν βραγχίων, ἐκ τοῦ περὶ τὸ στόμα περιεστῶτος ὕδατος ἔλκειν τῷ κενῷ τῷ ἐν τῷ στόματι τὸν ἀέρα, ὡς ἐνόντος ἐν τῷ ὕδατι ἀέρος. ταῦτα δ' ἐστὶν ἀδύνατα. πρῶτον μὲν γὰρ τὸ ἥμισυ τοῦ πράγματος ἀφαιροῦσι, διὰ τὸ τὸ κοινὸν ἐπὶ θατέρου λέγεσθαι μόνον. ἀναπνοὴ γὰρ καλεῖται, ταῦτης δὲ τὸ μὲν ἐκπνοή ἐστι τὸ δ' εἰσπνοή· περὶ ήσ οὐθὲν λέγονται, τίνα τρόπον 10 ἐκπνέουσι τὰ τοιαῦτα τῶν ζώων. οὐδένδ' ἐνδέχεται αὐτοῖς εἰπεῖν· ὅταν γὰρ ἀναπνεύσωσι, ταῦτη ἢ ἀνέπνευσαν πάλιν δεῖ ἐκπνεῖν, καὶ τοῦτο ποιεῖν ἀεὶ παραλλάξ, ὥστε συμβαίνει ἀμα δέχεσθαι τὸ ὕδωρ κατὰ τὸ στόμα καὶ ἐκπνεῖν. ἀνάγκη δ' ἀπαντῶντα ἐμποδίζειν θάτερον θατέρῳ. εἴτα ὅταν 15 ἀφῶσι τὸ ὕδωρ, τότε ἐκπνέουσι κατὰ τὸ στόμα ἢ κατὰ τὰ βράγχια, ὥστε συμβαίνει ἀμα ἐκπνεῖν καὶ ἀναπνεῖν· τότε γάρ φασιν αὐτὸ ἀναπνεῖν. ἀμα δ' ἀναπνεῖν καὶ ἐκπνεῖν ἀδύνατον. ὥστ' εἰ ἀνάγκη

## ON RESPIRATION, I.—II.

require more breathing because of their quantity of heat ; but the other creatures which have no lung do not breathe at all.

II. Democritus of Abdéra and certain others who have discussed breathing have not differentiated between living animals, but appear to speak as if they all breathed ; Anaxagoras and Diogenes, asserting that all creatures breathe, describe the method by which fishes and oysters breathe. Anaxagoras says that fishes breathe by drawing up the air in the mouth, when they discharge water through their gills ; for a vacuum cannot exist ; Diogenes says that by means of the vacuum in the mouth they breathe by drawing the air from the water surrounding the mouth, whenever they let out water through the gills, because there is air in the water. But this is impossible. First of all they leave out half the facts, by assigning to one side only what is common to both. For what is called breathing includes both breathing out and breathing in. But of the former they make no mention ; how, that is, such animals breathe out. Nor can they explain it ; for when animals breathe in, they must breathe out again in the same way as they breathe in, and must perform these functions alternately, so that they would have to receive water into the mouth and breathe out at the same time. The one operation must clearly meet and obstruct the other. Again, when they discharge the water, they are at the same time breathing out by the mouth or by the gills, so that they must exhale and inhale at the same time ; for they say that this is the time at which they inhale. But it is impossible to inhale and exhale at the same time. The conclusion would then follow that, if

Breathing  
in fishes.

ARISTOTLE

471 a

τὰ ἀναπνέοντα ἐκπνεῦν καὶ εἰσπνεῦν, ἐκπνεῦν δὲ μὴ ἐνδέχεται μηδὲν αὐτῶν, φανερὸν ὡς οὐδέν ἀναπνεῖ αὐτῶν οὐδέν.

20 III. "Ετι δὲ τὸ φάναι τὸν ἀέρα ἔλκειν ἐκ τοῦ στόματος η̄ ἐκ τοῦ ὕδατος διὰ τοῦ στόματος ἀδύνατον· οὐ γὰρ ἔχουσιν ἀρτηρίαν διὰ τὸ πλεύμονα μὴ ἔχειν, ἀλλ' εὐθὺς η̄ κοιλία πρὸς τῷ στόματί ἐστιν, ὥστ' ἀναγκαῖον τῇ κοιλίᾳ ἔλκειν. τοῦτο δὲ καν τάλλα ἐποίει ζῷα· νῦν δὲ οὐ ποιοῦσιν.  
 25 καν ἐκεῖνα δ' ἔξω τοῦ ὑγροῦ δύντα ἐπιδήλως ἀν αὐτὸ ἐποίει· φαίνεται δ' οὐ ποιοῦντα αὐτό. ἔτι πάντων τῶν ἀναπνεόντων καὶ ἔλκόντων τὸ πνεῦμα ὄρῳμεν γινομένην κίνησίν τινα τοῦ μορίου τοῦ ἔλκοντος, ἐπὶ δὲ τῶν ἵχθύων οὐ συμβαῖνον· οὐδὲν γὰρ φαίνονται κινοῦντες τῶν περὶ τὴν κοιλίαν,  
 30 ἀλλ' η̄ τὰ βράγχια μόνον, καὶ ἐν τῷ ὑγρῷ καὶ εἰς τὸ ξηρὸν ἐκπεσόντες, ὅταν σπαίρωσιν. ἔτι ὅταν  
 471 b ἀποθνήσκῃ πιγούμενα ἐν τοῖς ὑγροῖς πάντα τὰ ἀναπνέοντα, γίνονται πομφόλυγες τοῦ πνεύματος ἔξιόντος βιαίως, οἷον ἐάν τις βιάζηται χελώνας η̄ βατράχους η̄ τι ἄλλο τῶν τοιούτων γενῶν· ἐπὶ δὲ τῶν ἵχθύων οὐ συμβαίνει πειρωμένοις πάντα τρόπον, ὡς οὐκ ἔχόντων πνεῦμα θύραθεν οὐθέν. ὃν τε τρόπον λέγουσι γίνεσθαι τὴν ἀναπνοὴν αὐτοῖς, ἐνδέχεται καὶ τοῖς ἀνθρώποις οὖσιν ἐν τῷ ὑγρῷ συμβαίνειν· εἰ γὰρ καὶ οἱ ἵχθύες ἔλκουσιν ἐκ τοῦ πέριξ ὕδατος τῷ στόματι, διὰ τί τοῦτο οὐκ ἀν ποιοῦμεν καὶ οἱ ἀνθρωποι καὶ τάλλα ζῷα; καὶ 10 τὸν ἐκ τοῦ στόματος δ' ἀν ἔλκοιμεν ὅμοίως τοῖς ἵχθύσιν. ὥστ' εἴπερ κάκεῖνα ἦν δυνατά, καὶ ταῦτα ἀν ἦν· ἐπεὶ δ' οὐκ ἔστι, δῆλον ὡς οὐδέν ἐπ' ἐκείνων ἔστιν. πρὸς δὲ τούτοις διὰ τίν' αἰτίαν ἐν τῷ ἀέρι

## ON RESPIRATION, II.—III.

breathing creatures must both exhale and inhale, and they cannot exhale at all, none of them can breathe at all.

III. Again to say that they draw in air from the mouth, or from the water by way of the mouth is impossible ; for they have no windpipe because they have no lung, but the stomach is close up to the mouth, so that it would have to draw in the air by the stomach. In that case other living creatures would do the same thing ; but as a matter of fact they do not. Those also which live out of water would evidently do it too ; but it is clear that they do not. Again, in the case of all creatures which breathe and draw breath, we see that there is some movement of the part which draws, but this does not happen with fishes ; for no movement can be seen of the parts about the stomach, but only the gills move, both in water, and when they are thrown out on to land, so long as they breathe. Again when all breathing animals die of drowning in water, bubbles of air violently expelled rise ; for instance if one holds down by force tortoises, or frogs, or any other such species ; but it does not happen in the case of fishes, however much we try, as they do not draw any breath from outside. But the method by which they explain animals' breathing might also apply to men in water ; for if fish draw air from the surrounding water by the mouth, why should not we men and all other living creatures do the same thing ? Then we should draw the air from the mouth just like the fishes. If the one were possible, so also would the other be ; but since it is not true in the one case, it is clear that it is not true in the other either. In addition to this why do fishes die in the air, and are

*The  
physiology  
of the fish.*

## ARISTOTLE

471 b

ἀποθνήσκουσι καὶ φαίνονται ἀσπαρίζοντα ὥσπερ  
 τὰ πνιγόμενα, εἴπερ ἀναπνέουσιν; οὐ γὰρ δὴ  
 15 τροφῆς γε ἐνδείᾳ τοῦτο πάσχουσιν. ἦν γὰρ λέγει  
 Διογένης αἰτίαν, εὐήθης· φησὶ γὰρ ὅτι τὸν ἀέρα  
 πολὺν ἔλκουσι λίαν ἐν τῷ ἀέρι, ἐν δὲ τῷ ὕδατι  
 μέτριον, καὶ διὰ τοῦτ' ἀποθνήσκειν. καὶ γὰρ ἐπὶ  
 τῶν πεζῶν ἔδει δυνατὸν εἶναι τοῦτο συμβαίνειν.  
 νῦν δ' οὐδὲν τῷ σφόδρᾳ ἀναπνεῦσαι ἀποπνίγεται  
 20 πεζὸν ζῶον. ἔτι δ' εἰ πάντα ἀναπνεῖ, δῆλον ὅτι  
 καὶ τὰ ἔντομα τῶν ζώων ἀναπνεῖ· φαίνεται δ'  
 αὐτῶν πολλὰ διατεμνόμενα ζῆν, οὐ μόνον εἰς δύο  
 μέρη ἄλλὰ καὶ εἰς πλείω, οἷον αἱ καλούμεναι σκολό-  
 πενδραι· ἂν πᾶς ἡ τίνι ἐνδέχεται ἀναπνεῖν; αἴτιον  
 δὲ μάλιστα τοῦ μὴ λέγεσθαι περὶ αὐτῶν καλῶς  
 25 τό τε τῶν μορίων ἀπείρους εἶναι τῶν ἐντός, καὶ  
 μὴ λαμβάνειν ἔνεκά τινος τὴν φύσιν πάντα ποιεῖν.  
 ζητοῦντες γὰρ τίνος ἔνεκα ἡ ἀναπνοὴ τοῖς ζῷοις  
 ὑπάρχει, καὶ ἐπὶ τῶν μορίων τοῦτ' ἐπισκοποῦντες,  
 οἷον ἐπὶ βραγχίων καὶ πλεύμονος, εὑρον ἀν θᾶττον  
 τὴν αἰτίαν.

30 ΙV. Δημόκριτος δ' ὅτι μὲν ἐκ τῆς ἀναπνοῆς  
 συμβαίνει τι τοῖς ἀναπνέουσι λέγει, φάσκων κωλύειν  
 472 a ἐκθλίβεσθαι τὴν ψυχήν· οὐ μέντοι ὡς τούτου γ'  
 ἔνεκα ποιήσασαν τοῦτο τὴν φύσιν οὐθὲν εἴρηκεν.  
 ὅλως γὰρ ὥσπερ καὶ οἱ ἄλλοι φυσικοί, καὶ οὐτος  
 οὐθὲν ἀπτεται τῆς τοιαύτης αἰτίας. λέγει δ' ὡς  
 ἡ ψυχὴ καὶ τὸ θερμὸν ταῦτὸν τὰ πρῶτα σχῆματα  
 δ τῶν σφαιροειδῶν. συγκρινομένων οὖν αὐτῶν ὑπὸ<sup>τοῦ</sup>  
 περιέχοντος ἐκθλίβοντος, βοήθειαν γίνεσθαι  
 τὴν ἀναπνοήν φησιν. ἐν γὰρ τῷ ἀέρι πολὺν

## ON RESPIRATION, III.—IV.

seen to gasp convulsively as if they were choking, if they can breathe? For their symptoms are not due to lack of food. The explanation which Diogenes gives is childish; he says that in the air they absorb too much of the air, but in the water only a moderate quantity, and that this is why they die. But in that case it ought to be possible for it to happen with land creatures, but in point of fact no land animal has ever been choked by breathing in too much. Again if every living creature breathes in air, it is obvious that insects as well as other animals should breathe; but many of them seem to continue living even when severed, not merely into two parts but into more, for instance the so-called centipedes; how and with what organ can they breathe? The reason why men have given a false account of them is that they have never examined their internal anatomy, and have not considered the end in view that nature has in all creation; for if they had inquired why breathing is characteristic of animals, and had considered the question in the light of their parts, for instance the gills and lungs, they would have discovered the reason more easily.

IV. Democritus states that among animals that breathe there is a result of their breathing, and alleges that it prevents the soul from being crushed out; but he nowhere says that this is why nature has invented breathing; for generally speaking, like other natural philosophers, he never reckons upon any reason of this kind. But he does identify the soul with the heat, regarding both as first forms of spherical particles. So he contends that when these particles are being crushed by the surrounding air, which is pressing them out, breathing intervenes to help them.

Why do any living creatures breathe?  
Refutation of Democritus.

ARISTOTLE

472 a ἀριθμὸν εἶναι τῶν τοιούτων ἂν καλεῖ ἐκεῖνος νοῦν  
 καὶ ψυχῆν· ἀναπνέοντος οὖν καὶ εἰσιόντος τοῦ  
 ἀέρος συνεισιόντα ταῦτα, καὶ ἀνείργοντα τὴν  
 10 θλίψιν, κωλύειν τὴν ἐνοῦσαν ἐν τοῖς ζῷοις διέναι  
 ψυχῆν. καὶ διὰ τοῦτο ἐν τῷ ἀναπνεῖν καὶ ἐκπνεῖν  
 εἶναι τὸ ζῆν καὶ τὸ ἀποθνήσκειν· ὅταν γὰρ κρατῇ  
 τὸ περιέχον συνθλῖβον, καὶ μηκέτι θύραθεν εἰσιὸν  
 δύνηται ἀνείργειν, μὴ δυναμένου ἀναπνεῖν, τότε  
 συμβαίνειν τὸν θάνατον τοῖς ζῷοις· εἶναι γὰρ τὸν  
 15 θάνατον τὴν τῶν τοιούτων σχημάτων ἐκ τοῦ  
 σώματος ἔξοδον ἐκ τῆς τοῦ περιέχοντος ἐκθλίψεως.  
 τὴν δὲ αἰτίαν διὰ τί ποτε πᾶσι μὲν ἀναγκαῖον  
 ἀποθανεῖν, οὐ μέντοι ὅτε ἔτυχεν ἀλλὰ κατὰ φύσιν  
 μὲν γῆρᾳ, βίᾳ δὲ παρὰ φύσιν, οὐθὲν δεδήλωκεν.  
 καίτοι ἔχρην, ἐπεὶ ὅτε μὲν φαίνεται τοῦτο γινό-  
 20 μενον, ὅτε δὲ οὐ φαίνεται, πότερον τὸ αἴτιον ἔξωθεν  
 ἐστιν ή ἐντός. οὐ λέγει δὲ οὐδὲ περὶ τῆς ἀρχῆς  
 τοῦ ἀναπνεῖν τί τὸ αἴτιον, πότερον ἔσωθεν ή  
 ἔξωθεν· οὐ γὰρ δὴ δὲ οὐδὲ θύραθεν νοῦς τηρεῖ τὴν βοή-  
 θειαν, ἀλλ’ ἔσωθεν ή ἀρχὴ τῆς ἀναπνοῆς γίνεται  
 καὶ τῆς κινήσεως, οὐχ ὡς βιαζομένου τοῦ περι-  
 25 ἔχοντος. ἀποπον δὲ καὶ τὸ ἄμα τὸ περιέχον συν-  
 θλίβειν καὶ εἰσιὸν διαστέλλειν. ἀ μὲν οὖν εἰρηκε  
 καὶ ὡς, σχεδὸν τὰῦτ’ ἐστίν.

Εἰ δὲ δεῖ νομίζειν ἀληθῆ εἶναι τὰ πρότερον λεχ-  
 θέντα καὶ μὴ πάντα τὰ ζῷα ἀναπνεῖν, οὐ περὶ  
 παντὸς θανάτου τὴν αἰτίαν ὑποληπτέον εἰρῆσθαι  
 ταῦτην, ἀλλὰ μόνον ἐπὶ τῶν ἀναπνεόντων. οὐ  
 30 μὴν οὐδὲ ἐπὶ τούτων καλῶς. δῆλον δὲ ἐκ τῶν

## ON RESPIRATION, iv.

For in the air are a large number of these particles, which he calls mind and soul ; so that when breathing takes place and the air enters, these enter too and check the crushing, preventing the soul which is in the animal from passing out. For this reason upon breathing in and breathing out depend life and death ; for when the surrounding air by its crushing action wins the mastery, and nothing entering from the outside can check it, as breathing is impossible, death then comes to living creatures ; for he considers that death is the passing out of such forms from the body owing to the pressure of the surrounding air. But the reason why all living creatures must die at some time, though not at any particular time, but either naturally by old age or unnaturally by violence, he has nowhere explained. And yet he should have explained it, since sometimes it can be seen happening and sometimes not, whether the cause is external or internal. He does not even say of the origin of breathing, what its cause is, nor whether it begins from the outside or the inside. As a matter of fact the mind does not watch from the outside for the time to help, but the origin of breathing and of all movement comes from inside, and not by pressure from the surrounding air. It is improbable that the surrounding air causes compression and by entering causes expansion at the same time. For what he has said, and his way of explaining it, almost amounts to this.

But if we are to believe what has been said before —that not all living creatures breathe—one must suppose that this cannot be alleged as the cause of death in every case, but only in the case of breathing animals. It is not quite a satisfactory explanation even in their case. This is clear from the facts and

## ARISTOTLE

472 a

συμβαινόντων καὶ τῶν τοιούτων ὡν ἔχομεν πάντες πεῖραν. ἐν γὰρ ταῖς ἀλέαις θερμαινόμενοι μᾶλλον καὶ τῆς ἀναπνοῆς μᾶλλον δεόμεθα καὶ πυκνότερον ἀναπνέομεν πάντες· ὅταν δὲ τὸ πέριξ ἦ ψυχρὸν καὶ συνάγη καὶ συμπηγνύῃ τὸ σῶμα, κατέχειν 35 συμβαίνει τὸ πνεῦμα. καίτοι τότ’ ἔχρην τὸν 472 b θύραθεν εἰσιόντα κωλύειν τὴν σύνθλιψιν. νῦν δὲ γίνεται τούναντίον· ὅταν γὰρ πολὺ λίαν ἀθροισθῇ τὸ θερμὸν μὴ ἐκπνεόντων, τότε δέονται τῆς ἀναπνοῆς· ἀναγκαῖον δ’ εἰσπνεύσαντας ἀναπνεῖν. ἀλεάζοντες δὲ πολλάκις ἀναπνέουσιν, ὡς ἀνα- 5 ψύξεως χάριν ἀναπνέοντες, ὅτε τὸ λεγόμενον ποιεῖ πῦρ ἐπὶ πῦρ.

V. Ἡ δ’ ἐν τῷ Τιμαίῳ γεγραμμένη περίωσις περὶ τε τῶν ἄλλων ζώων οὐδὲν διώρικε τίνα τρόπον αὐτοῖς ἡ τοῦ θερμοῦ γίνεται σωτηρία, πότερον τὸν αὐτὸν ἡ δι’ ἄλλην τινὰ αἰτίαν· εἰ μὲν γὰρ 10 μόνοις τὸ τῆς ἀναπνοῆς ὑπάρχει τοῖς πεζοῖς, λεκτέον τὴν αἰτίαν τοῦ μόνοις· εἰ δὲ καὶ τοῖς ἄλλοις, ὁ δὲ τρόπος ἄλλος, καὶ περὶ τούτου διοριστέον, εἴπερ δυνατὸν ἀναπνεῖν πᾶσιν.

Ἐπι δὲ καὶ πλασματώδης ὁ τρόπος τῆς αἰτίας. ἐξιόντος γὰρ ἔξω τοῦ θερμοῦ διὰ τοῦ στόματος, τὸν περιέχοντα ὡθούμενον ἀέρα φερόμενον ἐμ- 15 πύπτειν εἰς τὸν αὐτὸν τόπον φησὶ διὰ μανῶν οὐσῶν τῶν σαρκῶν, ὅθεν τὸ ἐντὸς ἔξηρει θερμόν, διὰ τὸ μηδὲν εἶναι κενὸν ἀντιπερισταμένων ἀλλήλοις· θερμανθέντα δὲ πάλιν ἐξιέναι κατὰ τὸν αὐτὸν τόπον, καὶ περιωθεῖν εἰσω διὰ τοῦ στόματος τὸν ἀέρα τὸν ἐκπίπτοντα θερμόν· καὶ τοῦτο δὴ δια-

## ON RESPIRATION, IV.—V.

from experiences of a kind with which we are all familiar. For in high temperatures the hotter we get the more we have to breathe, and with all of us the breath comes faster ; but when the surrounding atmosphere is cold, which contracts and freezes the body, it checks the breath. And yet on the assumption made the air entering from the outside ought to prevent this pressure. But in point of fact the exact opposite occurs ; for when excessive heat is collected by not exhaling, then men need to breathe ; and they can only breathe by inhaling. But when they are hot they breathe rapidly, and they do so in order to get cool, but this according to Democritus's theory would be adding fire to fire.

V. The account given in the *Timaeus*<sup>a</sup> of the "pushing round" of the air does not explain in the case of animals other than land animals why this conservation of heat occurs in them, nor whether it is for the same reason or for some other ; for if breathing occurs only in land animals, we have to explain why only in them ; but if it does occur with the rest, but its mode of action is different, then we must be definite on this point, whether it is possible for all living creatures to breathe.

Plato's account of breathing. Refutation.

Moreover this kind of cause is really fictitious. For, upon this theory, when the heat passes out through the mouth, the surrounding air is pushed on and falls into the actual place from which the internal heat has passed out "through the flesh which is porous," one substance replacing another because a vacuum is impossible ; when the air has grown hot it passes out again through the same place as before, and pushes the hot air, which falls out, round again through the mouth ;

<sup>a</sup> *Tim.* 79 c.

ARISTOTLE

472 b

20 τελεῖν ἀεὶ ποιοῦντας, ἀναπνέοντάς τε καὶ ἐκπνέοντας. συμβαίνει δὲ τοῖς οὕτως οἰομένοις πρότερον τὴν ἐκπνοὴν γίνεσθαι τῆς εἰσπνοῆς. ἔστι δὲ τούναντίον. σημεῖον δέ· γίνεται μὲν γὰρ ἀλλήλοις ταῦτα παρ' ἄλληλα, τελευτῶντες δὲ ἐκπνέουσιν, ὥστ' ἀναγκαῖον εἶναι τὴν ἀρχὴν εἰσπνοήν.

"Ετι δὲ τὸ τίνος ἔνεκα ταῦθ' ὑπάρχει τοῖς ζῷοις 25 (λέγω δὲ τὸ ἀναπνεῖν καὶ τὸ ἐκπνεῖν) οὐθὲν εἰρήκασιν οἱ τοῦτον τὸν τρόπον λέγοντες, ἀλλ' ὡς περὶ συμπτώματός τινος ἀποφαίνονται μόνον. καίτοι γε κύρια ταῦθ' ὅρωμεν τοῦ ζῆν καὶ τελευτᾶν. ὅταν γὰρ ἀναπνεῖν μὴ δύνωνται, τότε συμβαίνει γίνεσθαι τὴν φθορὰν τοῖς ἀναπνέουσιν. ἔτι δὲ 30 ἄποπον τὸ τὴν μὲν τοῦ θερμοῦ διὰ τοῦ στόματος ἔξοδον καὶ πάλιν εἴσοδον μὴ λανθάνειν ἡμᾶς, τὴν δ' εἰς τὸν θώρακα τοῦ πνεύματος εἴσοδον καὶ πάλιν θερμανθέντος ἔξοδον λανθάνειν. ἄποπον δὲ καὶ τοῦ θερμοῦ τὴν ἀναπνοὴν εἴσοδον εἶναι. φαίνεται γὰρ τούναντίον· τὸ μὲν γὰρ ἐκπνεόμενον εἶναι 35 θερμόν, τὸ δ' εἰσπνεόμενον ψυχρόν. ὅταν δὲ θερμὸν 473 a ἦ, ἀσθμαίνοντες ἀναπνέουσιν· διὰ γὰρ τὸ μὴ καταψύχειν ἵκανῶς τὸ εἰσιὸν πολλάκις τὸ πνεῦμα συμβαίνει σπάνι.

VII. Ἀλλὰ μὴν οὐδὲ τροφῆς γε χάριν ὑποληπτέον γίνεσθαι τὴν ἀναπνοήν, ὡς τρεφομένου τῷ πνεύματι τοῦ ἐντὸς πυρός, καὶ ἀναπνέοντος μὲν ὥσπερ ἐπὶ πῦρ ὑπέκκαυμα ὑποβάλλεσθαι, τραφέντος δὲ τοῦ πυρὸς γίνεσθαι τὴν ἐκπνοήν. ταῦτὰ γὰρ ἐροῦμεν πάλιν καὶ πρὸς τοῦτον τὸν λόγον ἅπερ πρὸς τοὺς ἔμπροσθεν· καὶ γὰρ ἐπὶ τῶν ἄλλων ζῷων ἔχρην τοῦτο συμβαίνειν ἢ τὸ ἀνάλογον 10 τούτῳ· πάντα γὰρ ἔχει θερμότητα ζωτικήν. ἔπειτα

## ON RESPIRATION, v.—vi.

and this we continue to do perpetually, inhaling and exhaling. But those who believe this must think that exhalation comes before inhalation. But the opposite is the truth. And here is the proof ; these actions take place alternately, but the last thing men do is to exhale, so that inhalation must be the first action.

Again those who talk in this way have never explained why this happens in living creatures (I mean inhalation and exhalation), but their account suggests that it is a mere accident. And yet we see that it controls life and death ; for when the breathing creatures can no longer breathe, then destruction comes to them. Again, it is remarkable that we should be conscious of the successive exit and entrance of heat through the mouth, but unconscious of the entry of the breath into the chest, and its subsequent exit when it is hot. It is strange if inhalation is the entrance of the hot. For the opposite seems true ; what is exhaled seems to be hot and what is inhaled cool. For when it is hot men breathe hard ; for, because the entering breath does not cool sufficiently, one draws it in often.

VI. Nor can we suppose that breathing is for the sake of nourishment, on the supposition that the internal heat is nourished by breath, and that breathing is supplying fuel to the fire, and that exhalation takes place when the fire is sufficiently fed. For we shall make the same reply to this argument that we made to the previous ones ; for this or something analogous to it should have occurred in the case of the other animals ; for all of them have life-giving

Is breathing  
for the sake  
of food?

ARISTOTLE

473 a καὶ τὸ γίνεσθαι τὸ θερμὸν ἐκ τοῦ πνεύματος τῶν χρὴ τρόπον λέγειν, πλασματῶδες ὅν; μᾶλλον γὰρ ἐκ τῆς τροφῆς τοῦτο γινόμενον ὅρωμεν. συμβαίνει τε κατὰ ταῦτα δέχεσθαι τὴν τροφὴν καὶ τὸ περίττωμα ἀφιέναι· τοῦτο δ' ἐπὶ τῶν ἄλλων οὐχ ὅρωμεν γινόμενον.

15 VII. Λέγει δὲ περὶ ἀναπνοῆς καὶ Ἐμπεδοκλῆς, οὐ μέντοι τίνος γ' ἔνεκα, οὐδὲ περὶ πάντων τῶν ζῶν οὐδὲν ποιεῖ δῆλον, εἴτε ἀναπνέουσιν εἴτε μῆ. καὶ περὶ τῆς διὰ τῶν μυκτήρων ἀναπνοῆς λέγων οἰεται καὶ περὶ τῆς κυρίας λέγειν ἀναπνοῆς. ἔστι γὰρ καὶ διὰ τῆς ἀρτηρίας ἐκ τῶν 20 στηθῶν ἡ ἀναπνοή, καὶ ἡ διὰ τῶν μυκτήρων αὐτοῖς δὲ χωρὶς ἐκείνης οὐκ ἔστιν ἀναπνεῦσαι τοῖς μυκτήρσιν. καὶ τῆς μὲν διὰ τῶν μυκτήρων γινομένης ἀναπνοῆς στερισκόμενα τὰ ζῶα οὐδὲν πάσχουσι, τῆς δὲ κατὰ τὴν ἀρτηρίαν ἀποθνήσκουσιν. καταχρῆται γὰρ ἡ φύσις ἐν παρέργῳ τῇ διὰ τῶν 25 μυκτήρων ἀναπνοῇ πρὸς τὴν ὁσφρησιν ἐν ἐνίοις τῶν ζῶων· διόπερ ὁσφρήσεως μὲν σχεδὸν μετέχει πάντα τὰ ζῶα, ἔστι δ' οὐ πᾶσι τὸ αὐτὸν αἰσθητή- 478 b ριον. εἴρηται δὲ περὶ αὐτῶν ἐν ἑτέροις σαφέστερον.

Γίνεσθαι δέ φησι τὴν ἀναπνοὴν καὶ ἐκπνοὴν διὰ τὸ φλέβας εἶναι τινας, ἐν αἷς ἔνεστι μὲν αἷμα, οὐ μέντοι πλήρεις εἰσὶν αἷματος, ἔχουσι δὲ πόρους εἰς τὸν ἔξω ἀέρα, τῶν μὲν τοῦ σώματος μορίων ὁ ἐλάττον, τῶν δὲ τοῦ ἀέρος μείζους· διὸ τοῦ αἵματος πεφυκότος κινεῖσθαι ἀνω καὶ κάτω, κάτω μὲν φερομένου εἰσπειν τὸν ἀέρα καὶ γίνεσθαι ἀναπνοήν, ἀνω δ' ἵνοτος ἐκπίπτειν θύραζε καὶ γίνεσθαι τὴν ἐκπνοήν, παρεικάζων τὸ συμβαῖνον ταῖς κλεψυδραῖς.

## ON RESPIRATION, VI.—VII.

heat. Again, this arising of heat from the breath, being fictitious, how can we explain it? For we see that this arises far more from food. It would follow that the animal would receive nourishment, and discharge waste product in the same way ; and this does not seem to be true in other cases.

VII. Empedocles also discusses breathing, but not its purpose, nor does he clear up the question as applied to all living creatures, whether they breathe or not. Also when he speaks of breathing through the nostrils, he thinks that he is speaking of breathing in its proper sense. But, besides the breathing through the nostrils, there is also breathing from the chest through the windpipe ; without the latter no breathing through the nostrils would be possible. Again animals deprived of breathing through the nostrils do not seem to suffer for it, but when they lose their breathing through the windpipe they die. Nature employs this breathing through the nostrils for a subsidiary purpose in some animals—for smelling ; this is why nearly all animals share a sense of smell, but they have not all the same sense organ. A more detailed account of this is given in other works.<sup>a</sup>

Empedocles  
on breathing.

But Empedocles says that inhalation and exhalation occur because there are certain veins, which contain some blood but are not full of blood, but have openings to the air outside, smaller than the parts of the body, but large enough for air ; because it is the nature of blood to move up and down, when it is carried down the air flows in and constitutes breathing, but, when it rises, the air is driven out, and exhalation takes place, comparing it with what happens in water-clocks.

<sup>a</sup> Cf. *De An.* iii., 421 a 10, *De Sens.* 443 a 4, 444 b 7-15.

ARISTOTLE

473 b

ὦδε δ' ἀναπνεῖ πάντα καὶ ἐκπνεῖ. πᾶσι λίφαιμοι  
 10 σαρκῶν σύριγγες πύματον κατὰ σῶμα τέτανται,  
 καὶ σφιν ἐπὶ στομίοις πυκναῖς τέτρηνται ἀλοξιν  
 ρίνῶν ἔσχατα τέρθρα διαμπερές, ὥστε φόνον μέν  
 κεύθειν, αἰθέρι δ' εὐπορίην διδόοισι τετμῆσθαι.  
 ἔνθεν ἔπειθ' ὅπόταν μὲν ἀπαΐξῃ τέρεν αἷμα,  
 15 αἰθὴρ παφλάζων καταβήσεται οἴδματι μάργυρῳ,  
 εὗτε δ' ἀναθρώσκει, πάλιν ἐκπνεῖ, ὥσπερ ὅταν  
 παῖς  
 κλεψύδρην παιζῆσι δι' εὐπετέος χαλκοῖο.  
 εὗτε μὲν αὐλοῦ πορθμὸν ἐπ' εὐειδὲν χερὶ θεῖσα  
 εἰς ὕδατος βάπτησι τέρεν δέμας ἀργυφέοιο,  
 20 οὐ τότ' ἐσ ἄγγος δ' ὅμβρος ἐσέρχεται, ἀλλά μιν  
 εἴργει  
 ἀέρος ὄγκος ἔσωθε πεσὼν ἐπὶ τρήματα πυκνά,  
 εἰσόκ' ἀποστεγάσῃ πυνικὸν ρόον· αὐτὰρ ἔπειτα  
 πνεύματος ἐλλείποντος ἐσέρχεται αὐξιμον ὕδωρ.  
 ὡς δ' αὗτως ὅθ' ὕδωρ μὲν ἔχει κατὰ βένθεα  
 χαλκοῦ  
 25 πορθμοῦ χωσθέντος βροτέω χροῖ ἡδὲ πόροιο,  
 αἰθὴρ δ' ἔκτὸς ἔσω λελιημένος ὅμβρον ἔρύκει  
 ἀμφὶ πύλας ἴσθμοῖ δυσηχέος, ἄκρα κρατύνων,  
 εἰσόκε χειρὶ μεθῆ· τότε δ' αὖ πάλιν, ἔμπαλιν ἥ  
 πρίν,  
 πνεύματος ἐμπίπτοντος ὑπεκθέει αὐξιμον ὕδωρ.  
 ὡς δ' αὗτως τέρεν αἷμα κλαδασσόμενον διὰ γυίων  
 ὀππότε μὲν παλνορσον ἐπαΐξει μυχόνδε,  
 5 αἰθέρος εὐθὺς ρένμα κατέρχεται οἴδματι θῦον,  
 εὗτε δ' ἀναθρώσκῃ, πάλιν ἐκπνεῖ ίσον δπίσσω.

Λέγει μὲν οὖν ταῦτα περὶ τοῦ ἀναπνεῦν, ἀναπνεῖ  
 δ', ὥσπερ εἴπομεν, τὰ φανερῶς ἀναπνέοντα διὰ τῆς

## ON RESPIRATION, VII.

"Thus all things breathe in and out. All men have bloodless pipes of flesh stretching throughout the body, and these are pierced at their ends with many passages right through the ends of the nostrils, such that the blood is covered in them, but they give an easy passage to the air. Now whenever the gentle blood retreats, the rushing air will descend with raging tide, but when the blood leaps up again, the air again blows out, just as when a maid plays with a water-clock of gleaming bronze. When placing a shapely finger on the channel of the tube she dips the delicate body into water silver white, not then does the stream flow into the vessel, but the press of the air from within falling on the crowded holes checks it, until she sets free the rapid stream. Then the air gives way and the swelling water enters. So in the same way, when the water lies in the depths of the bronze vessel, the passage and channel being blocked by the human hand, the air outside craving entrance keeps the water back about the gates of the resounding channel, holding fast its extremities, until the maid lets go with the hand ; then again, in the opposite way, as the air rushes in, the swelling water flows out. In just this way the gentle blood coursing through the limbs, whenever it retreats back again to its recesses, at once a stream of air flows in with a rush, but when the blood leaps again the air flows back again as before."

This is what Empedocles has to say about breathing, but, as we have said, creatures whose breathing can be seen, breathe through the windpipe, and also

Refutation of Empedocles.

ARISTOTLE

474 a

ἀρτηρίας, διά τε τοῦ στόματος ἄμα καὶ διὰ τῶν 10 μυκτήρων. ὥστ' εὶ μὲν περὶ ταύτης λέγει τῆς ἀναπνοῆς, ἀναγκαῖον ζητεῖν πῶς ἐφαρμόσει ὁ εἰρημένος λόγος τῆς αἰτίας· φαίνεται γάρ τούναντίον συμβαῖνον. ἄραντες μὲν γὰρ τὸν τόπον, καθάπερ τὰς φύσας ἐν τοῖς χαλκείοις, ἀναπνέουσιν· αἴρειν δὲ τὸ θερμὸν εὔλογον, ἔχειν δὲ τὸ αἷμα τὴν 15 τοῦ θερμοῦ χώραν· συνιζάνοντες δὲ καὶ καταπιλγούντες, ὥσπερ ἐκεῖ τὰς φύσας, ἐκπινέουσιν. πλὴν ἐκεῖ μὲν οὐ κατὰ ταύτὸν εἰσδέχονται τε τὸν ἀέρα καὶ πάλιν ἐξιάσιν, οἱ δὲ ἀναπνέοντες κατὰ ταύτον. εὶ δὲ περὶ τῆς κατὰ τὸν μυκτήρας λέγει μόνης, πολὺ διημάρτηκεν· οὐ γάρ ἐστιν ἀναπνοὴ μυκτήρων 20 ἴδιος, ἀλλὰ παρὰ τὸν αὐλῶνα τὸν περὶ τὸν γαργαρεῶνα, ἢ τὸ ἔσχατον τοῦ ἐν τῷ στόματι οὐρανοῦ, συντετρημένων τῶν μυκτήρων χωρεῖ τὸ μὲν ταύτη τοῦ πνεύματος, τὸ δὲ διὰ τοῦ στόματος, διμοίως εἰσιόν τε καὶ ἐξιόν. τὰ μὲν οὖν παρὰ τῶν ἀλλων εἰρημένα περὶ τοῦ ἀναπνεῖν τοιαύτας καὶ τοσαύτας ἔχει δυσχερείας.

25 VIII. Ἐπεὶ δὲ εἴρηται πρότερον ὅτι τὸ ζῆν καὶ ἡ τῆς ψυχῆς ἔξις μετὰ θερμότητός τυνός ἐστιν· οὐδὲ γάρ ἡ πέψις, δι' ἣς ἡ τροφὴ γίνεται τοῖς ζῷοις, οὔτ' ἄνευ ψυχῆς οὔτ' ἄνευ θερμότητός ἐστιν· πυρὶ γάρ ἐργάζεται πάντα. διόπερ ἐν ᾧ πρώτῳ τόπῳ τοῦ σώματος καὶ ἐν ᾧ πρώτῳ τοῦ τόπου τούτου μορίῳ τὴν ἀρχὴν ἀναγκαῖον. εἶναι τὴν τοιαύτην, ἐνταῦθα καὶ τὴν πρώτην τὴν θρεπτικὴν 474 b ψυχὴν ἀναγκαῖον ὑπάρχειν. οὗτος δὲ ἐστὶν ὁ μέσος τόπος τοῦ τε δεχομένου τὴν τροφὴν καὶ καθ' ὃν ἀφίησι τὸ περίττωμα. τοῖς μὲν οὖν ἀναίμοις ἀνώνυμον, τοῖς δὲ ἐναίμοις ἡ καρδία

## ON RESPIRATION, VII.—VIII.

through the mouth and through the nostrils. So that, if he is talking of breathing in this sense, he must consider how what he has said of the cause will fit in ; for it is clear that just the opposite happens. When men breathe they raise the region (the chest), just like the bellows in a forge ; it is quite natural for heat to raise it, and the blood occupies the place of heat ; but when they are settling it down and cutting it off, as in the other case with the bellows, they exhale. But in the other case they do not admit and expel the air in the same way, but those who breathe do. But if he is speaking of breathing by the nostrils only, he is guilty of a grave error. For breathing is not peculiar to the nostrils, but the breath in this region also travels by the channel about the uvula, where the roof of the mouth ends, and, as the nostrils are perforated, part of the breath travels by this channel, and part by the mouth, both when entering and when going out. The accounts given of breathing by the other philosophers present many difficulties of this kind.

VIII. We have said before that life and the condition of the soul depend to some extent upon heat ; for digestion by which means animals assimilate their food cannot take place apart from the soul and heat ; for all this work is done by heat. Therefore in that region of the body which is first, and in the first part of that region in which this principle must exist, there the primary nutritive soul must exist. This is the region midway between that which receives the food and that which discharges the waste product. It has no name in the bloodless animals, but in animals

Aristotle's  
views.  
Bodily heat.

474 b

τοῦτο τὸ μόριόν ἔστιν. ἡ τροφὴ μὲν γὰρ ἐξ ἦς  
 5 ἥδη γίνεται τὰ μόρια τοῖς ζώοις, ἡ τοῦ αἷματος  
 φύσις ἔστιν. τοῦ δ' αἷματος καὶ τῶν φλεβῶν τὴν  
 αὐτὴν ἀρχὴν ἀναγκαῖον εἶναι· θατέρου γὰρ ἔνεκα  
 θάτερόν ἔστιν, ὡς ἀγγείον καὶ δεκτικόν. ἀρχὴ δὲ  
 τῶν φλεβῶν ἡ καρδία τοῖς ἀναίμοις· οὐ γὰρ διὰ  
 ταύτης, ἀλλ' ἐκ ταύτης ἡρτημέναι πᾶσαι τυγχά-  
 νουσιν. δῆλον δ' ἡμῖν τοῦτο ἐκ τῶν ἀνατομῶν.

10 Τὰς μὲν οὖν ἄλλας δυνάμεις τῆς ψυχῆς ἀδύνατον  
 ὑπάρχειν ἄνευ τῆς θρεπτικῆς (δι' ἣν δ' αἰτίαν,  
 εἴρηται πρότερον ἐν τοῖς περὶ ψυχῆς), ταύτην δ'  
 15 ἄνευ τοῦ φυσικοῦ πυρός· ἐν τούτῳ γὰρ ἡ φύσις  
 ἐμπεπύρευκεν αὐτὴν. φθορὰ δὲ πυρός, ὡσπερ  
 εἴρηται πρότερον, σβέσις καὶ μάρανσις. σβέσις  
 20 μὲν ἡ ὑπὸ τῶν ἀναντίων· διόπερ ἀθρόον τε ὑπὸ  
 τῆς τοῦ περιέχοντος ψυχρότητος, καὶ θάττον ὅτι  
 σβέννυται διασπώμενον. αὕτη μὲν οὖν ἡ φθορὰ  
 βίαιος ὅμοίως ἐπὶ τῶν ἐμψύχων καὶ τῶν ἀψύχων  
 25 ἔστιν· καὶ γὰρ ὅργανοις διαιρουμένου τοῦ ζώου,  
 καὶ πηγανυμένου διὰ ψύχους ὑπερβολήν, ἀποθνή-  
 σκουσιν. ἡ δὲ μάρανσις διὰ πλῆθος θερμότητος·  
 30 καὶ γὰρ ἀν ὑπερβάλλη τὸ πέριξ θερμόν, καὶ τροφὴν  
 ἐὰν μὴ λαμβάνῃ, φθείρεται τὸ πυρούμενον, οὐ  
 ψυχόμενον ἀλλὰ μαρανόμενον. ὥστ' ἀνάγκη γίνε-  
 σθαι κατάψυξιν, εἰ μέλλει τεύξεσθαι σωτηρίας·  
 τοῦτο γὰρ βοήθει πρὸς ταύτην τὴν φθοράν.

25 IX. Ἐπεὶ δὲ τῶν ζώων τὰ μὲν ἔνδρα, τὰ δ'  
 ἐν τῇ γῇ ποιεῖται τὴν διατριβήν, τούτων τοῖς μὲν  
 μικροῖς πάμπαν καὶ τοῖς ἀναίμοις ἡ γινομένη ἐκ  
 τοῦ περιέχοντος ἡ ὕδατος ἡ ἀέρος ψύξις ἵκανὴ  
 πρὸς τὴν βοήθειαν τῆς φθορᾶς ταύτης· μικρὸν γὰρ  
 ἔχοντα τὸ θερμὸν μικρᾶς δέονται τῆς βοηθείας.

## ON RESPIRATION, VIII.—IX.

with blood this part is the heart. The nature of the blood supplies the food from which the parts in animals grow. But the source of the blood and the veins must be the same ; for the one exists for the sake of the other, as its vessel and receiver. But in the animals with blood the heart is the source of the veins ; for not merely do the veins go through the heart, but they actually proceed from it. This of course is proved by dissection.

The other functions of the soul cannot exist without the nutritive (the reason for this has been discussed in my work *On the Soul*),<sup>a</sup> nor can that exist without natural heat. For it is in this that nature has fired it. But the destruction of fire, as has been said before, is due to either quenching or dying out. Quenching is due to opposites ; thus it is quenched by the coldness of the surrounding air, even when it is a mass of flame, and even more quickly when scattered. Now this violent extinction takes place equally in creatures with and without soul ; for when the living creature is dissected by instruments, and is frozen by excess of cold, it dies. But withering is due to excess of heat ; for if the surrounding heat is excessive, unless it receives food, the burning object dies, not because it grows cold, but by dying out. So then, if it is to survive, a cooling must take place ; for this protects it against destruction in this way.

IX. But since some living creatures spend their lives in water, and others on land, in the case of those which are bloodless and very small the cooling due to the surrounding envelope—whether water or air—is sufficient to protect them against destruction of this kind ; for as they contain little heat they need but

Breathing  
and life.

<sup>a</sup> *De An.* 411 b 18, 413 b 1.

ARISTOTLE

474 b  
 80 διὸ καὶ βραχύβια σχεδὸν πάντα τὰ τοιαῦτ’ ἔστιν·  
 ἐπ’ ἀμφότερα γὰρ μικρᾶς ὅντα τυγχάνει ροπῆς.  
 475 a ὅσα δὲ μακροβιώτερα τῶν ἐντόμων (ἄναιμα γάρ  
 ἔστι πάντα τὰ ἔντομα), τούτοις ὑπὸ τὸ διάζωμα  
 διεσχισται, ὅπως διὰ λεπτοτέρου ὅντος τοῦ ὑμένος  
 ψύχηται· μᾶλλον γὰρ ὅντα θερμὰ πλείονος δεῖται  
 τῆς καταψύξεως, οἷον αἱ μέλιτται (τῶν γὰρ μελιτ-  
 ὅ τῶν ἔναιαι ζῶσι καὶ ἐπτὰ ἔτη) καὶ τὰλλα δὲ ὅσα  
 βομβεῖ, οἷον σφῆκες καὶ μηλολόνθαι καὶ τέττιγες.  
 καὶ γὰρ τὸν ψόφον ποιοῦσι πνεύματι, οἷον ἀσθμαί-  
 νοντα· ἐν αὐτῷ γὰρ τῷ ὑποζῷματι, τῷ ἐμφύτῳ  
 πνεύματι αἴροντι καὶ συνίζοντι, συμβαίνει πρὸς  
 10 τὸν ὑμένα γίνεσθαι τρύψιν· κινοῦσι γὰρ τὸν τόπον  
 τοῦτον, ὥσπερ τὰ ἀναπνέοντα ἔξωθεν τῷ πλεύμονι  
 καὶ οἱ ἰχθύες τοῖς βραγχίοις. παραπλήσιον γὰρ  
 συμβαίνει κὰν εἴ τις τινα τῶν ἀναπνεόντων πνύγοι,  
 τὸ στόμα κατασχών· καὶ γὰρ ταῦτα ποιήσει τῷ  
 πλεύμονι τὴν ἄρσιν ταύτην. ἀλλὰ τούτοις μὲν  
 15 οὐχ ἵκανήν ἡ τοιαύτη ποιεῖ κίνησις κατάψυξιν,  
 ἐκείνοις δὲ ἵκανήν. καὶ τῇ τρύψει τῇ πρὸς τὸν  
 ὑμένα ποιοῦσι τὸν βόμβον, ὥσπερ λέγομεν, οἷον  
 διὰ τῶν καλάμων τῶν τετρυπημένων τὰ παιδία,  
 ὅταν ἐπιθῶσιν ὑμένα λεπτόν. διὰ γὰρ τοῦτο καὶ  
 τῶν τεττίγων οἱ ἄδοντες ἄδουσιν· θερμότεροι γάρ  
 20 εἰσι, καὶ ἔσχισται αὐτοῖς ὑπὸ τὸ ὑπόζωμα· τοῖς  
 δὲ μὴ ἄδουσι τοῦτ’ ἔστιν ἄσχιστον.

Καὶ τῶν ἔναιμων δὲ καὶ πλεύμονα ἔχόντων,  
 ὀλίγαιμον δ’ ἔχόντων καὶ σομφόν, ἔνια διὰ τοῦτο  
 πολὺν χρόνον δύνανται ἀπιευστὶ ζῆν, ὅτι ὁ πλεύμων  
 ἄρσιν ἔχει πολλήν, ὀλίγον ἔχων τὸ αἷμα καὶ τὸ  
 25 ὑγρόν· ἡ γὰρ οἰκεία κίνησις ἐπὶ πολὺν χρόνον

## ON RESPIRATION, ix.

little protection. For this reason nearly all creatures of this kind are short-lived ; for they have but little margin in either direction. But all the insects that are long-lived (for all insects are bloodless) have a division under the mid-region, so that the membrane there being thinner they may be cooled ; for being more hot by nature they need more cooling ; such insects as bees (for some bees live as long as seven years), and all the buzzing animals such as wasps and cockchafers and cicadas. For they produce the buzzing sound by breath, as though they were breathing hard ; for in the mid-region itself, as the breath residing therein rises and falls, a rubbing takes place against the membrane ; for they move this region, just as those animals which draw their breath from the outside do with the lung, and fishes with their gills. It is similar to what would happen if one throttled one of the breathing animals, by pinching its mouth ; for this will produce a rise in the lungs. But for the breathing animals such movement does not produce sufficient cooling, but it is enough for the others. They produce the buzzing by rubbing against the membrane, as we say, just as boys do through reeds pierced with holes, when they have put a thin membrane over them. This is how those of the cicadas which chirrup do so, for they are warmer creatures, and have a division under the midriff ; but in those which do not sing there is no division.

Of those animals which have both blood and lung, but whose lung has little blood and is porous, some can for this reason live for a long time without breathing, because the lung is capable of considerable expansion, having but little blood and moisture ; for its own movement is sufficient to keep it cool for a long time.

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διαρκεῖ καταψύχουσα. τέλος δ' οὐ δύναται, ἀλλ' ἀποπνίγεται μὴ ἀναπνεύσαντα, καθάπερ εἴρηται καὶ πρότερον τῆς γὰρ μαράνσεως ἡ διὰ τὸ μὴ ψύχεσθαι φθορὰ καλεῖται πνίξις, καὶ τὰ οὕτω φθειρόμενα ἀποπνίγεσθαι φαμεν.

80

"Οτι δ' οὐκ ἀναπνεῖ τὰ ἔντομα τῶν ζώων, εἴρηται μὲν καὶ πρότερον, φανερὸν δὲ καὶ ἐπὶ τῶν μικρῶν ἐστὶ ζώων, οἷον μυιῶν καὶ μελιτῶν. ἐν

475 b

γὰρ τοῖς ὑγροῖς πολὺν χρόνον ἀνανήχεται, ἀν μὴ λίαν ἡ θερμὸν ἡ ψυχρόν. καίτοι τὰ μικρὰν ἔχοντα δύναμιν πυκνότερον ζητεῖ ἀναπνεῖν. ἀλλὰ φθειρεται ταῦτα καὶ λέγεται ἀποπνίγεσθαι πληρουμένης τῆς κοιλίας καὶ φθειρομένου τοῦ ἐν τῷ ὑποζῷματι θερμοῦ.<sup>1</sup> διὸ καὶ ἐν τῇ τέφρᾳ χρονισθέντα ἀνίσταται. καὶ τῶν ἐν τῷ ὑγρῷ δὲ ζώντων ὅσα ἄναιμα, πλείω χρόνον ζῆται ἐν τῷ ἀέρι τῶν ἐναίμων καὶ δεχομένων τὴν θάλατταν, οἷον τῶν ίχθύων. διὰ γὰρ τὸ ὀλίγον ἔχειν τὸ θερμὸν δὲ ἀήρ ἵκανός ἐστιν ἐπὶ πολὺν χρόνον καταψύχειν, οἷον τοῖς τε 10 μαλακοστράκοις καὶ τοῖς πολύποσιν. οὐ μὴν εἰς τέλος γε διαρκεῖν πρὸς τὸ ζῆν, διὰ τὸ ὀλιγόθερμα εἶναι, ἐπεὶ καὶ τῶν ίχθύων οἱ πολλοὶ ζῶσιν ἐν τῇ γῇ, ἀκινητίζοντες μέντοι, καὶ εὑρίσκονται ὄρυτομενοι. ὅσα γὰρ ἡ μηδ' ὅλως ἔχει πλεύμονα ἡ ἄναιμον, ἐλαττονάκις δεῖται καταψύξεως.

15

X. Περὶ μὲν οὖν τῶν ἄναιμων, ὅτι τοῖς μὲν δι περιέχων ἀήρ τοῖς δὲ τὸ ὑγρὸν βοηθεῖ πρὸς τὴν ζωὴν, εἴρηται· τοῖς δ' ἐναίμοις καὶ τοῖς ἔχονσι καρδίαν, ὅσα μὲν ἔχει πλεύμονα, πάντα δέχεται τὸν ἀέρα καὶ τὴν καταψύξιν ποιεῖται διὰ τοῦ ἀναπνεῖν καὶ ἐκπνεῖν. ἔχει δὲ πλεύμονα τά τε ζωτοκοῦντα ἐν αὐτοῖς καὶ μὴ θύραζε μόνον (τὰ

## ON RESPIRATION, ix.—x.

But at last it is unable to go on, and is choked through not breathing, as has been said before. The destruction which is due to withering owing to lack of cooling is called choking, and we say that animals which die in this way are choked.

We have stated before that among living creatures insects do not breathe, and this is evident in the case of the small ones, such as flies and bees ; for they can swim in water for a long time, if it is neither too hot nor too cold. Yet those animals which have but little strength try to breathe more frequently. But these are destroyed and are said to be choked, when the belly is filled and the heat in the midriff is exhausted. For the same reason they revive if they are put for some time in ashes. Of all the animals which live in water the bloodless ones can live in the air for a longer time than the animals which have blood and admit the water like fishes ; for because they contain only a small quantity of heat, the air can keep them cool for a considerable time, as with the soft-shelled creatures and the cuttlefish. It does not enable them to live permanently thus because they contain but little heat, since most of the fishes live also in the earth, though they cannot move and are found by digging. For those which have either no lung, or a lung without blood, require cooling less often.

X. We have stated that in the case of the bloodless animals the surrounding air in some cases, and the water in others, are aids to life ; but in the case of animals with blood and those having a heart, all that have lungs admit the air and achieve cooling by breathing in and out. All viviparous animals have lungs—if that is they are viviparous internally and

Breathing  
In warm-  
blooded  
animals.

<sup>1</sup> *ὑγροῦ* B.

ARISTOTLE

475 b

γὰρ σελάχη ζωοτοκεῖ μέν, ἀλλ' οὐκ ἐν αὐτοῖς) καὶ τῶν ὡστοκούντων τά τε πτερυγωτά, οἷον ὅρνιθες, καὶ τὰ φολιδωτά, οἷον χελῶναι καὶ σαῦραι καὶ ὅφεις. ἐκεῖνα μὲν οὖν ἔναιμον, τούτων δὲ τὰ 25 πλεῖστα τὸν πλεύμονα ἔχει σομφόν. διὸ καὶ τῇ ἀναπνοῇ χρῆται μανότερον, ὥσπερ εἴρηται καὶ πρότερον.

Χρῆται δὲ πάντα καὶ ὅσα διατρίβει καὶ ποιεῖται τὸν βίον ἐν τοῖς ὅρνισιν, οἷον τὸ τῶν ὅδρων γένος καὶ βατράχων καὶ κροκοδείλων καὶ ἔμυδων καὶ χελῶναι αἱ τε θαλάττιαι καὶ αἱ χερσαῖαι καὶ 80 φῶκαι· ταῦτα γὰρ πάντα καὶ τὰ τοιαῦτα καὶ τίκτει ἐν τῷ ξηρῷ, καὶ καθεύδει ἢ ἐν τῷ ξηρῷ, ἢ ἐν τῷ 476 a ὑγρῷ ὑπερέχοντα τὸ στόμα διὰ τὴν ἀναπνοήν. ὅσα δὲ βράγχια ἔχει, πάντα καταψύχεται δεχόμενα τὸ ὅδωρ· ἔχει δὲ βράγχια τὸ τῶν καλουμένων σελαχῶν γένος καὶ τῶν ἄλλων ἀπόδων. ἀπόδεις δ' οἱ ἵχθυες πάντες· καὶ γὰρ ἄ ἔχει, καθ' ὅμοιότητα 5 τῶν πτερυγίων λέγουσιν.<sup>1</sup> τῶν δὲ πόδας ἔχοντων ἐν ἔχει βράγχιον μόνον τῶν τεθεωρημένων ὁ καλούμενος κορδύλος. ἀμα δὲ πλεύμονα καὶ βράγχια οὐδὲν ὅπται πω ἔχον. αἴτιον δ' ὅτι ὁ μὲν πλεύμων τῆς ὑπὸ τοῦ πνεύματος καταψύξεως ἔνεκεν ἔστιν (ἔοικε δὲ καὶ τοῦνομα εἰληφέναι ὁ πνεύμων διὰ 10 τὴν τοῦ πνεύματος ὑποδοχὴν), τὰ δὲ βράγχια πρὸς τὴν ἀπὸ τοῦ ὅδατος κατάψυξιν· ἐν δ' ἐφ' ἐν ὅργανον χρήσιμον, καὶ μία κατάψυξις ἵκανὴ πᾶσιν. ὥστ' ἐπεὶ μάτην οὐδὲν ὅρῶμεν ποιοῦσαν τὴν φύσιν, δυοῖν δ' ὅντοις θάτερον ἀν ἥν μάτην, διὰ τοῦτο τὰ μὲν 15 ἔχει βράγχια τὰ δὲ πνεύμονα, ἄμφω δ' οὐδέν.

XI. Ἐπεὶ δὲ πρὸς μὲν τὸ εἶναι τροφῆς δεῖται τῶν ζώων ἔκαστον, πρὸς δὲ τὴν σωτηρίαν τῆς

## ON RESPIRATION, x.—xi.

not externally (for the shark tribe is viviparous, but not in themselves) and among the oviparous the winged creatures such as birds, and the scaly creatures such as tortoises, lizards and snakes. Both these classes have lungs containing blood, but in the latter class the lung is usually porous. Consequently they breathe less often, as has been said before.

But all animals which live and have their being in <sup>Aquatic animals.</sup> water breathe, such as the genera watersnake, frog, crocodile, freshwater tortoise, and both sea and land tortoises and seals. All these bring forth their young on dry land, and either sleep on dry land, or in water with their mouth above the surface for breathing. But those that have gills are all cooled by admitting water; the tribe of so-called sharks and other legless beasts all have gills. All the fishes are legless; and what they have in the place of feet get their name ( $\pi\tau\epsilon\rho\gamma\iota\sigma$ ) from their similarity to wings ( $\pi\tau\epsilon\rho\gamma\xi$ ). Of animals with feet one only has gills so far as we have observed, the water newt. But so far no creature has been observed with both lungs and gills. The reason is that the lung exists for the purpose of cooling the breath (its name— $\pi\nu\epsilon\iota\mu\omega\tau$ —seems due to its being a receptacle for breath— $\pi\nu\epsilon\iota\mu\alpha$ ); but the gills assist cooling by water; one organ avails for one purpose, and one cooling is enough for all. Since, then, we know that nature does nothing in vain, and that if there were two organs for the purpose one would be useless, for this reason some creatures have gills and some lungs, but none of them have both.

XI. But since every animal requires food for its <sup>The mouth serves a double</sup> existence, and cooling for its preservation, nature uses

<sup>1</sup>  $\epsilon\chi\omega\sigma\tau$  B.

# ARISTOTLE

476 a

καταψύξεως, τῷ αὐτῷ ὄργάνῳ χρῆται πρὸς ἄμφω ταῦτα ἡ φύσις, καθάπερ ἐνίοις τῇ γλώττῃ πρὸς τε 20 τοὺς χυμοὺς καὶ πρὸς τὴν ἔρμηνείαν, οὕτω τοῖς ἔχουσι τὸν πλεύμονα τῷ καλουμένῳ στόματι πρὸς τε τὴν τῆς τροφῆς ἔργασίαν καὶ τὴν ἐκπνοὴν καὶ τὴν ἀναπνοήν. τοῖς δὲ μὴ ἔχουσι πνεύμονα μηδ' ἀναπνέουσι τὸ μὲν στόμα πρὸς τὴν ἔργασίαν τῆς τροφῆς, πρὸς δὲ τὴν κατάψυξιν τοῖς δεομένοις 25 καταψύξεως ἡ τῶν βραγχίων ὑπάρχει φύσις. πῶς μὲν οὖν ἡ τῶν εἰρημένων ὄργάνων δύναμις ποιεῖ τὴν κατάψυξιν, ὕστερον ἐροῦμεν. πρὸς δὲ τὸ τὴν τροφὴν μὴ διακωλύει παραπλησίως τοῖς τ' ἀναπνέουσι συμβαίνει καὶ τοῖς δεχομένοις τὸ ὑγρόν· οὕτε γὰρ ἀναπνέοντες ἄμα καταδέχονται τὴν τρο- 30 φήν· εἰ δὲ μή, συμβαίνει πνίγεσθαι παρεισιούσης τῆς τροφῆς ἡ τῆς ὑγρᾶς ἡ τῆς ξηρᾶς ἐπὶ τὸν πνεύμονα διὰ τῆς ἀρτηρίας· πρότερον γὰρ κεῖται ἡ ἀρτηρία τοῦ οἰσοφάγου, δι' οὐδὲν ἡ τροφὴ πορεύεται εἰς τὴν καλουμένην κοιλίαν. τοῖς μὲν οὖν τετράποσι καὶ ἐναίμοις ἔχει ἡ ἀρτηρία οίον πῶμα τὴν ἐπι- 476 b γλωττίδα· τοῖς δ' ὅρνισι καὶ τῶν τετραπόδων τοῖς ὠτόκοις οὐκ ἔπεστιν, ἀλλὰ τῇ συναγωγῇ τὸ αὐτὸ ποιοῦσιν· δεχόμενα γὰρ τὴν τροφὴν τὰ μὲν συνάγει, τὰ δ' ἐπιτίθησι τὴν ἐπιγλωττίδα. προελθούσης δὲ τὰ μὲν ἐπαίρει, τὰ δὲ διοίγει καὶ καταδέχεται τὸ πνεῦμα πρὸς τὴν κατάψυξιν. τὰ δ' ἔχοντα βράγχια, ἀφέντα διὰ τούτων τὸ ὑγρόν, διὰ τοῦ στόματος καταδέχεται τὴν τροφήν· ἀρτηρίαν μὲν γὰρ οὐκ ἔχουσιν, ὥστε ταύτη μὲν οὐθὲν ἀν βλάπτοντο ὑπὸ τῆς τοῦ ὑγροῦ παρεμπτώσεως, ἀλλ' εἰς τὴν κοιλίαν 10 εἰσιόντος. διὸ ταχεῖαν ποιεῦται τὴν ἀφεσιν καὶ τὴν λῆψιν τῆς τροφῆς, καὶ τοὺς ὁδόντας ὁξεῖς

## ON RESPIRATION, xi.

the same organ for both these purposes ; just in the same way some animals use the tongue both to appreciate flavours and for interpretation, so those animals which have a lung use what is called the mouth both for the work of nourishment and for breathing in and out. But, in those which have no lungs and do not breathe, the mouth is used for the work of nourishment, while the gills can supply naturally the cooling to those which need it. We shall explain later on how the function of the organs mentioned supplies cooling. But, to prevent hindrance to food supply, much the same thing happens to creatures that breathe and to those which admit moisture ; for they do not admit food at the time of breathing ; if they did, they would inevitably be choked by the food, whether dry or wet, entering through the windpipe into the lung ; for the windpipe lies in front of the oesophagus, through which the food passes into what we call the belly. In the four-footed animals with blood the windpipe has a kind of lid called the epiglottis ; but birds and four-footed beasts which are oviparous have not this lid, but they achieve the same result by contraction of the windpipe ; for when receiving food the latter class contracts the windpipe, the former closes the epiglottis. But, as the food continues on its way, the latter class expands the windpipe again, the former opens the epiglottis and admits breath for the purpose of cooling. But those which have gills, discharging water through them, receive food through the mouth ; for they have no windpipe, so that they cannot suffer harm from the water falling into it, but only from its entering the stomach. For this reason they make the discharge and the reception of food rapidly, and

purpose in  
breathing  
animals.

476 b

έχουσι, καὶ καρχαρόδοντες σχεδὸν πάντες εἰσίν· οὐ γὰρ ἐνδέχεται λεαίνειν τὴν τροφήν.

XII. Περὶ δὲ τὰ κητώδη τῶν ἐνύδρων ἀπορήσειεν ἀν τις, ἔχει δὲ κάκεῦνα κατὰ λόγον, οἷον περὶ τε 15 τοὺς δελφῖνας καὶ τὰς φαλαίνας, καὶ τῶν ἄλλων ὅσα ἔχει τὸν καλούμενον αὐλόν. ταῦτα γὰρ ἄποδα μέν ἐστιν, ἔχοντα δὲ πιεύμονα δέχεται τὴν θάλατταν. αἴτιον δὲ τούτου τὸ νῦν εἰρημένον· οὐ γὰρ καταψύξεως ἔνεκεν δέχεται τὸ ύγρόν. τοῦτο μὲν γὰρ γίνεται αὐτοῖς ἀναπνέουσιν· ἔχουσι γὰρ πλεύ- 20 μονα. διὸ καὶ καθεύδουσιν ὑπερέχοντα τὸ στόμα, καὶ ρέγχουσιν οἱ γε δελφῖνες. ἔτι δὲ καν ληφθῶσι τοῖς δικτύοις, ταχὺ ἀποπνίγονται διὰ τὸ μὴ ἀνα- 25 πνεῖν· καὶ ἐπιπολάζοντα φαίνεται τὰ τοιαῦτα ἐπὶ τῆς θαλάττης διὰ τὴν ἀναπνοήν. ἀλλ ἐπειδὴ ἀναγκαῖον ποιεῖσθαι τὴν τροφὴν ἐν ύγρῳ, ἀναγκαῖον 30 δεχόμενα τὸ ύγρὸν ἀφίέναι, καὶ διὰ τοῦτ' ἔχουσι πάντα τὸν αὐλόν· δεξάμενα γὰρ τὸ ὕδωρ, ὥσπερ οἱ ἰχθύες κατὰ τὰ βράγχια, ταῦτα κατὰ τὸν αὐλόν, ἀνασπὰ τὸ ὕδωρ. σημεῖον δὲ καὶ ἡ θέσις τοῦ αὐλοῦ· πρὸς οὐθὲν γὰρ περαίνει τῶν ἐναίμων, ἀλλὰ 35 πρὸ τοῦ ἐγκεφάλου τὴν θέσιν ἔχει, καὶ ἀφίησι τὸ ὕδωρ. διὰ ταῦτὸ δὲ τοῦτο δέχεται καὶ τὰ μα- λάκια τὸ ὕδωρ καὶ τὰ μαλακόστρακα, λέγω δ' οἷον τοὺς καλουμένους καράβους καὶ τοὺς καρ- κίνους. καταψύξεως μὲν γὰρ αὐτῶν οὐδὲν τυγ- 40 χάνει δεόμενον· ὀλιγόθερμον γάρ ἐστι καὶ ἀναιμοῦ 45 αἴκαστον αὐτῶν, ὥσθ' ἵκανῶς καταψύχεται ὑπὸ τοῦ περιέχοντος ύγροῦ· ἀλλὰ διὰ τὴν τροφήν, ὅπως μὴ ἄμα δεχομένοις εἰσρέῃ τὸ ύγρόν. τὰ μὲν οὖν μαλακόστρακα, οἷον οἱ τε καρκίνοι καὶ οἱ κάραβοι, παρὰ τὰ δασέα ἀφιᾶσι τὸ ὕδωρ διὰ τῶν ἐπιπτυγ- 477 a

## ON RESPIRATION, XI.—XII.

they have sharp teeth, set like a saw in most cases ; for it is impossible for them to chew their food.

XII. A difficulty might arise over the cetaceans among water animals, but they too have a logical explanation, such creatures I mean as dolphins and whales, and all other creatures which have what is called a blowhole. For these have no feet, but have lungs, and yet admit the water. But the reason of this is the one already given ; for they do not admit the moisture for the purpose of cooling. This cooling takes place when they breathe, for they have lungs. This is why they sleep with their mouths above water, and the dolphins at any rate snore. Again, if they are caught in nets, they are quickly choked because they cannot breathe ; and such creatures float on the surface of the water for the purpose of breathing. But since they have to do their feeding in water, they have to admit the water and then discharge it, and this is why they all have a blowhole ; for after having admitted the water they expel it again through the blowhole, just as fishes do through the gills. The position of the blowhole proves this ; for it leads to none of the parts with blood, but is situated in front of the brain, and discharges the water. For exactly the same reason the cephalopoda and crustacea admit water—I mean such creatures as the crayfish and the crab. For none of these happens to need cooling ; for each of these species is of low temperature and bloodless, so that it is sufficiently cooled by the surrounding water ; but the purpose of the blowhole in this case is for feeding, that the water may not flow in at the moment that they are absorbing food. The crustacea, such as crabs and crayfish, discharge the water through the folds by the hairy

The blow-hole in  
whales, etc.

μάτων, σηπίαι δὲ καὶ πολύποδες διὰ τοῦ κοίλου τοῦ ὑπὲρ τῆς καλουμένης κεφαλῆς. γέγραπται δὲ περὶ αὐτῶν δι’ ἀκριβείας μᾶλλον ἐν ταῖς περὶ τῶν ζώων ἴστορίαις. περὶ μὲν οὖν τοῦ δέχεσθαι τὸ ὑγρόν, εἴρηται ὅτι συμβαίνει διὰ κατάψυξιν καὶ διὰ τὸ δεῦν δέχεσθαι τὴν τροφὴν ἐκ τοῦ ὑγροῦ τὰ 10 τὴν φύσιν ὅντα τῶν ζώων ἔνδρα.

XIII. Περὶ δὲ τῆς καταψύξεως, τίνα γίνεται τρόπον τοῖς τ’ ἀναπνέουσι καὶ τοῖς ἔχουσι βράγχια, μετὰ ταῦτα λεκτέον. ὅτι μὲν οὖν ἀναπνέουσιν ὅσα πνεύμονα τῶν ζώων ἔχουσι, πρότερον εἴρηται. διὰ 15 τί δὲ τοῦτο τὸ μόριον ἔχουσιν ἔνια, καὶ διὰ τί τὰ ἔχοντα δεῖται τῆς ἀναπνοῆς, αἴτιον τοῦ μὲν ἔχειν ὅτι τὰ τιμιώτερά τῶν ζώων πλείονος τετύχηκε θερμότητος· ἀμα γὰρ ἀνάγκη καὶ ψυχῆς τετυχηκέναι τιμιωτέρας· τιμιώτερα γὰρ τὰ τοιαῦτα τῆς φύσεως τῆς τῶν φυτῶν. διὸ καὶ τὰ μάλιστα 20 ἔναιμον ἔχοντα τὸν πνεύμονα καὶ θερμὸν μείζονά τε τοῖς μεγέθεσι, καὶ τό γε καθαρωτάτω καὶ πλείστῳ κεχρημένον αἴματι τῶν ζώων ὀρθότατόν ἐστιν ὁ ἄνθρωπος, καὶ τὸ ἄνω πρὸς τὸ τοῦ δλου ἄνω ἔχει· μόνον διὰ τὸ τοιοῦτον ἔχειν τοῦτο τὸ μόριον. ὥστε τῆς οὐσίας καὶ τούτῳ καὶ τοῖς ἄλλοις θετέον αἴτιον 25 αὐτό, καθάπερ ὅτιοῦν ἄλλο τῶν μορίων. ἔχει μὲν οὖν ἔνεκα τούτου. τὴν δ’ ἐξ ἀνάγκης καὶ τῆς κινήσεως αἴτιαν καὶ τὰ τοιαῦτα νομίζειν συνεστάναι ζῶα, καθάπερ καὶ μὴ τοιαῦτα πολλὰ συνέστηκεν· τὰ μὲν γὰρ ἐκ γῆς πλείονος γέγονεν, οἷον τὸ τῶν φυτῶν γένος, τὰ δ’ ἐξ ὕδατος, οἷον τὸ τῶν ἐνύδρων· τῶν δὲ πτηνῶν καὶ πεζῶν τὰ μὲν ἐξ ἀέρος

## ON RESPIRATION, XII.—XIII.

parts, but the cuttlefish and polypus through the hollow above the so-called head. I have given a more exact account of these in my *Inquiry into Animals*.<sup>a</sup> Concerning the admission of water, then, it has been explained that it is for the purpose of cooling, and because those creatures which naturally live in water must derive their food from the water.

XIII. Next we must explain how this cooling takes place in creatures which breathe and in those which have gills. We have already stated that all living creatures that have lungs breathe. But two questions remain : why some creatures have the organ, and why those that have it need breathing ; the reason they possess it is that animals higher in the scale of creation have more heat ; for they must at the same time have a more advanced life ; they have, for instance, a life more advanced than the plants. So the animals which have a lung with the most blood and heat are greater in size, and that whose blood is purest and in the greatest quantity of all living creatures is the most erect, that is to say man ; "up" in his case corresponds to "up" in the whole universe just because he possesses this organ. So that the reason for its existence both in this and in other animals must be assumed, just as in the case of any other parts. It possesses it for this reason. One is bound to suppose that it is by necessity, and for the sake of motion that such creatures are so made, just as there are many that are not so made ; for some are made from a larger proportion of earth, such as the genus of plants, and others from water, such as the water animals ; but of the winged and land animals some are made from air and some from

The  
connexion  
between  
breathing  
and cooling.

<sup>a</sup> *Hist. An.* 523 a 30, etc.

477 a

τὰ δ' ἐκ πυρός. ἔκαστα δ' ἐν τοῖς οἰκείοις τόποις  
ἔχει τὴν τάξιν αὐτῶν.

XIV. Ἐμπεδοκλῆς δ' οὐ καλῶς τοῦτ' εἴρηκε,  
477 b φάσκων τὰ θερμότατα καὶ πῦρ ἔχοντα πλεῖστον  
τῶν ζώων ἔνυδρα εἶναι, φεύγοντα τὴν ὑπερβολὴν  
τῆς ἐν τῇ φύσει θερμότητος, ὅπως ἐπειδὴ τοῦ  
ψυχροῦ καὶ τοῦ ὑγροῦ ἐλλείπει, κατὰ τὸν τόπον  
ἀνασώζηται ἐναντία ὅντα θερμὸν γὰρ εἶναι τὸ  
5 ὑγρὸν ἥπτον τοῦ ἀέρος. ὅλως μὲν οὖν ἄποπον πῶς  
ἐνδέχεται γενόμενον ἔκαστον αὐτῶν ἐν τῷ ξηρῷ  
μεταβάλλειν τὸν τόπον εἰς τὸ ὑγρόν· σχεδὸν γὰρ  
καὶ ἀπόδα τὰ πλεῖστα αὐτῶν ἔστιν. ὁ δὲ τὴν ἐξ  
ἀρχῆς αὐτῶν σύστασιν λέγων γενέσθαι μὲν ἐν τῷ  
ξηρῷ φησί, φεύγοντα δ' ἐλθεῖν εἰς τὸ ὑγρόν. ἔτι  
10 δ' οὐδέ<sup>1</sup> φαίνεται θερμότερα ὅντα τῶν πεζῶν· τὰ  
μὲν γὰρ ἄναιμα πάμπαν, τὰ δ' δλίγαιμα αὐτῶν  
ἔστιν.

Ἄλλὰ ποῖα μὲν δεῖ λέγειν θερμὰ καὶ ψυχρά, καθ'  
αὗτὰ τὴν ἐπίσκεψιν εἴληφεν· περὶ δ' ἡς αἰτίας  
εἴρηκεν Ἐμπεδοκλῆς, τῇ μὲν ἔχει τὸ ζητούμενον  
λόγον, οὐ μὴν ὅ γε φησὶν ἔκεινος ἀληθές. τῶν μὲν  
15 γὰρ ἔξεων τοὺς<sup>2</sup> τὰς ὑπερβολὰς ἔχοντας οἱ ἐναντίοις  
τόποι καὶ ὥραι σώζουσιν, ή δὲ φύσις ἐν τοῖς οἰκείοις  
σώζεται μάλιστα τόποις. οὐ γὰρ ταύτὸν ἦ θ' ὅλη  
τῶν ζώων ἐξ ἡς ἔστιν ἔκαστον, καὶ αἱ ἔξεις καὶ  
διαθέσεις αὐτῆς. λέγω δ' οἷον εἴ τι ἐκ κηροῦ  
συστήσειν ἡ φύσις, οὐκ ἀν ἐν θερμῷ θεῖσα δι-  
20 ἐσωσεν, οὐδ' εἴ τι ἐκ κρυστάλλου· ἐφθάρη γὰρ ἀν  
ταχὺ διὰ τούναντίον· τήκει γὰρ τὸ θερμὸν τὸ ὑπὸ  
τοῦ ἐναντίου συστάν. οὐδ' εἴ τι ἐξ ἀλὸς ἡ νίτρου  
συνέστησεν, οὐκ ἀν εἰς ὑγρὸν φέρουσα κατέθηκεν·

<sup>1</sup> οὐτε B.<sup>2</sup> τοὺς om. B.

## ON RESPIRATION, XIII.—XIV.

fire. Each has its system in its appropriate element.

XIV. Empedocles is mistaken in saying that for the most part the creatures containing heat or fire live in the water, thereby escaping the excess of heat that lies in their nature, in order that, since they are short of coolness and liquid, they may be saved by their habitat being of an opposite nature ; for liquid is less hot than air. Generally speaking it seems unnatural that each animal born in the dry should change its habitat to the wet ; for most of them have no feet. But he, describing their structure from the beginning, says that they are born on dry land, but that they escape from it and reach the water. Further it is clear that they are not warmer than the land animals ; for some of them are altogether bloodless, and others have only a little blood.

He has examined in detail which of them are entitled to be called hot and which cold ; but as for what Empedocles has said about the cause, in one way his explanation is reasonable, but yet he does not tell the real truth of the matter. For it is opposite places and seasons which preserve them in so far as they have excess of either condition, but their nature is best preserved in their own places ; for the matter from which each species is made is not the same thing as its habits and disposition. What I mean is this : if nature were to make anything out of wax, she would not preserve it by placing it in a hot atmosphere, nor if she had made a thing out of ice ; for it would be rapidly destroyed by its opposite ; for heat destroys that which is constructed from its opposite. Nor if she had made a thing out of salt and nitre would she have taken it and placed it in water ; for

477 b

φθείρει γὰρ τὰ ὑπὸ θερμοῦ καὶ ξηροῦ συστάντα τὸ  
ὑγρόν. εἰ οὖν ὥλη πᾶσι τοῖς σώμασι τὸ ὑγρὸν καὶ  
τὸ ξηρόν, εὐλόγως τὰ μὲν ἔξ οὐροῦ καὶ ψυχροῦ  
συστάντα ἐν ὑγροῖς ἔστι, καὶ εἰ ψυχρά, ἔσται ἐν  
ψυχρῷ, τὰ δὲ ἐκ ξηροῦ ἐν ξηρῷ. διὰ τοῦτο τὰ  
δένδρα οὐκ ἐν ὕδατι φύεται, ἀλλ’ ἐν τῇ γῇ. καίτοι  
τοῦ αὐτοῦ λόγου ἔστιν εἰς τὸ ὕδωρ, διὰ τὸ εἶναι  
αὐτὰ ὑπέρξηρα, ὥσπερ τὰ ὑπέρπυρά φησιν ἐκεῖνος.  
οὐ γὰρ διὰ τὸ ψυχρὸν ἥλθεν εἰς αὐτό, ἀλλ’ ὅτι  
ὑγρόν.

Αἱ μὲν οὖν φύσεις τῆς ὥλης, ἐν οἶωπερ τόπῳ  
εἰσὶ, τοιαῦται οὖσαι τυγχάνουσιν, αἱ μὲν ἐν ὕδατι  
ὑγραί, αἱ δὲ ἐν τῇ γῇ ξηραί, αἱ δὲ ἐν τῷ ἀέρι θερ-  
478 a μαί. αἱ μέντοι ἔξεις αἱ μὲν ὑπερβάλλουσαι θερ-  
μότητι ἐν ψυχρῷ, αἱ δὲ τῇ ψυχρότητι ἐν θερμῷ  
τιθέμεναι σώζονται μᾶλλον· ἐπανισοῦ γὰρ εἰς τὸ  
μέτριον ὁ τόπος τὴν ἔξεις ἔντοπης ὑπερβολὴν. τοῦτο  
b μὲν οὖν δεῖ ζητεῖν ἐν τοῖς οἰκείοις τόποις ἐκάστης  
ὥλης, καὶ κατὰ τὰς μεταβολὰς τῆς κοινῆς ὥρας·  
τὰς μὲν γὰρ ἔξεις ἐνδέχεται τοῖς τόποις ἐναντίας  
εἶναι, τὴν δὲ ὥλην ἀδύνατον. ὅτι μὲν οὖν οὐ διὰ  
θερμότητα τῆς φύσεως τὰ μὲν ἔνυδρα τὰ δὲ πεζά  
τῶν ζώων ἔστι, καθάπερ Ἐμπεδοκλῆς φησίν,  
10 τοσαῦτ’ εἰρήσθω, καὶ διότι τὰ μὲν οὐκ ἔχει πνεύ-  
μονα τὰ δὲ ἔχει.

XV. Διὰ τί δὲ τὰ ἔχοντα δέχεται τὸν ἀέρα καὶ  
ἀναπνέουσι, καὶ μάλιστ’ αὐτῶν ὅσα ἔχουσιν ἔν-  
αιμον, αἴτιον τοῦ μὲν ἀναπνεύν ὁ πνεύμαν σομφόδες  
ῶν καὶ συρίγγων πλήρης. καὶ ἐναιμότατον δὴ  
μάλιστα τοῦτο τὸ μόριον τῶν καλούμενων σπλάγ-  
15 χρων. ὅσα δὴ ἔχει ἐναιμον αὐτό, ταχείας μὲν  
δεῖται τῆς καταψύξεως διὰ τὸ μικρὰν εἶναι τὴν

## ON RESPIRATION, XIV.—XV.

water destroys that which is made by heat and dryness. If then the matter of which all bodies are composed consists of wet and dry, naturally that which is made of wet and cold lives in water and, if it is cold, will live in the cold, but what is made of the dry will live in the dry. For this reason trees do not grow in water, but in the earth. Yet on the same theory he would assign them to the water because they are too dry, just as he says of the too fiery. On this theory they would enter water not because it is cold, but because it is wet.

The nature of matter is similar to that in which it lives ; in water live wet things, in earth dry, and in air hot. But as for their conditions those that are excessively hot thrive best in the cold, and those that are excessively cold in the warm ; for their environment best neutralizes the excess of their condition. They must seek this in the places appropriate to each matter, and in accordance with the changes in the ordinary seasons ; for states can be contrary to the place in which they live, but matter never. We have, then, proved sufficiently that it is not because of their natural heat that the water and land creatures are such as Empedocles says, and why some have lungs and some have not.

XV. The reason why those that have lungs admit the air and breathe, and particularly those which have a lung with blood, is that the lung is porous and full of tubes. And this part is more full of blood than any other of the so-called internal organs. All creatures that have this part full of blood need rapid cooling, because the possible variation of the fire in

The function of the lung.

478 a

ροπήν τοῦ ψυχικοῦ πυρός, εἴσω δ' εἰσιέναι διὰ παντὸς διὰ τὸ πλῆθος τοῦ αἴματος καὶ τῆς θερμότητος. ταῦτα δ' ἀμφότερα ὁ μὲν ἀὴρ δύναται ῥᾳδίως ποιεῖν· διὰ γὰρ τὸ λεπτὴν ἔχειν τὴν φύσιν διὰ παντός τε καὶ ταχέως διαδυόμενος διαψύχει· τὸ δ' ὕδωρ τούναντίον. καὶ διότι δὴ μάλιστ' ἀναπνέουσι τὰ ἔχοντα τὸν πνεύμονα ἔναιμον, ἐκ τούτων δῆλον· τό τε γὰρ θερμότερον πλείονος δεῖται τῆς καταψύξεως, ἀμα δὲ καὶ πρὸς τὴν ἀρχὴν τῆς θερμότητος τῆς ἐν τῇ καρδίᾳ πορεύεται τὸ πνεῦμα ῥᾳδίως.

XVI. Ὁν δὲ τρόπον ἡ καρδία τὴν σύντρησιν ἔχει πρὸς τὸν πλεύμονα, δεῖ θεωρεῖν ἐκ τε τῶν ἀνατεμομένων καὶ τῶν ἴστοριῶν τῶν περὶ τὰ ζῷα γεγραμμένων. καταψύξεως μὲν οὖν ὅλως ἡ τῶν ζώων δεῖται φύσις διὰ τὴν ἐν τῇ καρδίᾳ τῆς ψυχῆς ἐμπύρωσιν. ταύτην δὲ ποιεῖται διὰ τῆς ἀναπνοῆς, ὅσα μὴ μόνον ἔχουσι καρδίαν ἀλλὰ καὶ πνεύμονα τῶν ζώων. τὰ δὲ καρδίαν μὲν ἔχοντα, πνέυμονα δὲ μή, καθάπερ οἱ ἴχθυες διὰ τὸ ἐνυδρον αὐτῶν τὴν φύσιν εἶναι, τῷ ὕδατι ποιοῦνται τὴν κατάψυξιν διὰ τῶν βραγχίων. ὡς δ' ἡ θέσις ἔχει τῆς καρδίας πρὸς 478 b τὰ βράγχια, πρὸς μὲν τὴν ὄψιν ἐκ τῶν ἀνατομῶν δεῖ θεωρεῖν, πρὸς δ' ἀκρίβειαν ἐκ τῶν ἴστοριῶν· ὡς δ' ἐν κεφαλαίοις εἰπεῖν καὶ νῦν, ἔχει τόνδε τὸν τρόπον. δόξειε μὲν γὰρ ἀν οὐχ ὡσαύτως ἔχειν τὴν θέσιν ἡ καρδία τοῖς τε πεζοῖς τῶν ζώων καὶ τοῖς ἴχθύσιν, ἔχει δ' ὡσαύτως. ἢ γὰρ νεύουσι τὰς κεφαλάς, ἐνταῦθ' ἡ καρδία τὸ ὄξὺ ἔχει. ἐπεὶ δὲ οὐχ ὡσαύτως αἱ κεφαλαὶ νεύουσι τοῖς τε πεζοῖς τῶν ζώων καὶ τοῖς ἴχθύσι, πρὸς τὸ στόμα ἡ καρδία τὸ ὄξὺ ἔχει. τείνει δ' ἐξ ἄκρου τῆς καρδίας αὐλὸς

## ON RESPIRATION, xv.—xvi.

the soul is small, and the cooling air must pass throughout because of the quantity of blood and heat. But the air can easily fulfil both these functions ; for, because its nature is so rarefied, it can pass through the whole system rapidly and cool it. But water is just the opposite. From this it is obvious why animals which have blood in the lung breathe most ; for the warmer creature requires more cooling, and at the same time the air passes easily to the source of heat, which lies in the heart.

XVI. The way in which the heart is connected with the lung can be seen by dissection, and by my discussion of the subject in the *History of Animals*.<sup>a</sup> Connexion  
between  
heart and  
lung. Speaking generally, the nature of animals requires cooling owing to the fiery nature of the soul which exists in the heart. It achieves this cooling by breathing in the case of animals which have a lung as well as a heart. But those which have a heart but no lung, such as the fishes, because their natural habitat is in water, achieve this cooling by water through the gills. The position of the heart relative to the gills can be seen with the naked eye by dissection, and can be understood with accuracy from my *History*<sup>b</sup> ; but to summarize the matter at the moment, this is the method. One might suppose that the position of the heart is different in land animals and in fishes, but actually it is exactly similar. For the apex of the heart points in the direction in which they turn their heads. But since the heads of land animals and fishes do not turn in the same direction, the heart has its apex directed towards the mouth. Now from the extremity of the heart a tube

<sup>a</sup> *Hist. An.* 496 a etc., 511 b etc.

<sup>b</sup> *Hist. An.* 507 b 3.

478 b

φλεβονευρώδης εἰς τὸ μέσον, ἢ συνάπτουσιν ἀλλή-  
 10 λοις πάντα τὰ βράγχια. μέγιστος μὲν οὖν οὗτός  
 ἔστιν, ἔνθεν δὲ καὶ ἔνθεν τῆς καρδίας καὶ ἔτεροι  
 τείνουσιν εἰς ἄκρον ἐκάστου τῶν βραγχίων, δι’ ὧν  
 ἡ κατάψυξις γίνεται πρὸς τὴν καρδίαν, διαυλωνί-  
 ζοντος ἀεὶ τοῦ ὄδατος διὰ τῶν βραγχίων. ὡσαύτως  
 δὲ τοῖς ἀναπνέουσιν ὁ θώραξ ἄνω καὶ κάτω κινεῖται  
 15 πολλάκις δεχομένων τὸ πνεῦμα καὶ ἔξιέντων, ὡς  
 τὰ βράγχια τοῖς ἴχθύσιν, καὶ τὰ μὲν ἀναπνέοντα ἐν  
 ὀλίγῳ ἀέρι καὶ τῷ αὐτῷ ἀποπνίγονται· ταχέως γὰρ  
 ἐκάτερον αὐτῶν γίνεται θερμόν· θερμαίνει γὰρ ἡ  
 τοῦ αἷματος θίξις ἐκάτερον. θερμὸν δὲ τὸ αἷμα  
 κωλύει τὴν κατάψυξιν· καὶ μὴ δυναμένων κινεῖν  
 20 τῶν μὲν ἀναπνεόντων τὸν πνεύμονα τῶν δὲ ἐνύδρων  
 τὰ βράγχια διὰ πάθος ἢ διὰ γῆρας, τότε συμβαίνειν  
 τὴν τελευτήν.

XVII. "Εστι μὲν οὖν πᾶσι τοῖς ζῷοις κοινὸν  
 γένεσις καὶ θάνατος, οἱ δὲ τρόποι διαφέρουσι τῷ  
 εἶδει· οὐ γὰρ ἀδιάφορος ἢ φθορά, ἀλλ' ἔχει τι κοι-  
 25 νόν. θάνατος δὲ ἔστιν ὁ μὲν βίαιος ὁ δὲ κατὰ  
 φύσιν, βίαιος μὲν ὅταν ἡ ἀρχὴ ἔξωθεν ἦ, κατὰ  
 φύσιν δὲ ὅταν ἐν αὐτῷ. καὶ ἡ τοῦ μορίου σύστασις  
 ἐξ ἀρχῆς τοιαύτη, ἀλλὰ μὴ ἐπίκτητόν τι πάθος.  
 τοῖς μὲν οὖν φυτοῖς αὖσανσις, ἐν δὲ τοῖς ζῷοις  
 καλεῖται τοῦτο γῆρας. ἔστι δὲ θάνατος καὶ ἡ  
 30 φθορὰ πᾶσιν ὁμοίως τοῖς μὴ ἀτελέσιν· τούτους δὲ  
 παρομοίως μέν, ἄλλον δὲ τρόπον. ἀτελῆ δὲ λέγω  
 οἷον τά τε ὡὰ καὶ τὰ σπέρματα τῶν φυτῶν, ὅσα  
 ἄρριζα. πᾶσι μὲν οὖν ἡ φθορὰ γίνεται διὰ θερμοῦ  
 τινὸς ἔκλειψιν, τοῖς δὲ τελείοις, ἐν ᾧ τῆς οὐσίας

## ON RESPIRATION, xvi.—xvii.

consisting of veins and nerves runs to a point at the centre, at which all the gills connect. This tube is very large, and from different parts of the heart other tubes run to the extremity of each of the gills, through which the cooling process reaches the heart, the water passing through a narrow channel through the gills. In the same way in the breathing animals the chest moves up and down, as they admit and expel the breath, acting in the same way as the gills in fishes. So the breathing animals are suffocated if the air is small in quantity and remains the same ; for in either case it quickly becomes hot ; for in both cases the contact with the blood heats it. The blood being hot checks the cooling ; supposing that the breathing animals cannot move the lung, or the water animals the gills, owing to disease or old age, then death supervenes.

XVII. Birth and death are common characteristics of all living creatures, but the manner in which they occur differs with the species ; for their destruction does exhibit differences, although all have an element in common. Death may be either violent or natural, violent when its origin is external, natural when it originates in the creature itself. In the latter case the structure of the animal involved this end from the beginning, and it was no extraneous disease. This phenomenon is called withering in plants, and in animals old age. Death and destruction is the common fate of all animals alike which are not imperfect ; the latter have a similar end but in another way. By imperfect I mean, for instance, eggs and the seeds of plants, those at least which have no roots. In all cases destruction occurs owing to a failure of heat, but in the perfect animal the failure lies in that

Natural and  
unnatural  
death.

ARISTOTLE

478 <sup>b</sup>

ἡ ἀρχή. αὕτη δ' ἐστίν, ὥσπερ εἴρηται πρότερον,  
35 ἐν τῷ τε ἄνω καὶ τὸ κάτω συνάπτει, τοῖς μὲν  
φυτοῖς μέσον βλαστοῦ καὶ ρίζης, τῶν δὲ ζῷων τοῖς  
479 <sup>a</sup> μὲν ἐναίμοις ἡ καρδία, τοῖς δ' ἀναίμοις τὸ ἀνά-  
λογον. τούτων δ' ἔντα δυνάμει πολλὰς ἀρχὰς  
ἔχουσιν, οὐ μέντοι γε ἐνεργείᾳ. διὸ καὶ τῶν ἐν-  
τόμων ἔντα διαιρούμενα ζῶσι, καὶ τῶν ἐναίμων ὅσα  
5 μὴ ζωτικὰ λίαν εἰσί, πολὺν χρόνον ζῶσιν ἔξηρη-  
μένης τῆς καρδίας, οἷον αἱ χελῶναι καὶ κινοῦνται  
τοῖς ποσίν, ἐπόντων τῶν χελωνίων, διὰ τὸ μὴ  
συγκεῖσθαι τὴν φύσιν αὐτῶν εὖ, παραπλησίως δὲ  
τοῖς ἐντόμοις.

‘Η δ' ἀρχὴ τῆς ζωῆς ἐκλείπει τοῖς ἔχουσιν, ὅταν  
μὴ καταψύχηται τὸ θερμὸν τὸ κοινωνοῦν αὐτῆς.  
10 καθάπερ γὰρ εἴρηται πολλάκις, συντήκεται αὐτὸ  
ύφ' αὐτοῦ. ὅταν οὖν τοῖς μὲν ὁ πλεύμων τοῖς δὲ  
τὰ βράγχια σκληρύνηται, διὰ χρόνου μῆκος ἔηραι-  
νομένων τοῖς μὲν τῶν βραγχίων τοῖς δὲ τοῦ πλεύ-  
μονος, καὶ γινομένων γεηρῶν, οὐ δύναται ταῦτα τὰ  
μόρια κινεῖν οὐδὲ αὔρειν καὶ συνάγειν. τέλος δὲ  
15 γινομένης ἐπιτάσεως καταμαραίνεται τὸ πῦρ.

Διὸ καὶ μικρῶν παθημάτων ἐπιγινομένων ἐν τῷ  
γήρᾳ ταχέως τελευτῶσιν· διὰ γὰρ τὸ ὀλίγον εἶναι  
τὸ θερμόν, ἀτε τοῦ πλεύστου διαπεπνευκότος ἐν τῷ  
πλήθει τῆς ζωῆς, ἥτις ἄν ἐπίτασις γένηται τοῦ  
μορίου, ταχέως ἀποσβένυνται· ὥσπερ γὰρ ἀκαριαίας  
20 καὶ μικρᾶς ἐν αὐτῷ φλογὸς ἐνούσης διὰ μικρὰν  
κίνησιν ἀποσβένυνται. διὸ καὶ ἀλυπός ἐστιν ὁ ἐν  
τῷ γήρᾳ θάνατος· οὐδενὸς γὰρ βιαίου πάθους αὐτοῖς  
συμβαίνοντος τελευτῶσιν, ἀλλ' ἀναίσθητος ἡ τῆς  
ψυχῆς ἀπόλυσις γίνεται παντελῶς. καὶ τῶν νοση-  
μάτων ὅσα ποιοῦσι τὸν πνεύμονα σκληρὸν ἡ φύ-  
470

## ON RESPIRATION, xvii.

part which is the source of their being. This, as has been said before, lies at the point at which the upper and lower parts meet, in plants between the shoot and the root, and in animals with blood in the heart, and in bloodless animals in whatever corresponds to it. Some of these creatures have potentially many sources, but not actually. This is why some of the insects continue to live when divided, and those animals with blood which have not naturally much hold on life, live for a considerable time, when the heart is removed ; such as tortoises, whose feet move so long as their shells are on, because their nature is of a low order of construction, as is true also of the insects.

The source of life fails its possessors when the heat that belongs to it is not cooled. For, as has been said several times, it is wasted away by itself. When, then, in some animals the lung, and in others the gills, grow hard, the gills in the one case and the lung in the other drying through length of time and becoming earthy, these parts cannot move, nor expand, nor contract. But at last the limit of strain is reached and the fire dies out.

Consequently in old age they die rapidly, even when small ailments attack them ; for because the heat in them is very small, as in their long life most of it has been breathed away, any strain taking place in the part quickly extinguishes it. It is extinguished, just as if the flame within was very feeble and small. For this reason death in old age is painless ; for old men die without the occurrence of any violent disease, and the release of the soul occurs imperceptibly. But the diseases which cause hardening of the lung by

479 a

25 μασιν ἡ περιττώμασιν ἡ θερμότητος νοσηματικῆς ὑπερβολῆς, καθάπερ ἐν τοῖς πυρετοῖς, πυκνὸν τὸ πνεῦμα ποιοῦσι διὰ τὸ μὴ δύνασθαι τὸν πνεύμονα μακρὰν αἴρειν ἄνω καὶ συνίζειν. τέλος δ', ὅταν μηκέτι δύνωνται κινεῖν, τελευτῶσιν ἀποπνεύσαντες.

XVIII. Γένεσις μὲν οὖν ἐστὶν ἡ πρώτη μέθεξις 30 ἐν τῷ θερμῷ τῆς θρεπτικῆς ψυχῆς, ζωὴ δ' ἡ μονὴ ταύτης. νεότης δ' ἐστὶν ἡ τοῦ πρώτου καταψυκτικοῦ μορίου αὔξησις, γῆρας δ' ἡ τούτου φθίσις, ἀκμὴ δὲ τὸ τούτων μέσον. τελευτὴ δὲ καὶ φθορὰ βίαιος μὲν ἡ τοῦ θερμοῦ σβέσις καὶ μάρανσις.

479 b 5 φθαρείη γὰρ ἀν δι' ἀμφοτέρας ταύτας τὰς αἰτίας, ἡ δὲ κατὰ φύσιν τοῦ αὐτοῦ τούτου μάρανσις διὰ χρόνου μῆκος γινομένη καὶ τελειότητα. τοῖς μὲν οὖν φυτοῖς αὐλανσις, ἐν δὲ τοῖς ζώοις καλεῖται θάνατος. τούτου δ' ὁ μὲν ἐν γήρᾳ θάνατος μάρανσις τοῦ μορίου δι' ἀδυναμίαν τοῦ καταψύχειν ὑπὸ γήρως. τί μὲν οὖν ἐστὶ γένεσις καὶ ζωὴ καὶ θάνατος, καὶ διὰ τίνας αἰτίας ὑπάρχουσι τοῖς ζώοις, εἴρηται.

XIX. Δῆλον δ' ἐκ τούτων καὶ διὰ τίν' αἰτίαν τοῖς μὲν ἀναπνέουσι τῶν ζώων ἀποπνίγεσθαι 10 συμβαίνει ἐν τῷ ὑγρῷ, τοῖς δ' ἵχθυσιν ἐν τῷ ἀέρι. τοῖς μὲν γὰρ διὰ τοῦ ὕδατος ἡ κατάψυξις γίνεται, τοῖς δὲ διὰ τοῦ ἀέρος, ὃν ἐκάτερα στερίσκεται μεταβάλλοντα τοὺς τόπους. ἡ δ' αἰτία τῆς κινήσεως τοῖς μὲν τῶν βραγχίων τοῖς δὲ τοῦ πνεύμονος, ὃν αἴρομένων καὶ συνιζόντων τὰ μὲν ἐκπνέουσι 15 καὶ εἰσπνέουσι τὰ δὲ δέχονται τὸ ὑγρὸν καὶ ἐξιάσιν, ἔτι δ' ἡ σύστασις τοῦ ὀργάνου, τόνδ' ἔχει τὸν τρόπον.

XX. Τρία ἐστὶ τὰ συμβαίνοντα περὶ τὴν καρ-

## ON RESPIRATION, xvii.—xx.

tumours, or waste products, or by excess of heat due to disease as for instance in fevers, cause rapid breathing, because the lung cannot expand or contract far. But at last when they can no longer move the lung, they breathe their last and die.

XVIII. Birth is the first sharing in warmth of the nutritive soul, and life is merely the perpetuation of this. Youth is the growth of the first cooled part, and old age is its destruction, the prime of life being between the two. But violent destruction and death is the extinction or waning of the heat ; for destruction may occur from either of these causes, but natural death is the decay of the same part due to lapse of time, and to its having reached its appointed end. This phenomenon is called withering among plants, and death among animals. Death in old age is the withering of this part owing to its inability to grow cool because of old age. So we have now defined birth, and life and death, and explained why they occur among living creatures.

XIX. From these facts it is clear why those animals <sup>Fish.</sup> which breathe are suffocated in water, and fishes in air ; for the latter achieve cooling through the water, but the former through air, and when they change their habitat each is deprived of one or other. The reason for the movement in the one case of the gills, and in the other of the lung, by the expansion and contraction of which the former class exhale and inhale and the latter admit and expel water, and also the whole structure of the organ is to be explained as follows.

XX. There are three movements which take place <sup>Action of the heart.</sup>

479 <sup>b</sup>

δίαν, ἃ δοκεῖ τὴν αὐτὴν φύσιν ἔχειν, ἔχει δὲ  
οὐ τὴν αὐτὴν, πήδησις καὶ σφυγμὸς καὶ ἀνα-  
πνοή.

20 Πήδησις μὲν οὖν ἔστι σύνωσις τοῦ θερμοῦ τοῦ ἐν  
αὐτῇ διὰ κατάψυξιν περιττωματικὴν ἢ συντηκτι-  
κὴν, οἷον ἐν τῇ νόσῳ τῇ καλουμένῃ παλμῷ, καὶ ἐν  
ἄλλαις δὲ νόσοις, καὶ ἐν τοῖς φόβοις δέ· καὶ γὰρ οἱ  
φοβούμενοι καταψύχονται τὰ ἄνω, τὸ δὲ θερμὸν  
ὑποφεῦγον καὶ συστελλόμενον ποιεῖ τὴν πήδησιν,  
25 εἰς μικρὸν συνωθούμενον οὕτως ὥστ' ἐνίστι ἀπο-  
σβέννυσθαι τὰ ζῷα καὶ ἀποθνήσκειν διὰ φόβον καὶ  
διὰ πάθος νοσηματικόν.

‘Η δὲ συμβαίνουσα σφύξις τῆς καρδίας, ἣν ἀεὶ<sup>1</sup>  
φαίνεται ποιουμένη συνεχῶς, ὅμοία φύμασίν ἔστιν,  
20 ἣν ποιοῦνται κίνησιν μετ’ ἀλλγηδόνος διὰ τὸ παρὰ  
φύσιν εἶναι τῷ αἷματι τὴν μεταβολήν. γίνεται δὲ  
μέχρι οὖν ἀν πυωθῆ πεφθέν. ἔστι δὲ ὅμοιον ζέσει  
τοῦτο τὸ πάθος· ἡ γὰρ ζέσις γίνεται πνευματου-  
μένου τοῦ ὑγροῦ ὑπὸ τοῦ θερμοῦ· αἱρεται γὰρ διὰ  
τὸ πλείω γίνεσθαι τὸν ὅγκον. παῦλα δὲ ἐν μὲν τοῖς  
480 <sup>a</sup> φύμασιν, ἔὰν μὴ διαπνεύσῃ, παχυτέρου γινομένου  
τοῦ ὑγροῦ, σῆψις, τῇ δὲ ζέσει ἡ ἔκπτωσις διὰ τῶν  
ὅριζόντων. ἐν δὲ τῇ καρδίᾳ ἡ τοῦ ἀεὶ προσιόντος  
ἐκ τῆς τροφῆς ὑγροῦ διὰ τῆς θερμότητος ὅγκωσις  
ποιεῖ σφυγμόν, αἱρομένη πρὸς τὸν ἔσχατον χιτῶνα  
5 τῆς καρδίας. καὶ τοῦτ’ ἀεὶ γίνεται συνεχῶς·  
ἐπιρρεῖ γὰρ ἀεὶ τὸ ὑγρὸν συνεχῶς, ἐξ οὖν γίνεται ἡ  
τοῦ αἵματος φύσις· πρῶτον γὰρ ἐν τῇ καρδίᾳ  
δημιουργεῖται. δῆλον δὲ ἐν τῇ γενέσει ἐξ ἀρχῆς·  
οὕπω γὰρ διωρισμένων τῶν φλεβῶν φαίνεται  
ἔχουσα αἷμα. καὶ διὰ τοῦτο σφύζει μᾶλλον τοῖς  
10 νεωτέροις τῶν πρεσβυτέρων· γίνεται γὰρ ἡ ἀνα-

## ON RESPIRATION, xx.

in the region of the heart, which seem to be of the same character, but really are not : palpitation, pulsation and breathing.

Palpitation is the forcing together of the heat in the heart due to the cooling produced by waste products and decay, as occurs in the disease called heart palpitation among others, and also in fear ; for those who are afraid grow cold in their upper parts, and the heat retreating and rallying again produces palpitation, being forced into so small a space, so that sometimes animals suffer extinction and die through fear or through disease.

The beating of the heart which occurs, and which it seems to show continuously, is like the throbbing of an abscess, but the latter is accompanied by pain, because there is an unnatural change in the blood, and this pain continues until the pus produced is discharged. This latter affection is like boiling ; for boiling takes place when liquid is aerated by heat : it rises because the swelling becomes greater. In the case of abscesses, if there is no escape, relief comes in the form of suppuration, when the liquid grows thicker, but in boiling it results in overflowing its container. But in the heart swelling of the liquid which continually comes to it through heat causes pulsation, as it rises to the outermost part of the heart wall. This is a continually repeated process ; for the liquid is continually flowing in, from which the nature of the blood results ; for in the heart it is first manufactured. This is clear in birth from its beginning ; for the heart can be seen to contain blood before the veins are differentiated. For this reason there is more rapid pulsation in the young than in the old ; for more evaporation takes place in younger

480 a

θυμίασις πλείων τοῖς νεωτέροις. καὶ σφύζουσιν αἱ φλέβες πᾶσαι, καὶ ἄμα ἀλλήλαις, διὰ τὸ ἡρτῆσθαι ἐκ τῆς καρδίας. κινεῖ δ' ἀεί· ὥστε κάκεῖναι αἰεί, καὶ ἄμα ἀλλήλαις, ὅτε κινεῖ. ἀναπήδησις μὲν οὖν ἔστιν ἡ γινομένη ἀντωσις πρὸς τὴν τοῦ φυχροῦ σύνωσιν, σφύξις δ' ἡ τοῦ ὑγροῦ θερμαινομένου πνευμάτωσις.

XXI. Ἡ δ' ἀναπνοὴ γίνεται αὐξανομένου τοῦ θερμοῦ, ἐν ὧ ἡ ἀρχὴ ἡ θρεπτική. καθάπερ γάρ καὶ τὰλλα δεῖται τροφῆς, κάκεῖνο, καὶ τῶν ἄλλων μᾶλλον· καὶ γάρ τοῖς ἄλλοις ἐκεῖνο τῆς τροφῆς αἴτιον ἔστιν. 20 ἀνάγκη δὴ πλέον γινόμενον αἴρειν τὸ ὄργανον. δεῖ δ' ὑπολαβεῖν τὴν σύστασιν τοῦ ὄργανου παραπλησίαν μὲν εἶναι ταῖς φύσαις ταῖς ἐν τοῖς χαλκείοις· οὐ πόρρω γάρ οὕθ' ὁ πνεύμων οὕθ' ἡ καρδία πρὸς τὸ δέξασθαι σχῆμα τοιούτον· διπλοῦν δ' εἶναι τὸ τοιούτον· δεῖ γάρ ἐν τῷ μέσῳ τὸ θρεπτικὸν εἶναι 25 τῆς φυσικῆς δυνάμεως. αἴρεται μὲν οὖν πλεῖον γενόμενον, αἴρομένον δ' ἀναγκαῖον αἴρεσθαι καὶ τὸ περιέχον αὐτὸν μόριον. ὅπερ φαίνονται ποιεῖν οἱ ἀναπνέοντες· αἴρουσι γάρ τὸν θώρακα διὰ τὸ τὴν ἀρχὴν τὴν ἐνοῦσαν αὐτῷ τοῦ τοιούτου μορίου ταῦτο τοῦτο ποιεῖν· αἴρομένον γάρ, καθάπερ εἰς τὰς 30 φύσας, ἀναγκαῖον εἰσφέρειν τὸν ἀέρα τὸν θύραθεν, 480 b καὶ φυχρὸν ὄντα καὶ καταφύχοντα σβεννύναι τὴν ὑπεροχὴν τὴν τοῦ πυρός. ὥσπερ δ' αὐξανομένου ἥρετο τοῦτο τὸ μόριον, καὶ φθίνοντος ἀναγκαῖον συνίζειν, καὶ συνίζοντος ἔξιέναι τὸν ἀέρα τὸν εἰσελθόντα πάλιν, εἰσιόντα μὲν φυχρὸν ἔξιόντα δὲ 5 θερμὸν διὰ τὴν ἀφῆν τοῦ θερμοῦ τοῦ ἐνόντος ἐν τῷ μορίῳ τούτῳ, καὶ μάλιστα τοῖς τὸν πνεύμονα ἔναιμου ἔχουσιν· εἰς πολλοὺς γάρ οἷον αὐλῶνας τὰς

## ON RESPIRATION, xx.—xxi.

men. All the veins throb, and at the same time as each other, because they are attached to the heart. The heart is always moving ; therefore the veins are also, and they move at the same time as each other, when the heart moves. Palpitation, then, is the reaction which the heart makes to the pressure of the cold, but pulsation is the aeration of the heat in liquid.

XXI. Breathing occurs when the heat increases on <sup>The</sup> which the nutritive soul depends. For just as all the <sup>function of</sup> breathing. other parts need food, so does it, and even to a greater extent than the other parts ; for it is rather the cause of food in the other parts. As it increases the organ must rise. One may regard the structure of the organ as very like the bellows in a forge ; for neither heart nor lung is very far from adopting this shape. An organ of this kind must be double ; for the nutritive part must be in the middle of its vital force. When it expands it rises, and when it rises that part of the body which envelops it must also rise. This is what men seem to do when they breathe ; for they raise their chest, the source of this part residing therein doing the same thing ; for when the chest rises it must introduce the air from outside into it, as it does into the bellows, and being cold and producing coolness it quenches the excess of fire. Just as when it increases in size this part rises, so it must subside as it grows smaller, and, as it contracts, the air which entered in passes out again ; coming in cold and going out hot, because of its contact with the heat which resides in this part, especially in those whose lung contains blood. For the tubes in the lung fall

## ARISTOTLE

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σύριγγας ἐμπίπτειν τὰς ἐν τῷ πνεύμονι, ὥν παρ'  
έκάστην παρατέανται φλέβες, ὥστε δοκεῖν ὅλον  
εἶναι τὸν πνεύμονα πλήρη αἷματος. καλεῖται δ' ἡ  
10 μὲν εἴσοδος τοῦ ἀέρος ἀναπνοή, ἡ δ' ἔξοδος ἐκπνοή.  
καὶ ἀεὶ δὴ τοῦτο γίνεται συνεχῶς, ἔως περ ἀν ζῆν  
καὶ κινή τοῦτο τὸ μόριον συνεχῶς. καὶ διὰ τοῦτο  
ἐν τῷ ἀναπνεῖν καὶ ἐκπνεῖν ἐστὶ τὸ ζῆν.

Τὸν αὐτὸν δὲ τρόπον καὶ τοῖς ἵχθυσιν ἡ κίνησις  
γίνεται τῶν βραγχίων. αἱρομένου μὲν γὰρ τοῦ  
15 θερμοῦ τοῦ ἐν τῷ αἷματι διὰ τῶν μορίων αἱρονται  
καὶ τὰ βράγχια, καὶ διὰσι τὸ ὕδωρ· κατιόντος δὲ  
πρὸς τὴν καρδίαν διὰ τῶν πόρων καὶ καταψυχομένου  
συνίζουσι, καὶ ἀφίασι τὸ ὕδωρ. ἀεὶ δ' αἱρομένου  
τοῦ ἐν τῇ καρδίᾳ, ἀεὶ δέχεται πάλιν καταψυχο-  
μένου. διὸ κάκείνοις τοῦ ζῆν καὶ μὴ ζῆν τὸ τέλος  
20 ἐστὶν ἐν τῷ ἀναπνεῖν, καὶ τούτοις ἐν τῷ δέχεσθαι  
τὸ ὑγρόν.

Περὶ μὲν οὖν ζωῆς καὶ θανάτου καὶ τῶν συγ-  
γενῶν ταύτης τῆς σκέψεως, σχεδὸν εἴρηται περὶ  
πάντων. περὶ δὲ ὑγιείας καὶ νόσου οὐ μόνον ἐστὶν  
ἰατροῦ ἀλλὰ καὶ τοῦ φυσικοῦ μέχρι του τὰς αἰτίας  
25 εἰπεῖν. οὐδὲ διαφέρουσι καὶ οὐδὲ διαφέροντα θεωροῦ-  
σιν, οὐ δεῖ λανθάνειν, ἐπεὶ ὅτι γε σύνορος ἡ πραγ-  
ματεία μέχρι τινός ἐστι, μαρτυρεῖ τὸ γινόμενον.  
τῶν τε γὰρ ιατρῶν ὅσοι κομψοὶ ἢ περίεργοι, λέγουσι  
τι περὶ φύσεως καὶ τὰς ἀρχὰς ἐκεῦθεν ἀξιοῦσι  
λαμβάνειν, καὶ τῶν περὶ φύσεως πραγματευθέντων  
30 οἱ χαριέστατοι σχεδὸν τελευτῶσιν εἰς τὰς ἀρχὰς  
τὰς ιατρικάς.

## ON RESPIRATION, xxi.

into many channels so to speak, along each of which the veins stretch, so that the whole lung seems to be full of blood. The entry of the air is called inhalation, its exit exhalation. And this occurs continuously as long as the creature lives, and continually moves this part. This is why life depends upon inhalation and exhalation.

In the same way movement of the gills takes place among fishes. When the heat in the blood rises through the parts of the body the gills also rise, and the water passes through them ; but when it descends towards the heart through the passages, and as it grows cool, the gills contract and expel the water. As the heat in the heart is continually rising, so as it cools again it always returns. Just, then, as in land animals the achievement of living or not living depends entirely on breathing, so in the water animals it depends on admitting water.

We have nearly finished our entire inquiry into life, death and kindred subjects. As for health and disease it is not merely the business of the physician but also of the physical philosopher to discuss their causes up to a point. But the way in which these two classes of inquirers differ and consider different problems must not escape us, since the facts prove that up to a point the methods go hand in hand ; for those physicians who have subtle and inquiring minds have something to say about natural science, and claim to derive their principles therefrom, and the most polished of those who deal with natural science really conclude with medical principles.



# ON BREATH



## INTRODUCTION

It is generally admitted that this is not the work of Aristotle. It is in many respects unlike the other treatises in this volume, and it draws a distinction—unknown to Aristotle—between “veins” and “arteries,” though the latter term seems frequently to mean not blood-vessels, but air-passages. The essay belongs to the Peripatetic School, and for this reason has a right to a place among the works of Aristotle.

The obscurity of its meaning is exaggerated by the indifferent condition of the manuscripts, which in some cases are evidently wrong and in some actually defective.

## ΠΕΡΙ ΠΝΕΥΜΑΤΟΣ

481 a Ι. Τίς ή τοῦ ἐμφύτου πνεύματος διαμονή, καὶ τίς ή αὐξησις; ὁρῶμεν γὰρ ὅτι πλέον καὶ ἴσχυρότερον γίνεται καὶ καθ' ἡλικίας μεταβολὴν καὶ κατὰ διάθεσιν σώματος, ἡ ὡς τάλλα μέρη, προσγινόμενου τινός. προσγίνεται δὲ τροφὴ τοῖς ἐμφύχοις, ὥστε ταύτην σκεπτέον ποία τε καὶ πόθεν. δύο δὴ τρόποι δι' ὧν γίνεται, ἡ διὰ τῆς ἀναπνοῆς, ἡ διὰ τῆς κατὰ τὴν τῆς τροφῆς προσφορὰν πέψεως, καθάπερ τοῖς ἄλλοις. τούτων ἵσως οὐχ ἡττον ἄν<sup>1</sup> δόξειεν διὰ τῆς τροφῆς· σῶμα γὰρ ὑπὸ σώματος 10 τρέφεται, τὸ δὲ πνεῦμα σῶμα. τίς οὖν ὁ τρόπος; ἡ δῆλον ὡς ἐκ τῆς φλεβὸς ὀλκῆ τινὶ καὶ πέψει. τὸ γὰρ αἷμα ἡ ἐσχάτη τροφὴ καὶ ἡ αὐτὴ πᾶσιν. ὥσπερ οὖν καὶ εἰς τὸ ἀγγεῖον αὐτοῦ καὶ εἰς τὸ περιεχόμενον λαμβάνει τροφὴν εἰς τὸ θερμόν. ἄγει 15 δ' ὁ ἀήρ τὴν ἐνέργειαν ποιῶν, τὴν τε πεπτικὴν αὐτὸς αὐτῷ προστιθεὶς αὔξει καὶ τρέφει. οὐδὲν δ' ἵσως ἄποπον αὐτό γε τοῦτο, ἀλλὰ γενέσθαι τὸ πρῶτον ἐκ τῆς τροφῆς. καθαρώτερον γὰρ ὁ τῇ ψυχῇ συμφυέσ, εἰ μὴ καὶ τὴν ψυχὴν ὕστερον λέγοι γίνεσθαι, διακρινομένων τῶν σπερμάτων καὶ εἰς

<sup>1</sup> οὐχ οὕτω Β.

## ON BREATH

I. What is the meaning of the permanence of the breath implanted in the body, and how does its growth take place? We see that it becomes more and stronger, both according to change of age and the disposition of the body, or as in the other parts of the body by some addition. Living beings with souls have their addition by food, so that we have to consider the nature and source of these additions in the case of breath. There are two ways in which it occurs, either by breathing, or by the process of digestion due to the presentation of food, as in the case of the rest of the body. Of these two one would more naturally suppose it due to food; for a body is fed by a body, and breath is a body. What, then, is its method? Clearly by drawing in and assimilating breath from the veins. For the blood is the ultimate food, and is the same for all. So then it takes food into its warmth, just as into its container and envelope. The air, then, acts by producing activity and, by joining the aid of digestion to itself, produces growth and nourishment. Probably there is nothing strange in this, but it would be more strange to suppose it the result of food in the first instance. For that which naturally belongs to the soul is purer, unless one were to suppose that the soul is born afterwards, by the seeds separating and coming into their

The function of breath.

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20 φύσιν ἴόντων. εἴ τε<sup>1</sup> περίττωμα πάσης τροφῆς ἔστι, ποίᾳ διαπέμπεται τοῦτο; κατὰ μὲν γὰρ τὴν ἐκπνοὴν οὐκ εὔλογον· ἀντιλαμβάνει γὰρ εὐθύς. λοιπὸν δὲ δῆλον ὅτι διὰ τῶν τῆς ἀρτηρίας πόρων. τὸ δ' ἐκκρινόμενον ἥτοι λεπτότερον ἢ παχύτερον. ἀμφοτέρως δ' ἄτοπον, εἰ τοῦτο πάντων ἔσται καθα-  
25 ρώτατον. εἰ δὲ παχύτερον, ἔσονται τινες πόροι μείζους. εἰ δ' ἄρα κατὰ τοὺς αὐτοὺς λαμβάνει καὶ ἐκπέμπει, τοῦτ' αὐτὸς παράλογον καὶ ἄτοπον. ἡ μὲν οὖν ἐκ τῆς τροφῆς αὐξῆσις καὶ διαμονὴ σχεδὸν ταῦτα.

II. 'Η δ' ἐκ τῆς ἀναπνοῆς, ὥσπερ Ἀριστογένης οἴεται (τροφὴν γὰρ οἴεται καὶ τὸ πνεῦμα πεττό-  
30 μενον, οὐ τοῦ ἀέρος ἐν τῷ πνεύματι· τοῦτο δ' εἰς  
481 b τὰ ἀγγεῖα διαδίδοσθαι, τὸ περίττωμα πάλιν ἐκπέμ-  
πεσθαι) πλείους ἔχει τὰς ἀπορίας. ἥ τε γὰρ πέψις  
ὑπὸ τίνος; εἰκὸς μὲν γὰρ ὑπ' αὐτοῦ, καθάπερ  
καὶ τῶν ἀλλων. αὐτὸς δὲ τοῦτο ἄτοπον, εἰ μὴ  
διαφέρει τοῦ ἔξω ἀέρος· οὕτω δ' ἡ θερμότης ἀν-  
5 πέττοι. καὶ μὴν καὶ παχύτερον αὐτὸν εὔλογον εἶναι  
μεθ' ὑγρότητος τῆς ἀπὸ τῶν ἀγγείων ὅντα καὶ  
τῶν ὅλων ὅγκων, ὥσθ' ἡ πέψις ἀν εἰς τὸ σωμα-  
τῶδες εἴη. τὸ δὲ περίττωμα, εἴπερ γίνεται λεπτό-  
τερον, οὐ πιθανόν. ἄλογος δὲ καὶ ἡ ταχυτής τῆς  
πέψεως. εὐθύς γὰρ μετὰ τὴν εἰσπνοὴν ἡ ἐκπνοή.  
10 τί οὖν τὸ οὕτω ταχὺ μεταβάλλον καὶ ἀλλοιοῦν;  
ὑπολάβοι γὰρ ἄν τις μάλιστα τὸ θερμόν, καὶ μαρ-  
τυρεῖ οὕτως ἡ αἰσθησις· ὁ γὰρ ἐκπνεόμενος θερμός.

<sup>1</sup> εἴτε B.

## ON BREATH, I.—II.

own nature. If there is a waste product of all food, how can it be expelled in the case of breath? It is not reasonable to suppose that it is by exhalation; for that takes place immediately. There is left the obvious conclusion that it takes place by the channels of the windpipe. For that which is secreted is either lighter or denser. In either case it is absurd that it should be the purest of all. If it is thicker, there will necessarily be larger channels. But if it receives and discharges by the same channels, this is also improbable and strange. So the theory that the growth and continuance of breath arises from food presents these problems.

II. There is a theory that it arises from breathing, <sup>The physiology of breath in the body.</sup> as Aristogenes supposes (for he thinks that the breath when digested is a form of food: not, that is, of the air in the breath; this he thinks is absorbed into the receptacles, but the waste product is expelled again); but this theory involves even more difficulties. What is the agency of this digestion? It would be natural to suppose that it is due to the same thing as in other animals. But this seems improbable unless it differs from the outside air; for in this case its heat would digest it. And again it would seem probable that it should become thicker because of the liquid that arises from the containers, and from the general inflation, so that digestion would be into something corporeal. But that the waste product becomes lighter cannot be believed. The swiftness of digestion is unreasonable. For exhalation occurs immediately after inhalation. What then can it be which produces a change of state so rapidly? One might suppose that it was heat, and the senses give evidence of this, for the air breathed out is hot.

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ἔτι δ' εὶ μὲν ἐν τῷ πνεύμονι καὶ τῇ ἀρτηρίᾳ τὸ πεττόμενον, ἡ τοῦ θερμοῦ δύναμις ἐν τούτοις. ὅπερ οὖ φασιν, ἀλλ' ἐν τῇ κινήσει τῇ τοῦ πνεύματος 15 ἐκθερμαίνεσθαι τὴν τροφήν. εὶ δ' ἐξ ἑτέρου τινὸς οἰον ἐπισπάται ἡ καὶ κινοῦντος δέχεται, τοῦτ' ἐστὶ θαυμασιώτερον. ἀμα δὲ καὶ οὐκ αὐτὸ τὸ πρῶτον κινοῦν.

"Ετι δ' η μὲν ἀναπνοὴ μέχρι τοῦ πνεύμονος, ὥσπερ λέγουσιν αὐτοί, τὸ δὲ πνεῦμα δι' ὅλου τὸ 20 σύμφυτον. εὶ δ' ἀπὸ τούτου διαδίδοται καὶ πρὸς τὰ κάτω καὶ πρὸς τὰ ἄλλα, πῶς η πέψις οὕτω ταχεῖα; θαυμασιώτερον γὰρ τοῦτο καὶ μεῖζον· οὐ γὰρ διαπέμπει τοῦτο γ' εὐθὺς πεττόμενον τὸν ἀέρα τοῖς κάτω. καίτοι τὸ μὲν δόξειεν ἄν ἀναγκαῖον 25 ἔναι τοῦτο τῆς πέψεως γινομένης ἐν τῷ πνεύμονι, τῆς τ' ἀναπνοῆς κοινωνούντων καὶ τῶν κάτω.

Μεῖζον δ' οὕτως ἔτι καὶ παραδοξότερον τὸ συμβαῖνον· οἷον γὰρ διόδῳ καὶ θίξει γίνεται μόνον η πέψις. ἀλογον δὲ καὶ τουτὶ καὶ λογοδέστερον, εὶ δι' αὐτὸς πόρος τῆς τροφῆς καὶ τοῦ περιττώματος. εὶ δὲ δι' ἄλλου τινὸς τῶν ἐντός, οἱ αὐτοὶ λόγοι οἱ 30 καὶ πρότερον, εὶ μὴ τοῦτο λέγοι τις, ὡς οὐ πάστης τῆς τροφῆς οὐδὲ πᾶσι γίνεται περίττωμα, καθάπερ οὐδὲ τοῖς φυτοῖς, ἐπεὶ οὐδὲ τῶν τοῦ σώματος μερῶν ἐκάστου λαβεῖν ἔστιν. εἱ δὲ μή, οὕτι γε παντός. ἀλλ' ἄρα γε η μὲν ἀγγείων αὔξησις η αὐτὴ καὶ τῶν ἄλλων μορίων, εὐρυνομένων δὲ καὶ διυσταμένων τούτων πλείων δ ἀπὸ δ εἰσρέων καὶ ἐκρέων. εὶ δέ τι ἀναγκαῖον ἐνυπάρχει, τοῦτο αὐτὸ

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Moreover, if that which is digested is in the lung and in the windpipe, the force of heat must lie in them too ; this they deny, saying that the food is warmed in the movement of the breath. But it is still more amazing to suppose that it is, so to speak, absorbed from some outside source and receives it through the agency of some other impulse. But it is certainly not itself the prime cause of the movement.

Moreover the breathing only reaches as far as the lung, as they themselves admit, but the breath which is inherent in the creature goes all through it. If, then, it is received in succession from this to the lower parts and the rest, how is digestion so rapid ? This is more remarkable and a greater problem ; for it does not distribute the air the moment it is digested to the parts below ; and yet this would seem to be essential if digestion takes place in the lung, and the breathing communicates with the parts below.

But in this case what occurs is a greater and more inexplicable mystery ; for in this case digestion seems merely to be like a passage through and a contact. But it is unreasonable, in fact more unreasonable, to suppose that the same account applies both to food and to waste product. But if it takes place through any other of the internal organs, the same arguments apply as before, unless one is prepared to say that the waste product does not occur with all kinds of food, nor with all creatures, as it does not for instance with plants, since one cannot assume it of each of the parts of the body. And if not, certainly not in every case. But then the growth of the receptacles is the same as that of the other parts, and, as they expand and swell, the air flowing in and out becomes more. But if this is necessarily so, the question we are ask-

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ζητεῖται, τίς ὁ φυσικὸς καὶ πῶς οὗτος πλείων ὑγιῶς, ἐκ τούτου φανερὸν ἀν εἰεν. τοῖς δὲ δὴ μὴ ἀναπνευστικοῖς τίς ἡ τροφὴ τοῦ συμφύτου καὶ τίς ἡ αὔξησις; οὐ γάρ ἔτι τούτοις ἀπὸ τοῦ ἔξωθεν. 10 εἰ δὲ ἀπὸ τῶν ἐντὸς καὶ τῆς κοινῆς τροφῆς, εὐλογον κάκείνοις· ἀπὸ γάρ τῶν αὐτῶν τὰ ὅμοια, καὶ ὥσαύτως. εἰ μὴ ἄρα καὶ τούτοις ἀπὸ τοῦ ἐκτός, ὥσπερ καὶ τῶν ὀσμῶν αἰσθάνονται. ἀλλ’ οὕτω γ’ οἶνον ἀναπνοὴ γίνεται. περὶ οὗ κανόνα ἀπορήσειέ τις, εἰ κατὰ ἀλήθειάν ἔστιν, αὐτό τε τοῦτο προφέρων 15 καὶ τὴν ἐπίσπασιν τῆς τροφῆς (όλκὴ γάρ ἀμά πνεύματος), ἔτι δὲ ὑπὲρ τῆς καταψύξεως ἀντιλέγων, ὡς κάκείνων δεομένων. εἰ δὲ διὰ τοῦ ὑποζώματος αὐτοῖς γίνεται, ταύτη δῆλον ὅτι καὶ ἡ τοῦ ἀέρος εἴσοδος· ὥσθ’ ὅμοιόν τι τῇ ἀναπνοῇ. πλὴν οὐκ ἀφορίζεται τίς ὄλκὴ καὶ ὑπὸ τίνος. ἢ 20 εἰ μὴ ὄλκὴ, πῶς ἡ εἴσοδος; εἰ μὴ ἄρα αὐτομάτως. τοῦτο μὲν οὖν ἔχει καὶ αὐτὸς καθ’ αὐτὸς σκέψιν.

Τοῖς δὲ δὴ ἐνύγροις τίς ἡ τροφὴ καὶ αὔξησις τοῦ συμφύτου; χωρὶς γάρ τοῦ μὴ ἀναπνεῖν οὐδὲ ἐνυπάρχειν ὅλως ἐν τῷ ὑγρῷ φαμὲν ἀέρα. λοιπὸν 25 ἄρα διὰ τῆς τροφῆς, ὡς οὐχ ὅμοίως πᾶσιν, ἢ κάκείνα διὰ τῆς τροφῆς τὰ ἐνυγρα· τριῶν γάρ 490

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ing—what is the natural breath and how does it healthily increase in size—would be answered from our previous statement. But in those creatures which do not breathe, what is the food of their natural breath, and what is its growth? In their case it certainly could not come from the outside. But if it comes from the parts inside, and from the general store of food, it is reasonable that the same should be true in the case of the others; for similar results come from the same causes and in the same way. Unless, of course, it is possible that in their case too food comes from the outside, and that they apprehend it like scents. But this is really a sort of breathing. One might have considerable doubt as to whether this is true, instancing both the fact itself and the drawing in of the food (for a drawing in of the breath occurs at the same time), and also arguing against it because of the cooling, on the assumption that they, like other creatures, need it. If, then, this takes place through the diaphragm, clearly the entry of the air must also be by this way; so that in a sense it would be like breathing. But this does not define what this drawing in is, nor by what agency it takes place. If there is no drawing in, how is there any entry? Unless it is an automatic action. This however requires an inquiry all by itself.

But in the case of water animals what is the food, and the growth of their natural breath? For apart from the fact that they do not breathe, we do not suppose that, generally speaking, there is any air in water. So the only remaining supposition is that it comes through food, in which case, either the process is not the same as in all other creatures, or else the water animals also receive it through food; for one

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τούτων ἀναγκαῖον ἔν. καὶ ταῦτα μὲν ὡς περὶ τὴν  
αὔξησιν καὶ τροφὴν τοῦ πνεύματος.

III. Περὶ δὲ ἀναπνοῆς οἱ μὲν οὐ λέγουσι τύνος  
χάριν, ἀλλὰ μόνον ὅν τρόπον γίνεται, καθάπερ  
30 Ἐμπεδοκλῆς καὶ Δημόκριτος· οἱ δὲ οὐδὲ τὸν τρόπον  
ὅλως λέγουσιν, ἀλλ' ὡς φανερῷ χρῶνται. δεῖ δὲ  
καὶ εἰ καταψύξεως χάριν, αὐτὸ τοῦτο διασαφῆσαι.  
εἰ γὰρ ἐν τοῖς ἄνω τὸ θερμόν, οὐκ ἄν ἔτι δέοιτο  
κάτω. τὸ δὲ σύμφυτον πνεῦμα δι' ὅλου, καὶ ἀρχὴ  
ἀπὸ τοῦ πνεύμονος. δοκεῖ δὲ καὶ τὸ τῆς ἀναπνοῆς  
35 εἰς πάντα διαδίδοσθαι κατὰ συνέχειαν, ὥστε τοῦτο  
δεικτέον ὡς οὐκ ἔστιν. ἀτοπον δὲ εἰ μὴ δεῖται  
482 b τύνος κινήσεως καὶ οἰον τροφῆς. εἰ δὲ διαπνεῖ  
πρὸς πᾶν, οὐκέτι καταψύξεως εἴη χάριν. ἀλλὰ  
μὴν καὶ ἡ διάδοσις ἄλλως τὸ ἀναίσθητος, καὶ τὸ  
τάχος αὐτῆς. καὶ πάλιν τὸ τῆς παλιρροίας, εἴπερ  
ἀπὸ πάντων, θαυμαστόν, πλὴν εἰ ἄλλον τρόπον  
5 ἀπὸ τῶν ἐσχάτων. τὸ δὲ πρώτως καὶ κυρίως  
ἀπὸ τῶν περὶ τὴν καρδίαν. ἐν πολλοῖς δὲ οὕτω  
τὸ τῶν ἐνεργειῶν καὶ τῶν δυνάμεων. ἀτοπον οὖν  
ὅμως εἰ καὶ εἰς τὸ δστοῦν διαδίδοται· καὶ γὰρ δὴ  
τοῦτο φασιν ἐξ ἀρτηριῶν. διό, καθάπερ εἴρηται,  
σκεπτέον περὶ ἀναπνοῆς, καὶ τύνος ἔνεκα καὶ ποίοις  
10 μέρεσι καὶ πῶς. ἔτι οὐδὲ ἐπιφορὰ τῆς τροφῆς  
φαίνεται πᾶσι δι' ἀρτηριῶν, οἰον αὐτοῖς τε τοῖς  
ἄγγείοις καὶ ἄλλοις τισὶ τῶν μερῶν. ζῆ δὲ τὰ  
φυτὰ καὶ τρέφεται. ταῦτα μὲν οἰκειότερά πως  
τοῖς περὶ τὰς τροφάς.

IV. Ἐπεὶ δὲ τρέψις αἱ κινήσεις τοῦ ἐν τῇ ἀρτηρίᾳ

## ON BREATH, II.—IV.

of these three things must be true. So much, then, for the growth and increase of the breath.

III. On the question of breathing some authors, such as Empedocles and Demoeritus, do not say why it takes place, but only the method by which it occurs ; others again do not even deal completely with the method, but treat it as obvious. Now if its purpose is to produce cooling, one must make this point quite clear. For if the heat belongs to the upper parts, cooling would not be needed below. But the breath implanted within goes through the whole, and its source is the lung. But the action of breathing seems to be transmitted continually into every part, so we should have to prove that this is untrue. It is a strange thing, then, if the lower parts do not need some movement and food as it were. If, then, breath passes everywhere, there would be no need for cooling. But the transmission is in other ways imperceptible and so is its speed. Again, its reflux, if it comes from all parts, is astonishing, unless it takes place from the extremities in some other way. But its first and foremost reflux originates from the region of the heart. But in many creatures the process of energies and functions behaves in this way. All the same it is remarkable if it is transmitted to the bone ; for they say that this takes place from the air passages. So, as has been said, we must consider breathing, what it is for, in what parts it occurs, and how. Nor does the addition of food come to all organs through the air passages, for instance to the vessels themselves, and other parts of the body ; for plants live and are nourished. Perhaps these questions are more relevant to a discussion of food.

IV. But since there are three distinct movements How does breath act?

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15 πνεύματος, ἀναπνοή, σφυγμός, τρίτη δ' ἡ τὴν τροφὴν ἐπάγουσα καὶ κατεργαζομένη, λεκτέον ὑπὲρ ἔκάστης καὶ ποῦ καὶ πῶς καὶ τίνος χάριν. τούτων δ' ἡ μὲν τοῦ σφυγμοῦ καὶ τῇ αἰσθήσει φανερὰ καθ' ὅτιοῦν μέρος ἀπτομένοις, ἡ δὲ τῆς ἀναπνοῆς μέχρι μέν του φανερά, τὸ δὲ πλέον κατὰ λόγον, 20 ἡ δὲ τῆς τροφῆς ἀπασα κατὰ λόγον ὡς εἰπεῖν, ὡς ἐκ τῶν συμβαινόντων δὲ κατὰ τὴν αἴσθησιν. ἡ μὲν οὖν ἀναπνοὴ δῆλον ὡς ἀπὸ τοῦ ἐντὸς ἔχει τὴν ἀρχήν, εἴτε ψυχῆς δύναμιν εἴτε ψυχὴν δεῖ λέγειν ταύτην, εἴτε καὶ ἄλλην τινὰ σωμάτων μίξιν, ἡ δι' 25 αὐτῶν ποιεῖ τὴν τοιαύτην ὀλκήν. ἡ δὲ θρεπτικὴ δόξειεν ἀν ἀπὸ τῆς ἀναπνοῆς· αὕτη γὰρ ἀνταποδίδοται, καὶ ὅμοία τῷ ἀληθεῖ. εἰ δὲ μή, πᾶν ὅμαλίζει τοῖς χρόνοις τὸ σῶμα κατὰ τὴν τοιαύτην κίνησιν. ἡ εἰ μηδὲν διαφέρει τὸ ἄμα, πάντα τὰ μέρη σκεπτέον. ὁ δὲ σφυγμὸς ἵδιός τις παρ' αὐτάς, τῇ μὲν ἀν δοκῶν εἶναι κατὰ συμβεβηκός, εἴπερ, ὅταν ἐν ὑγρῷ πλῆθος ἦ τεθερμότητος, ἀνάγκη τὸ ἐκπινευματούμενον διὰ τὴν ἐναπόληψιν ποιεῖν σφυγμόν, ἐν τῇ ἀρχῇ δὲ καὶ πρῶτον, εἴπερ τοῖς πρώτοις σύμφυτον· ἐν γὰρ τῇ καρδίᾳ μάλιστα καὶ πρῶτον, ἀφ' ἣς καὶ τοῖς ἄλλοις, τάχα δὲ πρὸς τὴν 35 ὑποκειμένην οὐσίαν τοῦ ζῶου τὴν ἐκ τῆς ἐνεργείας ἀνάγκη τοῦτο παρακολουθεῖν.

“Οτι δ' οὐδὲν πρὸς τὴν ἀναπνοὴν ὁ σφυγμός, 483 a σημεῖον· ἐάν τε γὰρ πυκνὸν ἐάν τε ὅμαλὸν ἐάν τε σφοδρὸν ἡ πρᾶον ἀναπνέη τις, ὁ γε σφυγμὸς ὅμοιος καὶ ὁ αὐτός, ἀλλ' ἡ ἀνωμαλία γίνεται καὶ

## ON BREATH, IV.

of the breath in the windpipe, breathing, pulsation and the third which introduces and acts upon food, we must explain in each case where, how and why it takes place. Of these the movement of pulsation is perceptible to those who touch any part ; that of respiration is perceptible up to a point, but most of it is a question of theory, while the whole of the movement as it affects food is so to speak theoretical, but, in so far as it can be determined from its results, it is a matter of perception. It is clear that breathing has its source from within, whether we are right to describe it as a function of the soul, or the soul itself, or some other mixture of bodies, which produces such a drawing by means of bodies. But the nutritive soul would seem to arise from breathing ; for breathing corresponds to this, and is like it in truth. If this is not so, every body is equated with time by such a movement. If its simultaneous occurrence makes no difference, then all parts must be examined. The pulsation is a special feature beyond these, seeming on the one hand to be only incidental, since, when there is a quantity of heat in the liquid, that which is breathed out must cause pulsation by its interruption, but on the other it is to be regarded as an original source and primary, since it exists by nature in primary organs ; for first and foremost it is in the heart, from which it is communicated to the other organs. But it must necessarily follow from the underlying essence of the animal, which arises from its activity.

But there is evidence that pulsation has no connexion with breathing ; for whether a man breathes rapidly or steadily, heavily or quietly, the beating of the heart remains the same and unaltered, but

έπίτασις ἔν τε σωματικοῖς τισὶ πάθεσι καὶ ἐν τοῖς  
5 τῆς ψυχῆς φόβοις ἐλπίσιν ἀγωνίαις.

Εἰ δὲ καὶ ἐν ταῖς ἀρτηρίαις ὁ σφυγμός, καὶ ὁ  
αὐτὸς ὃν ρύθμῳ καὶ ὁμαλὸς ἦ, σκεπτέον· οὐκ ἔοικε  
δέ γε τοῖς μακρὰν ἀπηρτημένοις. ἥκιστα δ' ἔνεκά  
του φαίνεται γίνεσθαι, καθάπερ εἴρηται. τὸ γὰρ  
αὖτις ἀναπνοῆς καὶ τῆς ἐπαγωγῆς, εἴθ' ὡς ἔτερα  
10 πάμπαν ἀλλήλων εἴθ' ὡς θάτερον πρὸς θάτερον,  
ἔνεκά του φαίνεται καὶ ἔχει τινὰ λόγον. τριῶν  
δ' οὐσῶν πρότερον<sup>1</sup> εὐλογον εἶναι τὴν γε σφυγμώδη  
καὶ τὴν ἀναπνευστικήν; ἡ γὰρ τροφὴ προϋπάρ-  
χοντος. ἡ οὖ; τὸ μὲν γὰρ ἀναπνεῖν, ὅταν ἀπολυθῇ  
τῆς κυούσης, ἡ δ' ἐπιφορὰ καὶ ἡ τροφὴ καὶ ξυν-  
15 ισταμένου καὶ ξυνεστηκότος, ὁ δὲ σφυγμὸς εὐθὺς  
ἐν τῇ ἀρχῇ ξυνισταμένης τῆς καρδίας, καθάπερ ἐν  
τοῖς ψῷοις γίνεται φανερόν. ὥστε αὕτη πρώτη,  
καὶ ἔοικεν ἐνεργείᾳ τινὶ καὶ οὐκ ἐναπολήψει πνεύ-  
ματος, εἰ μὴ ἄρα τοῦτο πρὸς τὴν ἐνέργειαν.

V. Τὸ δὲ πνεῦμα τὸ ἐκ τῆς ἀναπνοῆς φέρεσθαι  
20 μὲν εἰς τὴν κοιλίαν, οὐ διὰ τοῦ στομάχου (τοῦτο  
μὲν γὰρ ἀδύνατον), ἀλλὰ πόρον εἶναι παρὰ τὴν  
δόσφιν, δι' οὗ τὸ πνεῦμα τῇ ἀναπνοῇ φέρεσθαι ἐκ  
τοῦ βραγχίου εἰς τὴν κοιλίαν καὶ πάλιν ἔξω· τοῦτο  
δὲ τῇ αἰσθήσει φανερόν.

"Ἔχει δ' ἀπορίαν καὶ τὰ περὶ τὴν αἰσθησιν. εἰ  
25 γὰρ ἡ ἀρτηρία μόνον αἰσθάνεται, πότερα τῷ πνεύ-  
ματι τῷ δι' αὐτῆς, ἢ τῷ ὅγκῳ, ἢ τῷ σώματι;  
ἢ εἴπερ δὲ ἡ πρώτη πρώτον ὑπὸ τὴν ψυχήν, τῷ κυριω-

<sup>1</sup> πότερον B.

## ON BREATH, iv.—v.

unevenness and strain appear during some bodily ailments and in conditions of fear, expectation and conflict in the soul.

We must next consider whether the pulsation occurring in the arteries maintains a steady and an even rhythm ; it does not seem so in those which are far apart. But, as has been said, this does not seem to exist for any purpose. The action of breathing and drawing in of food, whether each of them exists entirely for each other, or one for one purpose and one for another, seems to have an object and a rational explanation. But of the three functions it is reasonable to suppose that pulsation and breathing are prior. For food of course assumes something previous. Or is this wrong ? For breathing starts as soon as the embryo is released from its mother, but the growth and feeding belong to it while it is being constructed, and after it has been constructed, but pulsation begins at the very moment that the heart is formed, as can be observed in eggs. So that pulsation is prior in origin, and seems to be an activity, and not due to an interruption of the breath, except in so far as this contributes to its activity.

V. The drawing of the breath into the stomach in breathing does not take place through the throat (this would be impossible), but there is a passage along the loin, through which the breath is carried by breathing from the windpipe into the stomach and out again ; this is evidenced by the senses.

But these facts communicated by the senses present difficulties. For, if the windpipe merely feels, is it because of the breath passing through it, or by its swelling or by its bodily nature ? If the air is the first factor in life after the soul, is it by means of the

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of breath  
within the  
body.*

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τέρω τε καὶ προτέρω; τί οὖν ἡ ψυχή; δύναμιν  
φασι τὴν αἰτίαν τῆς κινήσεως τῆς τοιαύτης. ἡ  
δῆλον ὡς οὐκ ὀρθῶς ἐπιτιμήσεις τοῖς τὸ λογιστικὸν  
80 καὶ θυμικόν· καὶ γὰρ οὗτοι ὡς δυνάμεις λέγουσιν.  
ἀλλ' εἰ δὴ ἡ ψυχὴ ἐν τῷ ἀέρι τούτῳ, οὗτός γε  
κοινὸς. ἡ πάσχων γέ τι καὶ ἀλλοιούμενος εὐλόγως  
ἄν ἔμψυχον ἡ ψυχὴ, πρὸς τὸ συγγενὲς φέρεται, καὶ  
τῷ ὅμοιῷ τὸ ὄμοιον αὔξεται. ἡ οὖ; τὸ γὰρ ὅλον  
οὐκ ἀήρ, ἀλλὰ συμβαλλόμενόν τι πρὸς ταύτην τὴν  
85 δύναμιν ὁ ἀήρ, ἡ οὖ τὸ ταύτην ποιοῦν, καὶ τὸ  
ποιῆσαν τοῦτ' ἀρχὴ καὶ ὑπόθεσις.

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Τοῖς δὲ μὴ ἀναπνέουσιν, ἵνα ἀνεπίμικτος τῷ  
ἔξω. ἡ οὖ, ἀλλὰ κατ' ἄλλον τρόπον μιγνύμενος;  
τίς οὖν ἡ διαφορὰ τοῦ ἐν τῇ ἀρτηρίᾳ πρὸς τὸν  
ἔξω; διαφέρειν γὰρ εὔλογον, τάχα δὲ καὶ ἀναγ-  
5 καῖνον, λεπτότητι· ἀλλ' ἔτι δὲ καθ' αὐτὸν θερμὸς  
ἡ ὑφ' ἐτέρου; φαίνεται γὰρ ὁ ἔσω καθάπερ ὁ  
ἔξω· βοηθεῖται δὲ τῇ καταψύξει. πότερα δέ; ἔξω  
μὲν γὰρ πραῦς, ἐμπεριληφθεὶς δὲ πνεῦμα, καθάπερ  
πυκνωθεὶς καὶ διαδοθεὶς πως. ἡ μίξιν τινὰ ἀνάγκη  
λαμβάνειν, ἐν ὑγρότητί τε καὶ σωματικοῖς ὅγκοις  
10 ἀναστρεφόμενον; οὐκ ἄρα λεπτότατος, εἴπερ μέ-  
μικται. καὶ μὴν εὔλογόν γε τὸ πρῶτον δεκτικὸν  
ψυχῆς, εἰ μὴ ἄρα καὶ ἡ ψυχὴ τοιοῦτον, καὶ οὐ  
καθαρόν τι καὶ ἀμιγέσ. τὴν δ' ἀρτηρίαν μόνον  
εἶναι δεκτικὴν πνεύματος, τὸ δὲ νεῦρον οὖ. δια-  
φέρει δὲ καὶ ὅτι τὸ μὲν νεῦρον ἔχει τάσιν, ἡ δ'  
15 ἀρτηρία ταχὺ διαρρήγνυται, καθάπερ καὶ ἡ φλέψ.

## ON BREATH, v.

controlling and prior part ? What then is the soul ? They say that the reason of movement of this kind is its function. But it is clear that one is not right to censure those who call it the seat of reasoning and the passions ; for these speak of them as functions. But if the soul resides in the air, this is common. But if by some affection or change it becomes alive this soul would naturally be attracted to what is related to it, and like will increase by like. Or is this not so ? For, it may be said, the air is not the whole of the soul, but the air contributes something to its function, or else what creates or has created this is its origin and basis.

But what about those creatures which do not breathe, where there is no mixture with the air outside ? Or is this not so, but is it mixed in some other way ? What then is the difference between the air in the air passage and the air outside ? It is natural and perhaps inevitable that it should differ in lightness. But again, is it hot in itself, or only heated by something else ? For the air inside seems to be like the air outside ; but it is assisted by cooling. But which of the two is true ? Outside the air is mild, but when enclosed it is breath, and is in a sense thickened and dissipated. Must it then receive some mixing, by moving about in liquid and by bodily swelling ? It is not, then, very fine, if it is mixed. Now it is natural that the first receptacle of the soul should be fine (unless the soul itself is of this character, and is not pure and unmixed), and that the air passage should be the first receptacle of the breath and the nerve not. It makes a difference that the nerve can stand tension, but that the air passage is quickly broken through, just like a vein. But the skin is

# ARISTOTLE

483 b

τὸ δὲ δέρμα ἐκ φλεβὸς καὶ νεύρου καὶ ἀρτηρίας,  
 ἐκ φλεβὸς μὲν ὅτι κεντηθὲν αἷμα ἀναδίδωσιν, ἐκ  
 νεύρου δὲ ὅτι τάσιν ἔχει, ἐξ ἀρτηρίας δὲ ὅτι διαπνοὴν  
 ἔχει. μόνον γὰρ δεκτικὸν πνεύματος ἡ ἀρτηρία.  
 τὰς δὲ φλέβας ἔχειν πόρους, ἐν αἷς τὸ θερμὸν ὃν  
 20 ὥσπερ ἐν χαλκείῳ θερμαίνειν τὸ αἷμα· φύσει γὰρ  
 οὐκ εἶναι θερμόν, ἀλλ’ ὥσπερ τὰ τηκτὰ καταδια-  
 χεῖσθαι· διὸ καὶ πήγνυσθαι τὴν ἀρτηρίαν, καὶ ἔχειν  
 ὑγρότητα καὶ ἐν αὐτῇ καὶ ἐν τοῖς χιτῶσι τοῖς  
 περιέχουσι τὸ κοίλωμα. φανερὸν δ’ ἐκ τε τῶν  
 25 ἀνατομῶν εἶναι, καὶ ὅτι εἰς τὸ ἔντερον καὶ εἰς τὴν  
 κοιλίαν αἱ τε φλέβες καὶ αἱ ἀρτηρίαι συνάπτουσιν,  
 ἃς εἰκὸς εἶναι τὴν τροφὴν ἔλκειν. ἐκ δὲ τῶν  
 φλεβῶν εἰς τὰς σάρκας διαδίδοσθαι τὴν τροφὴν, οὐ  
 κατὰ τὰ πλάγια ἀλλὰ κατὰ τὸ στόμα, καθάπερ  
 σωλῆνας. ἀποτείνειν γὰρ ἐκ τῶν πλαγίων φλεβῶν  
 30 φλέβια λεπτὰ ἐκ τῆς μεγάλης φλεβὸς καὶ τῆς  
 ἀρτηρίας παρ’ ἑκάστην πλευράν, καὶ ἀρτηρίαν καὶ  
 φλέβα παρακεῖσθαι· καὶ τὰ ὄστεα δὲ καθάπτειν τὰ  
 νεύρα καὶ τὰς φλέβας καὶ εἰς μέσα καὶ εἰς τὰς  
 συμβολὰς τῶν κεφαλῶν, δι’ ὃν τὴν τροφὴν δέχεσθαι  
 τοὺς ἴχθύας καὶ ἀναπνεῖν· εἰ δὲ μὴ ἀνέπνεον,  
 35 ἐξαιρεθέντας ἄν ἐκ τοῦ ὑγροῦ εὐθὺς θνήσκειν.

484 a Τὰς δὲ φλέβας καὶ τὰς ἀρτηρίας συνάπτειν εἰς  
 ἀλλήλας καὶ τῇ αἰσθήσει φανερὸν εἶναι. τοῦτο δ’  
 οὐκ ἄν συμβαίνειν, εἰ μὴ ἐδεῖτο καὶ τὸ ὑγρὸν  
 πνεύματος καὶ τὸ πνεῦμα ὑγροῦ, τῷ θερμὸν εἶναι  
 ἐν νεύρῳ καὶ ἀρτηρίᾳ καὶ φλεβὶ, θερμότατον δὲ  
 5 καὶ οἷον φλεβωδέστατον τὸ ἐν τῷ νεύρῳ.

“Ατοπον οὖν τῇ τοῦ πνεύματος χώρᾳ τὸ θερμόν,  
 ἀλλως τε καὶ καταψύξεως χάριν. εἰ δὲ ποιεῖ καὶ  
 οἷον ἀναζωπυρεῖ θερμῷ τὸ θερμόν, γίγνοιτ’ ἄν.

## ON BREATH, v.

made from veins, nerves and air passages ; from veins because it emits blood when pricked, from nerves because it admits tension, and from air passages because it allows the passage of air. For the air passage alone is receptive of air. But the veins have passages, in which the heat, as though it were in a brazen vessel, warms the blood ; for it is not naturally hot, but the heat passes into it, just as soluble substances do ; this is why the air passage is hard, and contains moisture within it, and in the coverings which surround the cavity. It becomes obvious from dissection that both the veins and the air passages are connected with the internal organs and with the stomach, and that they naturally draw the food. But the food passes through from the veins to the flesh, not through the sides but through the mouth as through channels. For from the veins stretching sideways small light veins extend from the great vein and air passage along each side, and air passage and vein lie side by side. Both nerves and veins are attached to bones, both in the middle parts and in the junctions of the head, through which fishes admit food and breathe : if they did not breathe, when taken out of the water they would die at once.

But the veins and air passages are attached to each other, as can be discovered by feeling them. This would not be the case unless the liquid needed breath and the breath liquid, because there is heat in the nerve, in the air passage and in the vein, but the hottest and, so to speak, the most venous, is that in the nerve.

Heat is not suitable to the place of the breath, especially in view of the necessary cooling. But if it is a fact that heat is generated, and in a sense resurrected by heat, then it might happen in this way.

## ARISTOTLE

484 a

ἔτι πάντων τῶν ἔχοντων θερμότητα σύμφυτόν πως  
ἡ διαμονή, μηδενὸς ἀντικειμένου μηδὲ καταψύχον-  
τος. ὅτι γὰρ πάντα δεῖται καταψύξεως, σχεδὸν  
φανερὸν τῷ αἷμα κατέχειν ἐν τῇ φλεβὶ τὸ θερμὸν  
οίλον ἀποστέγον· διὸ καὶ ὅταν ἐκρυῇ, μεθιέναι τε  
καὶ ἀποθνήσκειν, τῷ τὸ ἡπαρ οὐκ ἔχειν οὐδεμίαν  
ἀρτηρίαν.

VI. Πότερον δὲ τὸ σπέρμα διὰ τῆς ἀρτηρίας ὡς  
καὶ συνθλιβόμενον, καὶ ἐν τῇ προέσει μόνον; ἐν  
οἷς δὴ φαίνεται καὶ ἡ ἐξ αἷματος μεταβολὴ τῷ τὰ  
νεῦρα ἀπὸ τῶν ὀστῶν τρέφεσθαι· καθάπτει γὰρ  
αὐτά. ἡ οὕτε τοῦτ' ἀληθές· καὶ γὰρ ἐν τῇ καρδίᾳ  
νεῦρον, καὶ νεῦρα δὲ ἐκ τῶν ὀστῶν ἡρτημένα. οὐ  
20 συνάπτει δὲ ἐν ἐτέρῳ, ἀλλ' εἰς σάρκα ἀποτελευτᾷ.

ἡ τοῦτο γ' οὐθέν· εἴη γὰρ ἀν οὐθὲν ἥττον ἀπὸ τοῦ  
ὸστοῦ ἡ τροφή. αὐτοῖς δ' ἀπὸ τοῦ νεύρου τοῖς  
ὸστοῖς μᾶλλον τὴν τροφήν. ἀπόπον γὰρ καὶ τοῦτο.  
ξηρὸν γὰρ φύσει καὶ οὐκ ἔχον πόρους ὑγρούς· ἡ  
τροφὴ δ' ὑγρόν. σκεπτέον δὲ πρότερον, εἴπερ  
ἀπὸ τῶν ὀστῶν, τίς ἡ τοῦ ὀστοῦ τροφή, ἡ φέρουσι  
25 πόροι καὶ ἐκ τῆς φλεβὸς καὶ ἐκ τῆς ἀρτηρίας εἰς  
αὐτόν. καὶ ἐν πολλοῖς μὲν εὐδηλοῖ, μάλιστα δ'  
εἰς τὴν ράχιν. τὰς δ' ἀπὸ τῶν ὀστῶν γίνεσθαι  
συνεχεῖς, ὥσπερ ταῦς πλευραῖς· τούτους δ' ἀπὸ  
τῆς κοιλίας τίνα τρόπον, ἡ πῶς τῆς ὀλικῆς γινομέ-  
νης; ἡ τὰ πολλὰ ἄχονδρα, καθάπερ ἡ ράχις· ἀλλ'  
30 οὕτι πρὸς τὴν κύνησιν, ἡ συνάψεως χάριν. δεῖ δέ,  
καὶ εἰ ἀπὸ τοῦ νεύρου τὸ ὀστοῦν τρέφεται, τὴν  
τοῦ νεύρου τροφὴν εἰδέναι. ήμεῖς δέ φαμεν ἐκ τῆς

## ON BREATH, v.—vi.

Again; the persistence of all things containing heat is in a sense a natural quality, provided that nothing opposes nor causes a cooling. That everything needs cooling is almost obvious from the fact that the blood retains the heat in the veins as if it occluded it. So when it flows out, the heat escapes and the animal dies, because the liver has no air passage.

VI. Does the semen pass through the air passage Nervos. by pressure, or does this only take place in emission ? In such cases also the change from blood (into flesh) is evidently due to the nerves being nourished from the bones ; for they knit them together. Possibly this is not true ; for there is a nerve in the heart as well as nerves attached to the bones. But the heart nerve does not unite anything, but ends in flesh. Possibly this is of no account ; for none the less the nourishment of the nerve would come from the bone. And yet the bones might more easily be supposed to derive their nourishment from the nerves. But this is curious, for the bone is naturally dry, and has no passages for liquid. But food is wet. We must consider first what the nourishment supplied by the bone is, if it comes from the bones ; and whether the passages both from vein and air passage carry it to the bone itself. In many places these passages are visible, especially those leading to the spine. But those leading from the bones are often continuous as they are in the ribs ; but how could they come from the stomach, and how would the food be drawn in ? For most of them have no cartilage, like the spine ; and are not therefore suited to movement, or for knitting together. But if the bone is fed from the nerve, one must inquire what feeds the nerve. We

ARISTOTLE

484 <sup>a</sup> θύροτητος γλίσχρας οὕσης τῆς περὶ τὸ αὐτό.  
 πόθεν δ' αὐτὴ καὶ πᾶς, λεκτέον. τὸ ἐκ φλεβὸς  
 καὶ ἀρτηρίας τὴν σάρκα, ὅτι πανταχόθεν αἷμα τῇ  
 35 κεντήσει, ψεῦδος ἐπί γε τῶν ἄλλων ζώων, οἷον  
 ὀρνίθων καὶ ὄφεων καὶ ἵχθύων ἡ ὄλως τῶν φωτόκων·  
 ἀλλὰ τῶν πολυαίμων τοῦτ' ἔδιον, ἐπεὶ τῶν ὀρνιθίων  
 γε καὶ τεμνομένων τὸ στῆθος ἵχώρ, οὐχ αἷμα. Ἐμ-  
 484 <sup>b</sup> πεδοκλῆς δὲ ἐκ νεύρου τὸν ὄνυχα τῇ πήξει. ἀρ'  
 οὖν οὕτω καὶ δέρμα πρὸς σάρκα; ἀλλὰ τοῦ ὀστρα-  
 κοδέρμοις καὶ μαλακοστράκοις πᾶς ἀπὸ τῶν ἐκτὸς  
 ἡ τροφή; τούναντίον γάρ δοκεῖ μᾶλλον ἀπὸ τῶν  
 ἐντὸς ἡ τῶν ἐκτός. ἔτι δὲ ποία καὶ διὰ τίνων ἡ  
 5 ἐκ τῆς κοιλίας δίοδος; καὶ πάλιν ἡ ἐκείνων ἀνα-  
 στροφὴ πρὸς τὴν σάρκα, καίπερ ἄλογος οὖσα.  
 πολὺ γάρ τι θαυμαστὸν φαίνεται καὶ ἀδύνατον  
 ὄλως. ἄρα γε ἄλλοις ἄλλη τροφή, καὶ οὐ πᾶσι  
 τροφὴ τὸ αἷμα· πλὴν ἐκ τούτου τᾶλλα.

VII. Τὴν τῶν ὀστῶν φύσιν ἄρα σκεπτέον ἡ πρὸς  
 10 κίνησιν ἡ πρὸς ἔρεισμα, καὶ πρὸς τὸ στέγειν καὶ  
 περιέχειν, ἔτι δ' εἰς ὕσπερ ἀρχαὶ ἔνια, καθάπερ ὁ  
 πόλος. λέγω δὲ πρὸς μὲν κίνησιν, οἷον ποδὸς ἡ  
 χειρὸς ἡ σκέλους ἡ ἀγκῶνος, ὅμοίως τήν τε καμ-  
 πτικὴν καὶ τὴν κατὰ τόπον· οὐδὲ γάρ τήν τοπικὴν  
 οἷον τε ἀνευ κάμψεως. σχεδὸν δὲ καὶ τὰ ἔρεισ-  
 15 ματα ἐν τούτοις. τὴν δὲ τοῦ στέγειν καὶ περιέχειν,  
 οἷον τὰ ἐν τῇ κεφαλῇ τὸν ἔγκεφαλον, καὶ ὅσοι δὴ  
 τὸν μυελὸν ἄρχειν. αἱ δὲ πλευραὶ τοῦ συγκλείειν.

## ON BREATH, VI.—VII.

ourselves say it is from the liquid surrounding it which is glutinous. Then it must be explained whence this arises and how. The idea that flesh is made from vein and air passage, because blood issues from every point at which it is pricked, is false in the case of the other animals such as birds, snakes, and fishes and generally of the oviparous animals. It is really peculiar to the full-blooded animals, since, when the breast of the small birds is cut, it is not blood but ichor that flows out. Empedocles thinks that nail is formed from nerve by a process of hardening. Is the relation between skin and flesh the same? But how is it possible for either the hard or soft-shelled creatures to get their food from the outside? They seem on the other hand to derive it rather from inside than from outside. Again, of what nature and by what means is the passage from the stomach? And again its return as flesh, unreasonable though it is? The whole thing is mysterious, and generally speaking inexplicable. Perhaps other animals have another source of food, and it is not blood in all cases; and yet the others are really formed from blood.

VII. Now we have to consider the nature of the bones, whether they are designed for movement or for support, and also as covering and envelope, and whether some are the origin of movement, like the axis of the universe. By "for movement" I mean the movement of the foot, or hand, or leg, or elbow, equally for bending and for movement from place to place; for this latter movement is impossible without bending. Support seems to depend in man upon the bones mentioned. As covering and envelope, I mean as the skull covers the brain, like those who regard the marrow as the controlling agent. The ribs are

The  
function of  
the bones.

ARISTOTLE

484 b

ἀρχὴ δὲ καὶ μένον ἡ ράχις, ἀφ' ἣς καὶ αἱ πλευραὶ πρὸς τὴν σύγκλεισιν. ἀνάγκη γὰρ εἶναι τι τοιοῦτον· ἄπαν γὰρ τὸ κινούμενον ἔξ ήρεμοῦντος.

20 "Αμα δὲ καὶ δεῖ γε εἶναι τὸ οὖ ἔνεκα. ἐν ᾧ δὴ καὶ τὴν ἀρχὴν ἔνιοι, τόν τε ράχίτην καὶ τὸν ἔγκεφαλον. ἔτι δὲ παρὰ ταῦτ' ἐπὶ συναφῆς καὶ συγκλείσεως χάριν, οἷον ἡ κλείς· ὅθεν ἵσως καὶ τοῦνομα. πρὸς δὲ τὴν χρείαν ἔκαστον καλῶς.

οὕτε γὰρ ἡ κάμψις, οὕτε τοῦ ὅλου οὕτε τῶν μερῶν, 25 εἰ μὴ τοιαῦτα, οἷον ράχις, πούς, ἀγκών. εἴσω γὰρ δεῖ τὴν κάμψιν πρὸς τὴν χρείαν. ὅμοίως δὲ καὶ τὴν τοῦ ποδὸς καὶ τῶν ἄλλων τοιαύτην. ἄπαντα δὲ ἔνεκα του, καὶ τὰ ἐν τούτοις ὀστᾶ, οἷον ἡ ἐν τῷ ἀγκώνι κερκὶς ἔνεκα τῆς στροφῆς τοῦ ἀγκώνος καὶ τῆς χειρός. οὐ γὰρ ἐδυνάμεθα

30 πρηνῆ καὶ ὑπτίαν κινεῖν ἀνευ ταύτης, οὐδὲ τοὺς πόδας ἐπαίρειν καὶ κάμπτειν, εἰ μὴ δύο αἱ ἐν τῇ κινήσει κερκίδες. ὡσαύτως δὲ καὶ τὰ ἄλλα σκεπτέον, οἷον ἡ τοῦ τραχήλου κίνησις, εἰ ἐν τὸ ὀστοῦν. δεῖ δὲ καὶ ὅσα πρὸς κατάληψιν ἡ σύνδεσμον, οἷον ἡ μύλη ἡ ἐπὶ τῷ γόνατι. ἀλλὰ καὶ διὰ τί τοῖς

35 ἄλλοις οὖ. ὅσα μὲν οὖν κινητικά, πάντα μὲν μετὰ νεύρων, ἵσως δ' ὅσα πρακτικῶς μάλιστα, οἷον τὰ περὶ ἀγκῶνα καὶ σκέλη καὶ χεῖρας καὶ πόδας. τὰ δ' ἄλλα συνδέσμου χάριν, ὅσα δεῖται. ἐνίοις γὰρ ἵσως οὐδὲν ἡ ἐπ' ὅλιγον, οἷον ἡ ράχις, ἀλλ' ἡ<sup>1</sup> κάμψις. καὶ γὰρ ἡ πρὸς ἄλληλα κόλλησις ἵχώρ

485 a

1 ἡ B.

<sup>a</sup> i.e. radius in the arm and tibia in the leg.

## ON BREATH, VII.

intended to enclose. The origin and fixed part of the system is the spine, from which the ribs radiate to enclose. They must be of this character ; for all movement depends on something stationary.

At the same time there must be a purpose for which they exist. Some class as this both the spinal marrow and the brain. Besides these there are bones at the junctions for the purpose of interlocking, such as the collar-bone ; perhaps its name (the key-bone) is derived from this. Each of these is admirably suited to its object. If it were not for such bones as the spine, the foot and the elbow, there could be no bending either of the whole or of parts. The bending of the elbow must take place inwards to achieve its purpose ; and the same thing applies to the foot and the other limbs. All things exist for a purpose, as do the bones in these parts ; for instance the radius in the forearm for the purpose of bending the elbow and the hand. For without it we could not move either forward or upward, nor raise and bend the feet, if there were not two radii <sup>a</sup> employed in the movement. In the same way we must consider other things, such as the movement of the neck, whether there is one bone only concerned. We have also to consider what belongs to seizing or knitting together, like the patella over the knee ; and why no other bones have such an arrangement. All the bones concerned in movement work with sinews, and most of all those which are connected with action, such as those about the elbow, legs, hands and feet. All the others, which are needed, are for the sake of knitting together. Some have little or no function, except for bending ; such as the spine. For what connects the bones to each other is ichor

## ARISTOTLE

485 <sup>a</sup>

έστι καὶ ὑγρότης μυξώδης. τὰ δὲ καὶ συνδεῖται νεύροις, οἷον τὰ περὶ τὰ ἄρθρα.

VIII. Πάντων δ' ἔστι λόγος ὁ βελτίων ὡς καὶ 5 νῦν ζητεῦν· ἀλλὰ τὰς ἀρχὰς ἐφ' ἵκανόν, ὥν χάριν, σκεπτέον. οὐκ ἀν δόξειε κινήσεως ἔνεκα τὰ δύτα, ἀλλὰ μᾶλλον τὰ νεῦρα ἢ τὰ ἀνάλογον, ἐν φράστη πνεῦμα τὸ κινητικόν, ἐπεὶ καὶ ἡ κοιλία κινεῖται καὶ ἡ καρδία νεῦρα ἔχει· τὰ δ' οὐ πᾶσιν, ἀλλ' 10 ἐνίοις, ἀνάγκη καὶ πρὸς τὴν τοιαύτην κίνησιν νεῦρα ἔχειν, ἢ εἰς τὸ . . . . ὁ γάρ πολύπους ἐπ' ὀλίγον καὶ κακῶς βαδίζει. δεῖ γάρ τοῦτο λαβεῖν ὥσπερ ἀρχήν, ὅτι πᾶσιν, ἢ ἄλλου τινὸς χάριν· ἀλλὰ πρὸς τὴν κίνησιν τὴν οἰκείαν, οἷον τοῖς μὲν πεζοῖς πόδας, καὶ τοῦτο τοῖς μὲν ὀρθοῖς δύο, τοῖς δὲ παντελῶς 15 ἐπὶ τῆς γῆς πλείους, ὅσοις ἢ ὑλη γεωδεστέρα, καὶ ψυχροτέρα. (τὰ δὲ καὶ ἄποδα ὅλως ἐγχωρεῖ· βίᾳ γάρ οὕτω κινεῖσθαι.) τοῖς δε πτηνοῖς πτέρυγας, καὶ τούτων τὴν μορφὴν οἰκείαν τῇ φύσει. διάφορα δὲ τοῖς πτηνικωτέροις καὶ βραδυτέροις. πόδας δὲ τροφῆς χάριν καὶ ἀναστάσεως, πλὴν τῆς νυκτερίδος· 20 διὸ καὶ τὴν τροφὴν ἐκ τοῦ ἀέρος. καὶ μὴ δεῖσθαι διαναπαύσεως· οὐ δέονται γάρ δι' ἄλλων. τὰ δὲ ὀστρακόδερμα τῶν ἐνύδρων ὑπόποδα διὰ τὸ βάρος. καὶ ταῦτα μὲν πρὸς τὴν κατὰ τόπον ἀλλαγὴν· ὅσα δὲ πρὸς τὴν ἄλλην χρείαν, ὥσπερ ὑφηγεῖται καὶ ἔκάστον τὰ ἴδια, καὶ εἴ τι μὴ προφανές, οἷον διὰ

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<sup>a</sup> Five or six letters are missing in all mss.

## ON BREATH, VII.—VIII.

and mucous fluid. The rest are bound together by sinews, such as those about the joints.

VIII. An investigation like this is the best for discovering all things, but we must consider as far as is desirable what they are for. Bones would not seem to exist for the sake of movement, but rather the sinews, or what corresponds to them, in which the organ of movement essentially resides, since both the stomach moves and the heart has sinews ; this is not true in all cases but in some ; they must then have sinews with a view to movement of this kind or for . . . .<sup>a</sup>. For the cuttlefish walks very little, and that little indifferently. We must assume as a starting-point that all have these organs for different purposes, each being adapted to its own special form of movement ; for instance, feet for animals that move on land, and of these two for those which stand erect, more for those which are flat on the ground, whose material essence is more earthy and colder. (It is thus possible for some creatures to be entirely footless : and such can only be moved by force.) For the winged creatures thus have wings, and each has a shape appropriate to its nature. There is a difference between those whose flight is faster or slower. They have feet for the purpose of getting food and for standing upright ; except for the bat ; because the bat gets its food from the air. Such creatures do not need to alight for rest ; and they need not do so for any other reason. The hard-shelled water creatures have feet to support their weight. And they use them for transport from place to place ; all that serve any other need, are as the special qualities of each dictate. This is true even if the reason is not obvious, for instance why many-

485 a

25 τί τὰ πολύποδα βραδύτατα, καίτοι τὰ τετράποδα θάττω τῶν διπόδων πότερον ὅτι ἐπὶ γῆς ὅλα τὰ σώματα; ἢ ὅτι φύσει ψυχρὰ καὶ δυσκύνητα; ἢ δι’ ἄλλην αἰτίαν;

IX. Οἱ ἀναιροῦντες ὡς οὐ τὸ θερμὸν τὸ ἐργαζόμενον ἐν τοῖς σώμασιν, ἢ ὅτι μία τις φορὰ καὶ 30 δύναμις ἡ τμητικὴ τοῦ πυρός, οὐ καλῶς λέγουσιν. οὐδὲ γάρ ὅλα τοῖς ἀψύχοις ταῦτὸ ποιεῖ πᾶσιν, ἀλλὰ τὰ μὲν πυκνοῦ, τὰ δὲ μανοῦ καὶ τήκει, τὰ δὲ πήγυνυσιν. ἐν δὲ δὴ τοῖς ἐμψύχοις οὕτως ὑποληπτέον, ὥσπερ φύσεως πῦρ ζητοῦντα, καθάπερ τέχνης· καὶ γάρ ἐν ταῖς τέχναις ἔτερον τὸ χρυσοχοϊκὸν καὶ 35 τὸ χαλκευτικὸν καὶ τὸ τεκτονικὸν πῦρ ἀποτελεῖ, καὶ τὸ μαγειρικόν. ἵσως δ’ ἀληθέστερον ὅτι αἱ 485 b τέχναι· χρῶνται γάρ ὥσπερ ὄργανω μαλάττουσαι καὶ τήκουσαι καὶ ξηραίνουσαι, ἔνια δὲ καὶ ρύθμιζουσαι.

Τὸ αὐτὸ δὴ<sup>1</sup> τοῦτο καὶ αἱ φύσεις· ὅθεν δὴ καὶ πρὸς ἄλληλα διαφοραί. διὸ γελοῖον πρὸς τὸ ἔξω κρίνειν. εἴτε γάρ διακρίνον εἴτε λεπτύνον εἴθ’ ὅτιδήποτ’ ἐστὶ τὸ θερμαίνεσθαι καὶ πυροῦσθαι, διαφορὰν ἔξει τὰ ἐργα τοῖς χρωμένοις. ἀλλ’ αἱ μὲν τέχναι ὡς ὀργάνω χρῶνται, ἡ δὲ φύσις ἄμα καὶ ὡς ὑλη.

Οὐ δὴ τοῦτο χαλεπόν, ἀλλὰ μᾶλλον τὸ τὴν φύσιν αὐτὴν νοῆσαι τὴν χρωμένην, ἥτις ἄμα τοῖς αἰσθητοῖς πάθεσι καὶ τὸν ρύθμον ἀποδώσει. τοῦτο γάρ οὐκέτι πυρὸς οὐδὲ πνεύματος. τούτοις δὴ καταμεμῖχθαι τοιαύτην δύναμιν θαυμαστόν. ἔτι δὲ

<sup>1</sup> δὲ B.

## ON BREATH, VIII.—IX.

footed creatures are the slowest movers, and yet quadrupeds move faster than bipeds. Is it because the whole body is on the ground (*i.e.* in the case of the many-footed creatures)? Or because the others are naturally cold and hard to move? Or again is it for some other reason?

IX. Those who maintain that heat is not the operative principle in bodies, or that the destructive function of fire is its one and only movement and power, are inaccurate. For it does not produce exactly the same effect in all soulless things, but some it thickens and some it thins and melts, others again it hardens. So in the case of all creatures possessing soul we must assume that the results are the same, seeking the effects of fire in nature, just as we should of fire in a craft; for in the crafts, the art of the goldsmith and of the carpenter, fire produces different results; so it does in cooking. Perhaps more accurately the crafts produce the different results; for they use the fire as an instrument for softening, melting or drying, and in some cases for tempering.

In nature things achieve the same results; whence the differences they exhibit. To judge, then, from the outside is absurd; for whether we consider heating and firing as a separating, lightening or anything else, the results will vary according to the user. But the crafts use fire as an instrument, but nature uses it in this way and as material.

This presents no difficulty, but rather the difficulty lies in the fact that nature, the user, herself thinks, seeing that she will assign the balance to perceived effects. This is not due either to fire or breath. And it is remarkable that such a function should be mingled with these. But moreover the same re-

τοῦτο θαυμαστὸν ταῦτὸν καὶ περὶ ψυχῆς· ἐν τούτοις γὰρ ὑπάρχει. διόπερ οὐ κακῶς εἰς ταῦτόν, ἢ ἀπλῶς ἢ μόριόν τι τὸ δημιουργοῦν, καὶ τὸ τὴν κίνησιν ἀεὶ τὴν ὁμοίαν ὑπάρχειν ἐνέργειαν· καὶ γὰρ 15 ἡ φύσις, ἀφ' ἣς καὶ ἡ γένεσις. ἀλλὰ δὴ τίς ἡ διαφορὰ τοῦ καθ' ἔκαστον θερμοῦ; εἴθ' ὡς ὅργανον εἴθ' ὡς ὕλην εἴθ' ὡς ἀμφω. πυρὸς γὰρ διαφοραὶ κατὰ τὸ μᾶλλον καὶ ἥττον. τοῦτο δὲ σχεδὸν ὕσπερ ἐν μίξει καὶ ἀμιξίᾳ· τὸ γὰρ καθαρώτερον μᾶλλον. ὁ αὐτὸς δὲ λόγος καὶ ἐπὶ τῶν ἄλλων 20 ἀπλῶν. ἀνάγκη γάρ, ἐπείπερ ἔτερον ὀστοῦν καὶ σάρξ ἡ ἵππου καὶ ἡ βοός, ἢ τῷ ἐξ ἔτέρων εἶναι ἡ τῇ χρήσει διαφέρειν. εἰ μὲν οὖν ἔτερα, τίνες αἱ διαφοραὶ ἑκάστου τῶν ἀπλῶν; καὶ τίς; ταῦτας γὰρ ζητοῦμεν. εἰ δὲ ταῦτά, τοῖς λόγοις ἀν διαφέροι. ἀνάγκη γὰρ δυοῖν θάτερον, καθάπερ ἐν τοῖς 25 ἄλλοις· οἷνον μὲν γὰρ καὶ μέλιτος κρᾶσις<sup>1</sup> διὰ τὸ ὑποκείμενον, οἷνον δ' αὐτοῦ, εἴπερ ἔτερα, διὰ τὸν λόγον. διὸ καὶ Ἐμπεδοκλῆς μίαν<sup>2</sup> ἀπλῶς τὴν τοῦ ὀστοῦ φύσιν, εἴπερ ἀπαντα τὸν αὐτὸν λόγον ἔχει τῆς μίξεως, ἀδιάφορα ἔχρην ἵππου καὶ λέοντος καὶ ἀνθρώπου εἶναι. νῦν δὲ διαφέρει σκληρότητι, μα- 30 λακότητι, πυκνότητι, τοῖς ἄλλοις. ὁμοίως καὶ σάρξ καὶ τὰ ἄλλα μόρια. ἔτι δὲ τὰ ἐν τῷ αὐτῷ ζῷῳ διαφέρουσι πυκνότητι καὶ μανότητι καὶ τοῖς ἄλλοις, ὥστ' οὐχ ἡ αὐτὴ κρᾶσις. παχὺ μὲν γὰρ

<sup>1</sup> κρᾶσιν B.<sup>2</sup> αἰτιαν B.

## ON BREATH, ix.

markable feature occurs with the soul ; for it exists in them also. Therefore the fact that its motion always exerts a similar activity may reasonably be referred to the same source, either completely or to some part which produces the result ; for the nature, from which their birth arises, remains the same. But what difference can there be between the forms of heat occurring in each individual ? Whether we are considering the heat as an instrument, or as matter, or as both. For the only differences that heat can show must be in its greater or smaller quantity. This is equivalent to finding it in a mixture or unmixed ; for the purer is more. The same argument applies to other simple substances. For it is necessary, since the bone or flesh of the horse and ox differ, that they must either be composed of different substances, or be employed in different ways. If they are actually different, what are the differences between each of the simple things, and what is it ? For this is what we are looking for. If they are the same, then they can only differ in proportion. One of these two things must be true, as in other cases ; for a mixture of wine and honey differ because of their material, but a mixture of wine differs, if it differs at all, because of its proportion. Therefore Empedocles described the nature of bone as only one, supposing that all have the same proportion in the mixture, so that there should be no difference between the bones of a horse, lion and man. But they do differ in hardness, softness and in other qualities. So also do flesh and other parts differ. They even differ in hardness and softness, and in other qualities in the same animal, so that the proportion of mixing cannot be the same. For coarse and fine, great and

ARISTOTLE

485 b

καὶ λεπτὸν καὶ μέγα καὶ μικρὸν εἴη ἐν τῷ ποσῷ,  
 ὃ σκληρὸν δὲ καὶ πυκνὸν καὶ τὰ ἐναντία τούτοις ἐν  
 τῷ ποιῷ τῷ τῆς μίξεως. ἀναγκαῖον δὲ τοῖς οὕτω  
 λέγουσιν εἰδέναι πῶς τὸ δημιουργοῦν ἔτερον εἴη  
 486 a ἄν. καίτοι τοῦτο πλέον ἡ ἔλαττον εἶναι, καὶ τῷ  
 καθ' αὐτὸν καὶ τῷ μεμιγμένῳ, ἡ ἐν ἄλλῳ πυροῦσθαι  
 καθάπερ τὰ ἐψόμενα καὶ ὀπτώμενα. ὅπερ ἵσως  
 ἀληθές· ἂμα γὰρ ἐγκαταμίγνυται καὶ ποιεῖ τὸ τῆς  
 486 b φύσεως. ἄρα ὁ αὐτὸς καὶ περὶ σαρκὸς λόγος· καὶ  
 γὰρ αἱ αὐταὶ διαφοραί. σχεδὸν δὲ καὶ περὶ φλεβὸς  
 καὶ ἀρτηρίας καὶ τῶν λοιπῶν. ὥστε δυοῖν θάτερον,  
 ἡ οὐχ εἰς ὁ λόγος τούτων κατὰ τὴν μίξιν, ἡ οὐ  
 σκληρότητι καὶ πυκνότητι καὶ τοῖς ἐναντίοις τοὺς  
 λόγους ληπτέον.

## ON BREATH, ix.

small, are quantitative differences, but hard and thick and their opposites are differences in the quality of the mixture. But those who argue in this way must know how what creates them differs. And yet this too may be either greater or less, and may differ by existing alone or in a mixture, or by being heated in something else like things which are boiled or baked. Perhaps this is the true solution ; for it is in the mixing that it achieves its true nature. Then the same explanation may be given of flesh ; for the differences in it are the same. And the accounts of vein, air passage and the rest are approximately the same. So of two things one is true : either the proportions of the mixtures are not the same, or we cannot give any true account in terms of hardness, thickness or their opposites.



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