ARISTOTLE: -- DE SENSU AND DE MEMORIA.

INTRODUCTION, TRANSLATION, & COMMENTARY.

by

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I have attempted to give an adequate translation of the first two tractates belonging to the Parva Naturalia and I have appended a commentary which, I hope, will elucidate the many difficulties occurring in the interpretation of the text.

As regards the text I have been fortunate in having to my hand the admirable edition prepared for the Teubner series by the late W. Biehl. Before its appearance many of the difficulties seemed absolutely hopeless, but now there appear but few passages where emendation seems to be desirable or, at least, where any alteration that can come nearer to the ipsissima verba of Aristotle may be successfully devised.

As my interest in preparing this edition was not mainly textual, I have refrained from discussing variant readings at great length unless they were of importance in determining the actual doctrine of the treatise. My purpose was to give a rendering of the Greek which should be accurate and should meet the needs of students of philosophy who, not being expressly classical scholars, have hitherto had no adequate means of becoming acquainted with those two important works. I have not prepared
an apparatus criticus but simply reproduce Biehl's text, indicating alterations I have made at the foot of the page from time to time. For full information as to the MS. sources of our text I refer to Biehl's introduction. Suffice it to say that the MSS. fall into two main classes, L S U and F M Y; the former though often agreeing with the excerpts found in Alexander's commentary and drawn from a source of high antiquity, yet seem to be specimens of an 'improved' version in which the crabbedness of the original text has been smoothed down, though often with a loss of the significance which a more thorough going interpretation might have found in the concise and often awkward phrasing of the authentic statements. The F M Y group (of which Paris E - 10th century - is the most important), though full of misspellings and inaccuracies, seem to have suffered from less editorial tampering and thus apparently give us hints as to the genuine reading; they are often supported by the ancient Latin translation of William de Moerbeka used by Thomas Aquinas. Unfortunately the commentators generally have followed the former group, especially Vatican L (14th century) and often expend great pains on explaining passages where their version is hopeless.

In my commentary I have tried not only to give such explanations of ordinary words and expressions as a student not yet versed in the Aristotelian philosophy will find useful but to contribute an adequate elucidation of the undoubted difficulties which continually arise. In some it is, I think, rather more.
In dealing with these I have derived much assistance from Mr. Roden's monumental edition of the De Anima. Many of the arguments in the De Deon arose also in connection with the larger psychological treatise and, as a result of Mr. Roden's labours, the path is now much clearer than formerly. Mr. Bower's work on "Greek Theory of Elementary Cognition" came to hand just as the proof was finished the correction of the proofs of the present volume. Though mistakes some points in which we are not in agreement, I see many more in which I should have been able to profit by his great learning if the result of his researches had been accessible at an earlier date.

It should be stated that the present work originally formed a thesis for which the University
Edinburgh awarded me, in April 1804, the degree of Doctor of Philosophy. Since that date it has been revised and slightly enlarged.

It remains for me to thank the Syndics of the Cambridge University Press for undertaking the publication of this volume, and to express my gratitude also to the Press, Reader and staff for their valuable assistance. I am much indebted also to Mr. J. A. Smith, Balliol College, Oxford, for many important criticisms and suggestions. Above all my thanks are due to Mr. W. D. R. Row, of Oriel College, Oxford, who has read the whole work both in proof and in manuscript and whose counsels and criticisms have guided me at every turn.

April 1806.

G. R. D. Row.
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ambitious than Wallace's commentary on the De Anima; at the
same time it is hardly on such a massive scale as M. Rodier's monumental work on the same. I have not inserted quotations from the commentators quite so lavishly as the latter editor and I have also tried to restrict the discussions to the actual text before us. Largely owing to the excellent work, much of which must be regarded as final, to be found in the second volume of the 'Traité de l'Ame' it has been unnecessary to make every διαφορά in the De Sensu the occasion for a lengthy excursus on a series of passages, drawn from the De Anima itself and other works as far apart as the Categories and the De Generatione Animalium. Most of the really serious difficulties arise in connection with the larger psychological work and I have benefited by the result of previous discussion.

I have also prefaced an introduction, in which, without recapitulating to too great an extent what is to be found in the notes, I have tried to set forth in brief the substance of the doctrine contained in the works here translated and to indicate the chief philosophical problems arising in connection with them.

I here append a list of the chief works to which I refer. (Scattered contributions, e.g. emendations in periodicals or programmata, are fully described when quoted.)
COMMENTARIES:-


THOMAS AQUINAS: De Sensu and De Memoria, Parma ed. Vol. XX.

SIMON SIMONIUS: De Sensu and De Memoria, Geneva 1556.

THOMAS: De Sensu, Florence 1555.


MICHAEL EPHESIUS: De Memoria, -- Aldine.

TEXTS:-

BEKKER'S Aristotle, Berlin 1831.


TRANSLATIONS:-


H. BENDER: Parva Naturalia, Stuttgart.

HAMMOND: Aristotle's Psychology, 1902.

ZIAJA: De Sensu 436a1 - 439b18, Breslau (Prog.).

HAMILTON: Commentary on and translation of part of De Memoria in Reid's Works, note DXX.

WORKS BEARING ON THE SUBJECT:

WALLACE: Aristotle's Psychology.

RODIER: Traité de l'Ame, Paris, 1900.

TORSTRIK: De Anima.

TRENDELENBURG: De Anima.

Hayduck: Prog. Kön, Gym. zu Meldorf 1876-77.


COOK WILSON: In Journal of Philol. XV.

Seyrantein: In Journal of Philol. XVII.
In conclusion, take this opportunity of stating that the work here presented was originally designed as a thesis for the degree of Doctor of Philosophy presented by the University of Edinburgh. Since the award of that degree (1st April 1904), it has been carefully revised and slightly enlarged. My best thanks are due to Mr. G. Crenn of Balliol College, the special examiner appointed by the University of Edinburgh, for many valuable criticisms and suggestions, and likewise to Mr. P. Ross of The College for whose careful revision of many improvements and omissions.
ARISTOTLE'S DE SENSU and DE MEMORIA

Introduction. Section I.

The two treatises known briefly as the De Sensu and the De Memoria form the initial members of that collection of tracts on separate psychological topics known to the Latin commentators as the Parva Naturalia. The full list of these 'opuscles' is not found in De Sensu Ch. I., but practically the whole of the topics to be discussed are there set forth. They are essays on psychological subjects of very various classes and there is so much detail in the treatment that, if incorporated in the De Anima, they would have detracted considerably from the unity of the plan of that work. Consequent on the separateness of the subjects in the Parva Naturalia, the method of treatment is much more inductive than in the De Anima. There, on the whole, he is working outwards from the general definition of soul to the various types and determinations of psychic existence, while here, not being hampered by a general plan which compels him to move continually from the universal to the particular, he takes up the different types of animate activity with an independence and objectivity which was impossible in his central work.
Some plan of course, there must be in any coherent scientific exposition, and Aristotle seems to proceed from a discussion of those activities which are ἔντραται to animals, i.e., belong to animals quæ animae, to those which are ἀνεματορία, viz., affections which, though found in animals, are not uniquely a feature of animate existence; to the former category belong sensation and memory, etc., to the latter evidently such phenomena as πάθη καὶ γνῶσεις, πάθη καὶ θέαμα. I have selected the first two treatises of the former class, on Sense and on Memory, for translation and comment. They have perhaps more importance for general psychological doctrine than any of the others and in them certain metaphysical problems of unusual interest are raised.

Section II. The De Sensu.

The νοητὴν ἀγωγὸν καὶ ἀληθὸς sense and its objects, is not merely a treatise on the subjects referred to in the title but takes in also an account of the organs of sensation, in detail not and account of each organ but of the general character and ultimate constituents of the sensitive members. This occurs in Chapter 2 and thereafter the objects of the special senses are discussed not merely as relative to sense but in their own proper nature as modifications of external reality.
reality. It is this which distinguishes the account of sense given from that in the De Anima; there the objective physical nature of that which stimulates the sense-organ is only glanced at. The treatment of taste and odour is particularly minute and here we get involved in the details of the Aristotelian physics which now-a-days seems so crude and remote from our habits of thought. In fact, in the whole of this treatise we seem to be immersed in detail and there is loss of the wide generalisation and speculative insight which characterise his chief psychological work.

In the treatment of the special sense-objects there are notable omissions. Not a word is said about touch, while the physical process involved in hearing has little more than a reference made to it. 1

In Chapters 6 and 7 Aristotle goes on to discuss certain problems which have arisen in the course of the discussion—problems lying at the root of all perceptive process. First, do the objects of perception have any part too minute to be perceived? Are there any imperceptible magnitudes? The answer is no; but this is not stated without an important reservation. Considered separately the minute parts of an object are only potentially perceptible, though taken in conjunction with the other parts that go to make up the total object, they do make an

Note 1. In Chapter 6, 446b212.
an impression on the sense and hence are actually perceptible. The simple converse of this proposition is proved at the end of Chapter 7. Every sensible object has magnitude; whatever has magnitude has parts and there is no atomic object of sensation. If you suppose an object to be so far removed as, while yet remaining visible, to be perfectly indivisible to the eye, it must occupy a mere point in space; any further removal from us would render it invisible while any nearer approach would give it magnitude. It then occupies a point where the distance at which it is invisible and that at which it is visible meet; but, since a point is an absolute numerical identity and is without parts, the object occupying this point must be simultaneous by visible and invisible—an absurd conclusion.

In the second part of Chapter 6, Aristotle raises points about the process involved in the stimulation of sense by a distant object, deciding that in the case of sight it is instantaneous. In Chapter 7, he inquires about the principle of co-ordination in sense perception. He decides that, except in the case of sensations which fuse, we cannot account for the simultaneous perception of two objects unless we assume that there is some unitary principle over and above the special senses which, though numerically a unit like a point, yet has a double aspect, like the point, which may be regarded as the.

Note 1. 446a20 ff.
the terminus of each of the two lines which it separates; or again the unit of the central sensitive principle may be regarded on the analogy of that of the self-identical object which yet may have diverse attributes. This central sense is plural, though it is \( \delta \zeta \). Its organ is the heart, a member to which other functions as well as those of co-ordination are ascribed. 

Section III. The De Memoria.

The full title of this treatise is \( \chi \epsilon \pi \iota \nu \mu \omicron \nu \iota \sigma \tau \omicron \omicron \alpha \iota \sigma \omicron \eta \varsigma \lambda \theta \iota \omicron \nu \alpha \omicron \omicron \omicron \varsigma \sigma \omicron \epsilon \iota \omicron \nu \sigma \sigma \nu \tau \omicron \nu \omicron \omicron \zeta \nu \rho \omicron \omicron \nu \iota \zeta \omicron \omicron \nu \varsigma \lambda \theta \iota \omicron \nu \lambda \omicron \omicron \nu \zeta \) and the two subjects occupying respectively the first and second of the two chapters which the book contains.

Memory (\( \mu \nu \omicron \nu \eta \) ) depends upon the retention of a sense stimulation after the object producing it has ceased to affect us. The stimulus appears to persist in the heart and is then known as an image (\( \varphi \alpha \nu \tau \omicron \omicron \zeta \omicron \omicron \nu \) ). Memory consists in regarding this \( \varphi \alpha \nu \tau \omicron \omicron \zeta \omicron \omicron \nu \) as the image of the absent object and not merely as an object of consciousness that does not refer to a reality other than itself. The condition to be fulfilled, if the image of an object is to be regarded as objective, is to unite with it the image representing the time which has elapsed since the experience took place. 

Note 1. De Mem. and Section III., below.
Memory may occur either through the persistence of the original sense stimulation or by its reinstatement by another process which has been originally experienced in connection with it. This latter process of reinstatement it is which Aristotle distinguishes by the term \( \nu\upmu\alpha\tau\iota\gamma\rho\iota\) \( \varepsilon \). In its most typical meaning it is the purposive revival of a previous experience by a process of active search among the contents of mind, but apparently involuntary recollection is also grouped along with the voluntary. In describing the process Aristotle formulates definitely for the first time the three well-known laws of the Association of Ideas, the laws of Similarity, Contiguity and Contrast. With some subsidiary discussions, e.g., that which shows the dependence of memory and recollection on bodily processes, the treatise on memory closes. On the whole this treatise is on a higher level and contains more suggestive thoughts than the previous one.

**Section IV. Aristotle's Physiology.**

In order to understand the relation in Aristotle of the Physiology to the Psychology of sense and memory we must go back to the De Anima and seek the sources of our discussion there.

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there. The common terms for the phenomena belonging to both faculties alike are \( \text{μετάφραση} \) modification and \( \text{αλλαγή} \) change or process. But the question is, of what are they the changes or modifications? They are \( \text{αλλαγή} \) of the soul, or \( \text{μετάφραση} \), but all the \( \text{αλλαγή} \) (with the exception of \( \text{μετάφραση} \)) are common to soul and body alike (De An. I. Ch I) and are equally affections of the body as of the soul. The true \( \text{φυσικός} \) scientist—who studies the phenomena of life must not leave out of account the material embodiment of the psychic processes. Sight is, as it were, the soul of the eye but it cannot be studied apart from the eye; and this holds good of all psychical phenomena generally. At the same time Aristotle does not lose sight of the superiority of the mental aspect of the facts. The soul generally is \( \text{ανοιγμένος} \), that is to say, in manifesting soul the body realises its proper end and fulfils its proper function. \( \text{Εντατικό} \) means perfection and properly (like \( \text{μετάφραση} \)) refers to something mental. Aristotle illustrates the relation of soul to body, by that existing between a manufactured article (an axe) and the idea realized in it. Here once more the \( \text{πρακτικός} \)
is something mental (though of course the cases are different, as the motive of an axe is not an immanent motive principle regulating the existence of the thing through a series of changes, as the soul of a man maintains his bodily life). Similarly an act of perception which is a \( \nu \alpha \nu \iota \gamma \) a passive affection, in so far as it involves a bodily affection is, \( \nu \alpha \nu \iota \gamma \) an act of mind, \( \nu \alpha \nu \iota \gamma \) and not a mere \( \nu \alpha \nu \iota \gamma \) \( \nu \alpha \nu \iota \gamma \). Just as in the act of perception or knowledge the passive bodily determination serves as the instrument for the realisation of a mental act; so in the passive alteration which must be experienced in building up a state of knowledge there is involved a transition which is not \( \nu \alpha \nu \iota \gamma \) -qualitative change, in the usual acceptation, but is the realisation of a determinate state of mind the existence of which alone makes the processes of transition intelligible. We may generalise then and say that in so far as they are bodily affections mental phenomena are processes or passive modifications; mind as such is \( \nu \alpha \nu \iota \gamma \) ; in thinking we are not passively affected. 2

This is especially true of the highest faculty of consciousness, \( \nu \alpha \nu \iota \gamma \), the apprehension of concepts, but

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Note 1. De An. II., Ch. 5 passim.
Note 2. Cp De An. II., Ch. 5, 417a38. Cp. also 1. Ch. 3, 407a32.
but the question need not be raised here whether in the human soul this impassivity or pure spontaneity of thought is anything that has a separate existence. Aristotle's answer in his special discussion of the subject in De An. III., Ch. 5 leaves no room for doubt that it is not so. The human soul is \( \varphi \varphi \) \( \varepsilon \gamma \varphi \), merely the cognitive aspect of a process that is ultimately material.

Thus Aristotle's theory of the relation of mind and body may be designated as a doctrine of psychophysical parallelism. But this should not blind us to the fact that with him the mental aspect of the process is no epiphenomenon. Mind occupies the higher place in the scale. It is the important member of the pair of correlatives, is the end for which the bodily changes exist and has all the dignity implied in the epithets \( \varepsilon \gamma \varphi \) \( \varepsilon \gamma \varphi \), and \( \varepsilon \gamma \varphi \) \( \varepsilon \gamma \varphi \). Having made this reservation we may be quite untroubled at finding in his account of sensation and memory what looks like the crudest materialism. Objects exist in the physical world external to and in relation with an organism; they, whether when in contact with it, or at a distance, act upon this organism and produce changes, whether mechanical (mere \( \varepsilon \gamma \varphi \)), or qualitative (\( \varepsilon \gamma \varphi \)), in certain of its members. The reception of these changes in the sense-organ is perception. But why
why should the mere production of a process in a bodily part be an apprehension of the object which causes it? We must remember what Aristotle says about sense being ἐν ἐνσει and what he affirms about the sense holds equally of the sense-organ. In fact, he frequently talks of a sense and its organ without determination of the two.¹ Evidently then what gets inside the organ must be the ἐν ἐνσε of the external object. If we think of the ἐν ἐνσε or knowable character of the object as existing independently in the external world, then the ἐν ἐνσε which is present in the sensorium cannot be numerically the same; it will be only specifically identical with it or analogous to it. With regard to the subjective processes persistent in the central sensorium and representative of absent objects this seems to be the view held.² Again with sense a similar position seems at times to be taken up. The eye is transparent and receives the light which exists in the external medium³ and similarly the movement of the air which sound is, is something ἀναγκαίον and merely sets in activity a corresponding movement in the air of the internal ear. But from another point of view it seems erroneous to talk of the ἐν ἐνσε in the object and that in the organ as being numerically

Note 1. De Sensu Ch. 2, 438a13 note; cp. De An. III, Ch. 2.
Note 2. De Mem. Ch. 2, 452b15 note.
Note 3. De Sensu, Ch. 2, 438b10.
Note 4. De An. II, Ch. 8, 420a17.
numerically different. You may not talk of the same concept when realised in two distinct individuals as being numerically different; it is rather the individuals that are numerically distinct, while in concept, i.e., specifically, they are one. Thus it is in ἡ τῶν that the object and the organ are one. The τῶν of the object is its ἴδιότητα. Hence the ἴδιότητα of the object and that of the sense-organ are one; it is only in respect of particular existence (τὸ μόνον ἴδιότητα) that they can be regarded as distinct. 1

A grave difficulty arises here; the object as it is for knowledge will, on this showing only exist in the act of perception; it will have merely potential existence before this. Such is the view taken in De An. III., Ch. 2 and Metaph. III., Ch. 5, to the effect; but there Aristotle is quite sure that though the sense object as such only exists in perception yet its ἴδιότητα (substrate) exists independently. There is, however, no way of characterising this substrate if all the qualities given in sensation are abstracted from it and yet it is clear that when Aristotle talks of the ἴδιότητα of sense objects he cannot mean the mere indiffereniated ἴδιότητα ἴδιότητα. He cannot, on the other hand, mean by their objects with geometrical and kinetic qualities only, the subterfuges by which

Note 1. Cp. De An. III., Ch. 2, 426a15 1/2 b17

2. Ch. below Sec. XI. Introduction for a further discussion of the objectivity of objects of sense.
which atomistic physics avoids the difficulty of the independence of the external object; Aristotle did not believe in atoms. Accordingly we continually find expressions which imply that the \( \sigma \rho \gamma \rho \nu \sigma \tau \omega \lambda \chi \rho \alpha \) already exists as realised in some way in the external object. In truth, the fact that the external object is the agent in perception and transmits its character to the sense, shows that it must already possess that character. It is from this point of view that Aristotle discusses the physiology of the sense organs.

It is obvious that, if the sensoria are to be capable of receiving the same \( \sigma \rho \gamma \rho \nu \sigma \tau \omega \lambda \chi \rho \alpha \) as that existing in the external object, they must consist of the same \( \tau \lambda \gamma \); if, on the other hand the subjective affection were merely an \( \tau \lambda \gamma \) of the external as is suggested in De Mem. Ch. 2, 452b16 (\( \epsilon \nu \) v.) it would hardly be necessary for the \( \tau \lambda \gamma \) to be identical. The latter, of course, is the modern conception. Molecular disturbances in the brain correspond one by one to different transferences of energy in the external world; every event in the universe can have an appropriate and more or less adequate symbolisation in the human brain. But one would hardly say that the formula of the neural process (if it could be found) was the same as that which expressed the production of a red

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Note 1. E.g., De An. II, Ch 5, 418a3:

Note 2. This is implied in De An. Loc. cit. 418b6. 

rod light or the flight of a projectile, nor would the oscillation of particles in the brain be in the least like those external phenomena. Aristotle on the other hand tried to think of the subjective ἀνίκητος as occurring in pari materia with the external event and probably where he refers to the subjective ἀνίκητος as an ἀνακινησις of the external he does so because he is thinking of the processes in the central organ involved in memory; the heart, the organ of memory, is not of the same character as the external transparent medium; but the eye, the organ of the special sense of sight, is.

Section V. Physiology of the Special Senses.

The qualitative identity of the organ with the vehicle or medium in which the objective sensuous quality is generated is most conspicuous in the case of sight and hearing. The ἀνικητος of the ear the transparent pupil accept, in the one case the impulsive movement set up in the external air, in the second the light which is the basal principle of all specific modifications of colour. The primary constituent of the visible ἁπαξ of things is light. Light is the activity of a transparent element which penetrates all bodies in differing degrees.

Note 1. De An. II., Ch. 8, 420a3. De Sens. Ch. 2, 435b20.
Note 2. De Sens. Ch 2, 433b15.
Note 3. De Sens. Ch. 3.
degrees and shows, at the extremity of solid bodies, as colour. This colour is either positive or negative, black or white, and all other colours are mixtures of those two elements in different proportions.\(^1\) The visible form of a thing is therefore the determinate mixture of these two constituents and, when we see, this (by a \(\text{not transition}\) process said to be not a transition in time\(^2\)) gets, as it were, stamped upon the sense-organ.\(^3\) We hear that it is the colour which stimulates the medium\(^4\) and consequently the sense, and one would thus suspect that the colour was something different from the process which it produces. But that can hardly be so; the colour or modification of light must be the visible form of the object and it is that or something qualitatively identical with it which enters the eye. The process of transition in the medium which results in the establishment of vision, or indeed of any of the mediated acts of sense-perception, seems to be conceived as consisting in a pushing forward of this sensuous character until it actually gets embedded in the percipient organ. In the case of hearing this process is mere \(\text{not change in place, whereas in smell it is a continuous qualitative change}\) and in sight something still higher, something not a

\(\text{Note 1. De Sens, Ch. 3, 438b17.}\)
\(\text{Note 2. Cp De Sens, Ch. 6, 446b28.}\)
\(\text{Note 3. De An. III. Ch. 12, sub fin. and De Mem. Ch 1, 749a31; also De An. II. Ch. 12, 424a19.}\)
\(\text{Note 4. De An. II., Ch. 7, 418a31.}\)
a transition at all in the sense of occupying time. There must be, however, some object which originates the process which itself does not move. This is, we must suppose, the 

transition of the sensuous character. It is, however, Aristotle's practice to allude both to the object which causes sensation and its sensuous character, the sound or colour, by the single word ἡ τρισμός.

It had been the ambition of the earlier psychologists to identify each sense organ with one of the four elements. On the theory that like is perceived by like each organ will perceive the qualities of that element with which it is nature identical. Aristotle shows that, prior to perception, the organ must be unlike the quality perceived. The sense organs are not all composed of a single element. Two are, as we have seen, (the eye and the ear), but the organ of smell consists of both air and water when ἄσκον, if present anywhere, enters into all and ἄσκον into that of touch. But we do not by any organ perceive the qualities actually possessed by the substance composing it. The qualities possessed by any of the elements are tactual, while those apprehended by the senses of sight, hearing and smell are not tactual. The organ fulfils

Note 1. Cp. De Sens., Ch. 6, 446b27 and also De An. III., Ch. 12, 434b30ff.

Note 2. Here I follow the account in De An. III., Ch. 1, 425a3ff.
fulfills its function in being the vehicle or neutral receptacle of qualities existing in a vehicle of the same nature outside it. In being neutral in the way the organ will be capable of receiving the opposite determination which characterise the contents of each sense. In the case of the qualities apprehended by touch the organs, being composed of the various elements, must show a μισθος of the various tactual qualities; this must mean a combination in equal proportions of those qualities in order that something neutral and capable of registering the variations on this side and that of the mean point may be formed. This organ would naturally be the flesh, which is a composite formed from all the elements, and we should expect that Διογένης was the μισθος in question, but though at times this is his doctrine, in the De Anima Aristotle apparently will not have it so, meaning however probably only that the external surface of the body is not the sensorium but rather the medium which communicates tactual impressions, the real organ ρας ου τον θεραπευόντος being the heart. This, however, is after all a fleshly organ and in fact, on the analogy of the senses of sight and hearing, the medium must be of the same nature as the receptive organ, for it has to be capable of transmitting the stimulus which ulti-
ultimately reaches the organ and so causes perception. 1 Evidently he conceives of the exterior flesh of the body transmitting the tactual properties of things, heat, cold, hardness, softness, etc., by a progressive qualitative alteration like the propagation of odour in the air or, in a way, light in the transparent medium. Since the organ and the medium alike are bodily members and they receive and transmit the differential of other elements than earth, they cannot consist of one element alone; they cannot be the hard parts of the body, e.g., bone, etc., which must be referred to earth 2 , and hence there is nothing left for them to be but the flesh.

The eye consists of water; though air would have served, being also transparent, yet water is more easily retained in position. 3 The material out of which it is constructed is derived from the brain, which Aristotle describes as an organ with an excess of moisture. 4 The material of the organ of

Note 1. For confirmation of this view cp. De Part Animal. II, Ch. 8, 655b24. Talking of the flesh he says: νάσσον μορφήν ἔχειν, τὴν θερμαντικὴν ἐξίσωσιν νὰ ἐπιτίθεται ἀληθινώς, ἀπὸ τῆς ἀκüρας ἢ τῆς ἀληθείας τῆς ἡρμῆς. The flesh functions both as organ and medium cp. Rümker Des Arisotles Lehrte von den Äußern Sinness- vermögen pp. 55-56.


Note 4. De Sens. Ch. 2, 438b23 and De Gener. Animal. II. Ch. 6, 744b25.
of hearing is simply a ὅτατον γίνεται. The ultimate
organ of touch seems, as we have seen, to be the heart, and
consists of flesh, a compound of all the elements. Yet, though
not consisting of υγία alone, the flesh, as something
ὅμοιος, i.e., solid, seems to contain a preponderance of
υγία, that element which is most characteristically υγίνεται. 1
This fact may lend some countenance to a statement made at the
end of the second chapter of the De Sensu, according to which
the organ of touch consists of earth. This assertion as it
stands without qualification is in flat contradiction with the
teaching in the De Anima and it is noteworthy that it occurs
in a passage where Aristotle is not stating his own final opin-
ions, but is discussing in a tentative way some possible work-
ing interpretation of the theory which assigns a special ele-
ment to each organ. 2 Aristotle there tries to combine with it
his own theory that the organ is, before perception, only poten-
tially of the nature of the determination which it perceives.
But this will conflict with the doctrine that the organ of
touch actually consists of υγία; for, in order to perceive
the qualities of υγία, it will need to be only potentially of

Notes 1. Cp. De Part. Animal, II, Ch. 1, 637b19 τοῦ ἐπὶ, and Ch. 8,
655b29 and cp. also notes to De Sens. Ch. 5, 445a18 ὅτενκα.
Note 2. 438b30.
Note 3. Cp. De Sens. Ch. 2, notes to 438b16 ὅτενκα and Bumeker
of that nature and is, in fact, Aristotle says, warm, being connected with the heart, the seat of the animal heat, and what it must have the character opposite to υποθελικαλέλακα.

Similarly the organ of smell will be only potentially warm, if the nature of odour lies in heat. This will accord with a derivation of the sensorium of smell, like that of vision, from the watery substance of the brain. But, though heat is required for the diffusion of the odorous principle it is not that principle and consequently the theory breaks down once more. His own doctrine, as we have seen, is that the organ consists both of air and of water.

The organ of taste is the tongue though, as the sense of touch, there is a reference back to a still more primary organ—the heart. Aristotle regards taste as a subvariety of touch, evidently on the ground both that contact with the object is necessary in each alike and that taste discriminates in an indirect way the tactual properties of things which go to make up their nature as the possible constituents of nutriment. A certain independence, however, is allowed to the tongue and, since tastes only exist in humid matter, the tongue must have a neutral humidity, once more the doctrine of the sense-organ show-

Note 2. De Sensu Gh 4, passim.
Note 3. De An. II. Ch. 30, 422a34 πάντων.
showing an ωίς of opposite determinations. In this case, however, the parallel to the other senses cannot be consistently worked out. The opposite determinations in taste are not excess and deficiency of δύσις but rather τό χλωρό and its negative τό μπικήρο, which are ultimately reduced to τό μπικήρο and τό χλωρό respectively. Again, in the passage from De An. II. Ch. 10, referred to above, Aristotle confuses two distinct conceptions; if the tongue is only potentially humid as he says, it cannot be described as of a neutral humidity.

The above inconsistencies only show the enormous difficulty in giving any coherent account of the process of sense stimulation in terms of the ancient physics. They in no way detract from the value of the central principle involved,—that the organ is of a nature capable of manifesting in itself the contrary determinations which characterise the objective qualities falling under any one specific sense; that apart from stimulation by an object the organ is perfectly neutral as regards these determinations and hence may in certain cases (touch at any rate) be regarded as a μέτρον, for the mean is neutral as regards opposite determinations and hence is μέτρον.

Note 1. The explicit references are only to touch (De An. II/ Ch. II, 424a4, III Ch. 13, 435a21, Meteor. IV/ Ch. 4, 82a19) and the discrimination of pleasure and pain (De An. III, Ch. 7, 431a11).
Section VI. The Physiology of the Common Sense.

In addition to the special senses, there is an unifying or central sense by means of which we perceive the determinations of number, unity, figure, magnitude and change involved in the apprehension of the special sensations of colour, sound, hardness etc. Figure and magnitude are perceived at least by two senses viz. sight and touch, and unity seems to be an idea involved in the functioning of each single sense alike. Again the comparison and discrimination of qualities belonging to different senses requires a unifying principle in some way over and above the particular sense organs. Indeed the simultaneous discrimination of qualities given by the same sense seems to require the existence of such a principle. Lastly to this also is to be ascribed the self-consciousness that accompanies all perception e.g., the perceiving that we see, hear and feel etc.

This central sense is localised in an internal organ and

Note 2. Cp. De An. III, Ch. 1, 425a20 and De Sens. Ch 7, 447b25. It is specific unity which is perceived by the functioning of a single sense.
Note 3. De An. III, Ch. 2, 426b2 serr.
Note 4. Cp. De An. loc. cit. infra and III, Ch. 7, 451a17 serr. and also De Sens. Ch. 7, 454b17 serr. and notes.
Note 6. vid. 127.
6. As well as note that the mere fact of talking about the 'common sense' in the 'central sense' may give a wrong impression of the way in which Aristotle conceived the faculty to exist. Aristotle in fact, as we know from the text of his De An. III ch. 1, 425a13-20, does not admit a common sense in the independence of the special senses as one of those which function in the independence of the others, as such it would require to have a special sense independent of the other sense-organ - a doctrine against which he argues in De An. III ch. 1, 425a13-20. The common sense is, in fact, that common function which all the special senses possess, namely that of discrimination, which a common to all is contrasted with the special reception - which each has for the separate kinds of objective quality - of sound, color, etc. In this function of discrimination, which requires the coordination of the stimuli received by the special sense-organs in a central or common sense-organ. Perhaps, then, in strictness, we should talk not about a common sense but about the common discrimination function of sense.
and that is universally admitted to be the heart. But great difficulties arise when we attempt to determine whether it is the heart as a whole which is the organ, or only some part of or constituent in it. Great uncertainty also surrounds the question as to how the central and the peripheral organs are connected and, similarly, what is the exact relation between the inner faculty and the special senses. As to the physiology of the central organ there is but little said in the two treatises which we are discussing (the passages, De Mem. ch. 1, 4506 and ch. 2, 453a14 do not help us much), while as to the connection between central and end organ there is not a word. Accordingly a full discussion of this subject may with advantage be postponed till we come to deal with the De Somno, De Insomnus and De Juvent, De Resp. etc. (as we hope to take them up later on). At present it will be sufficient to examine the main contentions of Neuhäuser as to the subject in question in so far as they derive confirmation or the reverse from passages in our text.

Neuhäuser maintains (1) that, though many passages would


Note 3. C. Bäumer pp. 79-80.
would lead us to believe that the perception of the special sense-qualities is localised in the end organs, this is not really so. The stimulation communicated from the external object to the medium to the end organ is continued right up to the heart. Perception does not result unless the heart is in a condition in which it can function\(^1\), hence it is the presence of the Y in the central organ that constitutes perception. Secondly (2), the medium of communication between the peripheral and central organs consists of canals, (in the case of the three senses of sight, hearing and smell), which are filled with a substance identical with that which composes the end organs themselves.\(^2\) This he extracts from statements\(^3\) (a) that these organs are in connection with the heart, (b) that from them extend into the veins of the brain, (c) that the organs of hearing and smell are themselves really full of air (\(\sigma\omega\pi\rho\sigma\circ\) ) and (d) that, in the case of the eye, its substance has issued through the from the brain;\(^5\) finally, (e) it is neither the blood

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Note 1. De Sommo. ch. 2, 455a33 and b11.
Note 5. De Somm. ch. 2, 43b23.
blood nor any bloodless part which is the organ of sensation, but a structure created out of it. Thirdly, (3), the central organ of sensation is not the heart itself but a substance found in its middle chamber and designated by Aristotle\(^1\) ἀγαθομορφόνες θύμην and also ὑαλόν. We hear as well that this substance is analogous to the element found in the stars (ἀκαταστασις ὑάλου τό ἑαυτόν ἁλόμορφον φωτόν), yet it is not ὑάλον though we generally identify ἀγαθομορφόνες the aether with fire, and we hear elsewhere\(^2\) that this principle is ἀναλομορφομενον - suffused with fire. The point is that this substance is different from the elements of the subluminary world and seems to serve as a basis or substratum for terrestrial conscious life, just as the upper aether serves as the substratum for the psychical existence of the heavenly bodies. It is frequently named τὸ φυσικόν θύμην, τὸ συμφωνικόν θύμην etc., and is to be identified with τὸ συμφωνικόν πρώτον of which we hear so much in the Πρώτη ἁλόμορφη κατασκευή.\(^3\) Neuhäuser seems to show quite conclusively\(^4\) that the heart is properly characterised as the place in which the central organ

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Note 2. 469b6-17. De Resp. ch. 8, 471b12-16, 448a29.
organ, of perception is situated, not as the organ itself (except surely in the case of the sense of touch); again, if the organ of consciousness is not the heart as a whole but only some constituent in it, the seat of this organ is probably the middle chamber of the heart.

Now, these contentions may all be just, but the question arises whether this element or anything of the nature of a substance will serve as a counterpart of that principle of unity which, according to Aristotle, the common sense must be. This ἅπασα ἀγαθὸν τῆς ἀρετῆς must be a substance and hence quantitative. Aristotle tells us that the primary organ of sensation or that which perceives must be a magnitude. It is the sense or its concept which is non-quantitative. Now in the De Anima III, Ch. 2, 427a1 sqq. he likens the principle of unity to something for which the only analogue is a point, the point which, while remaining indivisibly one, has yet a double reference as the end of the two segments respectively of a line which it intersects. This is also the doctrine to be extrac-

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**Note 1.** In the passage in De Part. Animal. II, Ch. 1, 647a28, where he talks of ὑπομονή (evidently the heart) being capable of receiving all sense-qualities he is probably referring to tactual ἀκοή.

**Note 2.** Neuhäuser op. cit. p. 86.

**Note 3.** De An. II, Ch. 13, 424a19, sqq.
In the latter passage he takes up the supposition that different qualities could be simultaneously discriminated by an organ which, while not atomic, was yet atomic in the sense of being completely continuous. Such a description would fit, if not the heart, that supposed internal substance of celestial affinities which it contains. The hypothesis is negated and Aristotle passes on to the conclusion of the De Anima, that that which accounts for the holding of different sensations in unity must be actually a perfect unity, though in aspect diverse. It is true that he also compares the unity of this psychic principle to the unity of an object with diverse qualities. But, as we shall see, this involves no difference of theory; the ascription of two attributes to one spatial thing involves a reference to an identity which is itself not spatial.

Hence we come to the conclusion that Aristotle in accounting forapperception has to make reference to an unity that cannot be described as a material organ. It is

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Note 2. The heat in the heart is De Gen.
Note 3. Both here and in De An.
is true that in consonance with his general psycho-physical parallelism he should be forced to try to think of it as an organ, but it has that characteristic which nothing corporeal can possess; it is \( \infty \) .\(^1\) Hence we cannot conceive both the soul and its immediate substrate (numerically the same as the central organ of sensation) as unity.\(^2\)

It is naturally just here that the parallelism of mind and body, \( \infty \) should break down. It is just in co-ordinating and distinguishing the contributions of the senses that the \( \infty \) of a typical act of mind comes in. It is as referred to a unity that sensations are anything for mind. Now qua \( \infty \) qua mental, a psychical phenomenon is nothing passive and nothing to be ascribed to body. Mind in its proper nature is \( \infty \); and hence, if we were to ascribe the function of apperception of sensations to anything, it would need to be assigned to the \( \infty \) which is \( \infty \) and 'comes in from outside.'\(^3\)

The essence of my contention is, that it is impossible to ascribe to an organ that which, not being an instance of \( \infty \) passive alteration, it is the function of nothing

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Note 1. I note that Neuhäuser p. 110 agrees with me in thinking that De Oent. ch. 2,451a26 refers to the organ of sensation.

Note 2. Neuhäuser p. 104.
nothing corporeal to account for. Unless Aristotle were to maintain that the substrate of the soul, the ψυχή, ους οντες, were not extended (which would be the same as making it immaterial) he could not attribute to it the unification of consciousness.

At the same time this psychical substance may very well be the organ which accounts for the plurality of impressions which are united in one act by the mind. It may be this which is the delicate structure capable of receiving and retaining the multitude of impressions which function in memory. In our treatise (the De Memoria) there is nothing which bears this out. We hear about processes in the central organ being interfered with by the too great pressure of the parts above them, and of defects of memory being due to excessive fluidity or hardness of the receptive structure. This last description would surely suit the heart as a whole better than the mysterious ψυχή which it contains. It really does not matter much which was Aristotle's theory; anything extended will suffice, so far as space goes, for the reception of a plurality.

On the subject of the connection between central and end

Note 2. De Mem. ch. 27, 453b1.
Note 3. De Mem. ch. 1, 450b1.
end organ there are, in our treatises, no materials to enable us to come to a decision. We hear\(^1\) of affections going on in both the central and the end organ and we hear that it is the \(\text{νεύρα}\) going on in the eyes which causes us to have light sensations still when we turn aside out of the sun into the dark.\(^2\) Of course it may still be the case that perception does not occur until the \(\text{νεύρα}\) reach the heart, but it is not necessary to believe that the medium of communication was, according to Aristotle, qualitatively the same as that of the end organ, and that the process transmitted to the heart was hence qualitatively the same as that realised in the end organ.\(^2\) An impression in the central organ is known as a \(\text{φαντάσμα}\),\(^3\) the question is whether an \(\text{αίσθησις}\) is, as Neuhäuser maintains, numerically the same as and only in aspect different from a \(\text{φαντάσμα}\). Without committing ourselves to an answer it might be profitable to point out that a possible solution is that, though consciousness cannot arise unless the central organ is stimulated, the stimulation reaching it might be only analogous\(^4\) to and not identical.

Note 1. De Insom. ch. 2, 459a67.
Note 2. Neuhäuser thinks that in maintaining this doctrine Aristotle anticipated the discovery of the nerves (due to Herophilus) or at least invented an analogue to them.
Note 4. Cp. note to De Mem. ch. 2, 452b15, 16.
identical with the modification of the peripheral organs.
Section VII. The Objects of Special Sensation.

(a) Colour. The ground-work of all colour phenomena is ἀόρατον which is a πνεύμα a common characteristic of two of the four elements, namely air and water. We translate ἀόρατον as the transparent medium, but though it functions as a medium between the coloured object and the eye, it is not merely as a medium that Aristotle considers it. It is most frequently referred to simply as ἀόρατον without the further qualification that it is a medium. It is properly a vehicle or ground-work for the manifestation of colour. It penetrates all bodies to a greater or less degree (Doubtless Aristotle means all composite bodies which contain air and water in some proportion) and it is in so far as they are thus permeated by it that they are capable of showing colour. The colour of a solid body is the limit, i.e., the surface not of the body itself but of the ἀόρατον in it. That is the colour seen, but the same nature extends right through the body. Similarly bodies that are not opaque but consist of a diaphanous substance altogether (αὐρατόν τῷ ἀόρατῳ).

Note 1. De Sens. Ch. 3, 439b8.
Note 2. De Sens. Ch. 3, 439a31 sgs.
Note 3. 439b12.
show colour. 1 But that colour is light. This brings us to the consideration that it is not merely the existence of the transparent vehicle that causes colour or light phenomena to arise. In itself it is a mere ἕναν. 2 it must be raised to the state of ὑπερένα by the presence of fire in it. 2 Hence light is the 'colour' of the diaphanous quality in bodies which is due to some other determining cause (ἐνάματα ἀνακάμρησις); it is not anything self-existent. It is equally defined as ἡ ἔνασκαλος ἐναντίον ἅγια ἡ στοιχεῖα συνήργον. 3

The presence of fire causes the existence of actual light, the positive determination of the transparent medium, its absence darkness, the privation of light. There are the contrasted determinations for substances typically transparent; in definitely bounded (opaque) bodies, in which, it is implied, ὃδέ ἐναντίον does not exist in the same degree or purity, the contrasted determinations are black and white. 3 Thus far there is no particular difficulty in the Aristotelian conception; light and colour are determinations ultimately identical, of the type ἐν ἁμαρτία, affecting a material or vehicle which, apart from their determinations, is neutral to

Note 1. 439b1.
Note 2. 439a18.
Note 3. Ch. 3, 439b16.
to them. Light is to be conceived as an all pervasive character of transparent substances equally and instantaneously present in every part. But when we come to consider the action of a coloured object upon the eye and remember that it is said to affect the vision by means of a through the medium, it seems natural to consider this to be light. When, in De Sensu chapter 6, Aristotle talks of light proceeding from the sun through the medium to the eye, it is evidently thought of as the stimulation which causes sight. Similarly, when in the latter part of the same chapter he affirms that all parts of the medium are affected at the same time, that light travels instantaneously (and hence is not really a ) he seems to be still thinking of it as an activity exerted by the object on the eye ( ). Yet in other passages it seems to be rather the indispensable condition of the operation of a coloured object on the eye. The colour stimulates the transparent medium which already is in a condition of actuality, i.e., is illuminated; objects are seen Again in De Sensu Ch 2, 439b2, light is referred to as possibly

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Note 2. 446a23 segg.
Note 3. 446b27 segg.
Note 4. 447a9.
Note 5. De An. II, Ch. 7, 409a7 segg.
possibly itself the medium. It is the *hýrphone* through the medium, whether that be light or air (in a state of illumination), that causes vision. Hence from this point of view light is not the activity exerted by the object on the sense-organ but merely the condition of the exertion of this activity. When, in Chapter 6, Aristotle denies that light is a *hýrphone* (equally whether that *hýrphone* be of the type *phoró* — spatial transference *phoró* — qualitative alteration) he is still thinking of it as an activity and the substance of his contention is, that that *hýrphone*, which was elsewhere treated as the indispensable condition of that activity, is itself the activity which accounts for vision. It is very difficult to get the two conceptions to blend. The transference of the *phoros* of the object to the sense organ can only be thought of as a *hýrphone*, a process involving time. The activity as such is caused by the coloured object, whereas the *hýrphone* is caused by the presence of the illuminating fire. Yet Aristotle, misled by the apparent instantaneousness of light, wished to conceive as not a *hýrphone* that which could only be a *hýrphone* and to raise the rank of an *hýrphone* something not physical at all.

Note 1. Cp. notes Ch. 6, ad. loc.
The fundamental colour-tones are black and white and Aristotle thinks to account for all other tints by the mixture of these two. He apparently wishes to make out that a mixture or rather chemical union of the substances which are black and white will give the chromatic tints.\(^1\) One might have thought that common observation would have refuted this and it is true that he does not say exactly this but merely "when substances unite so do their colours." True union of any two substances is one in which the original character of the component substances is lost and a third distinct qualitative character emerges as characterising every minutest part of the compound. To our modern chemical theory this holds true only if we stop our subdivision of the composite at the molecule. Any further analysis is supposed to give us parts which are not qualitatively identical, \(\&c.\), the molecule is supposed to split into atoms which have the qualities of the diverse component substances. But to Aristotle this was not so; the minutest conceivable subdivision of a true compound would still yield parts which were qualitatively identical with the whole. The compound was \(\omega_{\omega}\).\(^2\) Of such a sort was the

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Note 2. Cp. notes to Ch. 3, 440a31 sqq.
the mixture of black and white resulting in the chromatic tones supposed to be. More juxtaposition of the minute parts of differently coloured substances resulted in the production of an indeterminate neutral tint which varied with the acuteness of our perception and our remoteness from the object. It is noteworthy that, if one were to define black and white in the modern way as the capacity of a surface to reflect none or all of the light cast upon it, one could account for the chromatic tints as mixtures of these two capacities, e.g., the different proportions in which the object reflected or did not reflect the light. But, of course, nothing like this is to be found in Aristotle. What is suggestive in his theory is his contention that the difference of the composite tones depends upon the different proportions of the ingredients entering into them. This is an attempt to assimilate the theory of colours to that of harmonies; the pleasantest colours are those in which the proportions are simplest. This idea, if erroneous, is interesting as showing his readiness to recognize that mathematical relations enter into the constitution of reality. These relations are arithmetical; from mere geometrical characteristics you cannot derive any new quality but, given a pair of opposed fundamental sensuous attributes, you can by a proportionate combination of the two account for the
(Introduction p. 37 note 1.)

with.

In metaphys. ch. 7, 1057a 15-22, black and white are distinguished as to díazpíntinón gnó knása and to ouýpítinón knása 
respectively and one might suspect that this implied some theory that white was the active and black the passive element in colour mixture.

... in accordance with the primæto in met. ch. 1, 378a 27 to ýp ouýpítinón gnó knása à 1 7ó 3 1. But from various passages in the topos

... 1189a 20, IV ch. 2, 1230a, VII ch. 3, 1520a 8 we find that it is white which is to díazpíntinó gnósás. It is said also to be díazpíntinó by Ph. 828.

Suppose the fact alluded to by this term is that it describes the redemptive energy of the same organ. If indeed the term is properly Aristotelian and not simply taken by way of illustration from some current popular theory, it is to be connected with the doctrine referred to in De an. III ch. 13, 435b 15 and elsewhere, that excrescise stimulation destroyed the same organ and white being the present colour will tend to this extreme.
the intermediate qualities. The same theory is worked out also in connection with flavour.

(b) Sound is not treated at length in the De Sensu and the theory of taste and smell involves to a still greater degree than that of light the crudities of the Aristotelian physics. Not that we should speak with entire disrespect of the generalisation which assigned the constituents of all things to but few ultimate elements. The grouping of substances together according as they were dry, fluid, gaseous or manifested warmth implied something more than a mere universal of sense in each case. The distinctions reappear in modern science not as the designations of different primitive substances but as making distinct states in which all matter can exist. At least ὅτε ἑκατέριον ἄτομον καὶ ἄλλον ἐνόησιν ὁ ἄλλον, and ὅ ἀνερ corresponds to the solid, the liquid and the gaseous states and in the celestial fire - ἐν οὐρανῷ - which through not identical with Aristotle in a way shadows forth the conception of the ether.

(c) Flavour is, according to the De Sensu, a qualitative affection of liquid by dry substance. This modification is effected by the agency of heat (heat is the co-operating cause) and the process by which it is produced is
is a sort of solution of the dry in the liquid (νερό, καταστροφή 1). Knowing Aristotle's theory of the qualitative modification of one substance by another,2 we shall, however, refuse to regard this as a diffusion of the particles of the solid in the liquid. It is no mechanical diffusion but what we should call a chemical union of the dry with the moist; it is, in fact, an union more intimate than our chemical union is supposed to be. If it were not so, then really the particles of the solid would stimulate the sensation and there would be some ground for the Democritean theory that it was the different shapes of these particles that produced the different flavours. This Aristotle entirely rejects;3 though taste is a tactual sense, that does not mean that it is acted upon by the spatial and mechanical properties of the minute parts of bodies, analogous to those properties discerned by touch when the bodies have an appreciable mass.

It is not the particle impinging on the tongue that causes the taste, but the qualitative modification of the liquid medium which is identified as the flavour. If we lived amidst this vehicle4, surrounded by it as we are by the air, then it would

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Note 1. De Sens. 441b15 cp. also Ch. 5, 445a14.
Note 2. Cp. above in connection with colour mixture.
Note 3. Ch. 4, 442a29 sgg.
Note 4. De Sens. Ch. 6, 447a7.
would act as a medium just exactly as the air does in odour or sound, and the sense of taste would be a mediated one. In assigning the sense of taste as a subvariety of touch, Aristotle, no doubt, has in mind the fact that, as things are, it is only effected by contact with a portion of the substance in which the qualitative modification known as flavour subsists; he also, of course, has in view his theory that the fundamental qualities of flavour, sweetness and bitterness, are really indices of the tactual properties of food which go to determine its value as nutriment. The sweet \( \tau \gamma \lambda \alpha \upsilon \phi \rho \epsilon \) is identified with the light \( \tau \eta \nu \kappa \rho \sigma \omega \), with that light substance which can be raised up by the supposed vital heat operative indigestion and so incorporated in the organism. The bitter \( \tau \iota \nu \kappa \rho \sigma \omega \), being heavy, sinks down and passes away as excrement.\(^2\) Those actual properties, be it noted, are not spatial or dynamical according to Aristotle but qualities given by the special sensations of touch and it is upon such tactual attributes of objects that their value or hurtfulness for our organisms depend.\(^3\)

All other tastes than sweet and bitter are composites in different proportions of those two qualities, exactly as the

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**Note 1.** De Sens. Ch. 4, 441a3.

**Note 2.** De Sens. Ch. 4, 441b23 sqq.

**Note 3.** De An. III., Ch. 13, 435b4 sqq.
the chromatic tones are compounds of black and white. ¹

(c) For odour to exist we require the prior production of flavour; we must already have a liquid modified by flavour or, what is the same thing², dry substance which has produced a qualitative modification on liquid. The further solution of this flavoured substance in either air or water, it seems to be, which produces odour.³ The diffusing agency is again heat⁴ but it must be a fresh diffusion of the rapid substance which produces odour; if not, odour to creatures living in water would be identical with taste, whereas Aristotle distinctly assigns the sense of smell as such to them.⁵ Similarly odour to animals that respire is not simply the presence in air of exactly the same thing that in liquid causes taste; it is a 'diffusion' in air of the flavour itself not of the cause of the flavour. But, since flavour is the basis of odour, differences in the latter correspond to the varieties of the former⁶ and the scents derive their names

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Note 1. Cp. above (c) on colour.
Note 2. Cp. notes to Ch. 5, 442b29.
Note 3. Ch. 5, 443b6.
Note 4. 443b15.
Note 5. 443a2, 444b20.
Note 6. 443b8.
names from those distinguishing the tastes to which they correspond, owing to the similarity of the actual sensations. ¹

Animals that respire perceive odour by means of the air in which it is 'diffused' entering the nostrils. The characteristic which modifies the air seems to be thus transferred to the organ, which Aristotle probably thought was composed of air alone in respiring animals. ² The air in entering the organ displaces a membrane ³ and so affects communication. But, in animals which dwell in water, the organ (probably consisting of water) is uncovered, just as the eyes also of fishes have no protecting covering; though the manner of perception is different the sense is still the same, for it is the same objective quality which affects them as in us causes smell. ⁴

Thus far odours are strictly parallel to flavours and serve as an index for the character of the food from which they proceed. But we can classify them in a different way and not according to the taste to which they correspond; or rather as Aristotle says, there are two different varieties or groups of odour. As we saw, heat is required in the propagation of all ⁵, the Θυμίας τούτος of odour contains

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**Note 1.** Cp. De An. II 9, Ch. 9, 421b1.
**Note 2.** Cp. De An. III, Ch. 1, 425a5 (spe. θυμίας τούτος) and cp. section V above.
**Note 3.** Ch. 5, 444b22.
**Note 4.** Cp. notes to 444b20.
**Note 5.** Cp. 444a24.
contains the heat. Now in man this heat entering the nostrils tempers the cold which is supposed to prevail in the brain and its neighbourhood. Odours then appear to have a direct effect upon health and to be regarded as pleasant or the reverse in proportion as their action is beneficial or not. It is thus that Aristotle accounts for the appreciation felt by man for the scents of flowers and perfumes which have no association with edible things, an appreciation not felt by the lower animals. In the latter the brain not being nearly so large in proportion to their size does not apparently need this tonic influence. Thus Aristotle assigns to what we should call an aesthetic satisfaction a purely physiological and naturalistic explanation.

Section IX. Perception as Quantitative.

In Chapters 6 and 7 of the De Sensu, Aristotle raises the question (1) whether all perception is of a quantum and (2) whether all quanta are perceptible. Both are answered in the affirmative; the reasons for maintaining the former principle we have already seen. Spatial quantity is to be identified as the continuous ( \( \tau \)) and the continuous is

Note 1. De Sens. Ch. 5, 448b17 sqq.
Note 2. Ch. 7, 449a20 sqq.
Note 3. Ch. 6, 445b2 sqq., cp. also Ch. 7, 448a19 sqq.
Note 4. Sec. II., above.
is just that in which there is no least part, in which you never come to the indivisible; objects of perception may, however, appear to be indivisible and therefore non-quantitative.\(^1\)

What this admission amounts to we must now discuss. In raising the problem whether there are an infinite number of perceptible parts in any object (e.g., whether all quanta are perceptible), Aristotle points out that the different species of qualities belonging to any one sense must form a limited number.\(^2\) They can all be arranged in a linear series with the simple qualities most opposed to each other forming the extreme points and the others arranged in proximity to the two poles in accordance with the preponderance of the one or the other element respectively in them. But though thus arranged in linear fashion they do not form a continuum, i.e., in analysing the whole of which they are constituent parts, you come ultimately to units which cannot be subdivided, i.e., you come to the indivisible. Hence there must be a finite number of parts or steps between each end of the scale. This is a general proposition that holds good equally of a series of cognate qualities and of the number of middle terms to be interposed between subject and predicate in the proof of any proposition.\(^3\) It is

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**Note 1.** Ch. 7, 448b14.

**Note 2.** Ch. 6, 445b23.

**Note 3.** Cp. notes Ch. 6, 445b23.
is true equally of any finite magnitude. There must be a finite number of assignable parts between point A and point B or else Achilles can never overtake the tortoise.¹ What then becomes of the assertion that all quantities are perceptible, i.e., that no matter how far you analyse the object the parts obtained are still something for sense? Aristotle solves the difficulty by pointing out that it is one thing for a part to be perceived by itself and another as in the whole. We come to a limit at which a part ceases to be per se actually (ἐναλήθεια) an object of perception. The very minute parts of bodies are in their individuality only potentially (πρωτεύουσα) perceptibles, as taken along with the others and going to compose the whole they are, no doubt, actually perceptible.

¹ They do produce an effect upon the sense, but taken in their individuality, they do not; in fact, if a very minute part of any substance is actually isolated from the whole it is altered qualitatively and reduced to the nature of the new medium in which it is placed.² The substance of the whole doctrine is, that the sum of distinct objects of consciousness into which any total can be divided is limited and that, for explicit consciousness, such units are indivisible. All specific existences are as such indivisible and the mind can grasp absolute

Note 2. 446a7 sgg.
will not explain the special differential perceived by sense, and the atoms themselves, if corporeal, cannot be thought of as having merely mathematical and mechanical properties. To think of them we must invest them with the attributes known to us by sense. Hence instead of assuming that the sense-quality of an appreciable object is due to the configuration alone of its parts, it is as well to suppose that those parts have qualitative affections which, if not identical with those of the whole, are yet like them sensuous and contribute in some way to the resultant nature of the total object.
then be defined not as a region but as that state of an object in which as a separate object, it cannot be distinguished, but still in conjunction with others helps to produce a total psychical disposition. Whether the object can ever become a distinct element in consciousness per se depends upon circumstances. Sometimes by straining the attention or banishing other stimuli we can detect separate sensations hitherto unnoticed; sometimes sensations which, we know, must to a more acute sense appear distinct, are known to us only in the total volume which they produce. So too with ideas and memories, some can be aroused in their individuality by recollection, while others are real only in so far as by their former existence they modify our total present mood.

Aristotle's doctrine of the infinite divisibility of sensation (as above explained) fits in well with his general polemic against the atomic theory. With his expressly physical objections to atoms we are not here concerned. What his teaching amounts to is, that, though the characters of the minute parts called atoms are supposed to explain the sensational quality of the total substance which they compose, they themselves as occupying space will have parts and hence will want explaining by the nature of their minute parts and so on ad infinitum. Merely mathematical or mechanical qualities will
absolute unity. This must be the truth underlying the state-
ments that sense objects can appear indivisible; as objects of mind they may be indivisible, though, as existences in the physical world and hence continuous, they cannot really be so.

Aristotle's distinction between the actual and the potential perceptibility of a sense object may throw some light upon the conception of the subconscious existence of ideas which is so much in evidence in modern psychology. To many writers it seems to be the case that ideas or sensations may go on diminishing in intensity until they reach a zero point at the threshold of consciousness, after which they pass over into the subconscious region and go on existing as 'petites perceptions' with a separate individuality just as good as that which they had before. They are not 'unconscious mental modifications' e.g., they are still in some way present to consciousness, for, it appears, they may go on diminishing still further in intensity until they reach a zero of total oblivion. Now such a conception of an intermediate subconscious zone interposed between the conscious and the unconscious is quite self-
contradictory. A sensation in its individuality is either an object of consciousness or it is not; if it is not you may call it subconscious if you like, meaning by that that in conjunction with others it produces an effect upon the mind, but in its individuality it is not an object of consciousness of any grade whatsoever. The subconscious 'region' should then
being a \( \gamma_{2}^{t} \gamma_{v}^{t} \) and having an indefinite plurality of parts within it, can easily account for that --- the different parts may be differently modified. What he wants to find out is how the different determinations can be simultaneously discriminated, for that requires simultaneous existence in the same individual entity, not merely in different parts of it. Discrimination and coordination go together; as he shows in the De Anima (1) the consciousness which discriminates must be single. The objects perceived must not be present in separate moments (2) or to a divided consciousness.

In chapter 7 of the De Sensu, Aristotle without first hinting at his theory of how an indivisible unit of consciousness is possible and thus leaving the field free for any other theory, asks whether discrimination of different sense elements in an indivisible moment can be effected. He distinguishes the cases of (1) perception of opposite qualities belonging to the same sense, e.g. black and white and (2) determinations due to different senses --- sweet and white. If, he says, such discrimination were likely to occur it would be most natural to expect it in the case of the \( \gamma_{2}^{t} \gamma_{v}^{t} \) contrary determinations of one single sense, --- \( \gamma_{2}^{t} \gamma_{v}^{t} \) \( \gamma_{2}^{t} \gamma_{v}^{t} \) \( \gamma_{2}^{t} \gamma_{v}^{t} \) \( \gamma_{2}^{t} \gamma_{v}^{t} \) for the modifications due to black and white colour being localised.

SECTION X.

APPERCEPTION.

Apperception is, of course, a term not corresponding to any expression in Aristotle, but by it we may designate that function of sense in which it judges (ὑπ' ἰνν’ ) and by so doing coordinates in the same indivisible act different objects. The physiology of the matter we have already dealt with; Aristotle localises the function in a central organ and hence it may be held to correspond to what is known to modern science as the action of the higher centres as opposed to the stimulation of end organ and lower ganglia merely. The latter affection does not result in perception of the typical human kind, which requires that higher coordination which has often been referred to by the current psychological term "apperception." The term ἀναπτύξεις with Aristotle includes discrimination (ὑπ' ἰνν’) and though in the discussion in the De Sensu he almost invariably employs the former term whereas in the De Anima the latter emerges more conspicuously, he does not mean to distinguish two different functions by the different expressions. ἀναπτύξεις implies both receptivity and discrimination and would not be ἀναπτύξεις without discrimination. Accordingly, when Aristotle asks how perception of two objects at the same time is possible, he is not asking how two impressions may be received at the same time; the sense organ,
in the same organ are more 'together' than those caused by sweetness and whiteness (which exist in different organs), and hence they have more chance of being coordinated. But as it turns out, when two modifications occur together, either one drives out the other or modifies it in some way and is so modified in return that a third and new modification arises in which the individuality of the component elements is lost. Two equal and contrary determinations might completely annul each other (1) but when we get qualities belonging to the same sense simultaneously presented, what does occur is a fusion of the two elements as in the case of harmony; they form one thing, a compound, and are as such present to consciousness, their individuality is lost and hence they cannot be discriminated. In an obscure passage (2) which Biehl has had to reconstruct almost entirely, Aristotle rejects the theory that this discrimination can be effected by the determination in different ways of the different parts of an organ which are yet continuous with each other. This leads up to his own theory that, if either contrary or diverse qualities are to be simultaneously perceived there must be an absolutely indivisible psychical unity which can yet be viewed in two different ways at the same time. Its nearest analogue is, as has been said, (3) the mathematical point, or the unity of an object which possesses divine attributes. It has been debated whether

1. 447a25.  
2. 448b17 sqq.  
3. Section VI.
those two solutions of the difficulty are the same, or whether the latter, if satisfactory for the case of qualities like white and sweet, belonging to different senses, will not be insufficient to account for the harder (1) case of contrary modifications like black and white. A passage in the De Anima (2) might make us think so, but, as Rodier in his elucidation of De An. III ch. 7, (3) points out, there is no real discrepancy between the two theories. Opposed qualities - though existing in different parts of the same total object must (if between them they cover the whole extent of the ground) meet in a common indivisible point if they are still to be ascribed to the same object, and diverse characters (if) like white and sweet, which do not exist in different parts of the substance, must be deemed (as long as the substance has those qualities) to belong equally to its minutest parts i.e. to be held together in an unity which, like the point, is absolutely indivisible. Of such a nature, then, is the psychic faculty involved in discrimination. It would be natural, if we followed out the parallelism between mind and body mechanically, to imagine that there was some corporeal organ which had the same properties, and there is a passage in the De Memoria, (4) where, having evidently the organ of consciousness in mind, Aristotle refers to it as atomic; hence there

1. Cf. notes to 449a 3 sqq. 2. III ch.2, 426b28 sqq.
is some countenance for Neuhauser's theory that this organ is the mysterious vital heat of heavenly or transcendent origin. But as we have seen, nothing corporeal can fulfill the functions of an absolute indivisibility unity; the unity of apperception is generally styled \( \psi \nu \omicron \omega \omicron \gamma \delta \) (1) and perhaps the emphasis is on the latter word. It should have been in some way affiliated with the operation of \( \nu \omicron \omicron \omicron \omicron \), which is non-spatial and has a really transcendent origin. The account of the activity of \( \nu \omicron \omicron \omicron \omicron \) in De An. III ch. 6, is almost entirely parallel to his description of the higher function of sense. The tendency of Aristotle to treat \( \nu \omicron \omicron \omicron \omicron \) simply as the highest of the intellectual faculties --- that of pure conceptual thought --- prevents us from making this identification; but, on the other hand, his refusal to see in discrimination of any kind mere passivity or determination by what is foreign to one's own being, leads us to surmise that the faculties of Sense and of Reason must be in essence one. This doubt is his real belief but, as usual, it is veiled by his cautious manner of presenting the subject.

Section XI  Memory & Recollection

the text of the treatise on memory and recollection presents some difficulties in interpretation which are perhaps still greater than those met with in the De Sensu. The word of these occur in passages where e.g. 452615 e.g. 452639 e.g. 452616 e.g. I symbol are employed in one case at least and it is not claimed that a perfectly satisfactory explanation has been arrived at.

The main result of the treatise was shown in a attention (i.e. memory of moving) in used in a very restricted sense, and such sense that assumed to it in modern psychology. It does not comprise retention; that rather is an element present in the general faculty of imagination, of which memory is a special determination. To memorize a sense in memory by a pathetic changing from an actual perception to an image (paroxysm); it is the ascension of this image to some object existing in fact time which is memory in the more sense. Memory generally (though not always) always 2) the object which has been seen.
the originating sense-impression is not present, but that fact does not constitute the mental state a memory. The sense of time either determines it or determines how it enters into the psychological organism we can be said to remember. Thus, memory is relatively a high mental function and though it is said to be not denied of several of the lower animals, it is nothing which need emerge in the assimilation of present or past which must be found in any conscious mental activity experience.

Moreover, it seems that a mental image may be used and become an object of thought without any reference to historical reality which memory implies. It was quite natural that he should close. As we have seen already the ripples in the body reproduce some ripples which he existed in the external world and the tendency for thought is to appeal to memory as nearly as possible. Identity of nature to this time at least his whole theory of sense-perception implies this. Hence if a bodily ripples give knowledge of external reality in sense-perception there in no reason...
why it should not do so when the same
frictional stimulation is no longer present.
Certainly it is only when we remember in
the strict sense, that the bodily mirroring,
which function as roques stereotyping an
object of thought, gives us knowledge of the
external world which causes the perception to
which it is due; nevertheless it has an
objective character, just as the animal in
a picture has a definite nature for thought
as an object. I consciously independent
of the actual reference to the actual model
from which it was copied or ideas suggested it.
From this account it might appear that Aristotle believed
that the physiological modification in
our brain was the object of our thought
when we imagined anything. So it is in
a way but it is only physiological fig-
accident; it is the same whether
existing in the external world or in the
human brain. In our minds the
difference between the physiological
and the merely physiological scene, extreme
and we can think of the physiological

w 1168 20 off
for an only as being some vague concept
symbolization of the external; just as
we; Zeno, on whom the
complaint of panic starvation was very
inadequately communicated. It is noteworthy
that the difference of the physiological and
the physical seem to have been much more
clearly realized by the time of Zeno, who,
when defining mind as 'idea corporis,'
avoids the objection we have instanced
above by explaining that an idea
involves the nature both of the external body
and the human organism; it could otherwise
that in receiving the external it perceives
also the nature of our own body. The fact that
we thought in the thought
the physiological concept occasioning it, but
in itself the consciousness is that which
this modern symbolizes, need not conflict
with Kant's definition of memory as his
account of the objective nature of a given
agent apart from memory. And just as the animal in
a victim has an existence not 8+5 to 9,
animal, and not merely a weighing
animal arrangement as kept in the 8+5
arrangement.

Sokran II Prop. XVI and Corollary.
To modern thought it may seem strange that Aristotle should regard a perception as an alteration in the bodily organs, as something objective. But one must remember that this mirror was a sort of definite pattern, a definite object of any object external to the human organism, and that the knowledge of the one would not differ from that of the other in point of objectivity.

The stimulation of the sense organs by an external object might originally cause the mirror. But this stimulation is nothing else than the communication of the image of the external object to the human organism. It is this image which forms the content of thought and whether existing in the external physical object or in the sense organ is equally objective. The problem as to how we perceive and remember and think is never for Aristotle the question of how mind knows a real object. In this latter, a metaphysical difficulty is just distinct that real objects existed and could be known was the assumption from which he started.

Knowing were fact which must be accepted, but how a corporeal organism could...
manifest this function need not obscure the presence of the actual fact thought of in the body of the thinking being and at the moment of thought was the only solution he could offer. It is for modern physiology to discover a better. But his idea was an attempt in the right direction and a very natural answer also, for his question was not how mind thinks, but how we embodied creatures think.

If it be asked—‘in Aristotle’s a theory of representative knowledge or perception, we must answer no, at least it is not so in the modern sense of such a theory. In a sense, no doubt, there is representation between the individual and a body external to his organism in the sense organs, of sense organs mediates, but between ‘mind’ and its object nothing intervenes and an apprehension of an external object indirect — the immediate awareness? If an objective, real character of things. Hence Aristotle could think of a perception which was not due to an object — at the moment stimulating the senses, but was merely retained in the organism, as having objective apart from memory. This was so because the...
character it had equally real
whether in the subject or out of it.
memory in fact adds nothing to the
objectivity of the experiences involved
in it. It is merely the union of the
experiences caused by lapse of time and the
experience experienced by an external
tHING.
have an objective character without referring to the particular event or object to which it once referred. When it does refer and is used as a symbol or equivalent, the representation of the object is coincident with a representation of the true which has been now it was present to sense and in this coincidence alone which gives memory its true cause.

The character is involving continuity quality, spatial and temporal, which clears to sense-habitation and hence memory. Thus memory must be assigned to the faculty of sense and its organ. It is not a function of mind thought. The function of pure thought (1903) is that abstractive of concepts apart from experience (rectifying) this continues which forms them. Any way of the concept (e.g.) a static image or the equation becomes to the curve involved it is realized. But memory, that abstraction of time, which is a continuous, can they never belong to pure thought as such. Hence we may conclude (indeed if any interpretation?)

Note 1. 457 92. 2. Beuren ch. 7, 452 623.
In 453 a.d. we cannot infer it stated) that
higher beings, whose activity is purely
intellectual do not share in memory.

(4) Differences in processes of memory account for the condition of this bodily
organ (which is identical with the central organ of sensation). In
language suggested largely by a passage in
the first book of Plato. He describes the
cause of variation between different
individuals and the different phases of life;
generally speaking, the great fluidity
of the receptive structure causes interference of the impression; too great
intensity occasionally a different one
in getting any experience even impressed.

But only in the sense of recollection (which
we shall next proceed to discuss) bodily
conditions influence the recall of ideas
either by involving the sensory changes which
occur in the central nervous system causing
it to diffuse andague emotional
considerance.

(5) Recollection (prohymnsia) is also distinguished
from memory, the recollection of an image to some

event in the past which may be due
et to the persistence of a sense impression as to its remembrance after it; and
ous is a fact that these present sensations are
do as defined. It must, however, be
}

fully and unmistakably from the sensory

involved in learning (which can be identified

with the seat) may actually reciprocally

By learning mere knowledge previously

possessed which might have been recalled

but now to be learned into oblivion; under

these circumstances the memory is quite different

from recollection; the latter process is self-

contained while the former is upon

instruction. Again the brain from which

we start is different in the two cases; much

more than the meager knowledge required

in order to be capable of receiving instruction

will be necessary if we are to recall the

previous ideas ourselves.

The elements thus recalled are not fixed;

Nothing which bears a necessary connection

with one another, like the concepts

and judgments in mathematical science,

again they may be contemporaneously recollected.

Note: 451614.
the frame and early remembered, the latter
notes, but in both case the order I recall
depends upon the experiential connection
of the facts and the connection entries that
I take with the, 79 things contiguously offered,
the case with which an idea may be recalled
depends upon the frequency of the repetition
of the particular series of connections
which it is reintimated. Frequent repetition
due to custom produce a natural
disposition which tends to actualisation
just like any other 78 forms of 78.
Here however, just because this disposition
is due to custom, it is liable to the interposed
with just as any 79 contingency in nature
may be thwarted, only much so.
The law of association has formulated by
Aristotle (continuity, similarity and contrast) are obviously merely
principles power up the reinstatement of
ideas previously experienced. Hence then
we see in much common clear that
enlightened by modern psychology,
Aristotle certainly held in "associative
Theory of Knowledge" but for that therewas
recent theorists are hardly likely to
believe him. There are, however, other
psychological operations like "compensation"
that he left unaffiliated
to the persons involved in recollection.
This difference in his treatment I regard as
function a doubt due to his empirical
way of approaching his data and his
caution in all but the most general

Finally, we see that recollection is a
higher activity than mere memory. This
reaction is not an actual recollection.
though it may operate
voluntarily. It is typically a purposeful
reaction, and it is so regarded as a kind of
search, like the search for the middling term
in demonstration or for the mean segment
since its fulness is an end in practical
deliberation. Its purpose is to
agree with higher abstraction; it is in
this way illuminated by
the
drafts which account for mind best in
recollecting the word means. The above

4. a. Section IV above admit.
To produce an intensity which increases towards the upper sense, apart from this aspect of activity, we must, however, recognize that in recollection, there is a process going on in the upper sense or rather in the central seminary. The various ideas which reintegrate one another are all then described as mirifications and the end of a present recollection seems the attainment of a particular mirification in possession which seems to constitute a terminus to the series—namely the mirification corresponding to the idea then recalled. This thought, implied that these mirifications, prior to the act of recollection, are dormant, that is, that they are not until received mirifications, or lost then persist, in which the mirification when in dormancy? And the latter, the impression on the organ being like an imprint to the and no doubt we must have thought of the impression left by an experience on being some kind of structural modification of the organ. We talk of the subjective effects involved in apprehending magnitudes as being of the objective magnitudes.

Notes:
1. Re An I ch. 4, 408-617.
2. Oh. R. L. Thomas, ch. 3, 461 et seq.
themselves. He does not seek his meaning in the sentence of expression but, but
and then, the dominant impression is merely something of that nature of a thing
in the case of the sentence of impression, while the affection which when first
experienced a when revised is of the nature of a mirror, through a mirror which still
bear spatial configuration can be represented by a motion passing along a
determinate path as in the construction of a triangle. At any rate we found no
limit in Aristotle of that modern theory which would make propositional dispositions
consistent in the joint functioning of the same parts as are brought together when
an idea is explicitly realized.

1557
SENSE and the OBJECTS of SENSUOUS EXPERIENCE.

CHAPTER I.

436a Now that we have given a definite account of soul in its essential nature and of each of its faculties individually, the next thing to do is to consider animals and all things possessed of life and to discover which activities are specific and which they have in common.

Assuming as a basis our exposition about the soul, let us discuss the remaining questions beginning with those that are primary.

The most important of the characteristics of animals both generic and specific, evidently belong to soul and body in common, e.g., sense perception and memory, passion, desire and appetite generally, as well as pleasure and pain. These are found practically in all animals.

But further there are certain phenomena some of which are common to all things which participate in life, while others are shared by particular kinds of animal. Of these the most important fall into four pairs of correlative...
to wit waking and sleep, youth and age, the inhalation and
expulsion of breath, life and death. Concerning these
phenomena we must investigate both the nature of each and
the reasons for its existence.

It falls within the province of the scientist to survey
the first principles involved in the subject of health and
disease, for to nothing lacking life can either health or
sickness accrue. Hence pretty well the most of our nature-
ists do not stop until they have run on into medicine and
those of our medical men who employ their art in a more
scientific fashion, use as the first principles of medicine
this belonging to the natural sciences.

There is no lack of evidence that the phenomena we have
mentioned are shared by both soul and body in common, for they
all either occur in concomitance with sensuous experience
and are due to it. Some are modifications, some permanent
dispositions of sensuous experience, while some protect and
preserve and others destroy and annul it.

That the psychical function of sensation depends upon
the body is clear both a priori and apart from such evidence.
However, the nature of sense and its function and the reason
why this phenomenon is found in animals have already been ex-
plained in psychology. Animals qua animal must possess
possess sensation, for it is by means of this that we distinguish animate from inanimate.

To each animal in its own proper nature touch and taste must necessarily accrue, touch for the reason given in the psychology, taste owing to the fact that it takes nutriment; for by taste the pleasant and unpleasant are distinguished in food, so that as a consequence the one is pursued and the other shunned; to put it generally, flavour is a determination of that which is nutritive.

In animals with the power of locomotion, are found the senses which are mediated by smell, hearing and sight. These exist uniformly for the purpose of the self-preservation of the animals possessing them, in order that they may become aware of their food at a distance and go in pursuit of it and that they may avoid what is bad and injurious. Where intelligence is found they are designed to subserve the ends of well-being; they communicate to our minds many distinctions out of which develops in us the intelligent apprehension alike of the objects of thought and of the things of the practical life. Of these three sight is per se more valuable so far as the needs of life are concerned, but from the point of view of thought and accidentally, hearing is the more important. The characteristics are many and various which the
the faculty of sight reports, because all bodies are endowed with colour; thus by this sense especially are perceived the common sensibles; (by these I mean figure magnitude motion and number).

But hearing gives merely differences in sound and, in a few cases, in articulate utterance too. Hearing, however, has the greatest share in the development of intelligence, though this is an accidental function. Speech being audible is instrumental in causing us to learn; but this function it preserves not per se but accidentally, for speech in a complex of words, everyone of which is a conventional symbol. A consequence is that of those who from birth have been without one or other of those two senses, the blind are more intelligent than deaf-mutes.
We have already given an account of most of the ways these phenomena are explained. In a brief review, we may note that the present-day psychological approach attempts to explain them in terms of unconscious processes. For instance, they have been described as resulting from the interaction of external stimuli and internal states. This approach suggests that the nature of this phenomenon is determined by the person's state of mind, or more generally, their psychological state.

But this approach also raises doubts as to its accuracy. If it is based on the premise that which is consistent with a goal or a series of goals, then it may lead to the conclusion that the eye will of a manner perceive the world. For we do this not, the conscious self, but the unconscious mind. The conscious mind is the sum total of this element.
CHAPTER II.

We have already given an account of each of the sense faculties. But each develops, according to the course of nature, in a bodily sense-organ [and these we shall proceed to discuss].

Present-day investigators attempt to reduce them to the ultimate elements of all bodies; but, since the senses are five, they have a difficulty in reducing them to the four elements and the fifth causes them anxious consideration.

Sight they all ascribe to fire owing to the misunderstanding of a certain phenomenon, viz:--when the eye is pressed and moved fire appears to flash out [from it]; and it is the nature of this phenomenon to occur in the dark, or when the eyelids are closed, for then, too, there is darkness.

But this theory that sight is of the nature of fire raises a fresh difficulty; for, if it is impossible for that which is conscious and sees to be unaware of some object, the eye will of necessity perceive itself. Why then is this not the case when the eye is at rest? From the following considerations we shall discover the cause of this circum-
circumstance and of the apparent identity of fire and vision. It is the nature of smooth things to shine in the dark, but, nevertheless they do not produce light; now what we call the 'black' and 'middle' of the eye has a smooth appearance and it shows on the eye moving for the reason that this occurrence is a case of the reduplication of a single thing. The swiftness of the motion effects this, causing that which sees and that which is seen to appear to be distinct. Hence also if the motion is not swift and does not occur in the dark, the phenomenon does not take place. It is the nature of smooth things to shine in the dark as e.g. the heads of certain fishes and the juice of the cuttle-fish. When the eye moves slowly, the effect—the apparent simultaneous identity and duality of that which sees and that which is seen—is not produced. But in the former case the eye sees itself as it does too when reflected in a mirror; [this is so] for, if it really consists of fire, as Empedocles alleges and we read in the Timaeus, and if vision is produced by the issuing forth of light from the eye as it were from a lantern, why does not sight function in the dark as well as by day?

The explanation in the Timaeus, that the sight issuing from the eye is extinguished in the darkness, is quite without
without point, for what can the extinction of light mean? Heat and dryness are annulled by damp or cold, as we see in the case of the fire and flame in burning coals; but neither of these is a characteristic of light. If they are and we do not detect their presence owing to the smallness of their amount, light would of necessity be extinguished in broad daylight too, when it was wet, and darkness would increase in frosty weather. This at any rate, /viz. extinction/ is what happens to flame and burning bodies, but nothing of the kind occurs in the phenomenon in question.

Empedocles evidently holds the view at times that we see upon the issuing of light /from the eye/ as we mentioned before. At any rate these are his words:

"As who a journey intendeth himself with a candle equip-peth
Through the blustering night with its fiery radiance gleaming,
And, to ward off every gust, in lantern-case fits it,
That this may part to this side and that the breath of the wild winds,
While the fire pierces through, inasmuch as its nature is subtler,
And shines over the threshold with splendour that naught
naught can conquer,

Thus too the world-old fire was confined in the delicate membranes

And liethid not, the screens of the spherical-fashioned pupil;

These keep in check the ocean of water that circles around it,

But the fire pierces through, inasmuch as its nature is subtler."

Sometimes he says this is the way in which we see, but at other times he explains it by a theory of effluxes issuing from the objects seen.

Democritus is in the right in saying that the eye consists of water, but his theory that sight is the mirroring of an object is wrong. This phenomenon indeed—the visibility of an object in a mirror—occurs in the case of the eye because it is smooth and exists not in it (the reflecting eye) but in the spectator; for the phenomenon is one of reflection. But he seems to have attained to no clear general theory of the mirroring and reflection of objects. It is ridiculous too that it never entered his head to ask why the eye alone sees and none of the other things in which images are mirrored.

Thus his theory is true that the sight organ consists of
of water; but the eye functions not quâ aqueous but quâ transparent; this property it shares with air as well.

But water is more easily kept in, being denser than air and hence the pupil and the eye are composed of water.

The facts themselves make this clear; what issues from the eyes when they are hurt is evidently water and when they are quite in the embryonic stage it is excessively cold and brilliant. Further, in sanguineous animals the white of the eye is fat and oily; this is designed to keep the moisture unfrozen. Hence the eye is less liable to be chilled than any other part of the body; no one ever felt cold under the eyelids. In bloodless animals, however, the eyes have a hard skin and this it is which protects them.

The theory is wholly absurd that sight is effected by means of something which issues from the eye and that it travels as far as the stars or, as some say, unites with something else after proceeding a certain distance.

Then this latter a better theory would be, that the union is effected in the eye—the starting point; but even this is childish. What can the union of light with light mean? How can it come about? The union is not that of any chance light with any other chance light whatsoever. Again how can the internal light unite with the external? The membrane
membrane of the eye divides them.

We have elsewhere stated that vision without light is impossible; but whether it is light or air that intervenes between the object seen and the eye, it is the motion propagated through this that produces sight. Thus, as our theory would lead us to infer, the interior of the eye consists of water; for water is transparent. Just as we cannot see without the presence of light outside the eye, so without light inside the eye vision is impossible; this is the reason why the eye must be transparent, and since it is not air it must be water.

The reason for these contentions is that the consciousness, or the psychical faculty of sense perception does not reside on the surface of the eye but evidently within; this is why the interior of the eye must be transparent and receptive of light. The facts make this plain; for there have been cases of people wounded in war, the temple in such a way that the passages of the eye were severed, to whom darkness seemed to ensue just as when a light is put out; this was because the transparency we called the pupil was severed like a lamp that has its wick put out.

Thus if our account is at all in accordance with fact and if, as in the fashion proposed, we should reduce the sen-
sensoria to the elements and correlate each of the senses with one of the latter it is clear we should ascribe the eye's power of sight to water and the capacity of perceiving sounds to air and the sense of smell to fire.

This is because that which has the faculty of smell is potentially what smell is in actuality; for the object of sensation rouses the sense to activity, which hence necessarily is that which before [stimulation] is potentially.

Now odour is a smoke-like fume and smoke-like fumes originate from fire; hence the organ of smell is appropriately located in the regions around the brain, as the substrate of that which is cold is potentially hot.

The origin of the eyes is of the same fashion; they derive their composition from the brain, the coldest and most watery of the bodily members.

The sense of touch is connected with earth; and taste is a species of touch. Hence the sensoria of both--taste as well as touch--are closely related to the heart, which has qualities contrary to those of the brain and is the warmest of the members.

Let this be the way in which we discriminate the sensitive organs of the body.
CHAPTER III.

In the Psychology we have given a general account of the objects corresponding to the particular sense organs, to wit colour, sound, and smell, and touch; we have stated what their function is and described the mode of their operation in relation to the several sense organs. But the nature we must ascribe to any one of these objects we have still to consider; we must ask for instance, what is colour or sound or odour or touch? So too, what is the object of touch? Let us begin our inquiry with colour.

Now we can regard each of these sense-objects in two ways, as potentially or actually existent. We have explained in the Psychology in what sense actual colour and sound are identical with or different from actual sense experience, e.g., sight and hearing; but now we are to discuss the nature of each of those sense-objects in virtue of which they cause sensation and its activity.

It was stated in the work quoted above when we treated of light that it is the colour of the transparent medium contingently determined; for when anything of the nature of fire
fire is found in the transparent medium; its presence constitutes light, its absence darkness.

What we have spoken of as the transparent element is nothing which is found exclusively in air or in water or in any one of the substances of which transparency can be predicated; it is some sort of constitution and potency which they have in common and which, not being an independent reality, finds its existence in these bodies and subsists in varying degrees in the rest of material substances. Thus, in so far as these bodies must have boundaries, this too must have its limits.

Now it is in the transparent medium, apart from its limits that light has its being; but it is clear that the boundary of the transparent element which exists in bodies is something real. That this is colour the facts make plain, for colour either exists in the boundary or constitutes the boundary of a thing and hence (a corroborating circumstance) the Pythagorean terminology identified the visible superficies with colour. This was plausible; for colour exists in the boundary; but it by no means is the boundary of the body; nay, we must believe that internally there exists the same constitution as externally displays colour. So both air and water show tint; the sheen they have is a phenomenon of this kind; but here, because it exists in something with no
no definite boundaries, the colour both of the air and of the sea is not the same when regarded from afar and from near at hand. In solid bodies, however, unless the surrounding medium cause it to change, the coloured appearance remains equally with the surface, fixed. It is therefore clear that in both cases it is the same nature which is capable of being endowed with colour: hence the transparent element in so far as it is found in bodies (and it exists in all in varying degrees) causes them to be endowed with colour. But since it is in a bounding surface that colour is found, it is in the surface of this—the transparent element—that colour exists. Colour then is the limit of the transparent element in a determinately bounded body; and it is found in all bodies alike, both in transparent substances themselves such as water and anything similar to it, and in those which appear to have a surface colour of their own.

Consequently, that, which in air causes light, may be present in the transparent medium or it may not, â€” may be wanting. Thus, just as we can explain light and darkness respectively by the presence or absence of this cause in the air, so in the case of solid bodies we can account for the existence of black and white colour. But the other colours still await classification and an inquiry into
the various ways in which they may be produced.

Firstly, white and black may be juxtaposed in such a way that by the minuteness of the division of its parts each is invisible while their product is visible, and thus colour may be produced. This product can appear neither white nor black, but since it must have some colour and can have neither of the above two it must be a sort of compound and a fresh kind of tint. In this way, then, we may conceive that numbers of colours over and above black and white may be produced and that their multiplicity is due to differences in the proportion of their composition. The juxtaposition may be in the proportion of three of the one to two of the other, or three to four or according to other ratios. Others again may be compounded in no commensurate proportion, with increase of the one element and deficiency of the other which are incommeasurable; and colours may, indeed, be analogous to harmonies. Thus, those compounded according to the simplest proportions, exactly as is the case in harmonies, will appear to be the most pleasant colours, e.g., purple, crimson and a few similar species. (It is an exactly parallel reason that causes harmonies to be few in number.) Mixtures not in a calculable ratio will constitute the other colours. Or again all tints may show an arithmetical proportion between their elements,
elements, but in some the scheme of composition may be regular in others not, while when those of the latter class are themselves impure this may be due to an absence of calculable proportion in their composition.

This is one of the ways in which colours may be produced; a second is affected by the shining of one colour through another. This we may illustrate by the practice sometimes adopted by painters when they give a wash of colour over another more vivid tint, when, for example, they wish to make a thing look as though it were in the water or in the air. Again we may illustrate by the sun which in itself appears white, but looks red when seen through mist and smoke.

According to this account the multiplicity of the colours will be explained in the same way as in the theory mentioned before; we should have to suppose there was some ratio between the superficial and the underlying tints in the case of some colours, while in others there would be an entire lack of commensurate proportion.

Thus we see that it is absurd to maintain, with the early philosophers, that colours are effluxes and that vision is effected by a cause of the efflux type. It was in every way binding on them to account for sensation by means of contact and therefore it was obviously better in the medium set up by...
by the sense-object of sensation to say that sensation was due to a movement, and thus account for it by contact without the instrumentality of effluxes.

According to the theory of juxtaposition, just as we must assume that there are invisible spatial quanta, so must we postulate an imperceptible time to account for the imperceptibility of the diverse stimuli transmitted to the sense-organ, which seem to be one because they appear to be simultaneous. But on the other theory there is no such necessity; the surface colour causes different motions in the medium when acted on and when not acted on by an underlying tint. Thus it appears to be something different and neither black nor white.

Therefore, if an invisible spatial quantity is an impossibility and every magnitude must be visible at some distance, we must dismiss the former theory and ask what sort of a colour-mixture this latter also is. But, on the former theory as well, there is nothing to prevent distant objects appearing to have a uniform colour.

The statement that no magnitude is invisible will be discussed later on. But let us premise that substances are mixed not merely in the way some people think—by a juxtaposition of their ultimate minute parts, which, however, are imperceptible to sense—but that they entirely interpenetrate each other
in every part throughout; how this happens in all cases was explained in general terms in our dissertation on mixture. The former theory accounts for the mixture only of those things which can be resolved into ultimate least parts, e.g., men or horses or seeds. In a division of men, a man is the least part, in the case of horses a horse; thus by juxtaposition of these individuals a mixture is produced consisting of a man of both components. We do not talk of mixing single man with single horse. On the other hand, things which cannot be resolved into least parts, cannot be mingled in this way; they must entirely interpenetrate each other; and these are the things which most naturally mix. We have already, in our treatment of mixture, explained how this is possible.

Now, if all this being so, it is clear that when substances are mixed their colours too must be commingled and that this is the supreme reason why there is a plurality of colours; neither superposition nor juxtaposition is the cause. In such mixtures the colour does not appear single when you are at a distance and diverse when you come near; it is a single tint from all points of view. The reason for the multiplicity of colours will be the fact that things which mix can be mixed in many different proportions, and some mixtures will show a numerical ratio, others only an incommensurable excess.
excess of one of the elements. So far indeed as other considerations go the same treatment will apply to the juxtaposition or superposition of colours as to their mixture. The reason why they, and likewise tastes and sounds, have definite species limited in number, will be given later on.
CHAPTER IV.

We have defined color and accounted for the multiplicity of its tints, while sound and articulate utterance have been treated in the Psychology we are now to discuss smell and taste.

While as subjective sensations they are practically identical, their vehicles are divergent and taste in a close and deep relationship to human experience.

The reason of this is that our sense of smell is inferior to that of other animals and in the present of the human nasum.

In disregard of taste, however, we have all other senses, and taste in a sense of touch.

To proceed to our discussion—water is characteristically of a limpid and palate, yet, either it must tasteless as it may be or acceptable to which the various flavors reside in water are to be detected, the American theory. For the sense of all tastes. In this case all tastes will originate out of water, but different ones will arise from different parts of the water.
CHAPTER IV.

We have defined colour and accounted for the multiplicity of its tints, while sound and articulate utterance have been treated in the Psychology; we are now to discuss smell and taste.

While as subjective phenomena they are practically identical, their vehicle is diverse; and tastes as a class are more vividly presented to human perception than odours. The reason of this is that our sense of smell is inferior to that of other animals, and is the poorest of the human senses. In delicacy of touch, however, we excel all other animals; now taste is a sort of touch.

To proceed to our discussion—water is characteristically of a flavourless nature; yet, either it must tasteless as it is, be the receptacle in which the various flavours reside in amounts too minute to be detected—the Empedocles theory—, or it must be a material adapted to be the matrix, as it were, for the germs of all tastes. In this case all tastes will originate out of water, but different ones will arise from different parts of the matrix. Or we may hold that water is
is entirely undifferentiated and impute the causality to that which acts upon it, for instance heat or the sun. A glance will suffice to show the falsity of the Empedoclean theory; for we can observe that the alteration in flavour is due to heat, when fruits are plucked, integument and all, and set in the sun and reddened. Their new flavour then cannot be extracted from water; nay, the change must take place within the fruit-covering itself. Through lying and drying fruits become, in time, harsh and bitter instead of sweet and display all sorts of flavours; further, any kind of taste, so to speak, can be produced by subjecting them to the process of cooking.

Similarly water cannot possibly constitute the material of a universal matrix (of flavours). It is a matter of observation that out of the very same water (taken) as nutrition, (plants) develop different flavours. True, this leaves us with the theory that the water is acted on in some way and changes in consequence. Now, plainly, it is not owing to the power resident in heat that it acquires the capacity (for stimulating sense) we call flavour; water is the thinnest of all liquids, thinner even than oil, though oil on the other hand, spreads out more than water on account of its viscosity. Water, however, is non-cohesive and hence...
hence is more difficult to keep in the hand without spilling than oil.

Since water by itself is the only substance which shows no thickening under the influence of heat, clearly something else must be the cause of the phenomenon in question, for all flavours tend to exhibit density. The heat is the cooperating cause.

It is a conspicuous fact that all the savours found in fruits exist also in the soil. Hence many of the early physical philosophers allege that water takes its character from the soil through which it passes. This is clearly so in the case of saline waters, for salt is a species of earth. Filtration through a bitter makes the taste bitter, and there are many springs some of which are bitter, some acid and others possessing manifold other tastes. Hence, as one would expect, it is principally in plants that flavours as a class develop.

The reason for this acquisition of a specific character by water is — it is the nature of humidity, as of everything else, to be acted on by its opposite; now its opposite is dryness. Hence fire too has an effect upon it, for fire, by constitution is dry. But of fire heat is a peculiar property, of earth dryness, as we explained in discussing the
the elements.

Now, by constitution, fire qua fire and earth qua earth do not display activity and passivity, nor do any of the other elements per se; it is in so far as they have opposing qualities that [the elements] one and all react on each other. Thus, just as men by dissolving colours or savours in water communicate those qualities to the water, so the agency of nature acts upon that which is dry and earthy in character; by the aid of heat it causes liquid to percolate and pass through dry and earthy substance and thus gives it a definite quality. Thus is flavour, the modification which the said dry element produces in liquids and which is potentially capable of stimulating the sense of taste into active operation. This effect which it produces upon the sense-faculty has already potential existence [in the sense-faculty], for sensation is parallel, not to learning, but to the exercise of knowledge.

It is not of all dry substance but of that which is nutritive, that flavours are a modification positive or negative. The fact that neither does the dry apart from the humid nor liquidity apart from dryness [yield savour], supplies us with a proof of this, for neither of these alone but their mixture, furnishes nutriment to animals. In the food
food of animals it is the objects of tactual sensation that cause growth and decay; it is qua hot or cold that the food they eat is responsible for their phenomena, as heat and cold cause growth and decay. On the other hand it is in so far as it affects the taste that what is given to animals nourishes them, for they all thrive on that which is sweet, either pure or mixed [with something else].

The full discussion of these facts which is entailed will be found in the work *On Generation*; at present we must touch on them only so far as is necessary. Heat causes growth; it is the active cause in the preparation of food, making the light elements rise and allowing the saline and bitter to fall on account of their weight. In fact, in plants and animals, their native heat performs the same function as that fulfilled by external heat in the case of external bodies; hence it is by sweet things that they are nourished. Other tastes are commingled with food for the same reason as the saline and acid; they serve as *seasoning*. This is necessary because the sweet is, in comparison with all [other things], excessively nutritive and tends to rise in the stomach.

Just as colours arise from a mixture of black and white, so tastes are a product of the sweet and the bitter. Proportion it is—a difference in the quantity [of their components].
components that gives them individuality; and either the mixture and consequent stimulus is in terms of some numerical ratio, or it varies indefinitely.

The mixtures, however, which produce pleasure are in a calculable numerical proportion. Sweet flavours alone are oily; saline and bitter are practically the same; but sour, pungent, astringent and acid occupy an intermediate position. The species of tastes and colours are practically equal in number. If one, as is reasonable, reckons grey to be a kind of black, there are \( \frac{90}{90} \) of each, for the remaining colour, yellow can be referred to white, as oily was to sweet. Crimson, purple, green and blue are intermediate between black and white; and all other colours are got by combining these.

Just as black is absence of white in the transparent medium, so salinity and bitterness are a deficiency of sweetness in nutritive liquid. Consequently the ashes of things which have been burned are bitter for the searching they have received has expelled their palatable qualities. Democritus and most of the physical philosophers who treat of sensation commit a most senseless blunder. They identify all sense qualities with the tactual. If this were true, it is clear that each of the other senses would be a sort of touch; but it is not difficult to see that this is impossible.
impossible.

In addition they treat the common sensibles as though they were the objects of a special sense; but this is erroneous, for figure, roughness and smoothness as well as the sharpness and bluntness found in material bodies, are generic objects of sensation which, if not discerned by all the senses, are common to sight and touch at least. Hence we can explain the fact that we can make mistakes in perceiving the latter but are never deceived as to the special sensibles; sight, for instance, makes no mistakes about colour, nor does hearing err in the matter of sounds.

These philosophers, however, reduce the special to the common, following the example of Democritus in the case of black and white. He identifies the one with the rough, the other with the smooth and he reduces flavours to geometrical figures. But it falls to sight first, if to any sense, to discriminate the common sensibles; it is at any rate, the function of the most delicate sense to discern the finest differences in its particular domain and so, if it fall to taste first to perceive the common sensibles, taste would need to possess the finest discrimination of figure and be as well the best means of perceiving the other common sensibles.

Further the objection is, that the objects of special
All show contrariety in their determinations; for example, in colour black and white are opposed, in taste sweet and bitter. But there seems to be no opposition between one figure and another. What is the figure opposed to the circle? Again, as figures are infinite in number, there must be an infinitude of tastes also, for why should one figure produce a taste and not another?

This is our account of flavour and its effect on taste. The other qualities flavours present find their special treatment in the Natural History of Plants.
CHAPTER V.

The theory to be accepted about odour also is the same as that about flavour. Precisely as dry substance produces an effect in liquid, liquid impregnated with flavour acts in a new field, operating in air and water alike.

We have just said that the transparent element is common to these two substances, but it is not qua transparent that it affects the sense of smell; it does this in so far as they dissolve and absorb by erosion dry substance which possesses flavour; both substances form a medium for this sense, for smell is exercised not only in air but in water also. The case of the fishes and the testacea makes this plain; they evidently employ the sense of smell and yet neither is there air in the water (for it rises to the surface if ever it gets in) nor do these animals breathe.

Premising, then, the fact that air and water are both moist, we might define odour as the nature dry substance possessing flavour assumes in the moist, and the object of the sense of smell will be anything so qualified.

That this phenomenon issues from the possession of flavour
flavour, is clear on a review of these substances that are and those that are not odorous. The elements are odourless, to wit—fire, air, earth and water, since they have no taste—both those of them which are moist and those which are dry—except when forming a combination. Hence the sea too smells, for it has a taste and contains dry substance. Salt smells more than natron, as the oil extracted from it proves, while natron is more odorous than earth. Moreover, stone is odourless, since flavourless; but woods, being possessed of taste, are scented, the watery ones less so. Again, among metals gold is odourless, having no taste; bronze and iron have a smell. The dross left, when the fluid element is smelted out of these metals in every case possesses less odour than the ore itself.

Silver and tin smell more than the one class and less than the other; for they are aqueous.

Some people think that the smoky variety of fume constitutes odour, since it is a joint product of earth and air. All ascribe odour to this. Hence too the saying of Heraclitus that "if all things were turned into smoke the nostrils would distinguish them." Now all ascribe odour to this phenomenon, some taking it to be steam, others a fume, while some again ascribe it to both.

Steam is a sort of moisture, and smoke-like fume a joint...
joint product of air and earth; out of the former water condenses out of the latter some species of earth. But neither of these seem to be odour; for steam may be classed as water, while again smoke-like fumes cannot exist in water; but creatures living in water do employ the sense of smell, as already said. Further the theory of fumes is similar to that of effluxes and, if that theory was erroneous, so is this.

It is clear that moisture, both as it exists in the atmosphere and as it exists in water, can derive something from and be modified by dry substance which possesses flavour, for air too has moisture in its constitution. Moreover if the effect of the dry substance in liquids and in air, when it is, as it were, dissolved in them, is similar to its previous action in liquid alone, manifestly odours and tastes must be analogous to each other. Indeed in several cases this correspondence occurs; odours are pungent and sweet, harsh, astringent and oily and we might regard fetid odours as corresponding to bitter tastes; this would explain the parallel impalatability of the former and noisomeness of the latter. Thus it is clear that smell is in air and water precisely what odour is in
congelation.

There are two sorts of odorous qualities: it is not the case, as some allege, that there are not different species of odour. They do exist; but we must determine in what sense they are authentic and in what sense not.

The one set are in order parallel to the various flavours as we have explained. Their pleasantness and unpleasantness belongs to them contingently, for, since they are qualities of that which forms our food, these smells are pleasant when we are hungry, but when we are sated and not requiring to eat, they are not pleasant; neither are they pleasant to those who dislike the food of which they are the odour. Hence, as we said, their pleasantness and unpleasantness is contingent and hence too they are common to all animals. But the other class of smells are per se pleasant, for example the scents of flowers. They have no influence either great or small in attracting into our food nor do they constitute anything to the longing for it. Their effect is rather the opposite: there is a truth contained in Strattis's jibe at Euripides—"Pray perfume not the good pea-soup." Those who do as a fact mix such elixirs with their drink get a forced pleasure by accustoming themselves to it, so that the pleasantness arising from the two sensations becomes apparently the result of
of one. This sort of odorous quality, is thus peculiarly the object of human sense, but that co-ordinate with the varieties of flavour is proper to the other animals as well, as said before. Those odours, because their pleasantness is contingently attached to them, are classified in species which correspond to the several flavours, but in the other group this is by no means so, as there agreeableness and the reverse attach to the essential nature of the odour.

The cause of the restriction of odour of this kind to human sense comes from the constitution of the body in the region of the brain. The brain is of a cold nature and the blood around it, the veins is thin and pure and is easily chilled; (this explains why the upward ascending fumes from food on turning cold cause a morbid flow of rheum.) Hence it is for man's benefit, for the preservation of his health, that this species of odour has come into existence. This is its only function and it evidently fulfils it. Food, though sweet, being both dry and moist, is frequently unhealthy; but the odour, perse pleasant, of a fragrant perfume, is beneficial to us in whatever state we are. It is for this reason that it is by means of respiration that smell takes place, if not in all animals, yet in man and, among sanguineous animals, in the quadrupeds and such as participate more largely in an aerial
When scents are carried up to the brain, owing to the lightness of the warm element contained in them, the parts in this region have a healthier tone; this takes place because the power in odour to produce an effect is constituted by heat.

Nature employs respiration for two purposes; its chief function is to maintain the action of the chest, its secondary one subserves the ends of smell, for the passage of the breath through the nostrils is, as it were, a cursory contrivance.

The reason why the class of odours of this description is restricted to man, is, that his brain is larger and more humid than that of all other animals in proportion to his size. This is why he alone so to speak, among the animals, perceives and also enjoys the odours of flowers and similar objects; they are pleasant because their heat and activity are proportionate to the excess of humidity and cold in that part of the body.

Among other animals, in those which have lungs, breathing is the means which nature has bestowed upon them for the perception of the other genus of odour. This was to avoid creating two sense-organs; for since they too breathe, by
of odourous qualities, the only one possessed by them, is sufficiently well-efected, just as it is in man who perceives both kinds.

That non-respiring animals perceive odorous quality is a matter of observation. Fishes and the insect-tribe perceive quite accurately and at a distance by means of the species of odour connected with nutriment, even when they are far away from the things that form their special food. For example bees and the kind of small ants called (3) and, among marine creatures, the purple-murex and many similar animals have a very acute perception of food by means of smell.

But the organ of perception is not so obvious and so one might raise a difficulty and ask, "what is the organ with which these animals perceive smell, if in all respiring animals the sensation occurs in one way only, viz., by respiration (as is evidently the case in all creatures that breathe), and none of these breathe but yet do perceive odour? Perhaps they do not smell but have a new sense over and above the five."

This, however, is impossible; it is smell that is the sense of that which smells and this they perceive. Yet perhaps the manner of perception is not the same; perhaps in the case of respiring animals the breath displaces a superficial...
the sense-organ; (this will explain why when we do not inhale
the breath we do not smell; but in the non-respiring animals
this is entirely lacking. A parallel for this is the eye;
some animals have eyelids and, unless these are open, they
cannot see; but hard-eyed animals, not possessing them, do
not require anything to open them, but see an object directly
out of the organ which itself has the capacity of vision.
from the moment it becomes visible.

Similarly, in accordance with our previous distinction we
must notice that none of the other animals are distressed by
the smell of things per se malodorous, unless any of them
chance to be destructive to life. These noxious odours
have a destructive effect upon them, just as they have upon men
too, in whom the gas arising from coal causes headache and fre-
quently death. So too sulphurous and bituminous fumes have
the power of causing death in the other animals and are shunned
by them in consequence. But they reek not at all of the es-
sential unpleasantness of the smell, though many plants are
malodorous, unless it make some difference to the taste and to
eating.

The number of the senses is uneven and the sense of smell,
since an uneven number has a middle term, seems itself to oc-
cupy the intermediate position between the senses which require
contact, viz., touch and taste, and those where the perception
perception is mediated by something else, to wit, sight and hearing. For this reason also odour is a quality both of that which is nutritive (which falls with the class of things tangible) and of the audible and the visible, and hence the sense of smell is exercised both in air and in water. Thus the object of smell is something common to both of these and is found in things tangible, things audible and things transparent.

We had, therefore, good reason in comparing it to an infusion and solution of dry substance in that which is liquid and fluid. This is the sum of our account of the sense in which it is correct and that in which it is incorrect to talk of species in odour.

The theory held by certain Pythagoreans that some animals live on odours is an irrational doctrine.

In the first place, food must be a composite substance; the creatures that it nourishes are themselves not simple in structure. Hence from food a waste residue is developed which in some is internal, in others—plants, external; secondly, water by itself alone and unmixed has no nutritive tendency; food which is to form a concrete body must have solidity. Much less reason is there for supposing that air can be solidified. Furthermore, in all animals there is a receptacle for food and out of this the body is supplied upon the entrance of
of sentiment. But the organ for perceiving smell is in the head; odour enters the body along with the waft of the air we breathe and so passes into the organs of breathing.

It is clear, then, that the object of the sense of smell has, per se, nothing to do with nourishment. That it makes a difference to health is, however, obvious; both the experience of the sensation itself and our argument prove it. Hence we may conclude that odour has precisely the same office in relation to health as flavour has in food and in relation to the creatures that food nourishes.

This finishes our account of the objects relative to the several sense-organs.
The question might be raised whether, if all bodies are infinitely divisible, the same is the case with their sensuous qualities—also, e.g. colour, flavour, odour, sound, weight, cold, heat, lightness, hardness and softness. Or is this impossible? Each of those phenomena is able to cause sensation; they are all styled (sense-qualities) owing to their power of stimulating the sense. Consequently, on the former alternative sensation will be capable of infinite subdivision and, as well, every magnitude will be perceptible, since it is impossible to perceive anything white which is not a quantum.

If this were not so, body might exist which was totally without colour or weight or any other similar attribute. Consequently it would be totally imperceptible, for the above form the list of the sense-qualities. The object of sensation must then be composed of things which are imperceptible. It must be composed of constituents which are sensible, for it certainly cannot consist of mathematical entities. Further how should we distinguish them or be aware of them? By means of thought? But they are not objects of thought; thought does not think external objects unless sense cooperates.

At the same time, this, if true, seems to give evidence in support of the theory of atomic magnitudes, since
it would furnish a solution of the problem. But atomic magnitudes are impossible, as was explained in our treatment of motion.

The solution of this problem and the reason why the species of colour, taste, sound, etc. are limited in number, will become apparent at the same time.

Where extremes exist the internal parts must be determinate. Now contraries are extremes and every object of sense exhibits contrariety. e.g. in colour black and white, in taste sweet and bitter, and in the others every one the contrary qualities form extremes.

Now continuous quantity when divided falls into an infinite number of unequal parts but into a finite number of equal parts. On the other hand that which is not per se continuous, falls into a finite number of species. Thus, while on the one hand sense-qualities must be considered as species, but on the other hand universally present the aspect of continuity, we must, to solve the difficulty, bring in the distinction between potential and actual. It is by this means that we explain why the ten thousandth part of a visible grain of millet escapes notice although the sight has encountered it, and why a sound within a quarter-tone escapes detection, although the whole series of notes (in which it exists), being continuous, is heard; the interval which would yield us a mean point relatively to the extremes is not discernible and so too it is with very minute fractions in other objects of sense; they are potentially
perceptible but not actually so unless they be isolated. So the one foot measure has potential existence in the two-foot rule but, from the moment bisection takes place, it is something actual.

But it is reasonable to believe that when fractions so excessively minute are isolated they are moreover resolved into the surrounding medium, just as a tiny drop of flavouring is lost when spilled in the ocean, and so escapes perception. However that may be, since not even in the act of perception is excessively minute sensation in its individuality appreciable or isolable (it has a potential existence in that which is more accurately discriminated), neither will it be possible to have actual perception of the similarly minute object of sense in its separateness. Nevertheless perceptible it is; for it already is so potentially and, when taken in union with the whole, it becomes actually perceptible. Thus certain magnitudes and their qualities escape detection; this is our account of them and of the reason why that is so and of the senses in which they are and are not perceptible. But when the constituents of anything are already so related among themselves as to be also actually perceptible and perceptible not merely in the whole but individually as well, determinations of colour and flavour and sound must be finite in number. It may be asked -- Do the objects of sense or the motions which issue from sense-objects (whichever of the two theories perception involves,)
when acting on us penetrate the medium through which they pass prior to causing sensation. This is evidently the case e.g. with odour and sound; he who stands nearer perceives the odour earlier, and a sound reaches the ear after the blow is struck. Is the same thing true of the object of vision and light?

Empedocles too had the very same theory; he says that light penetrates the medium first before meeting our sight or reaching the earth. This looks like a reasonable account of the phenomenon, for when a thing moves it moves from starting point to terminus and hence there must be some lapse of time as well while it passes from the one point to the other. Now every [lapse of time] is divisible and so there was a moment when as yet the ray of light was not perceived but was still on its passage through the medium. Though in every act, hearing and perception generally is complete as soon as exercised and there is no process in the establishment of the content of sense, yet sensation is not devoid of process on this account nor possesses it any the less; take for example the case of sound which does not meet the ear simultaneously with the striking of the blow. This is shown too by the distortion of the letters (of a word when uttered) which is explained by their passage through the medium; we appear not to hear what has been said because the air in moving gets distorted. Does the same [lapse of time in transmission] occur in the case of colour.
and light? It is not, certainly, in virtue of some such modal determination as constitutes the relation of equality that subject and object in vision are related. If it were, they would not require both to be in a definite place; when things are equal it makes no difference to their equality whether they are near or far apart. In the case of sound and odour it is reasonable that this lapse of time during transmission should occur. Like the air and the water they are continuous yet in both cases the motion of transmission falls into a number of parts. Hence too there is a sense in which it is the same thing which is heard by the person who stands nearest and by him who is farthest away and the same thing which is smelled by both and there is a sense in which it is not. This seems to constitute a difficulty for some people; they say it is impossible that what is identical should be heard or seen or smelt by different persons in different ways and that they cannot hear and smell it because they are many and apart; if they could what is one thing would itself become separated from itself.

The solution is, that all do perceive the numerically identical and self-same thing which is the originating cause of the movement, e.g. the bell, the frankincense, or the fire, but yet the stimulus peculiar to each is numerically different though specifically the same. We can hence explain how many people may see and smell and hear the same thing and do this at the same time too. Here we are dealing not with bodies,
but qualities and motions (if this were not so the latter phenomenon could not occur), though they do not exist apart from body.

About light a different account must be given. Light is due to the presence of something but is not a motion. Universally speaking there is not even similarity between qualitative alteration and spatial transference; motions of translation, as one would expect, penetrate the medium first before reaching us (sound seems to be a motion of something which travels). On the other hand with things that suffer alteration it is by no means so; they may be altered in one mass, and not one half before the other, for example water freezes all at one time. However if what is heated or frozen is great in bulk, one part is acted on by that which is contiguous to it, the change in the first being due to the agent itself which is the cause of the alteration; and the alteration does not necessarily take place at the same time and over the whole. Taste would be like odour if we lived in water and perceived things at a distance before touching them. It is reasonable to believe that in those cases where the organ of perception employs a medium the effects are not all simultaneously produced; but we except the case of light for the reasons given and on the very same account, sight too, for it is light which causes vision.
DE SENSU VII.

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There is a certain other problem also connected with perception
--- Can we perceive two things in the same individual moment
(of time), or can we not? {not}, if it is the case that a
15. stronger stimulus displaces one which is more feeble. This is
the reason why one does not see things that directly meet the
eyes, when one is in a state of profound meditation or of
terror or when hearkening to a loud sound.

Let us point this as true, and likewise the fact that any
20 single thing is more perceptible by itself than when in a compound.
For example a wine is more readily distinguished when pure
than when mixed; (and so with honey and tint) the tonic is
more distinctly perceived when alone than when it is sounded
along with the octave, as the two {when together} work on each
other.

Here we get as a result elements which go to form one
25 single thing. If it is the case that the stronger stimulus
displaces the weaker, it must, if they are simultaneous, itself
be less distinct to sense than if it were alone, having suf-
20 ered diminution to some extent by the admixture of the weaker,
if the pure is always the more perceptible. So if {two}
different stimuli are equal, neither will be perceived; either
will annul the other to an equal extent. But they cannot be perceived as pure; hence either no sensation will result or another one derived from both, precisely as things when mingled yield something fresh so long as it is a true mixture that takes place.

Thus in certain cases of the simultaneous presentation of sensation something derivative results, but in certain cases not, and such are instances of objects falling under diverse senses. (Mixture occurs with objects when their most extreme divergences of quality are related as contraries; white and shrill do not yield anything unitary except per accidens, but, quite otherwise, low and high yield a concord.) Since then this is so, neither will it be possible to perceive them together. If they are equal in intensity the stimuli will cancel each other, since no unitary sensation is derived from them, while, if they are unequal, the stronger will produce sensation and both will not be perceptible, since consciousness would more readily distinguish two objects by a single sense and if they both belonged to a single sense, e.g. high and low, than it would these; for the double function would more readily be simultaneous on the part of this self-same sense than on the part of two different senses, e.g. sight and hearing.

But by a single sense we cannot perceive two objects
simultaneously unless they combine with each other. For the combination requires to be something unitary and of an unitary object the perception is single and a single sensation is one possessing internal simultaneity. Consequently things in combination must be simultaneously perceived, because apprehended by a single act of perception. Of an unit, it is numerically one that the explicit perception is single while it is specifically one that the implicit perception is single. Hence also, if the explicit perception is single it pronounces those objects to be numerically one. Hence they must have entered into combination and so when they are not combined, there will be two explicit sensations. But when the faculty is single and the time individual, the activity of sense must be numerically one; the stimulation and exercise of a single faculty must be single at a unitary time and the faculty is single.

Thus it is impossible to perceive two things simultaneously by a single sense, if but certainly, when objects of the same sense, if dual, cannot be simultaneously perceived, it is clear that still less will this be possible in the case of objects of two different senses, e.g. white and sweet.

Consciousness appears to recognize numerical identity not otherwise than by the simultaneity of the perception, while specific unity is given by the unity of the sense which discriminates it and the manner in which the perception occurs. By this I mean that, though supposing it be black and white,
objects specifically distinct, that the same sense discriminates, and sweet and bitter, that a sense which is self-identical, though different from the former, distinguishes, yet there is a diverse manner in which it perceives either contrary, and it is in the same manner as each other that the senses apprehend corresponding members (of different pairs of opposites), e.g. sight perceives white in the same manner as taste does sweetness; and the former perceives black as the latter does bitter.

Further, if opposites [sensibles] give opposite stimuli and opposites cannot coexist in anything identical and individual, but under a single sense we find things opposed to each other as, for example, sweet is opposed to bitter, it is impossible to perceive them simultaneously. Similarly it is clear that neither will things that are not opposites be simultaneously intuitable. Some of them fall within the province of white and others of black, and in the same way in other cases—e.g. flavours, some are assignable to sweet others to bitter.

Neither can composites be simultaneously perceived unless as forming a unity, for they are proportionate combinations of opposites e.g. chords of the octave and of the fifth. If they are apprehended as one, a single ratio prevails between the extremes, but otherwise not, for that would require the simultaneous apprehension of the ratio of greater to less or odd to even on the one hand; and, on the other, that of less to greater or even to odd.

The consequence of all this is that, if there is a still
greater remoteness and diversity between qualities which, though occupying corresponding positions in their respective genera, yet are heterogeneous, than between those ascribed to the same genus, e.g. sweet and white which, though corresponding to each other, nevertheless are heterogeneous, and if sweet differs still more from black than from white (in ideal content), then they (sweet and black) are still less capable of being simultaneously perceived than members of the same genus; hence, if in the latter case this is impossible, neither can it occur with the former.

There is a theory mooted by certain people about concords, that the sounds though not arriving simultaneously yet appear to do so, (their lack of simultaneity) being undetected, when the time (between them) is imperceptible.

Is this correct or is it not? (If true), one might readily assert that we also apparently see and hear at the same time because the intervening moments are undetected.

We answer that it is not true, and there can be no imperceptible time, none that escapes us; every (moment) can be perceived. For, if when one has consciousness of (himself or of another) (person) during a continuous (period of) time, he cannot at that time be unaware that he exists, but there is within the continuous time a (section) of such (minute) size as to be wholly imperceptible, clearly one would then be unaware whether he was himself and whether he was self-perceiv...
or self-consciousness if one still was conscious, there would be neither time in which northing of which one could be conscious except thus, -- by being percipient during part of the time or perceiving part of the thing, if there are magnitudes both in time and in things which their minuteness makes imperceptible. But this is not so for, if one sees a whole line and perceives a time continuously identical, one does not do so by means of a part of them. Subtract from A B the whole line a part C B in which there is no sensation; then perception in one part of this whole or of one part of it gives consciousness of the whole: which is like seeing the whole earth because one sees this particular part of it or walking a whole year because one walks during this part of it. Remember in BC there is no consciousness; hence, by being conscious in part of this whole AB, one is said to be conscious of the whole time and see the whole extent.

The same reasoning will hold with the part AC, for perception is always in a part and of a part and it is impossible to perceive anything in its entirety. But this conclusion is absurd, hence, everything is perceptible though its size is not apparent; we see the extension of the sun or a four-cubit measure from afar, though the determinate size is not apparent and sometimes things seem not to have size but to be indivisible.

We cannot, however, see the indivisible: the reason for
this was stated before. Hence from these considerations it is clear that no part of time is imperceptible.

But we have to discuss the problem raised before --- whether it is possible or not to perceive several things simultaneously. By simultaneously I mean, in a time which, for the various things relatively to each other, is one and atomic.

Firstly then, is the following solution possible --- that they are indeed simultaneously perceived but by different psychical organs, not by an individual organ, though by one which is individual in the sense of forming a continuous whole? Or is it the case that if so, in a single sense, for instance sight, which will perceive different colours by something different in each case, these partitions will assuredly form a plurality specifically various? (This is so,) for it, again, perceives by means of generic identity.

If some one were to allege that the psychical faculties were like the two eyes, specifically alike, this causes no difficulty, because perhaps we may assert that in the case of the eyes there is a single product and the exercise of their function is unitary, and so far as they yield a unitary result, specifically the sense-organs are also single, but when the sensations are diverse the case is different.

Further identical senses will be rendered multiple and distinct in the same sense as one talks of distinct sciences;
for neither is there activity apart from its appropriate potentiality nor without this does a sense exist.

But if these contentions are correct and hence these qualities cannot be perceived in a single individual moment by means of a division in the organ of perception, it is clear that no other qualities can, for there was a better possibility of these in their severalness being simultaneously perceived than of qualities generically different: If it is really the case that the mind perceives sweet with one part, white with another, the product of these must be either one or not one. But it must be an unity. What is the unity then which that perceives? There is no such unitary product.

Hence there must be some unity in the soul by which we perceive all things, as before stated, though different genera are perceived by different organs. Is that, therefore, which apprehends sweet and white, a unit so far as it is actually indivisible, but diverse in so far as it is actually divisible? We answer that in the case of the soul it is the same as with things. An identical and numerically single thing can be sweet and white and have many other qualities, as long as its properties are not disunited from one another, though in aspect of existence each is diverse. Accordingly we must in the same way which is perceptor of affirm that with the soul too, that everything is self-identical and numerically single though, in apprehending objects, now generically now in species (different), it has a corresponding
diversity in the aspect of its existence. Hence the mind may perceive things simultaneously by means of something self-same and unitary though not notionally the same.

That every object is a magnitude and that the indivisible cannot be perceived, is clear. The distances from which an object cannot be seen are infinite, but the range from which it is visible is limited, and this holds true also for the objects of smell and hearing and all things perceived without actual contact. But there is a point which terminates the range from which vision is impossible and is the first from which the thing becomes visible. That indeed must be indivisible which, when at a distance beyond this point, cannot be seen, but must be seen when nearer. If, then there is really anything indivisible which is an object of perception, when placed at the terminal point which, while the last at which it is not perceptible, is yet the first at which it is perceptible, it will turn out to be both visible and invisible at the same time; which is impossible.

This is our account of the sensoria and the objects of sense and the manner of their existence both generally and relatively to each sense organ. Of the remaining subjects let us consider first memory and recollection.
MEMORY AND RECOLLECTION.

I.

We must define and account for memory and the act of remembrance and assign the psychical faculty which provides for this phenomenon and for the act of recollection. The two phenomena are not identical, for it is not the same people who have good memories and who have good powers of recollection; as a rule those people remember well who are slow-witted, while on the other hand those excel in powers of recall who are clever and quick at learning.

Hence as a preliminary to our argument the question arises how are the objects of memory characterised? Mistakes are often made about this. Now the future cannot be remembered; it is rather the object of opinion and hope. (There might be a science which belonged to the province of hope; some people say that prophecy is such a science.) Nor does memory regard the present; it is perception which is concerned with this, for by perception we apprehend neither the future nor the past but the present only. Memory concerns the past; no one would say that he remembers that the present is present, e.g. this particular white object, when he is looking at it.
Nor would he say that he remembers that the object of thought is present whenever he chances to be engaged in thought or contemplation; in the one case he says he perceives, in the other merely that he knows. But when knowledge or perception are present without actual experience of the real objects, in those circumstances one remembers that the angles of a triangle are equal to two right angles in the one case that he learned or thought of something, in the other that he heard, or saw, or had some similar sense experience. When one is actually conscious of remembering, he must recognize in consciousness that previously he had heard or perceived or thought of the thing remembered.

Hence memory is neither perception nor conceptual thought, but some permanent condition or modification attaching to them dependent upon lapse of time. What is now we do not in present time remember, as has been said before; with the present perception is employed, with the future hope, with the past memory. Hence all remembering implies lapse of time; and so, those that have a sense of time are the only animals that remember, and the organ of memory is that which enables us to perceive time.

Imagination has been already discussed in the Psychology. We cannot think without imagery, for the same phenomenon occurs in thinking as is found in the construction of geometrical figures; there, though we do not employ as a supplementary requirement of our proof, a determinate in the size of the
triangle, yet we draw it a determinate size. Similarly in thinking also, though we do not think of the size, yet we present the object visually to ourselves as a quantum, though we do not think of it as a quantum. If the nature of the object be qualitative but indeterminate, our presentation is of a determinate quantity, though we think of it as qualitative merely.

The reason why we can think of nothing apart from time, belongs to a different inquiry, but we must apprehend magnitude and change by the same means as that by which we are conscious of time. Imagery is a phenomenon belonging to the common sense; so this is clear, that the apprehension of these determinations belongs to the primary organ of sensation: and memory, even the memory of concepts cannot exist apart from imagery.

Hence since all this is so, indirectly it belongs to the noëtic faculty, but in its essential nature to the primary principle of sensation. This is the reason why it is found in several of the other animals and not only in man or those possessing the power of entertaining opinions and endowed with intelligence. If it belonged to the conceptual faculties it would not be found in many of the other animals and perhaps in none that are mortal since, as facts are, all living beings do not possess it because not all have a sense of time. Always, when in the act of memory (as already said), we remember that
we have heard or seen or learned this thing, we are conscious also that it was prior; now prior and posterior are [distinctions] in time.

Hence it is clear to what psychic faculty memory belongs; it belongs to that to which imagination [must be assigned]. To the class of objects of memory per se belong all things that can be imagined; to the indirect, all that cannot be divorced from imagination.

A difficulty might be raised as to how it can ever come about that, though contemporaneously with our present [mental] modification the real object is not present, yet it is the absent object which is remembered. [But this is no impossibility,] for it is clear that we must regard the [modification] arising from sensation in the soul and in that bodily part where sense resides, as if it were a picture [of the real thing], and memory we call the permanent state of this modification. When a stimulus occurs it imprints as it were a sketch of the sense-affection exactly as a seal-ring acts in stamping.

This is the reason why memory does not occur in those who are in [a] rapid [state] of transition, whether owing to [some] perturbing experience or their period of life; it is as if this stimulus, like the seal, were stamped on running water. Again in others their worn out condition — like that of old buildings — and the hardness of the receptive structure,
prevent the affection from leaving an impression. Hence we explain why the very young and the aged have no memory; in the former growth, in the latter decay, cause rapid transition. For like reasons, neither very quick-witted nor very slow people seem to have good memories; in the one class there is too much fluidity, in the other too much density, and hence the former do not retain the image in the mind, while in the latter it never gets fixed.

If these are indeed the facts with regard to memory, whether do we remember this resultant modification or that which caused it? If the former, there would be no such thing as memory of things absent. On the other hand, if it is the latter we remember, how, though perceiving the former, do we remember the absent object which we do not perceive? Once more, if the impression we possess is like a sketch, why is the perception of this very thing the memory of some other thing and not of it itself? It is this modification of consciousness which one engaged in remembering has present to his mind and it is this that he perceives. How then can one remember what is not present to one? One might as well see or hear what is not present.

But perhaps there is a way in which this can occur and really come about? That is so, for, as the animal depicted on the panel is both animal and representation and, while remaining one self-identical thing, is yet both of these,
though in aspect of existence the two are not the same, and we can regard it both as animal and as copy, so too the image in us must be considered as being both an object of direct consciousness in itself and relatively to something else; an image; in its own nature it is an object of direct inspection or an image, so far as it represents something else it is a copy and a souvenir.

Hence when the change connected with it is actually experienced, if the mind perceives it in terms of its own proper nature, it appears to present itself to consciousness in the guise of an object of thought or an image; but when it is perceived as referring to something else, we regard it as the copy in the painting and as the picture of Cariscus although we have not then beheld him. Here this way of regarding the thing is an experience different from what occurs when we regard the object as an animal in chalk merely; in the latter case the psychical modification occurs merely as an object of thought, in the former as a memory, because there it is viewed as a representation.

Hence sometimes we do not know, when those psychical changes due to previous perception take place in us, if it is as connected with a previous perception that they occur and we are in doubt whether it is a memory or not. Sometimes it chances that on reflection we recollect that we have heard or seen the thing previously; this takes place when, after
regarding the object of consciousness in its own nature, we change and refer it to something else. The reverse of this also occurs, as befell in the case of Antipheron of Oreos and other ecstatics; they took their mental images to be objective and said they remembered the occurrences. This comes about when we take what is not a representation as though it were one. But exercise strengthens the memory through the repeated performance of the act of recollection, which is merely to view the image frequently as a copy and not in its own nature.

This is our account of memory and the act of remembering; it is the permanence of an image regarded as the copy of the thing it images, and the member in us to which it appertains is the primary seat of sensation and the organ employed in the perception of time.
MEMORY AND RECOLLECTION.

II.
Recollection remains to be dealt with. First (of all) we must insist as fact all (the conclusions come to) in our Tentative Reasonings (which were correct). Recollection is neither the recovery nor the acquirement of memory.

When on the first occasion one learns or experiences (something), he neither reacquires a memory (for none has previously existed) nor does he derive it from some originating source. But when a [psychical] disposition and an experience (once) produced then memory is found; hence it does not come into being in conjunction with the origination of the experience ([in us]).

Further, when some [experience] has been produced in the individual and ultimate [organ of sensation], the experience and the knowledge [in question] (if it is proper to call the disposition or experience knowledge; but there is nothing to prevent our having indirectly remembrance also of some of the objects of knowledge) have already existence in the experiencing subject. But memory in the proper sense will not exist till after the lapse of time. We remember in present time what we have previously seen or heard, we do not remember what we
have now experienced. But further, clearly we may remember,
not in virtue of a present act of recollection, but by being
conscious or feeling the experience from the start. On the
other hand when we reacquire the knowledge or consciousness
or experience the permanence of which we call memory, here and
now we have recollection of any of these. As a result we
remember them and memory ensues; not that that can be said
without restriction (in all cases) when previous experiences
are repeated in consciousness; in some cases it is so but
in others not, for the same man may learn or discover the same
thing twice. Recollection then must differ from the latter
operations; it requires a more considerable basis to start
from than in the case of learning.

The occurrence of an act of recollection is due to the
natural tendency of one particular psychic change to follow
another. If the sequence is necessary, it is clear that, on
the former change occurring the second will be summoned into
activity; when, however, the connection is not necessary
but due to custom, the occurrence of the second process will
take place only in most cases. It so happens that some
people receive a greater bent from a single experience than
others in whom the sequence has frequently taken place and
hence, in some instances, after seeing the things once, we
remember them better than others who have seen them frequently.
Thus when we recollect, one of our previous psychic changes
is stimulated which leads to the stimulation of that one, after which the experience to be recollected is wont to occur. Consequently we hunt for the next in the series, starting our train of thought from what is now present or from something else, and from something similar or contrary or contiguous to it. This is the means of effecting recollection; the change in those cases is now identical, now contiguous, and now partially inclusive of the idea to be recalled and hence the remainder formerly occurring subsequently to the rest is but small.

This is the way in which the search for the idea not present is carried out and, even when there is no search, it is in this way that recollection occurs, when the one process occurs after the other; and in general it is after experience of other changes such as we have described that the process in question occurs. We must consider, not how we remember things remotely connected but those that are close to each other, for it is clear that the method is the same in both cases. I use the expression 'next in order' without implying a prior search or act of recollection; for it is owing to the custom of their being experienced in sequence that one particular process follows another. Hence, when one wishes to recall something, this is what he does — he tries to find the starting point of a process after which the one in question will recur. This is why the swiftest and best
way of recollecting is to start from the beginning; the subjective changes are related to each other in the same way as the facts remembered stand to each other in virtue of their place in the series. Those things are easily recalled which have an orderly arrangement such as we find in mathematics; but things wanting in exactitude are with difficulty remembered. To recollect and to learn a second time differ in this, that he who recalls a thing will be able by his own agency to pass to the process succeeding the starting point; when this is not so and the instrumentality of some one else is required, it is no longer a case of remembering.

Often when as yet unable to recollect, by searching one manages to do so and finds what he was seeking. Here what happens is, that one initiates many processes before he arrives at the stimulation of that one on which the object sought will ensue. Remembering depends upon the potential presence in consciousness of the causal process, and upon this, on the condition that, as mentioned, the transition be effected by one's own agency and by means of processes that one already possesses.

A starting point from which to begin must always be found. Hence commonplaces seem to be often the initial point in the act of recollection. The reason why these are employed is that we pass quickly from one to another e.g. from milk to white, from white to air, from this to wet, passing from
which we call to mind the late autumn, which is the season we had in view.

It is true that in general the middle member also of a whole series of terms seem to be a starting point; if one does not recollect before, one will do so when he comes to it, or else there is no other point from which he can pass to the recollection of the thing in question. Suppose for instance one has a series of thoughts A B C D E F G H; if one has not remembered at H, one remembers at E, if he is seeking for G or F; for from that point we can go in either direction both towards D and towards F. But if we are not seeking for one of these members of the series i.e. G or F, by going to C we shall effect recollection; if that is not so, by going to A we can. This is universally the process.

The reason why, though the same link is employed, recollection sometimes is and sometimes is not successful, is that we can pass to a further distance at one time than at another from the same starting point e.g. from C to F or to D. Hence, if the transition is mediated by some connecting link which has not lately been employed, one passes to the more familiar consequent, for the newly acquired habit has become exactly like a natural disposition. It is thus that we explain why frequently we recollect quickly what we have been meditating upon. It is just in accordance with a natural tendency to follow one another in a particular order that
things actually happen; and it is frequent repetition that produces a natural tendency. But since in the realm of Nature we meet with events contrary also to the order of Nature and due to chance, this is still more likely to occur in things due to custom, among which a natural order does not prevail to the same degree. Hence in some cases we are impelled to pass both to one point and to another, especially when something diverts us from the one to the other. Hence too, when we have to remember a name, we may recollect one like it and commit a verbal blunder as regards the proper one.

This is the explanation of the way in which recollection occurs. But there is a most important fact that we must have apprehension of time either determinate or indeterminata. Let us grant as real something by which we discriminate greater and less periods. It is reasonable that it should do so in the same way as it discriminates extended magnitudes; it knows things that have great size and are at a distance, not by our thought reaching out to them, as some say our sight does (for though they are non-existent they can equally be known), but by a process analogous to them: there exist in the mind figures and changes similar to the external objects.

What then is the difference between knowing the objects of greater size (the objective) and knowing the other set (the subjective) which are smaller? It may be possible
What then is the difference between knowing the object of greater size (the object) and knowing the other set (the subject) which are smaller? (For all the inner are smaller and analogous to the outer.) It may be possible that, just as in the case of the reversible forms of things, the subject has another corresponding one within it, so it is with distances. Hence, if $AB, BE$ be the process, that produces $AC, CD$, for $AC$ and $CD$ are in the same ratio as $AB$ and $BE$. Does not this then give $AF, FG$, quite as much as $AC, CD$? No, for $AC$ is to $AB$ as $HI$ to $I$. These processes, then, occur together, but if one wants to think $FG$, while he equally at the same time thinks $BE$, instead of the the ratio of $HI$ to $I$, he thinks that $K$ to $L$, for the latter lines are in the same proportion as $FA$ stands in to $BA$. 

![Diagram]

- $H, I, K, L$ are sequential points.
- $A, B, C, D, E, F, G$ are sequential points in a triangle formation.
that, just as in the case of the knowable forms (of things, the subject) has another corresponding one within him, so it is with distances. Thus, if \( AB, BE \) be the process, that produces \( AC, CD \), for \( AC \) and \( CD \) are in the same ratio as \( AB \) and \( BE \). So is there any difference between describing \( CD \) and

20 \( FG \)? (No; \( \frac{h}{k} \) is to \( \frac{m}{n} \) as \( \frac{a}{b} \) is to \( \frac{c}{d} \)). These processes occur together, and, if one wants to think \( FG \), he equally (at the same time) thinks \( BE \) and instead of \( HI \) he thinks \( KL \), for they are in the same proportion as \( FA \) stands in \( \sim \) to \( BA \).

Hence when the process corresponding to the (concrete) object and that corresponding to the time are coincident we have an act of memory. If one thinks that they are coincident without securing that they really are so, one thinks one remembers, for there is nothing to prevent one's being deceived and thinking one remembers when one does not. When, however, one actually remembers, it is impossible not to know it or to be unaware that that is so, for it is just in being aware of this that memory consists. But if the object-processes occur independently of that corresponding to the time, or the latter take place without the former, there is no memory.

30 The time (apprehending) process is twofold; sometimes one does not remember the interval with exact precision, as.
e.g. that he did something the day before yesterday, but sometimes our sense of time is accurate. All the same one remembers, though not aware of the exact interval; we are wont to say we do remember though we don't know when the thing happened, when we cannot tell what is the exact extent of the interval.

We have already asserted that it is not the same people who remember well and who recollect well. Recollection differs from remembering not merely in the superiority of the sense of time which it involves, but in the fact that, while many of the other animals possess memory, none of those now known, except man, share in recollection. The reason is that recollection is like a syllogism. One who recollects comes to the conclusion that he saw or heard or had some such experience previously and the process resembles a search, and owing to its nature, recollection accrues only to those that have the power of deliberation, for deliberation is a sort of syllogistic process.

Evidence that this experience is of a corporeal nature and that in recollecting we search for an image in a corporeal organ, comes from the fact that it distresses some people when they cannot recall a thing though applying their mind hard in attempting to do so and, when they no longer try to recollect, none the less the disturbance goes on. This happens especially with liverish people for they are the class most easily moved by images. The reason why recollection
is not under their control is, that, just as when one has thrown a thing, one can no longer check its course, so a man engaged in recollection and on the hunt for an idea stimulates into activity a bodily organ in which the experience is localised. Those feel the vexation most who happen to have fluid in the region of the sensory organ, for once the fluid is set in motion it is not easily brought to rest until the object sought for returns to mind and the process resumes its direct course. Hence, when they have set something in agitation, emotions of anger and fear, owing to the reaction of these organs, do not come to rest; on the contrary they react once more on them. The phenomenon resembles that when a name or a time or a sentence is bawled out aloud; after one has stopped, and without intending it, one is prompted again to sing or to speak.

Those who have a greater development in the upper parts of the body and dwarfs have poorer memories than those of the opposite type, because they have too great a weight pressing upon the organ of consciousness; the processes can neither persist in it from the time of the initial experience (on the contrary they are effaced); nor in the act of recollection can they easily take a direct course. The very young and the exceedingly aged remember badly because of their transitional state; the former are growing, the latter decaying rapidly: and besides, children are dwarf-like
up to a considerably advanced time in their life.

This is our account of memory and remembering, the nature thereof and the psychical organ employed by animals in remembering; likewise of recollection, its nature, mode of occurrence, and cause.
This is the common title of the treatise and that known to Alexander of Aphrodisias. As, however, the discussion is to be not about the soul *per se* but in particular about its connection with the body i.e. not merely psychological but especially physiological, Alexander suggests that *ἄνασμα* would be a more legitimate title. Sometimes *ἄνασμα* is used loosely instead of *ἄνασμα* even by Aristotle himself. Simon Simonius adopts this amended title, translating it 'De Organis Sensum et Sensibilium.'

This is evidently the investigation promised in De An. I 5, 402b15 where he asks if the objects of sensation may not be more profitably treated of before the function of sensation itself. In the whole passage 402b5 he points out that a definition of soul in the abstract is not sufficient for a comprehension of what soul is *ἀλλὰ καὶ ἀράπαλιν τὴν συμβασιν ἃ ἔχει τὸν σώματι· ποτε τὸν δίνατο τὸν ἐστὶν.*

Thus we must proceed beyond our abstract definition and give an account of the various *μόρια* — faculties of soul, but these again cannot be understood apart from their *ἐγγὺς* — functions, and once more point to an account of their *ἀντικήμωνα*.
objects. Aristotle doubts if their subjects should not be treated in the reverse order; to do so would be to begin with things 'notiora nobis'; for as later psychology also has pointed out, it is the things presented to our senses and not the psychical functions through which they are apprehended, which are in the order of time the primary objects of consciousness.

As a matter of fact, Aristotle does not adopt this reverse order in his exposition, thinking it sufficient to have pointed out the danger of resting content with a merely abstract treatment.

Thus we come finally to a discussion of αἰσθητική, the object of sense and the bodily organs through which they are apprehended. It is not to be thought however that the separation of topics in Aristotle's psychological writings is observed with perfect logical rigidity. The general outlines of what is here laid down have already been anticipated in De An. II., Chs. 7-11 and the detailed treatment of sound which is omitted from this treatise is to be found there in Ch. 8.

What in particular distinguishes this treatise from the De Anima is the greater detail with which ξύνομα are treated and the attention devoted to the bodily organ of each sense. ἐρωτευόμενος: a technical term with Aristotle almost equivalent to 'to define' (ἐρωτευόμενος = definition).
καθ᾽ ὁνόμασις another technical term: it is defined in Anal. Post. I ch. 4, 73a34 sqq. Those characteristics of a thing without which it would be impossible for it to be that thing belong to it καθ᾽ ὁνόμασις. They are stated in the definition. It is assumed that a thing can preserve its individuality though stripped of certain qualities. These latter are κυρίευς ουσίας. When Aristotle says he has given a definition of the soul per se, he means that he has stated the ultimate attributes that everything psychical (or rather everything living, for plants have ψυχή) must have. This definition appears in De An. II ch. 1, 412b5:  "οὐκ ἔχει Φύσιν ἐν τούτῳ νοοτροπίαν ὑποκεισμένην οὐ αὐτῆς ἀλλ᾽ ἃς γὰρ ἐκείνη." The question is, whether the soul per se is here contrasted with its faculties, or whether --- as Alexander suggests is also possible --- he is opposing soul considered alone to soul considered in its relation to the body. To this it may be objected that Aristotle never does consider soul apart from body. It is clear that Aristotle here means just what he says, after a discussion of soul in general and its faculties he is to go on to investigate their ψυχή or as he here calls them the ψυχήσεις of the living creatures. This is a progress in the direction of greater detail, for only ψυχήσεις is capable of being determined in various ways when it passes into activity or ψυχή. This will involve the more detailed treatment of the bodily organ of each ψυχή also. Hence the predominantly physiological character of this treatise.

For the reason why a definition of soul in general is not
sufficient, see De An. II. ch. 3, 414b20. Things like souls and figures, have no common nature which can exist apart from the particular type e.g. triangle, quadrilateral etc.

Such things have a nature, media inter univocorum et equivocorum naturam.'

'the regular word for potentiality translatable by 'faculty' by which term we also render υπόκοιλος. This latter term Aristotle inherited from the Platonic psychology. The word itself and the way in which Plato employs it suggest rather a theory of the separable and independent nature of the various faculties, the point of view, in fact, of 'faculty psychology'. Aristotle's is, however, far removed from any such theory.

This brings in plants, which also have γνώμη and to which some of the phenomena proposed for discussion belong (e.g. νέα γνώμης, σωφρονεία ηθος).

as a general term — action — used instead of the specific, ενέργεια, which is par excellence the name for the function or activity of anything possessing mind. (κυριεύσεις λογικής ἐνέργειας ἐν τίνι.)

that which is the peculiar possession of any one species.

But πράξις does generally over restricted application, meaning as
that Aristotle desires not merely to classify the psychic functions of animals but to discuss the things classified.

Simon would make out that the distinction falls wholly within the functions of animals and that here \( \text{\textit{\c{c}\v{c}a}} \) and \( \text{\textit{\c{c}\nu\v{c}}} \) mean respectively 'belonging to them qua animate and qua living' because there is no discussion of the functions of plants in the Parva Naturalia. However the missing treatise 'De Plantis' (cf. De Long et Brev. Vit. 467b8) seems to have been intended to carry on the discussion of the most universal of all the conditions of life. Simon seems to be right in denying that by \( \text{\textit{\c{c}\nu\v{c}}} \) Aristotle is referring merely to the functions which plants share with animals. But neither is it evident that the distinction falls wholly within the functions of animals as he asserts. As a matter of fact the Parva Naturalia though dealing chiefly with the functions of animals contain reference too to the phenomena of plant life. Possibly however Aristotle had no strict and complete classification in his mind, but merely wished to suggest that some functions might be the peculiar attributes of a certain species and of certain wider groups, as \( \text{\textit{\c{c}\nu\v{c}}} \) of man and \( \text{\textit{\c{c}\nu\v{c}}} \) of animals with \( \text{\textit{\c{c}\nu\v{c}}} \) of wings. Simon's view however derives confirmation from a passage further on (cf. note 118 of this chapter).

10. \( \text{\textit{\c{c}\nu\v{c}}} \). \( \text{\textit{\c{c}\nu\v{c}}} \) is to state as \( \text{\textit{\c{c}\nu\v{c}}} \) and \( \text{\textit{\c{c}\nu\v{c}}} \). This word has both a technical and a general meaning. It is
used to refer (1) to certain of the undemonstrable but indubitable principles which lie at the basis of the several sciences; this is its most common technical meaning.

Again it may be used to indicate a statement which is assumed as an ultimate principle without proof for the purposes of a particular discussion, but which is demonstrable and will be proved when it is convenient to do so (cf. Alex. 4, § 23).

Alexander is wrong in saying that the Στοκεία which is an undemonstrable principle of science is an ἐπιστήμη.

Aristotle (Anal. Post. I. ch.10) distinguishes three classes of first principles (1) the τοῦ ἄλλου ἐπιστήμη of all science e.g. the Law of non-contradiction, (2) definitions of the subject of demonstration (καὶ ἡ τεῖχισά 76a32) and their properties (ἡ σκέψις), (3) ὁ πρόσωπος which affirm the existence of the subject to which the science is to attach predicates e.g. lines and figures in geometry (76b5). These two latter classes of ἄλλου ἐπιστήμη are τοῦ ἄλλου --- appropriate to the science in question; they are both species of ὁ πρόσωπος (Anal. Post. I, Ch. 72b14 & seq.).

It is thus evident that, according to this technical use, an ἐπιστήμη is that which "renders conclusions unconditional and categorical" (Poste, Posterior Analytics, Appendix B. p.140)

It corresponds to what Mill (Logic I, ch.8, §§ 6 & 7) calls a 'postulate' --- the assertion that, e.g. the figure in geometry -- the triangle, exists, which renders our conclusions unhypothetical. Without this postulate which asserts the ex-
existence of the things defined there is no way of distinguishing
a science from any self-consistent system of mythology. Upon
definitions alone a science cannot be built.

There appears however to be another technical use of εἰσὶ τὰ ὁ
which was common in Greek geometry. The εἰσὶ is the
Q. E. F. of a problem or Q. E. D. of a theorem, the proposition
set up for proof. This seems to be the sense in which it is
employed in Eth. Nic. VII, ch. 8, 1126a17 (cf. Mr Burnet's note
on the passage ) and though Poste (op. cit. p. 105 note) cites it
as an instance of the former usage.

It is quite clear that here Aristotle uses ἐἰσὶ in
the wider sense of εἰσὶ . The conclusions of the De
Anima which can be proved are to be used as ἐἰσὶ in this
treatise. These therefore, though not indubitable first prin-
ciples, are still certain; they are not 'hypotheses' in the
modern sense, which are statements the certainty of which is
still in doubt and which are assumed in a merely provisional way.

In Posterior Analytics I, ch. 4, 73b33 sqq. it is
shown that what is a universal and peculiar attribute of a
species belongs to it primarily e.g. the equality of its angles
to right angles belongs to the species triangle primarily and not
figure, the genus (τὰ νάζων τις ἐν ἄληρα ἐν 𦈡α ὐπὸ ἀκτί
τοῦ ἅλοντος καὶ ὁρῶν τοῖς ἀπολήν ταῖς).

To be ἔστω then is to be ἔκτω and ἐστορὲν will refer to
the ὑδαι mentioned above 1.4. To proceed from ἗δαι to ἀναμία is to follow the 'ordo doctrinae' while from ἀναμία to ὑδαι is the 'ordo naturae', and this latter is the method which on the whole Aristotle follows in the De Anima in spite of his statement in De An. II, ch.2, 413all aqq.

Here however he is to begin with the ὑδαι which belong to animal quâ animal (if we interpret ἑδαι as Simon will have it cf. note 1) e.g. Sense, Memory, and later he will go on to those functions which animals share with other living things.

The 'ordo doctrinae' is also employed by him when he treats of sight before touch in the De Anima and in treating of animals before plants; it often proceeds from the γνωσις της ἀναμίας to the γνωσις της φυσις cf. Physics I.41.

Perhaps however ἐνθεωρεσις refers to ἐνθεωρησις as opposed ἐνθεωρησις merely. This, which is Ziaja's interpretation, makes the upshot of the whole matter that he is going to treat of animals and their functions first, as in fact he does. This interpretation relieves us from the necessity of limiting definitely to one or other of the two alternatives — peculiar to animal quâ animal — and — peculiar to individual species.

The most important both of the generic and specific functions of animals are functions both of the soul and the body and hence (as St Thomas says) the necessity of a separate treatise.
Memory does not belong to all animals cf. De Mem. 453a7; hence he says only that these functions belong to almost all animals.

The Aristotelian distinction between \( \theta v o s \) and \( \dot{\eta} \eta \nu \nu' \nu \) is not the same as the Platonic (cf. Eth. I. ch.13, 1102b11 sqq. assigns both \( \theta v o s \) and \( \dot{\eta} \nu \nu' \nu \) to that irrational part of the soul which truly is not absolutely irrational (\( \kappa r i v o s \, \dot{\alpha} \lambda o g o v \)) in so far as it partakes in a way (\( \mu v \gamma \nu \gamma, \dot{\epsilon} \nu \nu \)) in reason, but yet is irrational in so far as it opposes reason (\( \alpha v r i v t a \, \tau \nu \, \dot{\epsilon} \lambda o g o v \)).

According to Plato \( \dot{\eta} \nu \nu' \nu \) belongs to the wholly irrational part of the soul. Nevertheless though, according to Aristotle, \( \dot{\eta} \nu \nu' \nu \) and \( \theta v o s \) belong to the same \( \varphi b o s \, \gamma v \gamma, \gamma v \gamma \) yet they are distinguished in a way analogous to the Platonic; cf. Eth. VII, ch.8, 1199a25 sqq. \( \dot{\epsilon}v \dot{\eta} \nu \nu' \nu \) is a mere desire for what is pleasant as such, \( \theta v o s \) is passion acting without reflection but not mere craving for pleasure. cf. Zeller, Arist. and Earlier Peripatetics II, pp.112-3. Anger is an inadequate rendering of \( \theta v o s \), as the tenderer emotions are also ascribed.
to it by Aristotle cf. Polit. VII, 7, 1327b40. ὁ δὲ ἀποκαλυμμένος has been already treated in the De Anima. The accurate distinction of ἑυκοκατακτος ἐκ τοῦ ἁμαρκασμένος really falls into the background in Aristotle since their demarcation was not of importance for his psychology.

i.e. plants as well as animals. In addition to the above class there is 2nd a class of 'communissima' such as ῶ ἔφυτος καὶ ἐθανάτως and a third class which are ἤγειρα διάκεισθαι ἐκ ἀναπολείμματος καὶ ἐπιγένεσιν ἐπιτρέπει ὑπ' ὑμῖν ἀναπολείμματος. Aristotle means, as Simon maintains, peculiar to animal qua animal, than the first ὁ τίς ὁ οὕτως etc. is the tale of the constituent of the two, and the ἀποκαλυμμένος form the latter classes.

Simon says 'Est enim horum quasi privatio alterius'. They are related as a positive quality and its τρίπτησιν i.e. the contradictory within the same genus.

The first ἰδίνων of anything consists of the characteristics revealed in its definition --- the scientific "connotation" of the name. cf. Anal. Past. II ch.3.

According to Aristotle's logical theories it is impossible to prove the τικάτων of anything only its existence, i.e. that it occurs (τιματεύεσθαι); and this is done by giving its ἀγαθόν.
In De An. I. ch.1, 403a29 sqq. there is a discussion of the spheres of the ἀρχή and the διάλογος and it is first suggested that the physicist pays attention to the matter, the other to the λόγος καὶ τὸ ἔνστροφος (in his illustration the final cause) in natural phenomena. But the conclusion is come to, that the real ἀρχή pays attention to both. cf. also Metaph. VII ch. 11, 1037b16 sqq.

the premisses from which deduction is made.

This tractate, which should have followed the μηδέν ἀνανομώς (cf. 480b22) is not extant.

This word is applied both to those that had and those that have been deprived of a quality, cf. Metaph. V. ch. 22, 1022b 22 sqq.

Aristotle cites a case in which we can explain a phenomenon in medicine by geometrical principles, --- that circular wounds are slowest to heal (cf. Anal. Post. I ch.13, 79a15).

a reference to ἀπαθεία (cf. 1.18 above).

That sensation cannot exist apart from the bodily life is affirmed in De. An. II ch. 2, 413b27. κανόνα, ἀνάξια, ἐμπάθεσις, ὀνθύμωσι and ἀπαθεία generally occur along with sensation; it enters into their being: cf. De. An. II ch. 2, 413b22-24.

μνήμη is due to αἰσθήσεως; it is a ἐκ τῆς ψυχῆς ψυχικόν (cf. de Mem. 451a15) and a φάντασμα is a ψυχῆς ὑπότιμος ὑπόθεντα, i.e. a psychical affection originating with, and
being a persistence of, a sense stimulation; it is the
\[ \text{ἀναθέσεως} \] talked of in Anal. Post. II ch.19, 99b36
and De An. I ch.4, 408b18. Again the \[ \text{φάσμα} \]
is called
\[ \text{ἀναθέσεως} \] of \[ \text{ἀναθέσεως} \]. Cf. De Mem. ch.1, 451a3 and
De Insom. 461b21 and also An. Post. II ch.19, 100a3

A \[ \text{νάθος} \] is (1) in its most general signification, any attribute of
a thing whatsoever as opposed to the concrete reality itself
(cf. De Gen.et Corrig ch.4, 319b8 etc.). In accordance with the
etymology of the word there is, however, generally the side
implication of the \[ \text{νάθος} \] being a determination produced in
a thing which is passive and \( \varepsilon\varepsilon\iota\rho\sigma\mu\iota\nu \) suffers modification
by something else. Hence (2) \[ \text{νάθος} \] though often used in-
discriminately tends to be demarcated from a permanent quality
and to refer to a more temporary attribute; cf. Categ. ch.8,
9b28. It is often indistinguishable from \[ \text{παθήσεως} \].

If the subject --- the thing which has the \[ \text{νάθος} \] --- is mind
or one of its faculties, then the \[ \text{νάθος} \] is some modification
of consciousness. We must, however, distinguish as a special
meaning that sense of \[ \text{νάθος} \] (found in De Mem. ch.1, 450b1)
where it means mental perturbation.

For the use of \[ \text{νάθος} \] cf. Burnet, Eth. Nic. p.38. Here,
according to Alexander, \( \text{ἀναθέσεως} \) \[ \gamma\alpha\iota\varepsilon\sigma\iota\gamma\rho\sigma\varsigma \] come under
the designation of \[ \text{νάθος} \] \[ \gamma\alpha\iota\varepsilon\sigma\iota\gamma\rho\sigma\varsigma \]; cf. Comment. in
De Sensu p.7 (Wendland) 1.25: \( \tau\alpha\υ\theta\iota\varsigma\gamma\alpha\iota\rho\sigma\varsigma\nu\iota\varsigma\varsigma\) \[ \delta\varepsilon\iota\varsigma\nu\iota\varsigma\varsigma\].
The explanation is that exhalations from food proceed upwards to the brain, condense and, descending once more, press upon the seat of consciousness (the heart) and so produce sleep. Cf. also De Somm. 454a22. Aristotle seems here to be describing the character of the four mentioned above in 436a14. Hence by they can hardly be referring to memory which indeed is a of the image left by sensation not directly of sensation itself. Alexander thinks that by sensation itself is referred to. But, if we hold that one of the pairs of correlative indicated, perhaps may be intended, though in what sense these are is not clear; they belong rather to the 'nutritive soul'. preserves the life because it cools the heart—the ultimate organ of sensation, and prevents it from destroying itself by means of its own heat. Cf. De Vit. ch.3, 469a5 949, and De Resp. chapters 1, 8 & 16.

and are of life. is used here in the sense of deprivation (cf. note 22). here is equivalent to 'deductively' as opposed
The distinction between noun and verb seems here to correspond to that between faculty and function. Cf. μορφή and μετάμορφης De Mem. passim. In the famous passage in Anal. Post. II ch.19, 100a16 it is generally understood to be that between content and function — ὁ αἰσθανόμενος καὶ ῥέοντας που ἐκείνου εἶναι γίνεται.

The reference is to De An. II chapters 2, 3, 5 etc. Cf. 413b12.

This supports Simon's interpretation of ἔναντι in 436a4 above. If touch belongs peculiarly to each and every species, that must mean that it is a peculiar property of that nature which they all have in common. It is something which they have qua animate. The usual meaning of ἔννοια is "belonging to a species exclusively, but as each species is in the usual sense not the same, the question of the ultimate properties of things material and also important characteristics of ἔναντι (μορφή τῆς ἐκείνου καὶ τῆς τροφῆς αὐτῶν). Compare also III ch.12, 434b9 sqq. Touch is necessary for the animal's preservation.

In the same passage (II ch.4) we find that χονδρός also discriminates characteristics of ἔναντι and cf. below ch.3. Taste discriminates flavour, but χονδρός is simply a αἴσθησις of the fundamental characteristics of ἔναντι — the tangible
ones, and hence \( \gamma\omicron \omicron \omicron \omicron \omicron \omicron \omicron \) is a species of touch (441a3 below).

The omission of \( \mu\omicron\rho\omicron\omicron\omicron \) (LSUP & edd.) after \( \Theta\omicron\rho\omicron\nu\omicron\nu\omicron\nu\omicron \) makes this passage intelligible. Aristotle here refers to that which nourishes, not to the 'nutritive faculty' of the soul.

(1) In the first place, it is not \( \gamma\omicron\omicron\omicron\omicron\omicron \) but \( \gamma\omicron\omicron\omicron\omicron\omicron \) which should be a \( \gamma\omicron\omicron\omicron\omicron\omicron \) of any of the faculties of the soul and (2) that would be a \( \gamma\omicron\omicron\omicron\omicron\omicron \) not \( \gamma\omicron\omicron\omicron\omicron\omicron \) \( \Theta\omicron\rho\omicron\nu\omicron\nu\omicron\nu\omicron \) \( \delta\omicron\alpha\omicron\omicron\omicron \) but \( \gamma\omicron\omicron\omicron\omicron\omicron \) \( \alpha\delta\gamma\omicron\omicron\omicron \omicr

The first of the above reasons makes us reject Alexander's interpretation of \( \tau\omicron\omicron\Theta\omicron\rho\omicron\nu\omicron\nu\omicron\nu\omicron \) \( \mu\omicron\rho\omicron\omicron\omicron \) \( \tau\omicron\omicron\Theta\omicron\rho\omicron\nu\omicron\nu\omicron\nu\omicron \), which wants explanation and besides makes this statement a tautology.

Alexander himself suggests that the meaning is \( \tau\omicron\omicron\Theta\omicron\rho\omicron\nu\omicron\nu\omicron\nu\omicron \) \( \tau\omicron\omicron\Theta\omicron\rho\omicron\nu\omicron\nu\omicron\nu\omicron \) \( \tau\omicron\omicron\Theta\omicron\rho\omicron\nu\omicron\nu\omicron\nu\omicron \) \( \rho\omicron\omicron\omicron\omicron \) \( \delta\omicron\alpha\omicron\omicron\omicron \omicr

Hammond does not notice the importance of the alteration in Biehl's text and translates -- 'flavour is an affection of the nutritive soul' and explains that 'flavour as a property of food affects the processes of growth or the nutritive soul.'

But \( \tau\omicron\omicron\Theta\omicron\rho\omicron\nu\omicron\nu\omicron\nu\omicron \) \( \lambda\omicron\omicron\omicron\omicron \) = \( \tau\omicron\omicron\Theta\omicron\rho\omicron\nu\omicron\nu\omicron\nu\omicron \). Aristotle is clearly demarcating animals in general from the smaller number that possess local movement, by a distinction in their sensational consciousness also. In all animals we have touch and taste but in those that have \( \nu\omicron\omicron\omicron\omicron\omicron \) \( \tau\omicron\omicron\Theta\omicron\rho\omicron\nu\omicron\nu\omicron\nu\omicron \) we have also the senses which are stimulated by a medicine
external to the body (εἰς τὸ ἱλαρον ὄργανον). The objects of touch and taste are external as well as those of the other senses and hence it is no differentia of the senses of sight, hearing and smell to be "excited by external objects" as Hammond translates:

(cf. De An. III, 12, 434b14: οἷς ἡ κατασκεύασμα διὰ τὸν ἐξωτερικὸν ἔλεγχον, όποιον διψάνεται δραίος ἀνάμεσα)

For a discussion of the media (air, water and ὕδωρ) cf. ch.3-5, the discussion of the special senses and Rinker, Ἄριστοτέλους Λείηραν ἀνακούσαντον ὑποκείμενον ψυχῆς pp. 38 seq.

493b2. σωτηρίας ὑποκείμενον.


497a1. ηθομοσύνη, i.e. perceiving before they are in actual contact with it.

497a1. ηθομοσύνη is here used in a wide and general sense as equivalent to διανοϊκός -- the faculty which gives us universals; but used more accurately as in Eth. Nic. VI is ἐπὶ ἐκ τῶν οἰκονομικῶν (1141b9) i.e. knowledge of τὰ πράγματα. Cf. 1140 b5: ἐπὶ τὰ πράγματα ἐπιτύπωσεν (ἐπὶ τὰ πράγματα) ἀλλὰ περὶ ἐπιτύπωσεν τὸ περὶ τὰ πράγματα καὶ ἐπιτύπωσεν τὸ περὶ τὰ πράγματα.

The ηθομοσύνη is able to determine what is good and profitable πρὸς τὸ ἄριστον, ὕποκείμενον i.e. for his general welfare. ηθομοσύνη is one of the 'intellectual virtues.'

Some of the animals seem to have ηθομοσύνη: cf. Metaph. I ii. 980 a2 (where some are said ἀργύρωργοι than others).
cf. Metaph. I ch.1, 980a23

are concepts generally, the contents of 


is equivalent to ὑπηρέτης or ἴστημι which are regularly opposed to ἀπράπτω as well as a knowledge of τὰ ἥπακα. Cf. Eth. VI ch.5. 1140b2: ὅπου ἄν ἐσχ οροντος ἴστημι, ὁ ὑμεν. ὁ ὑμεν. things which ὅπως ἄν ἐσχ οροντος ἴστημι. Hence in the strict sense of the terms ὁροντος ἴστημι ὑμεν. contains a contradiction.

i.e. sight in its own sphere, in the objects directly presented to it. To the sphere of sight belong colour and the mathematical qualities of objects perceived by sight (cf. 1.9 below). Compare De An. II ch.6, 418a9 where the ὁροντος ἴστημι are said to be perceived ὑμεν. Besides those things which are perceived there are others that are perceived ὑμεν. ὁροντος ἴστημι e.g. we perceive by sight qualities referring to another sense, which are 'complicated' with the visual one in the same object and again we can perceive all sorts of other determinations of the visible object e.g. that such and such a white object is 'the son of Diaries' (418a21). Here some modification of the visual quality must pass as a symbol for or mean the other characteristics which we infer from it. But it is in the
perception of these associated elements that hearing contributes more to intellectual life, for to the audible sounds we have by convention (καὶ συνισταμένων) attached the concepts by which we think the whole of reality so far as it is known to us. 

It seems to be best described as the faculty of conceptual thought. Though sometimes defined so widely as to take in all mental activities superior to ἀιθομένος (cf. De An. III ch.4, 429a23: λέγω τί συνίσταται ἐν τῇ ἀμφιβολίᾳ τοιαύτῃ; cf. also De An.III ch.3, 427b27-29); in its most characteristic application it refers to the highest faculty of all. That seems to be the apprehension of concepts apart from imagery, the sensuous setting or ἀνάγκη by which they seem generally to be attended. Cf.De An.III ch.4, 429b21 and Rodier's notes to the preceding passage also ch.6, 430b30. Such simple concepts seem to form the starting point of all scientific knowledge and Eth. II. ch.6, 1041b7 ῥοή γὰρ ἀνεπάγω τὸ παθηματικὸν γνῶσιν. Cf. note 43. Aristotle does not mean to equate ἡ ἀκοή μόνη with ἀκοήν ἢ τὸν ἀκοὴν ἀπὸ τοῦ ὀργάνου τῆς ἀκοῆς; as we saw, by sight we may perceive objects κατὰ συμβεβηκόμενος. But it is audible sound alone which is elaborated into a system corresponding to the scheme of ideas and in each item suggestive of them.

Cf. De An.II ch.6, 418a17, III ch.1, 425a14, III ch.3, 428b22 and also below ch.4, 442b2 sqq. Cf. also note 43. ἡ ἀκοή is here omitted from the list, though codex L reads στάσις.

Cf. De An.II ch.8, 420b5 sqq. The wider definition of ἀκοή is 'φόρος τὸ ἢ τῷ ἵππον τῆς ἀκοῆς'. The narrower usage:
appears in 420b33 — σηματικόν γαρ ὑπὸ τοῦ ποταμοῦ τῆς ῥεῖν ὑδάτης.

It is sound which conveys a meaning. In 420b22 we find that it is υφή which permits of the realisation of τοῦ βαρέου (cf. above 436b20). The ἐστιν κατά (cf. 420b19 where υφή is said to be ἐστιν κατά) are the things chosen τοργήν ἐναν. Aristotle means quite clearly intelligence and the higher life generally depend upon ἀρχή and its special object κατά.

For the special reasons why sounds are best fitted to represent concepts, cf. Stout, Manual of Psychology, pp. 464 ff.

A σώματος αὐτὸν εἰς τὸν κατά τοῦ τῶν ἰδιών ὀρθών ἀποκαλεῖται. Hence the apprehension of the meaning of the word is not conventional for τοῦ τῶν ἰδιών ὀρθών ἀποκαλεῖται. Plato had maintained the opposite in the Cratylus (ch. IX sqq.). Cf. also 16a19. No sound is a word unless it become a conventional sign.
with a discussion of the organs corresponding to each sensuous function, naturally mentions the act of smelling and so proceeds to discuss its peculiar organ, which, though not parallel to the organs of sight and hearing in that it does not consist of any single element, he yet takes the opportunity of discussing. It seems however that Aristotle is really attempting to make the sense of smell in some way parallel to the other two and that 11.21 sqq. are intended to establish it. Hence the elaborate doctrine about the coldness of the region in which the sense-organ is situated and which is potentially warm; and we hear elsewhere that ἡ ραίν δὲν ωνας ὑπηρέτεως θεοχαρά γλυκαμήν ὑποδηματία (444a24). So that, in spite of the fact that he has not proved the sense-organ to consist of actual fire, Aristotle evidently wishes to establish some connection between fire and odour. Hence Ziaja (op. cit. p.11) maintains that he does not intend here to discuss the nature of the sense-organ of smell and that there is no conflict between this passage and any other. He points out how, when the brain is said to be ὁ γάρ δὲ ναὶ ὑπηρέτεως ὑπερματία, that agrees with the passage in De An. 425a3 sqq. where it is held that the sense-organs are composed only of air and water. This latter statement, it must be observed however, is not perfectly unqualified, for Aristotle goes on to say that fire, though not a special ingredient of any one, may be said to exist in all (ὁ γάρ ἁπτετ φύσι σοι θεοχαράς ἀποτομ) and that earth is
either in none or specially incorporated in the organ of touch (cf. below 1.25). This passage (q.v.) shows the difficulty which there is in extracting a consistent statement from Aristotle as to the nature of the sense-organs, and the fact that his theories on this subject seem to fluctuate makes it difficult to avoid thinking that here he at least starts with an attempt to work a parallel between those of sight and hearing on the one hand and that of smell on the other. It is quite evident, as Rodier De An. II p. 349 points out that της ὀργῆς, otherwise it could not support the statement πάντα ἐπὶ τὰς σημνικὰς; besides Aristotle plainly means the sense-organs in the other cases — τοῦ ἐπικοινοῦν, τῷ χαρᾶς νηστήσων, ῥᾳ ἐξαναπών.

Hence, unless we adopt Hayduck's bold emendations, we must conclude, (1) that the doctrine here is a tentative construction of a parallel between the organs of smell, touch and taste and those of sight and hearing; (2) that the parallel consists in assigning each to a special element (touch and taste, being generically the same, share one between them); (3) that though Aristotle cannot work out the parallel in the case of smell and the attempt to do so endangers conflict with the rest of his teaching, the theory has attractions for him owing to its symmetry and the fact that in so far as it can be worked out it connects with his account of the nature of the brain; and hence it was not deleted, but became incorporated with the re-
surrender of his preserved writings.

On Hayduck's suggestion γφ is changed to φ and the following statement is not a reason for the preceding one but a new premise from which, in combination with the preceding one, 11.25 sqq, is deduced.

Cf. De An. II ch.5, 418a3: τὸ διαφέροντος διόνυσος διόνυσος, κιγκίον ὁ τοῦτον ἄνθρωπον ἐν τῶν ἀνθρώπων ἀνθρώπων. cf. also II ch.12, 424a17-20: οὕτως ἀνθρώπος ἄνθρωπος. τὸ διάφέροντος διόνυσος τῷ ἄνθρωπῳ διόνυσος

and III ch.2, 425b23: τὸ γὰρ ἀνθρώπος ἄνθρωπος τῷ ἄνθρωπῳ διόνυσος τῷ ἄνθρωπῳ διόνυσος τῷ ἄνθρωπῳ διόνυσος. etc.

The theory is that the sense-organ is potentially capable of receiving the 'form' i.e. the perceptible properties of the object of sense. In the act of perception object and sense are one, but when the sense is not stimulated, it is only potentially perciptient, the object only potentially perceived. Cf. 425b26: ὃ ὁποῖος ἀνθρώπος ὁσὶ τῆς ἀλήθειας τῆς ἀλήθειας τῆς ἀλήθειας τῆς ἀλήθειας. In the act of perception the organ becomes like its object; previously to perception it is unlike. 418a5,6:

Note that Aristotle has no need to assume that the sense-organs consist of the elements because like is perceived by like. The organ was not like its object in consisting of the same material but in receiving its ἔμφασις — the pattern
according to which it was constructed. Cf. Introduction sect. 14.

The external object is the agent in perception, the sense-organ is passive. Cf. De An. II ch. 5, 417b20 --- τῇ ποιητικῇ ὑπερασπίζεται, ὁ δὲ διαγόρος παρὰ τῷ ποιητικῷ, διότι ὁ καὶ τὰ λοιπά παρὰ τῷ ποιητικῷ.

If we read ἐν in 1.23 below we cannot translate "the Latter (i.e. the sensation) must have an antecedent potential existence," as Hammond does, but 'the sensation is what it previously had the potentiality of becoming.'

The brain was not the organ of sensation according to Aristotle but played a subsidiary part in the bodily economy as neutralising the heat of the heart. On the other hand excessive cold in the brain was tempered by the dry warmth of odours (at least in man) which were healthful and hence delightful. Cf. below ch. 5, 444a 7 sqq.

This is an application of the general Aristotelian doctrine that opposites pass into each other. Things are only opposite in so far as they have the same ὑπάρχον and it is through having the same ὑπάρχον that they can pass into each other. Hence the ὑπάρχον is potentially capable of being either. Cf. Physics I ch. 9, 192a21, ἀναφορίζεται γὰρ ἐκκεντροστός ἡ ὑπάρχον, and Phys. IV ch. 9, 217a22: ἐστὶν ὑπάρχον ὡς ἐπικάτωτος, οὐκετί οὖν ὑπαρχον ταύτα εἰς φύσιν ὑπαρχον ὑπαρχον, etc., etc.

Cf. De. Gen.: Animal II ch. 6, 743b28 sqq. 744.
Comment on this doctrine will be postponed until we come to chapter IV, where taste is discussed at length.

One more proof that the whole passage is a discussion of sensoria.

It is true that the organs of taste and touch transmit προσωπικά sense affections to the heart, but we cannot translate πρόσωπον by 'conduct to the heart' as Hammond does because, according to Aristotle's general theory, all sense organs should do so and besides Aristotle is here not discussing the question of the communication of the exterior sense organs with the interior, but the nature of the composition of those sensoria. It is true that Aristotle does not make clear how the προσωπικά from the special senses are conveyed to the heart (cf. Zeller, Aristotle II pp. 67-70 English Trans.). Alexander says that there are three προσωποι extending from the heart to the brain and then to the three sense-organs of sight, hearing and smell respectively, but in the case of taste and touch the προσωποι communicate directly with the end organs; by these the προσωπικά are transmitted. For confirmation of this cf. De Juvent, 3, 469a12 sqq. De Inso. ch.3, 461a1sq. The blood seems to move to be the medium of transmission but we cannot certainly say so. It is true also that the heart, which is the organ of the common sense (cf. De Juvent, De Inso. loc. cit. above and Be according to Neubauer, it is certainly not the medium in the same nature as the end organs extending (with case of the sense behind the organs as localised in the heart) along προσωποί toward the heart. Cf. also loc. cit.
Somno ch.2, 455a21, τὸ χαίρειν ἀστήρεσθαι seems to be also the special organ of touch (cf. 455a23: τὸ ἱερὸν τῆς ἐνθύμησιν τοιοῦτον) τὸ ἁρπαγμὸν ἀπὸ ἑαυτοῦ τοῦ πάθους ἀνεξάρτως ἐν τῷ ἀρτικῷ τούτῳ) between which and the object, the flesh seems to be the medium (cf. De An. II ch.11, 426a15 ὅτι ἐν τούτῳ ἐν τῷ αὐτῷ τοῦ πάθους ἀνεξάρτως and III ch.2, 426b15 ὅτι ἐν τῷ αὐτῷ τοῦ πάθους ἀνεξάρτως). But however that may be --- and if the latter point is to be insisted upon we had better translate 'their organ is situated in the region of the heart' --- the question is here not one of communication, but of the origin of the organs in question. If the organ of smell is actually cold and potentially warm and apprehends what is in actuality warm (ὁ ἄγαν) so conversely the organ of taste and touch will be actually warm but potentially cold inasmuch as it apprehends what is actually cold, viz. χαίρειν.

Alexander, however, will not allow that χαίρειν is ὑπάρχει but maintains that this statement affects merely ὑπάρχειν i.e. the sense-organ. Certainly it is the Aristotelian theory that touch perceives not merely the qualities of χαίρειν ὑπάρχειν and τὸ θέλειν but all the four ultimate (and primary in that sense) qualities of objects (cf. above note 8) and others as well (cf. De Gen. et Corr. II ch.2, 329b17 sqq.). Hence once more we have evidence that the above argument is at best only tentative.

If we take it that the organ of touch is actually of the nature of earth and has its characteristic qualities then it
is impossible to see how it is connected with the heart which is the seat of warmth. If it is potentially of the nature of \( \gamma \) then it will, like the heart, have actually the opposite qualities. But in that case we shall have failed to account for the perception of \( \delta' \), as well as other qualities, by it, in the sense of reconciling that to the general Aristotelian doctrine that the organ is unlike the object before sensation but in the act of perception becomes qualitatively identical with it, as is stated in De An. II ch. 5, 417a20.
COMMENTARY

CHAPTER II.
In De An. Book II loc. cit.

πανέμορφον.

The four physical elements are fire (πῦρ), water (ὕδωρ), earth (γῆ), and air (ἀέρ). Each has a pair of ultimate qualities one of which it shares with another of the elements and the other with another. Thus there are four ultimate qualities and those elements are contraries of each other which have no qualities in common. Thus fire is hot and dry (θερμός ἀέρις); water is cold and moist (κρύπτως ὕδωρ). These are contraries of each other. But fire and water share their heat and moisture respectively with air, their dryness with earth; the latter two elements are opposed.

COMMENTARY

CHAPTER II.

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437 a 18. προβασιον.


ουν ἡ λέξις ἡ γνώμης ἀποκαλεῖται

§. ὁ δὲ διακριτικὸς χαρακτήρ τῆς ἐπιστήμης, οὐχ ὁ διάλογος (ὡς Ημμόννων ἔχει), ἀλλὰ ὁ ἀπαρκότερος γι̃ος τῆς ἐπιστήμης, ὁ λόγος του ὃς εἰς τὴν πρώτην διακρίσιν ἔχει.

- the primary differentiations of προβάσιον -

437 a 20. στοιχεία.

τ. The four physical elements are fire (πῦρ), water (ὕδωρ), earth (γῆ), and air (ἄηρ). Each has a pair of ultimate qualities, one of which it shares with another of the elements and the other with another. Thus there are four ultimate qualities and those elements are contraries of each other which have no qualities in common. Thus fire is hot and dry (σέρειν καὶ κρύπτων); water is cold and moist (ψυχρὰν καὶ ὑγρὰν). These are contraries of each other. But fire and water share their heat and moisture respectively with air, their dryness and coldness with earth. Thus these latter two elements are relatively to each other contrarily opposed.

Thus

The traditional four elements were first distinguished by Empedocles. Cf. Burnet, Early Greek Phil., p.59 also pp.240, sqq. Empedocles referred smell to air also. Theophrastus (R.P. 177b 17th ed.) says he did not assign any particular element as unconnected with touch and taste. Aristotle's statement here need not mean more than that there was a general tendency to correlate each sense with a particular element and that the disparity of the number of the senses and the elements respectively caused a difficulty when it was attempted to carry out the correlation completely.

Hearing and smell on the Empedoclean theory, touch and taste on the Aristotelian are grouped together.

Apparently the sensation caused by concussion of the optic nerve owing to a blow in the region of the eye. The words used however do not convey a very graphic description of this experience. Perhaps Aristotle is here generalising so as to include such light sensations as are caused by chemical changes in the eye itself. The theory is to be referred to Aëtophoron (Epikraleon). Cf. Theophrastus de Sensu 2.6: φύσεως υπήρξει (όποιον πάντα) ἐπιστήμου. Because there must be some object of vision and in the dark no other object is visible, the eye being of the nature of fire, will be visible. It should thus be visible at all times in the dark. As this is not the case, the theory is rejected.

Aristotle next goes on to give his own account of the phenomenon which professes to explain why this sensation of
light experienced in the dark occurs only when the eye moves rapidly.

Cf. 437b6 where adds confirmatory instances. From Meteor.III. ch.4, 373a35: ἀρα ἐξέπεμπται μὲν ἐν δοὺς ἑς ἄφας ἀπὸ πάνωρα φωτιζόντας τὰ ἐν ἀνυπάρκειαν. and 372a31 we should infer that this was really a case of reflection. Though, however, smoothness is assigned as the source both of luminousness in the dark and of reflection generally, the two phenomena are never identified. Cf. De An. II ch.7, 419a2, where fungi, horn and scales are enumerated along with the eye and the heads of fishes, as a class of ἁλόσας which are πορφυρά γερανομοινα ἀπὸ λαμπουσιν. Note πορφυρά γερανομοινα is all he says. He would not allow that they were really πορφυρά, for in that case they would really produce light. Thus according to Aristotle these substances were not in the strict sense phosphorescent (Bammer, An/ p.26).

ϕως is the ἡγέργεια or ἐπιφάνεια τοῦ διάφαραντος (cf. De An. II ch.7, 418b9, 419all,) --- the proper function of the transparent medium.

Again, in ch.3, 439a18 below, it is said to be the presence of something of the nature of fire in the transparent medium. Since, then, it requires something of the nature of fire to produce light and the eye does not consist of fire, it cannot be said to produce light. Hence it would be suggested that
the phenomenon is one of reflection, though where the light is to come from when the eyes are closed is not apparent.

There are many instances of \( \phi \) taking this sense (cf. 3, 440a7 etc.) But most interpreters take \( \phi \) to mean "This is evident," i.e. what was said before about the eye not producing light is evident because of what follows. But that is not the sense required. The 'one becoming two' is not the reason why the eye does not emit light. But the eye is seen because, though really one, it appears when quickly moved two.

This is very difficult to understand. Simon prefers to take Alexander's second interpretation, that one part of the eye sees the other --- that which is 'in loco naturali' sees that which is not. But the interpretation does not explain why swiftness of motion is essential to the phenomenon. Probably Aristotle was thinking of common instances of a single object appearing to be made double by rapid motion (as e.g. a vibrating string) and applied this in a confused way to the present case. He apparently thought that the eye, when at the one position, could see itself at the other if the oscillation between the two was so rapid that it appeared to be at both points at the same time. It will not do to say, as Ziaja does, that the eye regains its former position before the light from it, when at the place from which it has moved, arrives.
to Aristotle the propagation of light is instantaneous and one must not read into his words a theory of light vibrations. The eye at the position to which it moves.

Cf. 437a31 above.

Aristotle does not mean to identify the present phenomenon with reflection but merely to adduce another instance illustrating the apparent duality of the eye by the apparent duality of seer and seen caused by reflection in a mirror.

For the Platonic theory of sight-perception compare Timaeus ch.VII, 31 B and ch.XXX 67 C, sqq. and especially ch.XVI 45 B sqq.

Cf. Timaeus 45 D.

and its adverb ἄνεγται are constantly used in the sense of 'irrelevant': cf. De An. I ch.1, 403a2 of definitions that are mere vague generalities.

Cf. also Eth. Nic. II ch.7, 1107a30 etc. but it may mean as well 'unfounded' as in An.Post.I ch.3, 73a18. Here probably both implications are to be assigned to the word. The thought is, that it is absurd to talk of the ἄνεγται of
sight because the notion of 'quenching' has nothing to do with the nature of light. Hence the theory is groundless because of the irrelevancy of the ideas to the phenomena in question. In addition, even if they were relevant the theory would conflict with facts. The argument of the whole passage is that \( \alpha \) can be predicated only of \( \gamma \), not of light, for, as we saw before (cf. note 1), light is not fire though it requires the presence of \( \pi \). However, Plato and Empedocles when alleging that the light which issues from the eye is quenched in darkness imply that it is of the nature of fire which is \( \theta \) and is quenched by either moisture or cold, the contrary qualities. (The Aristotelian theory is that things are neutralised by and pass into their opposites.) Now \( \varphi \), is not of the nature of \( \gamma \) and hence to talk of its \( \varsigma \) is absurd.

Secondly even if there were something of the nature of fire in light though imperceptible, it would be extinguished by wet and cold weather which is not true.

For the distinction of \( \nu \) and \( \varphi \) cf. also Top. V ch. 5, 134b28.

The mere bringing forward of the fact that light is not quenched by wet shows that Aristotle really means to deny that it is of the nature of fire.

Alexander, however, evidently troubled by the fact that light is warm and hence perhaps should be identified with fire,
suggests an emendation or rather a reconstruction of the passage which would make out that Aristotle, while conceding that while fire is 'dry' and 'warm', points out that darkness which is supposed to extinguish it has neither of the opposed qualities and hence cannot do so. On this interpretation the rest of the passage would run --- but if darkness is really, though imperceptibly cold and wet, we should expect the marked presence of those characteristics to make a difference to sight by daylight. But this is not found to hold good." St. Thomas.

It would not be correct to say that light is not diminished when it penetrates water; frequently signifies rain or rainy weather.

Similarly must be here frosty weather, not ice.

They are 316 323. (Stein) p. 9, (Quirke, Die Fragmente der Vorsokratikern)

-suffused, is another reading which would make the construction easier.

suggested by Blass N. Jahrb f. Phil. u. Phil. 1883 p. 19 would improve the grammar of the passage. 'but they (at 8) let the fire through.'
words imply that Empedocles had no consistent theory but had recourse alternately to the doctrine that fire issued from the eyes and illuminated objects, and to that according to which effluences from bodies entered into the pores of the eye and so created perception.

The fact seems to be that Empedocles intended to account for vision by postulating that both those operations took place but had great difficulty in reconciling them, and that thus at one time we hear more about the one than about the other.

The difficulties attending the acceptance of either one or both theories are pointed out below by Aristotle in 438a25 sqq.

We may conjecture as Hammond does, op.cit. p.152 note, that he imagined that the images of things entering by means of the pores through the outer covering of the eye are illuminated by the fire issuing from the pupil. But it is not clear that he said anything so definite unless Aristotle means (in l. 28 below) that ἧ δὲ ἔργα τῆς ἐνοπτίστης ἔσται τοῦ λαμπροῦ was one of the positions held by Empedocles. It is manifest from what Theophrastus says (R. P. 177b) that, according to the Empedoclean theory, fire existed both in the external world and in the eye, and that the effluences from things which produced the perception of visible objects consisted of fire. Fire was the finest of all substances and could thus penetrate the finest of the pores.

Through the passages of the water we perceived dark objects. This must surely mean that objects throw off effluences composed
both of fire and water and that the fire penetrating through the fine pores is perceived by its 'like' fire, and the water, a crasser substance, can enter only by the wider pores and is recognised by its 'like' the water in the eye; cf. R.P. 177b. Of course it is qua light that objects are visible, (dark being but a privation of light) and hence the really important part in vision is that played by the fire. Thus Aristotle is justified in regarding the Empedoclean theory which referred vision to fire.

This doctrine was also shared by Zeller, Presocratic Philosophy, pp. 266 sqq. cf. p. 268. This doctrine was also shared by Zeller, Presocratic Philosophy, pp. 266 sqq. cf. p. 268.

The theory of Democritus was also one of things thrown off which affected the sense organs. But in the case of sight it seems to have been not actually the thrown off from the object but the impression caused by this in the air which was reflected in the eye. (cf. Theophrastus de Sensu, § 50, Zeller op. cit. II p. 219.) This was connected with his doctrine that we did not perceive things as they were in themselves but only as they affected the senses. Nevertheless, at the same time he seems to hold that the medium is at the same time affected by an effluence from the seeing eye, but how it is possible to reconcile this with any intelligible theory of reflection it is difficult to see.

It is noteworthy that Plato too had some such theory of interaction between the effluence from the eye and from the-
external object; cf. Timaeus 45 C.

The effluences are, however, according to him, fire (cf. the comparison of the eye to the sun in Rep. VI. 508/). But he also agrees with Democritus in holding that by like we perceive like and that perception takes place with the whole soul.

The visibility or being seen of the reflected object exists not in the eye in which the reflection takes place but in the eye of the spectator who sees the reflection.

I have here followed Ziaja and Bender in opposition to Alexander, Simon, Thomas, St Hilaire and Hammond. Hammond appears to make τοῦτο refer to τὴν ἀφανήν and then to supply a new subject —τὸ δρακόν— as the subject of σηκόν. This is surely in defiance of grammar.

If one译 τοῦτο to mean τὸ τὴν ἀφανήν δρακόν the sense would be plain enough and would be exactly what we require. This is however to give a very liberal interpretation to τοῦτο which should mean τὸ ἀφανῆς ἀφανής, which is the appearance of an ἀφανῆς in a smooth surface. Now, though Aristotle could not say that the ἀφανῆς (a special term used by Democritus) was not ἀπεικόνισθαι (the reflecting eye) he can quite well maintain that the appearing of the ἀφανῆς in
the reflecting surface is not itself in the surface. Alexander also takes ἐν ἑαυτῷ as the subject of ἐν ἑαυτῷ and interprets ἐν ἑαυτῷ as ἐν ἑαυτῷ ἐμφάνισιν. Simon and St Hilaire differ from him only in taking ἐν ἑαυτῷ to mean ἐν ἑαυτῷ ἐμφάνισιν.

If, therefore, we were to follow Alexander we should render—

'For reflection occurs because the eye is smooth but vision does not lie in the reflection of take place by means of it but occurs in the seer i.e. is an affection of one who has the power of sight.' According to Simon and St Hilaire we should turn the latter part of the sentence thus 'but vision does not lie in this property of the eye etc.'

In addition to the syntactical objections to these interpretations, they have the demerit of making Aristotle reason in a circle. In arguing against the theory that vision is reflection to state as one's reason that vision does not lie in the reflection of things in the eye and in its property as a reflecting structure, is merely to reiterate one's objection without proving it. ἐν ἑαυτῷ must refer to ἐν ἑαυτῷ and the argument is to the effect that reflection must presuppose vision, because the mirroring of anything is a fact not for the subject in whose eye it takes place but for a second person who sees it.

Note that ἐν ἑαυτῷ, the word for the sense faculty is used as though it referred to the sensorium.
The whole nature of ἃρματις will be treated below in ch. 

is the variant reading (L S U Alex.) which, if possible, only repeats the idea of ἀρματικώρια. With the ἀρμ., the ἀρμ. becomes expository.

Aristotle is here referring to what are now called the aqueous and vitreous humours.

The sanguineous and non-sanguineous animals were two main divisions in Aristotle's Zoology. cf. De. Part. Anim. IV ch. 5, 678a33. Insects and Crustaceans were placed in the latter class as the fluids in their bodies, not being red, were not thought to be blood.

Aristotle here returns to his criticism of the Empedoclean and Platonic theory. cf. above 437a22 - 438a5.

The transition to this topic once more is probably to be explained by the fact that Democritus too held a theory according to which something emanates from the eye. Hence Aristotle first mentions the doctrine in its most general form (λαοὶ ἀνθρώπων ἐξ ἐματικῶν ἀρματικώρια τοιαύτα) and then glides on to discuss the specially Empedoclean and Platonic theories.

Probably the more scientific Platonists or interpreters of Empedocles.

The fire which is the effluence from external bodies.
Alexander and Simon. Aristotle proposes to simplify the phenomenon by supposing that the union of fire with fire takes place in the eye itself before the internal fire issues out, i.e. in the starting place of the internal fire according to the more complex theory. It will be easier, he thinks, to support the theory if one omits that part which makes the union of fire with fire take place outside the eye.

One must not translate with Hammond "It would be better to assume that the combination of the eye with its object were in the eye's original nature."

In the first place, this makes Aristotle propose to supersede the older theory by an explanation which merely shelves the difficulty and refers it to a 'faculty'. Secondly, Aristotle is talking not of a combination of eye with object but of fire with fire; as is apparent from the next sentence, apart from which this one can not be understood.

Simon quotes De Part. Animal III ch.4, 665b14 (δὴν γὰρ
τὴν ἀλήθειαν μὲν ἔχειν οὐκ ἔχεις . . .) as an illustration of the principle of parsimony in Aristotle.

Alexander affiliates this and the following statement ---

οὐ γὰρ τὰ γενόμενα πᾶν. . . , to the doctrine expounded in De Gen. et Corr. I. ch.10, where we find 327b10: οὐ γὰρ δὲν
τὸν ἀνθρώπον ἄλλοις ἐξάγαλον ἀλλ' ἐν τούτῳ τοῖς λόγοις ἐξάγαλον τὸν ἄλλιον ἀνθρώπον i.e. only concrete objects (αὐτὸς τῷ) i.e. σῶμα can be missed; now light is a ἀνθρώπος of the definite type ζήσεως.
(cf. De An. III ch. 5, 430a15) and hence cannot experience μ/ξις.

This explanation assumes that the σομφοσίς here talked about is a case of μ/ξις, which is not quite evident. Neither is it evident that the union of light with light (σομφοσίς γίνοντας) mentioned in Plato Tim. 45 C against which this argument is directed, is properly a case of μ/ξις. Plato uses the term σομφοσίς below in 45 D probably hardly in the exact sense in which σομφοσίς is here employed. It need mean no more than 'kindred'.

σομφοσίς means no more than to grow together or unite, and not the union of two different substances which results in the production of a third distinct one, which is the sense in which Aristotle employs μ/ξις. Hence Alexander's discussion of the blending of lights (he denies that they can be united) seems to be irrelevant, and whether σομφοσίς can be brought under the category of μ/ξις is not clear.

Besides, if Alexander's were the correct interpretation, a Platonist might still reply that according to his theory light is nothing ἡ σομφοσίς and hence (according to Aristotelian principles) could combine with other light. Cf. Timaeus 45 C εἰναὶ τὰ ὄντα τῶν ἐστιν ἴν τοιοῦτον σομφοσίς by the union of the internal and the external light.

Perhaps Aristotle need mean no more than that the union of light with light is on the Platonic theory quite unexplained. Compare next note.
The commonest interpretation and that in consonance with Alexander's explanation (cf. above) is "Not everything will unite with anything else" and that is referred to the doctrine \( \nu \gamma \alpha \rho \delta \gamma \nu \nu \gamma \alpha \nu \) in De Gen. et Corr. I ch.10.

According to the translation I suggest the argument would run, 'How will this unexplained 'union' of the Platonists produce sight? When we see, we see something definite i.e. it is not with \( \tau \rho \gamma \alpha \nu \) that the union is effected. The theory is not capable of explaining in detail how we see.'

De An. II.ch.7, 418bl, 419a9, III ch.5, 430a16.

This seems to contradict what is said below in ch.6, 446b27:

\( \alpha \chi \lambda \rho \sigma \iota \varepsilon \pi \eta \zeta \sigma \iota \zeta \) (\( \gamma \delta \phi \varepsilon \sigma \iota \zeta \). It is true that \( \pi \eta \zeta \sigma \iota \zeta \) is frequently used for all the four varieties of change and as equivalent to \( \mu \tau \rho \gamma \alpha \nu \) --- change in general, not merely to \( \tau \gamma \phi \nu \tau \) --- local motion, which is its most characteristic sense (cf. Phys. IV ch.10, 215b13). The four species of change are 1. (\( \pi \alpha \iota \theta \nu \sigma \iota \alpha \nu \) \( \gamma \nu \zeta \sigma \iota \zeta \pi \varepsilon \phi \tau \varepsilon \) : 2. (\( \pi \alpha \iota \theta \nu \pi \chi \varepsilon \sigma \iota \zeta \pi \varepsilon \phi \tau \varepsilon \) : 3. (\( \pi \alpha \iota \theta \nu \pi \chi \varepsilon \sigma \iota \zeta \pi \varepsilon \phi \tau \varepsilon \) \( \phi \varepsilon \phi \nu \) : 4. (\( \pi \alpha \iota \theta \nu \pi \chi \varepsilon \sigma \iota \zeta \pi \varepsilon \phi \tau \varepsilon \) \( \alpha \lambda \zeta \omega \sigma \). Hence, if light is an \( \alpha \lambda \zeta \omega \sigma \) (qualitative change) and \( \pi \eta \zeta \sigma \iota \zeta \) is here used vaguely as including it there is no contradiction between the two passages. We shall, however, maintain when we come to chapter 6, that in the Aristotelian theory the propagation of light is not even to be described as \( \alpha \lambda \zeta \omega \sigma \).
is wider than consciousness, but Aristotle, though of course meaning merely consciousness here, is forced to use the wider term for want of a special word to designate conscious life in general without suggesting any one special faculty. We shall be forced to translate γνώση thus more than once.

This surely must mean γνώση, ὑμητίσως. The faculty or νοούμα τός of the special sense of sight resides within the eye. If this statement is capable of being generalised at all, it can be extended only so far as to include the organs of the other two mediated senses (hearing and smell). This cannot be taken as a reference, as Alexander (p. 36) seems to think, to the central sense, which resides further within the body (in the heart). It is not the function of this central faculty to discriminate the objects of the special senses. It is the seat rather of that self-consciousness which also discriminates the various special senses (cf. De An. III ch. 2) and is generally the organ of πνεύματος and ψυχῆς.

If the faculty of vision resided in the central organ then surely according to Aristotle's argument there would need to be a transparent medium extending through the body right up to it, and it itself would need to have the same property. Something internal is the organ, Aristotle says, and hence it must be transparent. The interior of the eye is that which fulfills the conditions. Why the organ should be transparent is due to his general theory that it should be capable of...
[Handwritten text not legible]
receiving the same determinations as those existing in the world outside, i.e. should be \( \tau \nu \tau \iota \varphi \varepsilon \) of the external bodies (De An. II ch.12, 421a13).

The statement that the sense faculty resides within is not a deduction from what is said in the De An. about the internal or central sense; it is a truth said to be given by observation (\( \xi \tau \gamma \alpha \cdot \iota \) ) and Aristotle at once proceeds to adduce a confirmatory instance.

Those who (\( \varepsilon \gamma \cdot \iota \) Thomas etc.) think that the reference is here to the central sense must hold that the \( \mu \rho \rho \), are the optic nerves, which Aristotle imagined to be ducts leading to the brain and ultimately to the heart. Cf. Hist. Animal IV ch.8, 533a13, De Part. Animal II ch.10, 656b17. Alexander, however, seems to understand them to be the \( \mu \rho \rho \) of the older philosophers --- the passages through which (according to their view) the eye's internal fire issued. Cf. Theophr. \( \xi \) Sens. \( \forall \varepsilon \) (R.P. 176b) and Arist. De Gen. et Corr. I ch.8, 324b26.

Alexander says \( \tau \nu \tau \iota \varphi \varepsilon \) \( \iota \gamma \varphi \alpha \rho \varepsilon \) \( \varepsilon \nu \tau \iota \eta \) and since the nerves are not transparent we can assume only that it is the passages supposed to exist in the eye itself. Blindness ensuing on the cutting of the optic nerve would show rather that the sense was not localised in the eye, but we have seen reason (see previous note) for maintaining that that is not the Aristotelian view. Hence Aristotle is not here referring to such a serious wound as one which would sever the optic nerve.
but to a more superficial injury to the eye. This is also borne out by the simile which follows. You cut the wick and the flame goes out and so you destroy the channel communicating the external light to the pupil and sight is destroyed. This interpretation also gives its characteristic sense. On the other hand we must remember that we need means more than (I have on the whole followed Simon here). "οὐ'

Cf. above 437a20. Aristotle does not commit himself to the proposed reduction.


This statement seems to contradict what is said in De An. III ch.1, 425a5: — η λαμπαδοδέος θυμίζει Λευδόν (εκ. πάνω η λαμπαδοδέος) — — το δ' ἔδωκε ψυχή οὐκ εἶχεν οὔτε λόγον.

If then we take λαμπαδοδέος to be the sense-organ here (a very common use cf. above 438a13 Bonitz Ind. 538a30) the two passages are in disagreement. Again the statement in 1.24 beneath η θυμίζει 
καὶ ἔργως ἐνθυμησάς τοι ἔνα τοῦ ἄνθρωπος ἀλλάζειν is in contradiction with ch.4, 443a21 sqq. where it is denied that θυμίζει is of the nature of ἐνθυμησάς.

These considerations have led Alexander and most interpreters to maintain that here Aristotle is not putting forward his own theory (οὐ γὰρ ἦν ἐνθυμησάς αὐτῷ λόγον, Alex. 38 1.14) but merely discussing the consequences and the detailed working out of the doctrine suggested by the earlier philosophers — namely the ascription of each sense organ to a separate element.
On this interpretation the reading of the majority of the codices in 1.17 above, which Biehl adopts is particularly welcome. EM & Y read merely in 1.17 above.

Thus it is contended that Aristotle's adoption of the correspondence of each sense organ to a separate element is merely hypothetical. Nevertheless it is strange that if this is so, Aristotle should go on to work out the connection between smell and fire by the aid of his own technical terms and connect it with his own theory of the excessive coldness of the brain. It almost looks as though the doctrine were one which had attractions for Aristotle and which was left as an unexpunged suggestion even after the possibility of reconciling it with the rest of his philosophy had been removed.

But, as it is stated, there are great difficulties to be overcome. The proof in 11.21-23 as Alexander recognizes, merely shows that the organ of smell is potentially of the nature of fire and is actually cold. It is not on all fours with the former two sense organs which are actually water and air respectively.

Hence Hayduck (Prog.Kön. Gym. zu Meldorf 1878-7) proposes not to take those lines as a proof of the previous statement and to read . He also proposes to omit 1.24 -- 1.25 as being in hopeless disagreement with the other passage at 443a21 sqq. His explanation is that Aristotle, beginning
Cf. De An. ch. 6, 418al5;, III ch. 3, 428bl3, 25, where he qualifies the statement that θυτήρ άνάγκης is true, by the expression ἵ匪...ἢρ κέντην λεγομένων. Apparently he did not know of colour blindness.

οὗτος cannot mean another set of people as Simon and St Hilaire think. It is part of the same doctrine as the preceding one to reduce the ἴον to the ηον. The error is (1) to assume that all sensation takes place by means of contact; (2) not to discriminate universal qualities of objects from the purely tactual, i.e. to treat them all as the data of a single sense; (3) to reduce all the sense qualities to these quasi-tactual determinations.

Cf. Theophrastus de Sensu, 65; ένομιν έξον τοις ἱπατοις οὐκ ακόμα ἐνομισμένοι...τοῦ τοποῦ εἰδότης καὶ μινεύτων...τοῦ τοποῦ εἰδότης...τοῦ τοποῦ εἰδότης...οὐκ ἔχοντας οἰκονόμας, ὁμοίας μινεύσειν πετείον.

Angularity was a characteristic of the atoms which caused acid and harsh tastes, roundness of those that caused souring; but their size and their difference of impact on the body together with the heat supposed to be thus caused (vid. p. loe.) played a part also.

For the Democritean theory of colour cf. Theophrastus, 73 & 80. The behaviour of the atoms relative to the πόσιν (cf. above on Empedocles, chapter 2, 437bl1) also was a determinant, as well
as the density of the atmosphere, according to Democritus.

Alexander says that the preference is given to sight rather than touch because the latter does not perceive ἐνδοργά (distance outward) and ἀτμός (a multitude of units). But surely the clause ἐν γόντι οὐ. etc. contains the reason. The illative force of γόντι is continually backwards. The clause ἐν γόντι οὐ. cannot, of course, be a consequence of τί, χρήσαι ἀτμός γόσσας μακροκόκα. It must be the ground for it. Hence the construction is loose; after ἀλήθεια should follow ὑπὸ γόντι without ἀλήθεια and the ἐν γόντι οὐ. clause should succeed. But that would make the argument too long and lumbering. Hence the ἐν γόντι clause is brought up and has the additional function of confirming the ἐν γόντι ἀλήθεια οὐ. clause. It is clear that if it confirm the ἐν γόντι clause, it will, whether intended or not, support the previous one. Aristotle argues 'if it is the function of touch to discriminate the χώρα, and this we would infer from the atomist theory that taste discriminates the most minute spatial difference -- τὸ ῥηχόν καὶ ἀτμόν = in particles imperceptible to the other senses, then it must in addition to perceiving the other χώρα be the best judge of figure.

But if the claim of taste to perceive best the χώρα rest on the fineness of its discrimination (falsely asserted), surely the real delicacy of the sense of sight is the cause of its justifiable claim.
The superiority of the sense of sight is as a rule assigned to its intellectual character: cf. ch. i, 437a, Metaph. I ch. 1, 980b25, De An. 429a3, 435b21. In the Problems 886b35 we read that sight is ἑκάστρον than hearing, which comes to much the same thing as ἴκατον. It is not said that touch generally is the most delicate of the senses; it is only contended that relatively to the senses of the other animals it is most delicate in man.

It looks, of course, strange to assign the discernment of the common sensibles to one sense when they are said to be common. Aristotle no doubt means their accurate discrimination. Simple experience would show that this is best obtained by sight.

Cf. De An. II ch. 11 and below ch. 6, 446a24 sqq.

Surely an account of proportionate elements in figure could be given analogous to the theory of proportionate numbers which he accepts.

Aristotle's treatise is not extant. Two by Theophrastus survive, De Causis Plantarum and Historia Plantarum.
DE SENSU

COMMENTARY: - CHAPTER V.
Commentary III.

(This chapter begins the treatment of the objects of the special senses. It treats of colour.)


In De An. I ch. 1, 402b67 Aristotle talks about the function (ἡγον) of the sense. The function of the sense is to perceive, that of the object to cause perception; but as we shall see (c. note 3), when functioning, sense and its object are qualitatively identical.

This practically repeats the sense of ἡγον. ἡγον contains more explicitly the notion of the realisation of an end than ἡγον but the two are often almost identical and tend to replace each other in our texts e.g. in De Mem. ch. I, 449b19.

is the essential nature of a thing as revealed in its definition (without going on to state its additional properties). Aristotle is now to discuss what each object of sense is in its own objective nature apart from its action on the sense-organs.

Similarly, De An. II ch. 5,417a20, we learn that, in the act of sensation, object and sensorium are alike. Whatever is said in this connection of the sensorium holds of the sense-faculty and as we have seen Aristotle often uses the name of the faculty interchangeably for that belonging to the organ. His theory shows in this respect what we might call a thorough-going psycho-physical parallelism.

It is by his distinction between the actual and the potential object of sense that Aristotle attempts to explain the problem about the independent existence of external objects of sense. Considered ὡς ἀληθεύουσαν or as ἀποθέωσις (op. Metaph. III ch. 5,1010b30) they have an independent existence, ἐν ἀληθεύουσαν not. Apart from perception also the sense also is a ἀποθέωσις merely and as potentialities sense and its object are different and have different names - χωνίς and γνώσις, ψυχος and ὄντις, χωνίς and ὅντις. But the ἀναφορά of each is one and the same e.g. ψυχος and ἀναφορά are one and the same.

It is, however, impossible for Aristotle to maintain this attitude to external reality consistently. If the sense is
is that which is receptive of the ἀναπτύξεως of things, how can it be said to receive that which prior to this reception had no existence. It is not sufficient to say that its ἐν οὐσίᾳ existed; if we strip the external world of all ἀναπτύξεως, nothing is left but the ἀφήνεται and this, being perfectly undifferentiated, cannot account for the difference of the ἀναπτύξεως which we apprehend at different times. Aristotle is forced to think of the ἀναπτύξεως as existing antecedently to the perception of it and consequently we find in De An. II ch. 5, 418a3: τὸ ἀναπτυξόμενον ἀναπτυξωμένον ὁμοίως ἀποκρίνεται. Thus the object apart from perception which is said (in Metaph. loc. cit.) to cause the perception and is yet called a συνομίλουν cannot be regarded as a mere συνομίλουν, for to exist ἀναπτυξωμένον is to have ἀναπτύξεως (cp. Metaph. IX ch. 8, 1050b2 and Bonitz ad. 1043a18, cp. also Ind. p. 219a25). According both to ancient and modern physical atomism this συνομίλουν which is yet something actual and not mere ὁμοίως would be described in terms of spatial configuration, mass and motion—the primary qualities from the atomistic point of view. This solution however could not be entertained by Aristotle, for whom the qualities relative to the special senses were as primary determinations of physical reality as motion, figure and mass (cp. notes to chapter 6, 445b6-7). The atomistic solution
solution is only a makeshift, but we are left with a bad contradiction in the Aristotelian theory.

For Aristotle's theory of \( \text{ἐνίσχυσις} \) cf. Introduction. At first sight it seems strange to define light as the colour of the transparent medium, especially as he goes on (in 439b10 below) to define colour as the limit of the transparent element in bodies. But that which renders bodies visible is colour and, though an object must have a definite boundary or surface for this colour to be detected, still we are bound to assume that throughout, so far as it is a coloured thing, its nature is the same (439a3$ below). This quality on which its colour depends and which transpierces it through and through is light (φως) which is, however, but the activity of proper function of that property \( \text{ἐνίσχυσις} \) which permeates all bodies to a greater or less degree. Cf. De An. II, ch. 7, 418b9: \( φως \) ἐνίσχυσις ὁ πάσης ἐν φύσει, τὸς \( \text{ἐνίσχυσις} \) ἐν \( \text{ἐνίσχυσις} \) καὶ \( \text{ἐνίσχυσις} \) τοῦ \( \text{ἐνίσχυσις} \) φως ὁ πάσης.
Thus though φῶς is not χρώμα in the sense in which that is the περιαρχή of the transparent element in bodies, still it is the colour principle which transfuses all substances.

By ἀντὶ τῆς θεᾶς, Aristotle means, not 'casually,' but 'indirectly,' i.e. subject to some condition being fulfilled, not in its own nature without further determination. Relatively to the thing which has a certain attribute only upon the supervention of some condition that attribute is contingent, and it seems to be with this in mind that Aristotle identifies the contingent and the conditioned in the proof of the antithesis in the fourth antinomy. But, from another point of view, when we take into account the dependence of this attribute upon its conditions it is seen to be necessary.

καραθανάτικα in Aristotle is by no means equivalent merely to 'due to chance' but in its general sense is used simply as opposed to τὸ γέγονεν, due not to the essence of the thing to which it belongs but to some external condition.

Cf. De An. II ch. 7, 418b12 quoted above in note 6 and again 419a24: τὸ γὰρ διαφέρειν ἐκ τοῦ τούτου (τοῦ ἀντίτη), γενὲς διαφέρειν. It is fire then or anything of the nature of fire, the sun or the celestial ether (τὸ ἀυριανὸν), which raises the transparent medium from a state of mere potentiality in which it is χρώμα — colourless and invisible.
invisible (418b28) to state in which colour is actually visible. The fire evidently makes it actually transparent and this state of actual transparency, ἀνακαίνησις, is light. We cannot say with Hammond that 'light is that which converts the potentially diaphanous into the actually diaphanous.' It is fire which performs this function.

(Cp. De An. 418b16 and 20) seems here to be reminiscent of its technical Platonic signification—immanence, and thus we could define light as "the immanence of fire in the transparent medium."

But there are two points of view from which light can be regarded: (1) as a state of illumination cp. De An. III ch. 5, 430a15, and (2) as a stimulation proceeding from the coloured object to the eye (Cp. De An. II ch. 7, 418b1). According to this passage in the De An. it is implied that the state of illumination must be already realized for the stimulation to take effect.

But Aristotle, though frequently talking as though there were a stimulation proceeding from object to eye and as though this were light, yet in chapter 6 below turns round and says that light is not a stimulation at all. According to the interpretation of that chapter which I adopt, it is not a stimulation of the type ἀλλοκοτία even (εἰς qualitative change)
change). Yet light is still said to cause us to see 't[447a11]
and to be something communicated to us through a medium.
It appears as though Aristotle, influenced by the apparent in-
stantaneousness of light transference, were trying to combine
into one the notion of it (1) as a \( \gamma \xi \), the state of
illumination and (2) as an action passing from the object to
the eye, two notions which will not unite.

Compare chapter 6, 446a20--447a11.

\[ \text{Diaphane} \] is no proper name of air or any one

\[ \text{trans} \] semi transparent substance.

\[ \text{De An. II ch. 7, 418b8; } \text{De Gen. et Corr. I ch. 10, 327a21.} \]

\[ \text{De An. II ch. 7, 418b8; } \text{De Gen. et Corr. I ch. 10, 327a21.} \]

\[ \text{De An. II ch. 7, 418b8; } \text{De Gen. et Corr. I ch. 10, 327a21.} \]

\[ \text{De An. II ch. 7, 418b8; } \text{De Gen. et Corr. I ch. 10, 327a21.} \]

\[ \text{Diaphanes is found in all, not merely in certain other bodies.} \]

\[ \text{as the general colour principle permeates bodies} \]

\[ \text{through and through in so far as they share in the material} \]

\[ \text{condition of colour phenomena} \]

\[ \text{De An. II ch. 7, 418b8; } \text{De Gen. et Corr. I ch. 10, 327a21.} \]

\[ \text{De An. II ch. 7, 418b8; } \text{De Gen. et Corr. I ch. 10, 327a21.} \]

\[ \text{De An. II ch. 7, 418b8; } \text{De Gen. et Corr. I ch. 10, 327a21.} \]

\[ \text{De An. II ch. 7, 418b8; } \text{De Gen. et Corr. I ch. 10, 327a21.} \]

\[ \text{Plut. Epit. Mem. I, 15; Stobaei Eclog I, 15 quoted} \]

\[ \text{by Diels Dox. Gr. p. 313.} \]
The point is that colour is not the boundary or surface of the body but, as appears in 439b1\(^2\) below, of the transparent element in the body.

We may supply \(\nu\nu\nu\nu\nu\) after \(\nu\nu\nu\nu\nu\), not necessarily Aristotle does not actually say that colour, in the sense of definite tint, pervades the body through and through. That resides in the surfaces. But the colour principle which is made definite only when the body has a definite surface, must pervade the body, in every part in so far as it is \(\nu\nu\nu\nu\nu\). This colour-principle can be nothing else than \(\nu\nu\nu\nu\nu\) and its opposite \(\nu\nu\nu\nu\nu\).

Most of the commentators, however, will have it that here Aristotle is distinguishing bodies which are coloured 'externally' e.g. air and water, which have no proper colour of their own, and those coloured 'internally' e.g. with a proper colour of their own, opaque bodies, and that he here declares that it is an identical principle in each class that makes them receptive of colour. The difference between the two classes is that the former having no definite surface, has no definite limit of the \(\nu\nu\nu\nu\nu\) in them and it is a definite boundary that gives definite colour. But it is solely the want of definiteness in their limits which causes the indeterminateness of the colour. Since they shew colour of some kind, they must have the constitution which renders colour
colour possible. This is their transparency, which we must hence ascribe to opaque bodies also.

If we accept this theory the translation will run as follows-

"We must however, believe that the type of construction which internally and of its own nature takes on colour is the same as that which receives its colour from without. Now air and water show colour, for the gleam they have betrays tint."

The advantage of this interpretation is that it does not make Aristotle say that the colour pervades the whole of an opaque object, for this, unless we explain the difficulty by the distinction between definite and indefinite colour as above, seems to conflict with his statement that colour resides on the surface.

Cf. also *Top V* ch. 3, 138a15. Simon would translate "appear to be coloured" as though they really were not. But, though colour were held to pervade pellucid substances which have no definite surface, that would not entail as a consequence that it permeated opaque bodies as well—which is the conclusion against which Simon wishes to fight.

Thomas and Simon translate this by 'aurora,' on what grounds it is difficult to discover. Perhaps it means the ray e.g. of the sun falling upon these bodies.

Alexander says that Aristotle here means to indicate
indicate solids as though they are more properly than air and water. But the distinction should properly be between pellucid and opaque bodies as in De An. II. ch. 7, 418a7 noticed that many were transparent. Probably leaves this latter class out of account. (Cf. ch. 5445a16 and notes beneath 439b17) The argument certainly requires here to mean definitely bounded or solid bodies. The omission of the class of transparent solids from consideration is simply a sign of the inadequacy of the theory.

This is the definition, the of χρωματικον per se and, in stating this, the De Sensu makes an advance on the De Anima which defined it merely in reference to the organ of sight as καταλεξει τοις χρωματικοις θεραπευσαι.

These are the 'corpora terminata' of the commentators which have a colour of their own and χρωματος. Many interpreters, however, disjoining from θεραπευσαι and uniting it with δοσολογιον, find themselves in a difficulty and identify those referred to by with θεραπευσαι! (Cf. 440a15).
constantly means to break up a genius into species or to discriminate species from each other. But, as Aristotle does not begin here by a classification of the 'intermediate' colours e.g. those over and above black and white, we must interpret ἔρημος ἢ σίδονιος as meaning merely 'after recognising the distinction' between the other colours and black and white. This is to take σίδονιος in its vaguest sense. It would be much better to read ἔρημος instead of ἔρημος. The phrase then becomes a common one as given by Aristotle in its wonted sense. Cf. Politics IV. ch. 10, 1295a8; ὑπάρχειν σίδονιος καὶ ἢ λευκών ἢ μαύρων ἢ σίδονιών etc.

It is true that owing to the form of the words σίδονιος we seem till to be and we are not committed to the promise of a preliminary classification of the species of colour which is not fulfilled.

The full list of the colours appears only in ch. 4, 442a sqq., and it may be argued that an omission may be overlooked. But Aristotle's theory is that the chromatic tones are obtained by a mixture of substances which already have the basal tones of white and black. The chromatic tones are intermediate between black and white, which appear to be regarded as lying at the two extremities of a continuum in the centre of which the other tints are found. Aristotle does not however attempt to assign its exact place in the scale to any one colour or state its affinity to either of the extremes. Each distinct colour depends upon the proportion in which the black and white, out of which it is formed, are mingled. But he does
does not venture to state the proportion which obtains in any one case. Cf. also Metaph. ch. 2, 1053 b 30.

The doctrine of composition or mixture is referred to again directly: cf. especially 440b1β.

A λόγος appears to be the relation which prevails between two numbers when a division of the greater by the less yields a rational quotient. Numbers that are not so related are said to be ὁμορρηματικοὶ λόγοι (Cf. 440a1β). λόγος then is not ratio in general but commensurate ratio. The incommensurate is the irrational - ἄλογον. Thus we cannot translate ὁμοσθαλέως, ὁμοθεατάω, ὀρθωτάω etc. by disproportionate, for that applies to a ratio when one of the terms is excessive, not to one where the quantities are incommensurate.

most easily reckoned, from λογίζω to reckon, contrasted with ἔρωτινόμε ὁμοπαθής ὁμομοιοῦσας etc. - Metaph XIV. ch. 1, 1092b 28

The reason is that the proportions where the division of one term by the other takes very little trouble are few in number. The Writer of the Problems in ch. 38, 920a27 avers that the most agreeable harmony is that of the octave, and the reason for this is that the terms are whole numbers 2 and 1, or 4 and 2, and the division yields no remainder. The next harmony in order of
of pleasantness is that of the fifth where the two notes are
related as 1 to $\frac{1}{3}$, and so on.

The proportion of elements may be uniform in every part
e.g. the combination is according to a regularly recurring
pattern, e.g. 3:1, 3:1, 3:1 etc., not 2:1, 4:1, 3:1 etc.,

Some commentators (e.g. Simon, Hammond) identify the $\zeta$ with the $\epsilon \theta \ Providence$; but, unless we read $\tau \pi \alpha$ before $\delta \epsilon \theta \omega$, in 1. 6 as Biehl suggests, this is im-
possible, for Aristotle has immediately before said that
both the $\tau \mu \eta \nu \epsilon \mu \alpha \omega$ and $\tau \mu \eta \nu \eta \mu \alpha \omega$ are $\epsilon \theta \tau \mu \eta \nu \epsilon \mu \alpha \omega$.

The impurity referred to must be want of saturation
e.g. want of colour, if it is caused by absence of proportion
between the elements and all colour involves a proportion be-
tween its components. But one may ask why does impurity seem
to occur only in the second class of colours—those due to
an irregular structure? The reason I would suggest is this—
Aristotle identifies the most pleasing colours with those
which depend upon a regularly recurring structure in the com-
bination of their elements. Relatively to these, other colours
are not so pleasing and hence not regarded as so pure,

if purity is a mark of excellence (as frequently in
Plato); but the colours of this second class contain in
themselves differences in purity. Their impurity we may
assign to a total want of commensurate proportion in their
their composition. Unless some such explanation as this is adopted we shall have to make ἀνόητος refer to both classes of colours; but this is to strain the Greek. Literally 'the shining of one colour through another.'

This second theory is, like the first, also rejected by Aristotle.

The reason for this is discussed in Meterology III. It is difficult to see what connection this paragraph has either with what precedes or what follows. It refers back to the theories of Empedocles and Democritus mentioned in chapter II.

Why was it necessary for the atomists to identify all sensation with touch? Surely because differences in sensation corresponded to differences in the tangible properties of things. Cf. chapter 4, 442β and 10: cf. 440a7 and 440b4.
stimulation will explain perception better than a theory according to which the actual particles of the distant objects impinge upon the sense organs. On the other reading (L.S.W. Alex. vet. Tr.) there is no argument.

Thomas and Alexander try to connect this with what follows, but one goes on to talk of impinging on the sense organ, not effluxes.

The discussion on the possibility of the existence of imperceptible quanta is contained in chapter 6,445b2. Aristotle argues at length against there being any such thing as an imperceptible time in ch. 7 below 448a19. The two moments of time in which the two sensations arrive would, on this hypothesis, be indistinguishable as two distinct moments, but would appear as one single moment which had no parts. Now, as time is a continuous, each part of it must be capable of resolution into other parts. Hence the supposition of an atomic time is absurd; no part is imperceptible. Cf. notes to chapter 7, and Intro. De. 13.

The surface colour sets in motion the medium and so affects the sense (Cf. De An. II ch. 7,418a31; when not set in motion. The surface colour
of the surface colour would be different if it itself were acted on by an underlying tint.

\[ \text{The common reading is } \eta \alpha \alpha \beta \gamma \tau \alpha \delta \varepsilon \eta \chi \rho \omega \chi \alpha \nu \varepsilon \alpha \gamma \iota \, \text{Alexander interprets this to mean that Aristotle admits that the superposition theory is one which accounts for one way of mingling colours. But it is strange that after rejecting the juxtaposition theory of mixture Aristotle should say } \eta \alpha \alpha \beta \gamma \tau \alpha \delta \varepsilon \eta \chi \rho \omega \chi \alpha \nu \varepsilon \alpha \gamma \iota \text{ — 'then too is a theory which accounts for the mixture of colours.' Simon, thinking that the difficulty about } \eta \alpha \alpha \beta \gamma \tau \alpha \delta \varepsilon \eta \chi \rho \omega \chi \alpha \nu \varepsilon \alpha \gamma \iota \text{ still applies to the superposition theory, suggests the punctuation and accentuation I have adopted and contends that here Aristotle is calling in question this second theory as well. If this is not so, he says, Aristotle must be convicted of carelessness, for he nowhere else points out the defect in the theory.}

\[ \text{Without accepting his argument (which seems to be unfounded) I think we can still accept his interpretation of the intention of the clause. Aristotle calls the } \eta \alpha \alpha \beta \gamma \tau \alpha \delta \varepsilon \eta \chi \rho \omega \chi \alpha \nu \varepsilon \alpha \gamma \iota \text{ theory in question because it really is not an account of the } \eta \alpha \alpha \beta \gamma \tau \alpha \delta \varepsilon \eta \chi \rho \omega \chi \alpha \nu \varepsilon \alpha \gamma \iota \text{ of the colours. The two colours are simply juxtaposed in} \]
in this case one on the top of the other instead of in minute parts side by side. This is merely a case of the \( \sigma \upsilon \beta \rho \iota \varsigma \) of the colours not of their true mixture. We may anticipate the doctrine which Aristotle refers to further down and which is expounded in De Gen. et Corr. I. ch. 10, 327b32. There are two spurious kinds of mixture, \( \mu \iota \hat{\varepsilon} \) merely \( \nu \rho \iota \theta \iota \mu \iota \gamma \) of the substances appear to sense to be mixed but are really not so. (1) First there is the juxtaposition of things that can be resolved into ultimate individual parts, e.g. grains of corn, etc. (\( \gamma \iota \varepsilon \varsigma \rho \iota \varsigma \varsigma \iota \kappa \iota \varsigma \) below); \( \delta \tau \alpha \nu \) \( \mu \iota \hat{\varepsilon} \) merely \( \chi \rho \iota \tau \alpha \nu \) of distant objects, which vanishes when we approach them. This is the kind of \( \mu \iota \hat{\varepsilon} \) referred to in 440b4 below which explains the \( \chi \rho \iota \tau \alpha \nu \) (440b4) of distant objects, which vanishes when we approach them. This is a case in which \( \sigma \upsilon \beta \rho \iota \varsigma \) and \( \mu \iota \hat{\varepsilon} \) are identical in the sense that \( \sigma \upsilon \beta \rho \iota \varsigma \) is the only \( \mu \iota \hat{\varepsilon} \) of which the objects are capable. (2) Secondly, when there is no limit to the minuteness of the parts, (e.g. in liquids) the mere juxtaposition of minute parts is merely apparent mixture (\( \nu \rho \iota \theta \iota \mu \iota \gamma \) of \( \mu \iota \hat{\varepsilon} \)). To more accurate vision the appearance of mixture ceases to exist. In true mixture (which seems to be analogous to what we should call chemical combination, cf. Mr. Joachim in Journal of Philol. XXIX.) every part of
of the compound produced by the union of two substances must be homogeneous with the whole. Each part of the one must completely interpenetrate the other, or rather in union the two substances must completely change their nature so as to be incapable of being found in actuality in any part however minute. (This implies a still closer union than that of chemical combination, according to which the atoms are juxtaposed in the molecule, which is not homogeneous in every part.)

Now superposition of colours one over the other does not imply their mixture in the true sense. This must mean 'on the former', i.e. the juxtaposition, theory not in their way' (referring to the account) as Hammond has it.

The argument is, that the one colour shines through the other and that at close quarters the duality of the tint can possibly be detected, though at a distance the two produce a certain 'common' tint. But, says Aristotle, this general indeterminate tint can equally well be produced by the juxtaposition of parts of different colour provided they are minute enough or we are far enough away. But it is not this neutral tint which varies with the accuracy of the vision.
vision, that has to be accounted for. Composite colours are on a different footing and neither of the two theories has succeeded in accounting for them cp. 440b15-18 beneath.

There is no need for substituting $\frac{3}{2}$ for $\frac{1}{2}$ with

\[ \text{vision, that has to be accounted for. Composite colours are on a different footing and neither of the two theories has succeeded in accounting for them cp. 440b15-18 beneath.} \]

\[ \text{There is no need for substituting } \frac{3}{2} \text{ for } \frac{1}{2} \text{ with} \]

The fact that no magnitude is invisible is the reason why we can account for the juxtaposition of minute parts differently coloured producing a common tint. If the parts were really invisible they would not produce any colour sensation either alone or together.

Compare chapter 6 below and notes.

The theory of juxtaposition is then rejected in so far as it implies the existence of invisible magnitudes, and retained to explain the production of neutral tints relative to the phenomena of our vision, in so far as it is conceded that the parts do not produce no effect upon our sight. The parts as we shall see, are perceived $\gamma\gamma\gamma\gamma$ only in the whole $\eta\eta\eta\eta$; individually taken they are only $\eta\eta\eta\eta$ perceivable.

infinitely minute parts, but the smallest parts that can be treated as individuals. Many things on division do not present such parts, e.g. water and other continuous substances
substances are specially \( \psi \) and prove to mix.  

Cf. beneath l. 10. De Gen. et Corr. 328b3: \( \tau \alpha \\upsilon \gamma \alpha \lambda i\varepsilon \nu \tau \iota \omega \sigma \mu \alpha \lambda \iota \varepsilon \omega \nu \gamma \alpha \lambda \iota \nu \alpha \).

Probably only the passages referred to above.  
E.g. water. Cf. note \( \alpha \gamma \) above.

The modern atomic theory holds that there is a limit to the process of resolution and that that is found when the atom is reached. But there is a difficulty here, for the atom if anything occupying space must be divisible into smaller components.

This is the reason of the real constant colour of objects.

i.e. the mathematical development of all three is alike.

How Aristotle reconciles this with the undoubted continuous graduation between colour and colour will be discussed when we come to chapter 6.
DE SENSU

COMMENTARY: -- CHAPTER IV.
This is the only place where Aristotle mentions the omissions in the De Sensu. Hence Biehl conjectures \( \delta \varphi \gamma \) instead of \( \varphi \nu \gamma \), (as otherwise the absence of any other treatment of touch will be unnoticed). \( \varphi \nu \gamma \) is defined in De An. II ch.8, 420b2 as \( \sigma \mu \delta \mu \rho \iota \nu \rho \sigma \) \( \tau \iota \rho \o \rho \sigma \) and again in 420b5 as \( \psi \o \rho \sigma \) \( \tau \iota \iota \mu \nu \chi \)\( \nu \o \). It is significant sound uttered by a living creature (cf. above chapter 1, 437al1 and note).

\( \psi \o \rho \sigma \) , of which \( \varphi \nu \gamma \) is thus a species, is defined in De An. 420 Obl. as \( \alpha \iota \rho \o \sigma \nu \iota \nu \gamma \nu \sigma \) \( \tau \iota \rho \o \) :cf. below ch.6, 446b30: \( \delta \nu \iota \iota \psi \o \rho \sigma \) \( \tau \iota \iota \o \) \( \alpha \iota \rho \o \nu \sigma \nu \iota \nu \gamma \nu \sigma \). This movement of the air is of the nature of a rebound. The air rebounds when struck in the same way as smooth bodies rebound from a smooth surface (cf. De An 420a21).

\( \delta \nu \iota \iota \psi \o \chi \)\( \gamma \)\( \iota \) .

De An. II ch.8.

\( \delta \nu \iota \iota \) (cf. note to chapter 1, 436b4 above) may mean phenomenon or affection generally, though it is not phenomenon in the widest sense in which that term is employed by modern thought,
viz. as including concrete substances. \( \nu \acute{\text{a}}\theta \acute{\text{o}} \) is phenomenon in the sense in which that means an affection, event or attribute accruing to any concrete subject. Now \( \nu \acute{\text{a}}\theta \acute{\text{o}} \) is often used for a peculiarly psychical affection and so perhaps the subject to which, as \( \nu \acute{\text{a}}\theta \gamma \), smell and taste are relative is the perceiving soul. Hence it will be as subjective phenomena that they are almost identical. This seems to be borne out by a passage in the De An. II ch. 9, 321a31 sqq. --- \( \delta \acute{\text{i}} \acute{\text{a}} \acute{\text{v}} \acute{\text{d}} \acute{\text{a}} \acute{\text{n}} \) \( \sigma \acute{\text{e}} \acute{\text{p}} \acute{\text{e}} \acute{\text{d}} \acute{\text{e}} \) \( \acute{\text{d}} \acute{\text{e}} \acute{\text{t}} \acute{\text{s}} \acute{\text{t}} \acute{\text{o}} \acute{\text{t}} \acute{\text{b}} \) \( \acute{\text{c}} \acute{\text{h}} \acute{\text{m}} \acute{\text{o}} \acute{\text{v}} \acute{\text{e}} \) which \( \acute{\text{a}} \acute{\text{n}} \) \( \acute{\text{d}} \acute{\text{e}} \acute{\text{t}} \acute{\text{s}} \acute{\text{t}} \acute{\text{o}} \acute{\text{t}} \acute{\text{b}} \) \( \acute{\text{e}} \acute{\text{d}} \acute{\text{e}} \acute{\text{m}} \acute{\text{a}} \acute{\text{a}} \) \( \acute{\text{p}} \acute{\text{t}} \acute{\text{h}} \acute{\text{o}} \acute{\text{m}} \acute{\text{o}} \acute{\text{s}} \) \( \acute{\text{t}} \acute{\text{o}} \acute{\text{b}} \) \( \acute{\text{t}} \acute{\text{o}} \acute{\text{b}} \) \( \acute{\text{t}} \acute{\text{g}} \acute{\text{a}} \acute{\text{m}} \acute{\acute{\text{a}}} \) odours not being distinctly presented like flavours have borrowed their names from the latter owing to the resemblance of the actual experience in the two cases. This is to follow Alexander and render \( \tau \circ \gamma \acute{\text{m}} \acute{\text{a}} \acute{\text{r}} \acute{\text{o}} \) by 'the sensation'.

Cf. Rodier \( \acute{\text{D}} \acute{\text{e}} \acute{\text{A}} \acute{\text{R}} \). Vol. II pp. 109-11.

For the connection between taste and smell cf. also De An. II ch. 9, 421a14: \( \acute{\text{k}} \acute{\text{o}} \acute{\text{i}} \acute{\text{o}} \acute{\text{t}} \) \( \acute{\text{a}} \acute{\text{n}} \) \( \acute{\text{g}} \acute{\text{a}} \acute{\text{v}} \acute{\text{f}} \acute{\text{y}} \) \( \acute{\text{a}} \acute{\text{t}} \acute{\text{o}} \acute{\text{b}} \) \( \acute{\text{h}} \acute{\text{p}} \acute{\text{t}} \acute{\text{o}} \acute{\text{m}} \acute{\text{e}} \) \( \acute{\text{r}} \acute{\text{t}} \acute{\text{h}} \acute{\text{o}} \acute{\text{t}} \acute{\text{b}} \) \( \acute{\text{t}} \acute{\text{o}} \acute{\text{t}} \acute{\text{o}} \acute{\text{b}} \) \( \acute{\text{a}} \acute{\text{n}} \) \( \acute{\text{a}} \acute{\text{b}} \acute{\text{e}} \acute{\text{o}} \) \( \acute{\text{a}} \acute{\text{n}} \) \( \acute{\text{a}} \acute{\text{b}} \acute{\text{e}} \acute{\text{o}} \) \( \acute{\text{g}} \acute{\text{a}} \acute{\text{v}} \acute{\text{f}} \acute{\text{y}} \) \( \acute{\text{a}} \acute{\text{t}} \acute{\text{o}} \acute{\text{b}} \) \( \acute{\text{h}} \acute{\text{p}} \acute{\text{t}} \acute{\text{o}} \acute{\text{m}} \acute{\text{e}} \) and 421a26 \( \acute{\text{a}} \acute{\text{b}} \acute{\text{e}} \acute{\text{o}} \) \( \acute{\text{a}} \acute{\text{n}} \) \( \acute{\text{b}} \acute{\text{e}} \acute{\text{o}} \) \( \acute{\text{g}} \acute{\text{a}} \acute{\text{v}} \acute{\text{f}} \acute{\text{y}} \) \( \acute{\text{a}} \acute{\text{t}} \acute{\text{o}} \acute{\text{b}} \) \( \acute{\text{h}} \acute{\text{p}} \acute{\text{o}} \acute{\text{m}} \acute{\text{e}} \) \( \acute{\text{r}} \acute{\text{t}} \acute{\text{h}} \acute{\text{o}} \acute{\text{t}} \acute{\text{b}} \) \( \acute{\text{t}} \acute{\text{o}} \acute{\text{o}} \acute{\text{b}} \) \( \acute{\text{a}} \acute{\text{n}} \).

Alexander, Thomas and Simon, however, seem to interpret \( \nu \acute{\text{a}}\theta \acute{\text{o}} \) not as subjective affection but as objective quality. It is true that this subjective similarity rests upon an objective foundation. Alexander explains the identity by means of the passage in ch. 5 beneath, 442b21 q.v. Odour is produced by the further modification of a substance in which flavour has been already developed; \( \tau \circ \gamma \acute{\text{p}} \acute{\text{t}} \acute{\text{o}} \acute{\text{b}} \) is needed as a
basis for both and the effect produced in the first case by 
\( \gamma \varepsilon \rho \omicron \) is obtained by dissolution (\( \nu m o u \pi v a \)), the same 
process as that by which \( \tau \delta \iota \gamma \nu \omicron \omicron \omicron \omicron \omicron \) produces odour both 
De Sens. pp.66.67, 88-91 (\( \Phi \)). But the similarity has an ob-
jective foundation it does not cease to be a subjective phenomenon 
and it is as such that we should infer \( \tau \delta \iota \theta \omicron \omicron \omicron \omicron \omicron \) to be 
understood in antithesis to \( \omega \eta \nu \varepsilon \omicron \omicron \omicron \omicron \omicron \) \( \omicron \omicron \omicron \omicron \omicron \) which must be 
interpreted as 'non in eisdem subjectis' as Simon renders it 
following Thomas and Alexander. The vehicle of taste is water, 
that of smell is air and water alike or rather that common 
nature which both have, named by Theophrastus \( \tau \delta \iota \omicron \omicron \omicron \omicron \omicron \) 
(cf. chapter 5 beneath). St Hilaire and Hammond think that 
\( \omega \eta \nu \varepsilon \omicron \omicron \omicron \omicron \omicron \) \( \omicron \omicron \omicron \omicron \omicron \) refers to the diversity of the organs of 
the two senses. But \( \chi \nu \omicron \omicron \omicron \) and \( \delta \varepsilon \omicron \omicron \omicron \omicron \omicron \) could hardly be said to 
exist \( \omicron

This is the explanation of a difference in function by a dif-
ference in faculty, a method much derided in modern psychology.
But when one remembers that the 'faculty' is a determinate 
structure or disposition of the sense-organ, and was so to 
Aristotle, the explanation, though not a genetic one, is seen 
to be adequate to the purpose in hand. Cf. Introduction.
The emphasis is probably on the former in the famous passage in De An. I ch.1, 402a2, where Psychology is said to rank among the first of the sciences in point of ἀπαθεία. For the want of definiteness in our sense of small cf. De An. II ch.9, 421a9 sqq.: τινας τε τελετήν οὖν ἡμέραν ἀνθρώπου, ἕτερα ἀκίνητα πολλάκις τοῦτον. The reason is ὅτι τὸ δοκεῖν ὑπὸ πάντων ἐστιν ὀψιαν τοῦ ἀνθρώπου τῆς τὴν τρίτην ὡς ἄρτι τοιοῦτον. That is to say, where feeling-tone enters largely into the sensation there can be no exactitude in our perception, as modern Psychology teaches is in most cases true. But the final reason for both phenomena is the indefiniteness of the structure of the sense-organ (ἑα πάντα ἐνυποστῆται τοῦ ἀνθρώπου). Compare De An. II ch.9, 421a21: ἐν τῇ πρώτῃ ἀρχῇ πολλοὶ τῶν ἀλαλοποιών διαφέροντως ἀπ' αὐτῶν.

The reason for the superiority of touch in man is the greater softness of his flesh. Softness of flesh is an index not only of the tactual discriminativeness but of intellectual endowment. Cf. De An. loc. cit. 421a26 and Part. An. II ch.16, 660a11: ἀλλὰ πάντα τὸ τῆς θαλάσσης ἐπιτήδειον τῶν ἄλλων ἀνθρώπων ὀφθαλμοῦ. ἐπειδὴ ὑπάρχει τῶν μὲν ζώων τὴν στις ἀποστιμῶν ἀρετὴν ἀλλ᾽ ἐκείνην ἀκαθαρσίαν.

Aristotle's ideal of ἀρετὴ would on this showing be the skilful surgeon or mechanician. But we must remember that τὸ ἑτεροτάμον ἔστω ἀρετὴκινήτω ψυχῆς were among χάριται and probably by softness of flesh he means sensitiveness to these influences as much as anything else and hence merely delicacy of constitution in general.
At least so Alexander understands him. Would this be an argument for the mental superiority of the female sex? If so, Aristotle is forgetting himself.

and hence is more than smell. Cf. De An. II ch.9, 421a18-20 also ch.10 422a8-11. The chief arguments to prove the identity of taste and touch are (1) that by taste we are sensible of the presence of food which is an object of tactual sensation (414b7 sqq. 434b18-19), (2) that is the vehicle of taste, and it is (422a11). But (3) Aristotle finds strong confirmation for his theory in the fact that neither requires an external medium for their operation as the others do (422a8 sqq.). The flavoured substance impinges directly upon the sense-organ -- the tongue. Again (4) the division into right and left parts, which is not to be detected in the case of the organ of touch, is almost unnoticeable in the tongue (656b33 sqq.) and (5) the softness of the human tongue causes its greater sensitiveness just as softness of the flesh generally causes delicacy of touch (660a17-21 cf. De An. II ch.9, 421a20 sqq. and last note suf. fin.) For this doctrine compare also the passage beneath 441b2 sqq.
Gf. Zeller, Presocratic Phil. (Eng. Trans.) II p.166, Burnet, Early Greek Phil., p.231, Empedocles §312 (Stein). But cf. Theophrastus De Sens. 7 (Dodd 500, R.P. 1776,) who says that Empedocles did not push his investigation of taste or touch further than to say that in them too sensation was caused by particles fitting into the pores of the sense-organ.

The meaning of παροντιμός is best illustrated by a passage in the De Gener. Animal IV ch.3, 769a26 sqq., where he explains a theory that the various qualities of animals all lie commingled in the semen which forms as it were a παροντιμός of all characteristics, by comparing the γόνος to a liquid in which many different flavours are dissolved. παροντιμός then evidently means a substance in which the germs of all things lie.

Tredelenburg (De An. p.214) thinks that the word is a Democritean term. It certainly is employed by Aristotle three times (Physics III ch.4, 203a21, De Coelo III ch.4, 303a16 and De An. I ch.2, 404a4) to describe the mixture of atoms out of which, Democritus asserted, the world was fashioned. It is however once employed with reference to the theory of Anaxagoras (cf. De Gen. et Corr. I ch.1, 314a18 sqq.,) according to which bone and flesh were the simple elements out of which air, fire, earth and water were constructed: οἵ ὡς (κυβερνητής Ἀναξαγόρας) ῥάττε μὲν ἔμπνευσαν ζωὴς στοιχεῖα (λέγοντες), γὰρ οὐκ ἔναι μόνον σῶμα καὶ ἄγγελον παροντιμόν.
flesh and bone -- constitute that in which the latter all lie in germ.' Cf. Zeller, Presocratic Phil. II p.332, Burnet, Early Greek Phil. p.290 and note. It is quite likely that the term originated with Anaxagoras whose interests lay more in biological phenomena than those of his predecessors, but there seems to be no doubt that Democritus, however inconsistent it may have been with the general drift of his mechanical philosophy, also employed it.

This special theory that water is ὄρυγμα μεταμορφωμένων ὀργάων -- must be assigned to Democritus at least in the first form in which it is stated. (See next note.) As Alexander (p.68) points out we must assume a spatial difference to be responsible for the difference of flavour in different parts, and this, says Alexander, stamps the theory as Democritean.

The first theory differs from the second in that it supposes that flavours exist in water οὐργά -- in actual fact though imperceptible to sense, while the second gives them only potential existence; according to it they exist in water only in germ. This second theory is then contrasted with a third, according to which water is qualitatively identical in every part and any flavour can be derived from any portion of it, the differences which we actually find being caused μεταμορφωμένων ὀργάων -- by the different amounts of heat to which different portions of water are exposed. Simon actually conjectures that this third theory must be assigned to Anaxagoras
owing to its compliance with his doctrine of πάρον ἐν πάσιν. It still comprises the doctrine that water is ὄρον πανορμήσιαν in which tastes lie in germ but assigns their actual differentiation out to an active external cause. (Note that Aristotle says τὸ μελόν not σκεύεσμα. All theories may have recognised the efficiency of heat in producing taste but not in producing differences in flavour.)

This passage causes difficulty, for at first sight it seems strange that, if Aristotle meant that the fruits were plucked, he should not have said χρήσων instead of χρησιίαν. Hence Thurot and Susenmihl (Philol. 1885) propose to read χρησιίαν. But though the word properly means σκεύεσμα χρήσια, yet there are passages in which it can only mean the fruit as a whole e.g. Meteor. IV ch.3, 380a11 and Problems 25, 925b30, and cf. below 441a30. Alexander suggests that it is possible to use χρησιίαν in its literal sense and that in the case, the point will be that fruits change in taste independently of the removal or permanence of the husk or peel.

But this is hardly the meaning required. The other interpretation is possible and the point is that, as the connection with the root has been severed, the water drawn up by the plant through its roots (τὸ ἔνεμον ᾤδοῖα) does not give the change in taste.

10. χρησιίαν is the MS. reading, but it should mean on the whole,
'ignited'; cf. De Part. Animal II ch. 2, 649b5, where υρος is distinguished from βαμάριν and identified with χλόα τολην. Where it does not mean actually to ignite, it at least denotes such intense heating as occurs in roasting or baking (cf. De Gen. Animal III ch. 2, 753b4, and Problems 927b39 sqq.). Now, here, in the case of the sun's action, no such intense degree of heating is involved. Hence I propose to read υροποιάριν which means 'reddened', and suggest that Aristotle is thinking of the reddening effect the sun produces on many fruits as it ripens them. He is here then referring to the ripening effect of the sun which actually makes fruits become sweet. (Mere cooking without adding a sweetening ingredient does not.) In the next clause he contrasts it with the effect produced by drying and withering which makes them bitter (cf. Problems 925b36: ἡμείαν παπαλάκαν παλαμομειρονάλ παλαματάλ γίνομαι). It is in the final clause --- 1.16, καὶ ψωμαίνοις κ.τ.λ., that he talks of the effect of cooking. The sense is the same whether we read υροποιάριν or υροποιάριν. The water is a material in which the germs of the flavours lie commingled.

Alexander, who reads διὰ τῆς ὑγείας τῆς, explains that many tastes arise out of the same water, as many different parts of the body, --- bones, flesh etc., are formed out of the same nourishment and again different trees are nourished by the same.
water; and thus similarly each part of the same tree, root
bark and fruit, has a characteristic flavour though feeding on
the same moisture. He is followed by Thomas who nevertheless
used the early Latin translation which gives the equivalent
of our reading. Both readings no doubt render such an inter-
pretation possible but ours rather suggests the translation I
have given. In that case the sense is simpler. There is no
parallel between water and food in general. Aristotle simply
says that different tastes originate are developed by plants
that live upon the same water; he may mean either the different
tastes found in bark and fruit or the different flavours of
different fruits. The latter is more probable since he has
just been talking of fruits. He means that the same water
can be supplied to different trees, yet you get different
flavours, which ought not to be the case if one definite flavour
resides in one definite portion of water as the second --- the
Democritean --- theory would make out. The Democritean theory
in its first form is thus refuted and Aristotle passes on to
the opinion of Anaxagoras.

and are correlations.

4 Δῶραμις in this line and again in the next, is practically
equivalent to ϕουσίς: cf. above ch.3, 439a22: καὶ δῶραμις ϕούσίς ἐστι
5 ἄρθρῳ πάντως. Cf. also De Mem. ch.2, 452a37 and note.

The argument is directed merely against the proposition that
water acted on by heat, without any other determinant, will
develop flavour. Water alone when heated does not thicken,
but all flavours reside in substances that show traces of
thickening to a greater or less degree. Hence water plus heat
are not alone the cause of flavours. That which causes the
thickening in fluids must be the cause. This is earth or
II ch.2, 330a4–5: καὶ τὸ ἑαυτό τὸ ἄρρητον ἑπτάκατος.

The whole of the above discussion is a good account of the
'dialectical' development of an Aristotelian argument.
Previous theories are dealt with in an order relative to the
amount they contribute to the final solution of the problem.
Though each is in turn set aside, some part of it remains un-
abrogated in the next, and the last to be discussed is that
which approaches most nearly to the true account of the matter.

It is not sufficient for the argument to say that flavours
thicken when heated, but that at all times they show traces of
density.

Cf. De An. II ch.4, 416a14 where ἀπὸ is likewise said to be
the cause of the growth of bodies. The ἀπὸ is ἀρκετά.

Some translators render ἀρκετά 'apparently', but with the
participle it should mean 'evidently'. The sense also requires
it for this, to Aristotle's mind is not an apparent fact merely,
but a real fact which furnishes the proof positive that κυμας is
dependent on τον ξυηφαντ. The previous proofs have been merely
negative and directed against the claims of other circumstances
to fill the position of cause.

This reasoning will support the reading Σο τον ηθως in
441b7 below.

Cf. Meteor. IV ch.7, 383b20, etc. The τον ηθως in 441b7 above
are Metrodorus and Anaxagorast, according to Alexander.

δε τον ηθως is the reading of MSS. L S U and evidently of the
ancient Latin translation. Alexander also interprets as though
this were the reading: δε τον ηθως ὅτι κυμας δε τοις ὑπὸ τον ηθως
κυμας δε τοις ὑπὸ τον χαμως, τουτεσταὶ τοις τοις χαμως, τοις
tαυτὶ της φυσικῆς μοι ὑπὸ τον ηθως τοίχους μάλλον.

the vet. tr. renders 'terra nascentibus' as though it actually
read δε τον ηθως. Whatever the reading Alexander's must be
the correct interpretation (cf. note A8). It is on account
of the savours being primarily in earth that they can enter
into plants. Aristotle does not say τον ηθως without being
able to produce reasons.

Aristotle is no doubt thinking in particular of the other
elementary qualities --- τον ξυηφαντ etc., but this statement is
with him an universal principle.

Cf. De Gen. et Corr. II ch.1 sqq. The fuller discussion
(13)

(ἔν ἂν ἐντόνε χρῆσθαι καὶ ἀμφίσβετον 329a27) referred to there seems to be lost, as all other references to the subject are more brief.

Up till this point the argument is clear. Aristotle is explaining what he has already proved as a fact. Earth in possessing the quality of dryness can act on ἄρα ἄμφος, since opposites modify each other. It is a case of explaining the qualities presented to the other senses by the interaction of the tactual properties of things. Cf. De An. II ch.5, 417a7, where he talks of the other ἀρχαί as the ἀλλήλων ἀλλάτικα of fire, earth, air and water. (Though he insists that in one way the former are prior to the latter cf. De Gen. et Corr. II ch.2, 329b14: ἐν' ὅτι ἡ ἀμφίσβετος ἄμφος ἄμφος ἄμφος.

The difficulty which now ensues is in connection with the function of ἄρα ἄμφος in helping to produce flavour.

The statement seems to conflict with that in De Gen. et Corr. II ch.2, 329b22: ἐν' ἂν μὴν ἐν ἀλλήλῳ καὶ παρὰ ἑαυτῷ ἀλληλοῦν, ἀλλ' ἀλληλοὺς καὶ μεταξάλλης ἐν ἀλληλοῦν. But probably there Aristotle is simply stating his doctrine in a rough provisional way. Really as ἀνέμεσα and hence οὔσα, the elements cannot be opposed to each other and act on each other. (So Alexander explains.) Cf. Categ. 3b24: ἐν' ἂν ἐντός ἐντός ἀλλήλῳ ἀλλήλοις σαρκί διέσχον ἀπαντήσεις ἐναί and it is ἐνάντια that act on each other; οὔσα is merely ἐνάντια ἐνάντιον. The upshot of the matter is, that it is not as substances, but as possessed of opposite qualities that the elements act on
each other. This sentence is then inserted as a caution, but how it furthers the main argument here is not apparent. Unless indeed we connect it with that preceding clause in which we find it stated that heat is the peculiar property of fire, dryness of earth. Liquidity ($\gamma\gamma\rho\nu$) will thus be the special characteristic of water, and the implication will be that the latter element will be acted on in a more pronounced way by earth, the element which has in an especial degree the attribute most opposed to its most characteristic quality. Fire possessing $\gamma\rho\nu$ in a less marked degree will act upon it also but not in the preeminent way in which $\gamma$ does.

When Aristotle says that $\theta\rho\nu$ is the $\upsilon\phi\nu$ of $\pi\nu\phi$, this cannot be in the full sense of $\upsilon\phi\nu$ consistent with the rest of his doctrine, for $\theta\rho\nu$ is also shared by $\gamma$ and, as we have seen, $\eta\rho$ is also $\xi\gamma\rho\nu$. He must mean as Alexander explains, in conformity with De Gen. et Corr. IV ch.4, 382a3: $\iota\upsilon\varphi \alpha\kappa\tau\alpha\rho\iota\nu$ $\iota$ $\delta\iota\rho\nu\alpha\theta\alpha\tau\alpha\tau\alpha\tau\alpha$ $\xi\nu\rho\phi\nu$ $\mu\iota$ $\gamma$ $\nu$, $\delta\gamma\rho\nu$ and $\delta\iota\rho\nu$, i.e. that earth is the principal illustration of dryness and possesses dryness in a special degree, fire, heat and so on. Cf. Alex. De Sens. pp.72-73 (W). Cf. also De Gen. et Corr. IV ch.5, 382b3: $\gamma\rho\nu$ $\sigma\omega\nu\mu\alpha$ $\delta\iota\rho\nu$. A cognate word $\lambda\sigma\rho\iota\beta\iota$ is used in 445al4 for the corresponding process which produces odour.

Susemihl (Philol.1885 and Burs.Jahresbl17) wishes to remove
τοῦ ἃς χαμοῦς, but in mentioning flavours here Aristotle is not illustrating a thing by itself. He compares the solution of the primitive εὐρέων which produces flavours to the solution of flavours actually produced.

No personification of Nature is implied here. Aristotle merely means that this is a natural process. The function of τὸ ὁμορραγεῖν in the process is obscure. Alexander makes it the cause of the percolation as well as the ὑπνήματα which renders τὸ δεῖγμα ὄντων determinate in quality; ὑπνήμα he renders by ἀλλοφιασώσα, i.e. changing qualitatively. But it is possible to understand it literally --- of the motion involved in the percolation. Some in different ways, e.g. Hammond and St Hilaire, translating ὑπνήμα, will have it to be concerned only in the ὑπνήματα. But unless we adopt the conjecture that the function of τὸ δεῖγμα ὄντων is to act on τὸ γραμματός, we may as well understand it to bring about local motion in this case as beneath in 442a6 where it is said to cause the light particles in food to rise upwards.

Here ἁπατοῖ is used in a wide sense but still with the signification of being the attribute of a subject that is passively affected when it (the attribute) comes into being.

Cf. De An. II ch.5, 416b34: ἐν ὁμορραγεῖν (ἐν ὁμορραγεῖν) ἀλλοφιασώσα τῆς στίγματος ἀλλοφιασώσα is that kind of ἅπατος denoting qualitative change. ἀλλοφιασώσα is practically identical with ἁπατοῖ (cf. Phys. VII ch.3, 245b13: τὸ ὁμορραγεῖν καὶ ἀλλοφιασώσα ἀπεσκοποῦσα...
and both words are employed indifferently in the De Anima for psychical modifications (cf. II ch.5, 418a2 and 417b14). But Aristotle points out that, though they both are used as though they were the proper terms (δια προς τος) for all psychical changes, there are some operations to which they are really not applicable.

1. In the first place the transition from the state in which man possesses knowledge to the exercise of that knowledge is hardly a case of ἐνταγμὸς ὧν ἡ ἀληθής ἀλληλούσα is in the usual sense. The change is not produced by anything external. To exercise his intelligence is in a man's own power — ἒκ τῆς ἄλλης — for the universals which are the objects of knowledge are in a way in the soul.

Again it is a case of ἔθνη ἐνθ' ἐνθυτικόν παράδοσω, but of ὑπονόησις i.e. the realisation of a predetermined end.

2. Secondly, changes such even as that from a state of ignorance to a state of knowledge, where the alteration is in a definite direction and towards the establishment of a definite higher development towards the realization of the potentialities of the thing in question (ἐφ' ἑαυτῷ ἐξ ἑαυτοῦ ἐκείνην ἐφ' ἑαυτὸν ἄλλος ἄλλον), is hardly ἀληθῇς ἀλληλούσα proper even though in the acquisition of knowledge one requires an external agent —— the teacher.

With these reservations Aristotle proposes still to use the terms ἀληθὴς ἀλληλούσα and παρ' ἑαυτῶν. They are no doubt, in one way, specially applicable to sensuous processes, because there
must be an external agent — the individual object (cf. 26: ἀγαμέμνον γαρ ἄρα ἄνδρα ἔννοια γενόμενον ἔννοιαν and cf. 417a6 sqq.). But Simon points out that even sense-perception cannot be properly a case of ἀνάγνωσμα, for agent and patient must be in the same genus, (De Gen.et Corr. I ch. 7, 323b32 et al.) which the sense-faculty and its object are not.

It would be possible to make οποτε ἄρα ἔννοια agree with the subject of ἀγαμέμνον, and this interpretation would give a meaning consistent with Aristotle's general doctrine, for previous to the act of perception the object is ἀναγνωσμένον. The next clause, however, requires us to construe it with τὸ ἀναγνωστικόν (as Hammond, Bender, St Hilaire do) or still better with τὸ ἀναγνωστικόν (Simon), for it is not the sense faculty which existed ἀναγνωσμένον before the act of sensation but its operation. The ἀναγνωστικόν, the faculty, actually exists before the sensational experience.

For the doctrine of this passage see De An. II 14.5, cf. 417b19: "ὅτι γὰρ ἐν τοίς ἑξήμασιν (ἐν θρησκείᾳ) ἡ ἀναγνώσμαται ἐν τῷ ἐπιστήμων.

In knowledge (cf. last note) there is a two-fold transition, (1) from a state of ignorance to the acquisition of a definite body of knowledge i.e. from mere indeterminate ἀναγνωστικόν to a determinate one of ἀναγνώσματα; (2) there is also the change from the possession to the exercise of this ἀναγνώσματα (ἐν ἀναγνώσματα) ἐν ἀναγνώσματα.

There is a corresponding double transition in sensuous process.
The first is effected by the parent (διό τοῦ γινόμενον) of the sensitive individual and is the creation of a being with fully developed sense-faculties. The second, corresponding to the exercise of knowledge, is the actual exercise of the sense-faculty and is produced by the object of sense. In sense, then, the formation of a permanent psychical disposition is due to natural agency, in knowledge to instruction; actual exercise of a faculty is in both a higher process originated in the first case externally, in the second internally.

Alexander thinks that this statement is made in order to rule out odour, which also owes its existence to τὸ γενόμενον. But, as διό is produced by τὸ γενόμενον, it is clear that those words are not used for the purpose of excluding it. By τὸ γενόμενον Aristotle surely means dry substance and it is the same substance as has flavour that is odorous. The intention is obviously to rule out all γενόμενον that is not αἰσθητικόν i.e. does not enter into a compound.

The positive modification is τὸ γεγονός the negative τὸ πανεχθέν: cf. 442aβ/sqq.

I read ὁ χριστός τῆς σὺν οἰκείας. The positive modification is τὸ γεγονός the negative τὸ πανεχθέν: cf. 442aβ/sqq.

I read ὁ χριστός τῆς σὺν οἰκείας instead of ὁ θεός τῆς οἰκείας with Bekker and Biehl. Wendland restores ὁ χριστός τῆς σὺν οἰκείας to the text of Alexander p.77 and the vet.tr. renders 'non est unus solum' which, in spite of what Biehl says, can be a translation of ὁ χριστός τῆς σὺν οἰκείας. This version apparently read also ὁ χριστός τῆς σὺν οἰκείας τῆς σὺν οἰκείας after 442a3.
for it inserts 'neque ipsis plantis'. ὀγκοῦ ἐπὶ καί καὶ μόνον gives the best sense, but μόνον might be dispensed with.

Alexander points out that ἀποκατάστασις and τερατικός are not identical. Things so far as quantitative cause increase; so far merely as potentially capable of forming the substance of the body which they nourish, they are said to be nutritive. Cf. De Gen. et Corr. I ch.5, 322a20 sqq. and also De An. II ch.4, 416a12 sqq.: 'ἐπί τε ἀκόλουθον μετὰ τῆς ἀμφίπτησιν ἀνακαθάρισθαι' (π. 70 πρὸς τὸν κύκλον π. τὸν κύκλον. 

Rodier op. cit. II p.242), ὃς Ἰατρὸς ἔστι καὶ οὐσία τροφῆς. That is to say, τροφή (the abstract term) or τροφή is the continuous renewal of the individual which preserves its identity as an individual of definite type i.e. as an οὐσία; ἀνεξάρτητος is that renewal in its quantitative aspect.

The point here, however, seems to be not to hold ἀνεξάρτητος and τροφή apart but to show that which has the function of causing growth must also have the properties of nutritive food, and reciprocally τῇ τροφῇ ὅν is known to sense as τῇ γενετικῇ (442a1) and the fundamental positive characteristic of things that taste is sweetness.

But food, as that which causes growth, is that which can rise up (owing to the agency of heat — for fire is the highest element) and so become incorporated in the body. Hence it is both warm and light (ἐν ᾧ a tactual quality), but that which is
light is sweet and hence that which causes growth is just that which has the gustatory quality of nutriment.

The whole argument rests upon the identification of τὸ κοπατοῦ (one of the ἔντερα) and τὸ γλωστὸ, the basal quality of τὸ γεύσεως and hence of τὸ ἐφεδρίμον. 

This is treated simply as a statement to be verified by observation. It is not a proposition established by any special proof elsewhere. It gives the first obvious definition of τὸ ἐφεδρίμον.

For the facts cf. Problems 930a34: ἄμετα 5

and Meteor. 355b7, also cf. note 7 below.

We must not translate 'whether pure or mixed', as thus we should assume that it was indifferent whether the sweetness was pure or mixed. As a matter of fact Aristotle, below in 1.17, says that pure sweetness makes the food indigestible.

For the process cf. De Part. Animal II ch.3, 650a2 sqq. ἄμετα 5. Aristotle is discussing not the production of food but the growth of the body owing to feeding. For the process cf. De Part. Animal II ch.3, 650a2 sqq.
The ultimate source of heat in the body of sanguineous animals is the heart. Cf. De Juvent, ch.4, 469b10: ἡ ρέματον τῆς τάσεως τούτου ἡν θέρμη τῆς θερμοχώρησε στοιχεῖον τοῖς θάνατοις.

For the connection of lightness and sweetness bitterness and weight cf. Meteor. II ch.2, 355b4 sqq: το άνευ ἐλαιινίου κρύον Σαμωνίς ἦν τὸ Βάρος, τὸ οὗ ἡ λύσιν καὶ νόημα ἀνάγεται. Για τὴν κυριότητα, πάθεις ἐν τοῖς δέασιν κρύσοις — ὅταν τὸ γάρ γλυκό καὶ νόημα σύν τῷ τῶν ἐνθέους τρόπον ἐνυδαθήσεται σὲ τὰς σαρκάς καὶ τὴν ἐνθέους τούτοις ἐνυδαθήσεται τὸν μὲν στὸ κ. τ. ἡ.

The bodily heat is however only the συνάθος in the production of τὸ ἀνεύ ἐλαιινίου καταρχὴς. The natural process due to heat is indefinite and has no direction. Fire burns on until its material is exhausted. But in living organisms there is a πραγματικός δύναμες ἡν ἡν ἐνυδασμὸς, i.e., there is a definite scheme and restriction in the development and this is due to τοῦ τοῦ, which is the real ἀντίκτονος. Cf. De An. II ch.4, 416a8-18.

In De Juvent 480a8 we hear that the blood ἐν τῇ ναρ σφίμαν ἀνικνύει. He is probably there referring to the very same process. We read in De Part. Animal II ch.4, 651a14: τὸ ἀνθρώπου ἐνυδάσματα τοῦ καλύτερον ὡς ἔνοχο ἐνυδάσμα τοῦ καλύτερον.

For Kenneth, I think that this ἀντίκτονος θερμή, which means the ultimate substrate, both of the sensation and nutritive soul, is also to be identified as the central sense of the connection of Introduction Sec. 11.
Aristotle is there talking to begin with of the evaporation from the sea, one of ἁλαζών. He expressly compares evaporation by the sun to the process of animal nutrition. The sea remains salt though the moisture which is evaporated from it and descends again in rain is not salt.

Cf. quotation on note 4. He has now explained what was previously proved as a fact—that χονίς ἀναργυρίως ἐκλέχει, and he has done so by identifying flavour par excellence with sweetness. Positive flavour is sweetness, just as positive colour is white. Their opposites are ἀμαρτήματα --- defects of being.

There is no one English word which will translate εὐγεύσεως. It is almost the technical expression for 'indigestible', but it implied a theory of indigestibility—that the food tended to rise too much. Cf. one of Aristotle's illustrations of final causality. The final cause of taking a walk after eating is τῶν ἐνιαυτῶν τὰ ἱερατικά --- An. Post. II ch.11, §471 sqq.

Biehl's reading ζύγῳ ἄνανσιν in l. 17 instead of ἄνανσις ἥν is doubtless correct. It does not, however, alter the general meaning.
It is not clear what exactly ἀίδος refers to --- the sense stimulus caused by γνώσις or the ἀίδος which produces γνώσις (Cf. 441b8).

It is quite impossible to reconcile the with the rest of the passage. If the two lists are to square, the number must be either six or eight, as Alexander too (Cf. ch.3, 439b3 sqq. above).

All MSS give ζία, but Susemihl (Philol. 1885) reasons, it is quite impossible to reconcile that with the rest of the passage. If the two lists are to square, the number must be either six or eight, as Alexander too. It is not by distinguishing ραον from ουδαν and λαον from ουδαν that eight members are distinguished. In other passages the different position of grey or the true chromatic tones is not noticed. They are both said to be ἄιανος λευκὸς καὶ μαύρον: cf. Categ. 10, 12a18, Top. I ch.15, 106b5, Metaph. X ch.5, 1056b27 sqq. The reason doubtless for ascribing grey to black rather than white when it is relative to both (Cf. Physics V. ch.1, 224b31, and ch.5, 229b17 sqq.) is that it is less positive than white, a species of white, which black also is.

The ascription of yellow to white seems to be a recognition
luminosity of its higher than that of the other colours.

Cf. Plato, Timaeus 68 B, who brings in ῥ ῳ ἀμφιβολὸν into its composition. For the correspondence of the tastes and the colours generally and the ascription to sweet and bitter of Ῥ ῳ ἀμφιβολὸν and Ῥ ῳ ἐκλειπὸν respectively cf. De An. II ch.10, 422a10 sqq. The ground for the identification of Ῥ ῳ ἀμφιβολὸν and Ῥ ῳ ἐκλειπὸν seems to be the lightness of both. Cf. De Part. Animal III ch.9 672a8 etc. Ῥ ῳ ἀμφιβολὸν μεταφέρεις ἐκ ἑνὸς ὀλίγο νήματος σοὶ ἐν εὐκτικῷ ἡν ἐκλειπὸν ἐστιν ἄν. Ῥ ῳ ἀμφιβολὸν is light because it is warm. Cf. also De Gen. Animal II ch.2, 735b25. Similarly Ῥ ῳ ἀμφιβολὸν and Ῥ ῳ ἐκλειπὸν are both heavy.

Three of these are the colours of the rainbow (with ὁ ἰ ῳ ἐντετάλληλον intermediate between φοινίκις and ἀριστιθάλεις; cf. Meteor. III ch.2, 372a8 sqq.) They alone are said not to be obtained by mixing (other chromatic tones presumably); ἀριστιθάλεις is less frequently mentioned.

τὸ ὅλον should naturally refer to ῤ ῳ ἐλαφρόν παρὰ ἀκλόμεστον but it is generally held to signify the other colours. Both statements would be in conformity with Aristotle's teaching.

Cf. De An. II ch.10, 422a31: τὸ ποτὸν παρὰ ἀκλόμεστον as equivalents for γλυκόν and πικρόν. For the doctrine of Theophrastus, De Sensu Plantarum, VI.1,2.

Cf. Theophrastus, De Sensu 60-62. R.P.199. Zeller, Presocratic Phil. II pp.265-270. This is part of the doctrine of ἀκλόμεστον.
the atoms which emanate from bodies actually impinge upon our sense-organs and so cause sensation by contact. It is against this that Aristotle wishes to argue in the first place.

The transition to this discussion is not mediated by the distinction between as Alexander thinks, but by the connection between taste and touch which suggests the Democritean theory that all sensation is effected by contact.

Alexander (p.83) gives four separate reasons which might be employed. But the most important consideration is the fact that the other senses require an external medium. It is the absence of this that makes taste a kind of touch. The other senses do not act by contact (cf. De An. II ch.7, 419a26).

For the distinction between the and the , cf. De An. II ch.6, 418a1, III ch.1, 425a1, III ch.3, 426b22 and above 437a8 etc. The former comprise motion and rest, figure, magnitude, number and unity. The latter are the qualities e.g. colour etc. reported by . The are however in modern philosophy as the primary qualities of bodies (cf. Hamilton's note D). They must be distinguished from what the commentators call the qualities in the Aristotelian scheme viz. , , , . It has been pointed out (e.g. by Hamilton p.829) that these are
hardly sense qualities at all and confirmation for this contention is drawn from Aristotle himself (cf. De An. 425al8, ἡ τὰ ρηθήματα οὐκ εἶδε καὶ ἀφίκεται ; and below ἡ τοῦ διάνοιας — τὰ ἑπαρχήματα ἐν καιρῷ). They may be all described as the mathematical and dynamical qualities of body and, according to the Atomistic philosophers, these were the only objective attributes of things, all the rest being merely changes in our sensibility. (Cf. Theophrastus, De Sens. 63: τὰ πρωτά ἐκ τῆς φύσεως διόρθωσαν, ἀλλὰ πάντα πάντως τὰς ἀκέραιας ἀλληλουχίας.) This holds good without qualification of four of the senses, but to some tactual qualifications they did assign objective existence ὁμοιάζοντας, τὸ συνιορίου, τὸ κόσμημα καὶ τὸ πνεύμα, deriving these however ultimately from ἀγάθων καὶ ἀθανάτων things that are light have more of void space in them than others. τὸ χολατόν and τὸ λιπών with τὸ ὄξιν τὸ ῥαγάτον seem to have been modifications of χαλάσμα. Here Aristotle also treats the latter from attributes as belonging to the category of τοί νωτά. He takes care to define τὸ ὄξιν τὸ ῥαγάτον as τὸ ἐν τοῖς ὑμνοῖς (the word commonly employed also for the atoms themselves as well as for mass in general) as these are also the names for determinations of such ἰδίαι as χορὸς and χαμῆς. He commonly puts τραμώσας and ἰδίαις along with other σωματικὴς διάφορας καὶ σωματικὴς κάθετος as ὑματικὸν καὶ συμβολικὸν which are consequent upon the primary determinations — ὑματικὰ, χοροῦ, etc. Cf. De Part. Animal II ch.1, 646al7 sqq.: τὰ ἐν καταλλαλείς διάφορας ταύταις ἀκόλουθοις, ὅπου χρόνος — καὶ δεινότητα κ.τ.λ.

Among such, even ἀγάθων τοὺς καὶ χαλάσμα are put in 644bl4;
but this is simply one of his rough general classifications. Aristotle did not, of course, mean to imply that "\( \gamma \) and "\( \tau \) are in themselves tactual differentiae of the same nature as hard and soft, but it was his view that you do not have the concept of body without some characteristically tactual datum. It is impossible to construct bodies out of merely mathematical determinations, a point which modern atomists do not sufficiently consider. You cannot analyse body into something that has no sensuous qualities, not even tactual ones.

If "\( \gamma \) and "\( \tau \) are to be regarded as the ultimate characteristics of bodies, they must be treated as though they already possessed a tactual content, as though they were merely tactual differentiae and this is exactly Aristotle's point here. They, the atomists, treat determinations of figure as though they in themselves contained a reference to tactual experience -- as though they were given by one special sense, that of touch, whereas as a fact they, though given in connection with tactual experience are not simply to be identified with it, and in fact can be discerned by means of other senses, notably that of sight.

In the De Anima III ch. 1, 425b4 sqq. Aristotle points out that it is owing to the fact that these mathematical and dynamical qualities of objects are given by more than one sense that they can be readily discriminated. Otherwise they would be confused with the special data of the single sense to which
they were attached, just as he contends that, if the whole surface of the body gave the same sensations as the tongue (which discriminates both flavour and tactual properties) taste and touch would seem to be the same sense. For a discussion of δείγμα cf. De An. II ch.11. Aristotle does not there fully debate the question of the plurality of the ἐναργείας e.g. θυρήνων and ψυχρών, ἐκ τῆς ὑγρών, καὶ κατα zewnętrzn Which touch presents us, nor does he consider to what extent determinations like ἀξίων, ἐκ τῆς ὑγρών, which appear in φωνή apparently as 'νοητά, must be treated as νοητά in the case of touch. His definition of τοιαύτα in Categ.8, 10a23 confirms his inclusion of them here in the list of the νοητά — ἐκ τῆς ὑγρών, ἐκ τῆς ὑγρών, ἐκ τῆς ὑγρών. Some philosophers were close to modernism in figures... Cf. De An. 418a10 νοητά βασκάτα τριήμερα, where however he illustrates only in the case of δείγμα and ἀκροβατία. 

Number and unity seem to be given by the exercise of any sense (Cf. 425a20 ἐναργεία σήμα ἐπὶ ἀκαλύπτω καταδεικνύοντα). On the other hand all are said to be perceived by means of τοιαύτα (425a17) and, in the case of the mathematical qualities such as are mentioned here, the νοητά which discriminates them can be nothing else than the motion of the only two sense organs which have a surface continuously graded in sensitiveness, the eye and the surfaces of the bodily members. Aristotle does not work this out but hence, probably, the reason why the discrimination of size and figure is limited to sight and touch.
Alexander maintains that this refers to Ch. 4, 440b29, where smell and taste are said to be εχεῖν ἵνα ἀναστήσει. He is now to explain the analogy between the two. Its objective basis is the fact that the process involved in the genesis of each is the same; it is στόχον οὐκ ἔχειν καὶ οὐκ ἔχει τὸ στοχόν (445a14); it is a process of infusion or solution. Add to this the fact that in both cases ἡγοῦν is the agent, with the sole difference that in taste it is not already modified, but in producing odour it must have been previously mingled with liquid. Further, as the vehicle of taste is ἢς ὑψότης, so that of odour is ἡγοῦται, for, as pointed out in 443b6, air as well as water is ἡγοῦται. Heat also seems to be operative or rather co-operative in the production of both (cf. 443b16 and note.).

Here Aristotle calls the agent operative in the production of odour τὸ ἵγενος ἢγεν. Elsewhere he names it τὸ ἵγενος ἢγεν and cf. De An. II ch. 9, 422a6; ἦς ἢ γεφράν τῆς ἢγεν. Hence Thuot, Förster and De An. p. 158 and Neuhäuser (Aristotle's Lehre von den Sinllich Erkenntnisse vermögen und s. Organon, p. 25) propose to read ἢγεν here instead of ἢγεν and Susemihl
(Burs. Jahresb. XVII p. 266) has lent his support to this conjecture. But, as Alexander points out, it makes no difference whether we call the agent here \( \xi \gamma \varphi \tau \) or \( \xi \gamma \rho \sigma \). We can call it either dry substance mixed with liquid or liquid mixed with dry. The main point is, that it must be \( \alpha \nu \rho \iota \omicron \mu \iota \chi \nu \nu \omicron \). i.e. 

\[
\tau \iota \omega \xi \gamma \rho \sigma \nu \omicron \chi \nu \nu \omicron.
\]

The new \( \nu \nu \omicron \nu \omicron \nu \omicron \) is the identical element in air and water of which it is the function to form a vehicle and medium for odour. Alexander (p. 89) has named this \( \tau \iota \nu \sigma \sigma \nu \omicron \nu \omicron \) (following Theophrastus) on the analogy of the term \( \tau \iota \delta \iota \alpha \gamma \alpha \pi \alpha \iota \nu \omicron \nu \omicron \) which is applied to the common constitution of air and water which enables them to form media for light. Cf. De An. II ch. 7, 419a22 sqq., where however he says that the medium of smell has no special name.

The expression \( \nu \nu \omicron \nu \omicron \nu \omicron \nu \omicron \) is however, quite vague and may mean merely \( \nu \n
cleanse, by scouring off and absorbing the surface of dry substance.' St Hilaire translates ἐπιθετήθεις τὸ δρομινὸν 'entant qu'il peut transmette et retenir,' Hammond by virtue of its capacity to exude and throw off (dry savour)." But these renderings are impossible.

Cf. De An. II ch. 9, 421a10: ὅπως ἐν τῇ ἐντολῇ τοῦ συνάρμολος ἀνθρώπων and beneath passim.

This term must not be taken as a modern zoological designation. Any animal with a shell from the turtle to the sea-urchin is ranked under the στράκα τέρμα: cf. De Hist. Animal VIII ch. 2, 590a19 sqq. Aristotle is, no doubt, thinking here of shell-fish. An example is afterwards given in 444b13 — (αί πορ-) the purple-murex which, he asserts in De Hist. Animal VIII ch. 2, 590b, goes in pursuit of its prey and feeds on minute fishes.


Aristotle thought the motion fishes make with their gills was not breathing. It is the expulsion of the water, which is taken in with their food, and which performs the 'cooling' function effected in respiring animals by the air. Cf. Zeller, Aristotle, II pp. 43.44 and Arist. Resp. 476al sqq. especially...
Cf. note above. Mr Cook Wilson (Journal of Philol. xi. 119) conjectures νόμιμος instead of ρυπός. This is possible but not necessary. τὸ δὲ ρυποὶ τὲρκτος is indifferently the ρυπὸς of the thing that smells and the odorous thing itself.

Cf. 437a20, 441b12 and notes. For the sources of the whole discussion cf. Meteor. IV.

For the doctrine contained in this statement cf. De Gen. et Corr. II ch. 2, 329b11; the elements differ only καί ἀπὸ τῶν ὀνομάτων.

The dry element is of course the salt contained in it: cf. 441b4, σὶν γὰρ ἀπὸ σκότους καὶ ἐν τῇ σφήνῃ 

The reference for χρόνος below is Meteor. IV. ch. 7, 383b20: (χρόνος) ἐν τῷ τελεῖον, for ἀλατος also ch. 7 and for χρόνος etc. chs. 8, 9, 10.

Either the one said to be extracted from salt has more smell than that which comes from natron and so the previous statement is directly verified, and there is a greater quantity of this product derived from salt and thus the stronger smell of salt is explained by the fact that it contains more χρόνος than the other substance.

What the process referred to is, one can hardly tell.

Aristotle in Prob. 935a3, talks of τὸ ἐν τοῖς ἀλατίν δρυσσάντων διαφωνοῦντες.
and this should mean a deposit or sediment. ξίφικον should point to some process in which heat was employed. μελάνιον was compounded with oil to form soap. Perhaps something similar was done with salt. Impure salt and oil may have been boiled together and the product which distilled over collected. This would rather confirm the suggestion that Aristotle is referring to the stranger smell of the one compound than to the other.

ςάρα is any salt of sodium or potassium that has a strong alkaline reaction. It is not potassium of sodium nitrate our salt-petre.

Anything that melted with heat was held to be aqueous. We must remember however that the concepts of ξίφικον and ιός are wider than what we understand by moisture and water. They correspond more nearly to the modern concept of the fluid state of matter. Hence Aristotle could talk of ιός in metals without meaning exactly that water, the actual particular substance known as such, was found in them. He was under the necessity of using popular terms with a more or less restricted denotation and a particular intension, for wide and far reaching scientific generalisations. To our mind this inevitably suggests both a fancifulness in the generalisation and a vagueness in the concept of the particular substance which permitted the name
for it to be so widely applied. Both those characteristics are true of all primitive theories for, as Aristotle himself remarks (Phys. I ch. 1, 184a21) ἀκούειν ὡς τὸν αὐτὸν τὸν ἑαυτόν καὶ σαφῆ ἀνεγιγμένην τάξιν. The concept corresponds, as modern science shows, to an important objective distinction in the condition of matter. The peculiarity of the Aristotelian theory lies in regarding ἔνδον not as a state into which matter may pass but as a quality which certain species of matter (ἀγρος ἔνδον) always possess.

Cf. above ch. 2, 438a25 and note. ἀέρος (cognate of Latin fumus) is used in two senses, (1) in its generic meaning it corresponds more exactly to our word reek; it is any vapour which rises up and is wafted upwards from a substance. As such it has two species (cf. especially Meteor. II ch. 4, 359b27 sqq.) which are distinguished as being respectively moist and dry or at least as containing a greater proportion of ἔνδον respectively. The former is steam or moist vapour, the latter is more accurately described as smoke.

Aristotle expressly proposes to use the general term to represent the latter variety (as he does in I ch. 3, 340b27 sqq) and (2) is its second and more restricted meaning. Both species of ἀέρος are hot by nature. The dryness of the smoky kind comes from the earth which enters into its
composition (340b26)

This seems to be a case of elision of the passage beneath 1.25. In consequence of the scribe's mistake 1.25 was mutilated and hence we must restore to it, with Christ, the τοιούτον which appears here.

Heraclitus fragment 37 in Mr Bywater's edition: cf. Burnet, Early Greek Phil. p.156. Hence Heraclitus must have held that odour was smoke.

Cf. Meteor. I ch. 9, 346b32. ἐρευνᾶντες τοῖos Ὀμός ἐραβύνοισιν

Cf. also note 15 to 443 a 23.

Cf. De An. II ch. 9, 421b10 sqq.

If the sense of smell was stimulated by effluxes it would be really a sense of touch cf. 440a17 and note. Another reason against the efflux theory (noticed by Alexander) is given in Problems 907a34. If that theory were true, odorous objects would evaporate away in time. Aristotle does not deny that smoke and vapour are odorous, (cf. above ch. 2, 438a26 and Prob. 906a21 sqq. where he talks of the odorous qualities of ὀμός) he only means that exhalations are not the mechanism for transmitting odour. The sensation of smell is not caused by the evaporated substance impinging on the sense-organs (cf. De An. 421b16). The ἀναπνεύοντας in respiring animals is the air and when that enters the nostrils it can be described as an ἀναπνεύοντας.
indeed, but it is πνευμάτικόν (cf. below 444a26) — a waft of air.

Aristotle has, however, great difficulty in not regarding odour as a gas or the analogous diffusion of a solid in a liquid. Cf. 438a22 and below 444b3, De An. 424b24 and below 444a29 note.

πνευμα — air or wind, is more especially the air we breathe.

dùmios . Between what is the similarity? Aristotle is explaining the correspondence between tastes and odours; — he has already pointed out one identity — the $\gamma\nu\sigma\tau\omicron\varsigma\nu\gamma\varsigma\omicron\varsigma$ of the vehicle of both. Now he asserts that the process which generates the two is identical — $\delta\nu\alpha\omicron\nu\sigma\omicron\chi\omicron\omicron$ . The argument is 'If in this case — the production of odour — the action of dry substance on moist is the same as in the production of taste — $\delta\gamma\rho\alpha\omicron\nu\gamma\rho\omicron\omicron\omicron\omicron$ , then we can explain the analogy of the two.' He is not comparing the effect of $\gamma\nu\sigma\tau\omicron\varsigma$ on air with its effects on the fluids proper, otherwise he would have said $\delta\gamma\rho\omicron\omicron\omicron\omicron\omicron\omicron\omicron\omicron$ after just pointing out that $\delta\gamma\rho\omicron\omicron\omicron\omicron\omicron\omicron\omicron$ . He means $\tau\omicron\omicron\omicron\omicron\omicron\omicron\omicron\omicron$ to include air and then gives air as the example, of $\tau\omicron\delta\gamma\rho\omicron\omicron\omicron\omicron\omicron\omicron\omicron$ which is most important for present purposes. It is a very common function of $\eta\alpha\omicron$ in Aristotle to coordinate the generic and the specific, the latter coming second and illustrating the former or defining it more exactly (cf. Boëth. Ind. p. 738). Cf. in this treatise 439ai7. $\tau\omicron\omicr
The above is Alexander's interpretation, but he suggests that the argument may be intended to compare the action of in producing odour in air and in the fluids proper. If it is the same, then, assuming already that odour is produced by flavoured substance, then we could explain why the odours we are cognisant of (which are propagated in air) correspond to flavours (which exist in liquid). But this is the reverse of the theory he contends for.

One thing seems certain, that Aristotle is not comparing the action of in producing tastes in water, with its action in diffusing odours in air, for in that case all mention of the propagation of odour in water would be omitted and it would be natural to infer that it did not exist in water; but this is the reverse of the theory he contends for.

Cf. De An. II ch. 9, 421a16-18: But below, in 25 sqq. he points out that though smells are distinguished as γλυκος, μαυρος, δρακόντας etc., the epithets applied to taste, yet not all objects have the taste and smell designated by the same name — γούστον δεδομένον ὠμοίως καὶ θηριῶς. Some are sweet both to taste and smell, others are not.

Cf. Meteor. IV ch. 3, 380b2, where unripe flavours are said to be
Cold generally is the principle which counteracts heat (De Gen. Animal. II ch. 6, 743b28), which is the great principle of life or activity according to the Aristotelian philosophy.

Cf. the similar role played by heat in the development of taste and nutrition (chapter 4 especially 442a). Its function in producing odour is not brought into such prominence, but cf. 444a24 ἐν γὰρ ἑπεξεργαζόμενης ὑλῆς ἐν τῷ ἄλοιπῳ, and 448b29 and also Problema 906b37 ἐν ὅμοιοι θεωρήσεις τῆς ὑλῆς, and elsewhere for the influence of heat in producing smell.

It is unlikely that Aristotle here refers to τὰ ὁρμητικὰ καὶ τὰ λογικά as Hammond (p. 173) thinks. If that were so it would mean that odour per se was exhaustively divided into two species the pleasant and the unpleasant, but nothing is said to confirm this. Aristotle certainly implies that all odours are either pleasant or unpleasant but he does not elevate those epithets into specific differences. Alexander (De Sens. 97, 23 sqq.) conjectures that perhaps τὰ ὁρμητικά and τὰ λογικά are the primary species of that kind of odour which is independent of taste, and the others are subsequent to them and, possessing no names of their own, correspond to the particular flavour and perfumes from which they originate.

This would make the classification of odours per se pleasant and the reverse correspond on the whole to the classification
of the species of the other sense-qualities. But it is hardly possible that νοητικον and νοητικός can be regarded as objective determinations like γλυκόν and τριφόρος. Besides, it is clear from De An. II ch. 9, 421b1 sqq. that the same epithets mark the species of odour per se pleasant as those which distinguish the varieties dependent on taste. Among odours per se pleasant are included the scents of flowers (27 below) and to these in the De Anima are applied the terms γλυκόν, ὑπερβολή etc.—γλυκόν γαρ γλυκικά [ἐν τοίς ἥπερ] ἀνόητα ναὶ μηνίας, ὑπερβολή δὲ ὑπερβολὴ ναὶ τοιχοῖς ἀπεικονίζει.

The smell of honey is no doubt one of the class of odours which follow the taste. That of crocus or saffron is a scent per se pleasant, for the taste of the substance is not sweet. Probably Aristotle would have explained the phenomenon that many things do not have the corresponding odour and flavour by this distinction between the two different orders of smell. The problem is, however, not worked out.

Alexander, though lending some colour to the suggestion that νοητικόν καὶ νοητικὴν are the species of odour per se pleasant and the reverse, yet does not hold that νοητικόν here refers to them. Aristotle is referring to the two great divisions of odour ὁσοῦ οὐκεδεδρύνει γαίην and that which is only ἄλλη ὁμολογητῆς ἡγίας. The latter is called τὸ ὅρμημα τῷ ὁμολογήτῳ in 444b10. It is true it should rather be a γάρσος and that term is employed in 444a30, 63, but Aristotle frequently
uses γένος -γένους indifferently to designate a class.

Here it certainly looks strange that Aristotle after using ἰθάνον to denote a wide group should in the next line employ it to refer to inferior species, but this is characteristic of the carelessness of his style. He says 'There are two species of odour' meaning by that two divisions and then the word 'species' suggests to him the fact that some people have denied the existence of any species at all in odour.

... i.e. indirectly: cf. note on ναρά συμβαίνεινος chapter 1, 437a5,11.

27b. lacuna after 1.26? cf. notes.

Euripides is criticised by the comic poet for sickening over-refinement of style. cf. Meinike Freq. Con. pacc. str. 3. 298.

Perhaps there may be a hint in comparing to ϕανη what would be left if the meretricious additions were removed. 

αἰσχρός is a perfume, not a spice. cf. Ac. ad Att.I, 19,2.

Perhaps the force of the taunt may be thus rendered. ---

'Don't put hair-oil in your soup!'

Aristotle is not necessarily to be regarded as mourning the degeneracy of his own time. The νόημα need not have that signification.

Anything contrary to nature (φανη) is αἰσχρός: cf. the famous λαθραίον τοῦ ἀληθινοῦ in Nic.Eth.I ch.3, 1096a5.

The idea here seems to be that gourmands get a pleasure
from odour which appears to arise from taste. It is in the
exercise of the latter sense (along with that of touch) that
men are intemperate. Cf. Prob. 949b6 etc. 

here and in 8 below is interpreted (by Alexander) as
who, influenced by 20.21 below (q.v.) thinks that other
respiring animals also perceived, though in a less degree, this
kind of odour. But in 20.21 Aristotle is talking merely of
odour in general and explaining why it is perceived by means
of inhaling the breath. It is because of its higher function
in man, that odour is drawn in with the breath and the same
mechanism is provided for animals (in which the higher functions
are lacking) in order that Nature might not have to devise a
new organ for them (444b4).

Independently however of the influence of 18.20.21, there
was some reason for Alexander interpreting "ον ασθήματος ονομάζεσθαι", for otherwise Aristotle appears to make an absolute qualitative
distinction in sensation depend upon a mere quantitative dif-
ference — the greater size of the human brain as compared
with that of other animals.

Cf. Animal Gener. II ch.6, 743b28 sqq.

This is obviously the same account of the origin of catarrh
as is given in De Somno, ch.3, 458a2. The ἄναθήματα is not
an exhalation from food as it exists outside the body; it
arises from the food that has been eaten. The process by which the nutritive element in food is diffused into the blood is called by Aristotle an ἀναθυματικός — volatilisation — in 456b3. It is an excess of this exhalation which, when carried up to the brain, produces a flow of phlegm. It is defined in Physics VII ch.3, 246a5; Prob. 859a14 etc. as ἀρμοστήρια — balanced proportion— of heat and cold (cf. beneath 1.3f).

Food is always a mixture. Alexander explains that it is always the cold associated with the liquid element in food which is the cause of its unhealthiness. He, however, identifies the ἀρακάζεσις from food which causes catarrh with the odour which is connected with taste. There is, however, nothing in the text to justify this and Aristotle has just refused to identify odour with ἀρακάζεσις.

Aristotle is probably thinking of the supposed efficacy of some perfumes in expelling colds and warding off infectious diseases.

It appears after ἀρακάζεσις in MSS. L S U. Alexander interprets ἀρακάζεσις but ἀρακάζεσις ἢ δούλη (οὐσία) cf. 443b27. Bekker's text is ἢ δούλη ἢ ἀρακάζεσις. The substantive after cannot be ἢ δούλη as Bonitz (Ind.533a3) suggests.
Aristotle is discussing not the food but the odour which is ἕφαγεν. Hayduck (Prog. Kön. Gym. Meldorf 1877) suggests ἔφαγεν after ἐδύσος as also does Mr Cook Wilson (Journal of Philol. XI pp. 119-20); but it is doubtful whether ἔφαγεν could designate the objective quality of odour which is supposed to promote health. The latter also suggests ἐκαθορίζειν καθ' αὐτήν ἔνας τόμος.

I suggest ἐκαθορίζειν καθ' αὐτήν ἔνας τόμος καθ' αὐτήν ἔνας τόμος. The former would mean odour essentially pleasant, whereas ἐκαθορίζειν καθ' αὐτήν ἔνας τόμος would mean smell which is essentially smell. But Aristotle does not wish to show that the opposite kind of odour is not essentially odour, but that it is not essentially pleasant.

Because of its function in maintaining health in man who is the final aim and end of all the endeavour of nature. Aristotle is talking of smell in general; he does not mean that its higher function is shared by any of the animals.

Aristotle seems to think of the air as entering into the constitution of the body. Certain organs e.g. of hearing (cf. ch. 2, 438b20 and De Animal. Gen. V ch. 2, 781a24 sqq.) seem to contain air. Animals that do not breathe have a ὁρμή which performs the same function as the breath. (Cf.
De Somno 2, 456a12). The spurious writings also declare that there is a σύνοψις in the lungs of respiring animals and in the heart. This doctrine may be a legitimate deduction from such passages as the present. Compare 481a1, 27, 482a34, 603a15 etc.

There is no reason for considering that should be postponed till 444b7 as Susemihl (Philol. 1885) and Hammond think, or for deleting it as Hayduck (op. cit.) wishes. It is certainly better to postpone than to delete them and they come in quite well at 57, but they may stand here quite well as a note to amplify what has been already said. They point out the double function of ἀναπνεύσεως, the operation which has just been under discussion.

Cf. De Resp. 473a24. The windpipe is the essential organ for conveying the breath. When it is closed death ensues. Not so in the other case.


St Hilaire quotes this passage as throwing light on Aristotle's aesthetic tastes. He makes an argumentation that Aristotle distinguished the highest kind of odour as existing a personal likeness as a theory and for evidence that the distinction was widely recognized in 8th and 9th centuries.
Biehl and Bekker read ἐὰν ἐὰν ἀναπνεύσῃ which, of course, must be taken along with ἀναπνεύσῃς τοῦ ἄρα. In that case we must understand ἐὰν ἐὰν ἀναπνεύσῃ to be equivalent to ἀναπνεύσῃς τοῦ ἄρα because we learn from De Resp. 477a7 that breathing is the final cause of the existence of the lung (ἐὰν ἐὰς ἀναπνεύσῃς τοῦ ἄρα ἔχει ἀναπνεύσῃς τοῦ ἄρα); the determining cause in the ordinary sense both of the existence of the lung and of ἀναπνεύσῃ alike is rather the greater vital heat of respiring animals (cf. 477a14).

But if we take this reading, the sense becomes very difficult. The sentence ἐὰν ἐὰς ἀναπνεύσῃ will mean that Nature gave the rest of the respiring animals the kind of smell not necessarily connected (for health reasons) with the head, in order not to make two organs and one of them have no functions. The thought will be that the animals, having nostrils, may as well smell by them. This is to make ἀναπνεύσῃ equivalent to the well known Aristotelian doctrine that Nature does nothing in vain. But this doctrine may be variously interpreted; here it would mean that, having once made a thing, Nature must assign it a use. But such a maxim is hardly to be identified with the principle of parsimony — entia non multiplicanda praeter necessitatem — which is surely the true import of the Aristotelian doctrine. If Nature really does nothing in vain and does not wish to make a superfluity of organs, it would surely be better not to give the lower
animals nostrils at all if the species of smell connected with food has no necessary connection with the upper part of the head. A still greater objection to the above interpretation is, that \( \alpha \varepsilon \tau \iota \gamma \iota \varepsilon \rho \iota \sigma \nu \) has to be taken as referring (1) to the organ of smell and (2) to the organ of breathing — the windpipe which is not an \( \alpha \varepsilon \tau \iota \gamma \iota \varepsilon \rho \iota \sigma \nu \) at all (Alexander notices this).

It is as above that St Hilaire, following most commentators, takes this passage, but Simon proposes to detach \( \sigma \iota \tau \iota \gamma \varepsilon \rho \iota \sigma \nu \) from what precedes and connect it with what follows translating as I have done. The reading must thus, of course, be \( \sigma \iota \tau \iota \gamma \varepsilon \rho \iota \sigma \nu \) which is the version found in MSS. L U pr. P. This is also supported by Mr Cook Wilson (Journal of Philol. XI p. 120). Cf. De Resp. 475b19. \( (\tau \iota \gamma \iota \varepsilon \rho \iota \sigma \nu \varepsilon \iota \tau \iota \tau \varepsilon \alpha -) \sigma \iota \tau \iota \gamma \varepsilon \rho \iota \sigma \nu \varepsilon \iota \tau \iota \tau \varepsilon \alpha \).

Or else we must believe that \( \sigma \iota \tau \iota \gamma \varepsilon \rho \iota \sigma \nu \) has fallen out after \( \lambda \varepsilon \pi \sigma \tau \eta \). The argument then is, that Nature made respiration the means of perceiving odour in the case of the other resiping animals in order to avoid making a separate sense-organ for them. The \( \alpha \varepsilon \tau \iota \gamma \iota \varepsilon \rho \iota \sigma \nu \) are the nostrils in man and the problematical new organ of sensation in the other animals. Nature in making the lower resiping animals perceive odour by means of the nostrils avoided making a second sense-organ of a new type — a type not found in man, her chief creation. But in the case of the non-respiring animals, as he goes on to say, probably some other contrivance has to be resorted to. It is thus that Alexander interprets
from 

hence it is strange he does not notice the ineptitude of the reading.

Biehl, following M Y, strikes out 'ē

which precedes 

But this does not affect the sense required, which is still inserted from the Greek.

St Hilaire renders 'et il leur suffit, quoiqu'ils respirent les deux espèces d'odeurs comme les hommes, d'avoir uniquement la perception de l'une des deux,' — a mistranslation.

Hammond — 'It is enough for these respiring animals that they have the sensation of only one class of smells' etc. But this is merely an obvious and insipid deduction from what has been said about the greater size of the human brain and besides throws no light, as it should, on the previous clause.

Cf. De An. II ch. 9, 421b26.

Though insects live in air they do not respire, thinks Aristotle. He had not the means at our disposal for observation, which show that the opposite is the case; cf. Packard, The Study of Insects, p. 40; Owen, Compar. Anatom. and Physiol. of the Invertebrate Animals, p. 368. Cf. De Resp. 475a29. But they employ 

in a way anaguious to respiration: cf. De Somno. ch. 2, 456all sqq.

Cf. Hammond, p. 305.

Not the species known by the name in modern Zoology, which is

Not 'purple sea-fish' nor 'les rougets de mer.' Aristotle asserts in De Animal. Hist. VIII ch. 2, 490b2 sqq, that χαλαμπάριον is among the class of shellfish that move and that it is caught by a bait, as it feeds on small fishes.

Cf. De An., loc. cit., 21-23. It is strange that Wallace (Aristotle's Psychology, p. 246) should think that Aristotle did not really mean that the manner of perceiving smells was different in respiring and non-respiring animals when he quotes (77) the passage from the De Sensu here beginning ὅτι ἐριστός ἄνθρωπος...

By a difference in 'manner' Wallace must mean a difference in the quality of the sensation. He blames Aristotle for being 'misled by language' in assuming that odorous quality should be perceived by the sense of odour.

But Aristotle throughout proceeds on the principle that the only way for establishing the identity of sensations is the identity of their objective ground. It is really impossible to tell whether the qualitative character of the mere subjective affection is identical in any two people or any two species. We have to assume that, where the objective content is the same, the quality of the sensation is the same. Thus I believe that my sensation when I enjoy the perfume of a rose
is the same as my neighbour's. We apprehend something that is chemically identical.

Now, though Aristotle knew nothing of chemical qualities in our sense, he tries to prove the objective identity of that which is perceived both by respiring and non-respiring animals. He points out in De An. loc. cit., 23, that it has the same physiological effect. Strong odours -- and he meant by odours practically chemicals diffused either in air or water (cf. note 20 and Intro.) -- have a distinctive action upon both classes alike and hence are the same. This inference was all the more easily made because he conceived their effect to be upon the head, organ of smell or, at least, the region in which it is situated and out of the material of which it is formed (cf. beneath \( \ell.32 \) \( \alpha\rho\gamma\sigma\phi\omega\sigma \).

That there should be chemical qualities apart from taste or smell and qualities of any kind which are not perceived by some of the senses, would have appeared strange to Aristotle and the normal Greek mind, for which had not been shattered the harmony between Nature and man, in whom evolution has developed senses to give warning of the most of the ordinary collocations of qualities which affect his well-being. But, if Aristotle had discovered that any quality, not distinguishable directly by man, still had an effect upon the sentience of some other form of life (e.g. the ultra-violet rays on ants) he would have been bound by his own principles to assume the
existence of a new sense in these creatures if the quality which affected them had a sufficient amount of objective difference from the qualities which stimulate human sensibility.

Cf. De An. 421b26-422a6, for a closely parallel account. 422al.

Here the meaning would be "from the possession of the faculty" or "from the time when the faculty (of seeing) exists." Alexander and all other editors read ἀπὸ τοῦ ὁμολογοῦντος ἀπὸ τὴν καλλήραν, ἢ ἑπεννενοῦν ἀπὸ τὸν ἀνθρώπον.

In De Hist. Animal IX ch.40, 626a26 he points out that bees dislike unpleasant smells. He probably is thinking of this here and below in 1.34 — ἄρα ἐπὶ

But in the De An. III ch.13, we hear that excessively strong odours, colours, sounds do not destroy life except...
The flesh (Cf. De An.II ch.11, especially 423b26) really forms a medium for touch. But the difference between this and an external medium forms an important basis for classifying the senses. Cf. De An.III ch.12, 434b15, and ch.13,435a16 sqq.

Because the objects of sight and hearing exist in air and water. Alexander says that so far as the γένος of ἰεράς is due to φύσις it is related to taste and touch, so far as ἱερός it is related to the externally mediated senses.

Note below τοις ἔργοις τίτων τοις ἔργοις: cf. chapter 3.

Note that Aristotle does not say that this is anything more than an analogue to the process which produces odour.

Cf. De An.III ch.12,434b20; ἢπόσωσαν δὲ καὶ θανατοῦ ὅς ἤπατος. The Pythagoreans may have observed the stimulating effect of some odours. Cf. Alex. De Sens., p.108a (πάντα).

Alexander thinks that Aristotle means that, because ἐκζάλλοντας (excrement) are both dry and liquid, they show that the food from which they are secreted is composite, i.e. consisting of both ὑάλος and ἔλασμα. (This must be so indeed according to the doctrine of the πεπράστηκαν ch.3,465b-14-19, where ἐκζάλλοντας is said to be ἐκζάλλοντας τοῦ ἔλασμα.
But probably the argument does not run quite in this way. Aristotle says that food must be composite. But probably he means a little more than merely ἄλημαντοι as in chapter 4, 441b27 sqq. συντέχον when applied to the objects of sense tends to mean more than merely composite, but refers continually to things that have density: cf. Meteor. IV ch. 5, 382a26 sqq.: ἐνακμαί ἔρχεται τὸ σύντεχον καὶ εἴδωλα γεφυρών ὑπὸ δύναμιν πολύμορφον. ὡς συντέχοις καὶ συντέχοις γεφυρών. Cf. συντέχοις below.

Though all the four elements, fire and air included, yet we hear in Prob. 932b2: οὐκ ἐκ τῶν πολλῶν τῶν ἄλημαντων αὐτὸ ἐκ μιᾶς συντέχους καὶ συντέχους ἀλλὰ. Hence he must prove that the most bodily of the elements is an essential constituent of χρώματος. Hence he is probably thinking of χρώματος as something solid. It is the heavy element in food (cf. 442aβ) and hence is to be identified with γυνὴ the heaviest element. Cf. De An. III ch. 13. N.B.) and more or less γυνὴ, and γυνὴ is 

Now σμήνιος is nothing crassly material in this sense; cf. Prob. 865a21: καὶ σμήνιον σωθεῖν. Hence he is probably thinking of σμήνιον as something solid. The argument is—the excrement proves that in the compound of which food consists there must be solid matter, but it might be objected that the water in it (and water is one of the media of odour) is the really nutritive element.
No, says Aristotle, water alone does not nourish; some of the more solid elements must be mingled with it and, if that is so, still less likely is it that air, which cannot be solidified, should support life. The reasoning is very much condensed. Water, ὲὕδατος ἄρα, cannot nourish a solid body? (But cannot it be solidified? Not unless something γενόμενον is mixed with it. This would be true (cf. 441a27 ἐφαρμόζεται ὡς ἀνέθικεν αὐτῷ ὑποστάσεα ἐν ἑαυτῷ) except in the case of freezing, which would certainly not produce a nutritive solid! Still less likely is it that air could be solidified. On this interpretation there is no need to insert ὦ after ἐν' ὀπίσθεν 1.20 as Hayduck, op.cit., suggests. The waste residue in plants, such as gum, the bark and in a way the leaves etc.

 Cf. above note 30.

6. τὸνος ἕρμα, i.e.

§ 30. Εἰ τὸνος ἕρμα: cf. De Somno 3, 456b2, 3 τὸνος τὸ ὑεράν θυραφην ἐπερεακτής ἀπὸ τὸν ἅπαν δικτυόν ἵππου.

§ 23. Ἀναφώνασις. Cf. notes 26 and 53. Aristotle allows the ἀναφώνασις theory in this modified form. Just as in the previous chapters, here also he adopts something from previous theories. The medium is a gas, in the case of breathing animals at least, but not an exhalation from the odorous substance. But he can only explain odour as a quasi-diffusion of substance in this gas.
With Aristotle however it is difficult to distinguish medium and object (cf. above 445a13 where he identifies ἔν τῷ ἐνεργῷ οὐ καὶ ἐν τῷ ἐνεργῳ...) and so we should be bound to say odour was an ἀρέταιον of some sort. That is however not quite accurate, as it is some native common to both gases and liquid that is ἐν οὐ σάμων or the νόημα ἑαυτοῦ of the two to Aristotle.

He seems here to have in a way anticipated the discovery of the truth that the difference of a substance in a liquid is analogous to its behaviour as a gas. Once more he differs from modern theory in regarding ἐν οὐ σάμων as a νόημα ἑαυτοῦ which had a permanent existence of its own instead of a mere state or disposition to act of matter which may cease to be so characterized.

This perhaps points to some subjective experience of his own.

As Biehl suggests, οὐ γὰρ ἀστὴρ must have fallen out or at least be presupposed before ἄστηρ ἑαυτοῦ. He has not discussed the ἀστήρ since chap.2, and at the beginning of chap.3, (439a6) he proposes to give an objective account ἐν γὰρ ἀστήρ 


This is a principle with Aristotle. Cf. De Coelo I ch.1 ad mit. σῶμα τοῦ μίγματος γίνεται --- a tridimensional magnitude. More strictly μίγματος is the quantitative determination that all bodies possess. μίγματος is that which is divisible into continuous parts (cf. Metaph. V ch.13, 1020a11 μίγματος δὲ τὸ μίγματος τὰς σωματικὰς ἀποκατάστασιν). The continuous (τὸ μίγματος) is that which is infinitely divisible.

Compare De Coelo 268a6 --- σωματικὸι μίγματος τὰς σωματικὰς ἀποκατάστασιν τὰς σωματικὰς συναρμολογίας, σῶμα τὸ πάντα συναρμολογίας. Cf. also Physics III ch.6,7. There Aristotle tells us that μίγματος are infinitely divisible only i.e. though the process of division can be carried ad infinitum there are no actually existing infinitely small parts. Compare μίγματος 1. 11 below, σωματικὸι 1. 29 etc.

A variant for ἀθανάτων: cf. Bonitz, Iad. p.554. In De Coelo I ch.1 Aristotle tells us that the objects of physical science are μίγματος καὶ σῶματα with their ἀθανάτων and the ἀρχή i.e. the elements.

Cf. ch.3, 439a7: ἀρχή, ἀρχὴ ὑδάτων etc. This is not
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989b29 sqq and also Metaph.XIII. ch.l.)

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the objects of mathematics from those of physics
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Phys.II

They are determinations of number and

magnitude taken in abstraction from the concrete
(cf. De An.

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ch.1, 403b15) and more particularly
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considered apart from the motiony'change of the objects to
which they belong.

Compare also Metaph.VI ch.l, 1026a7 sqq.

They are not really separable from the things of sense like

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the object of metaphysics but are considered as such. Cf.
De An.III ch.7, 316b5: τα μαθηματικά ου περιλυσίωνα ἐστι
καὶ ψηφιδωτά ροῦ τ᾽ (συμφωνόντως).
The argument is that if the constituent of sensible object are not themselves
insensible the only alternative left is that they are mathematical entities.
Alexander seems to take this as an argument against the existence
of imperceptible bodies, but it is rather a tentative argument
in favour of them. The ἐν makes this clear. Aristotle
would not begin an argument against a thesis with ἐν in
ordinary circumstances.

Here he understands ἐν in a wide sense as 'objects
of consciousness'. It has been conceded that the ultimate
constituents of bodies are not objects of sense and further
they cannot be objects of consciousness at all as they cannot
be merely mental entities --- ῥοῆς concepts.
We know object after an ῥοῆς or ῥοῦς or as in the case of mathematical
entities (already ruled out)? αὐθαίρως; the two.
ροῦς is that faculty of the soul which is peculiar to man
among mortal creatures (cf. De Nat., ch.1, 450a16) and which
receives the ῥοῆς forms intelligible character of things
without their matter (῾ροῆς). Cf. De An.III ch.4-8. The
objects of ῥοῦς are ῥοῆς and these evidently are nothing
else than concepts, as they are said to have their concrete
existence in the sensible forms of things whether mathematical
or otherwise. Cf. De An.III ch.8, 432a14 sqq. ῥοῦς in
operation (῾ροῆς ῥοῆς) is identical with its objects (431b17).

These insensible objects are the constituents of external
bodies and hence must be external. They must be ῥοῦς.
and contain $\lambda_1$ and $\lambda_2$ is indispensable for the apprehension of such objects. Cf. Metaph.VIII ch 1042a25; $\lambda_1$, $\lambda_2$ are $\lambda_3$ and these are the objects of $\lambda_4$: cf. De An.IIch.5, 417b22 etc.

Though Aristotle does not employ this argument here against the existence of imperceptible magnitudes, it raises a difficulty which besets all modern theories of atoms, ether etc. Physical scientists of a certain school continually talk of the atom as a mere concept. They do not explain how it is possible for solid bodies to be composed of concepts. Cf. Karl Pearson, Grammar of Science, Ch.vii passim.

This theory lies at the basis of the doctrine of $\lambda_5$, previously discussed , chapter 4 ad fin. It consists in finding the reality of physical bodies not in their sensuous characteristics but in some quantitative determination of their minute parts. But Aristotle refuses to entertain the theory that there are bodies with no sensible and only mathematical qualities, and in particular that they are atoms in the strict sense of bodies perfectly indivisible.

The reference is to the Physics --- frequently styled $\pi_6$, and in particular, as Alexander says, to the last books. Thomas is still more explicit and says the sixth, where indeed the chief discussion of the doctrine of
indivisible magnitudes is to be found. The theory that magnitude is infinitely divisible will be found in the third book, chs. 6 & 7, (cf. note 1) and the definition of continuity which, being the characteristic of all magnitude, entails its infinite durability, is to be found in Book V, ch. 3. Things that are continuous have a common boundary — ἡ πάντως ῥήμα ἀνήκοντο σὲ τὴν τοιοῦτον, (287a11). This is practically repeated in VI, ch. 1; σωματικὰ ὁμόθύμνημα τὰ ἐκ τῆς σχολῆς ὑπάρχουσα ὡς, (231a23), where he goes on to show that nothing continuous can be made up of indivisible parts. Indivisible parts must be either entirely discrete or entirely coincident and so cannot compose the continuous.

Hence Aristotle arrives at another definition of the continuous. It is that which is divisible into parts themselves infinitely divisible — ἡ ἀναμετρήσιμη διαφορὰ ἐκ τινὸς μεγάλου ἀναμετρήσιμου. (232b24). Since continuity is the universal characteristic of magnitude this yields us the further proposition that magnitude is that which is divisible into magnitudes — πᾶς ὁ μεγάλος ὁτι φῆσι μεγάλον ἀναμετρήσιμον. (232a23). Aristotle shows in addition that, if magnitudes were composed of indivisible parts, motions would be impossible; every distance would be traversed as soon as entered upon if motion, like magnitude, were made up of indivisible parts. Motion is continuous and likewise time.

Those proofs it is obvious affect only atoms that are held
to be spatially indivisible. To the modern theory that recognizes that the atom must have a definite bulk and even a refutation composite structure Aristotle's reasoning does not apply. The atoms are only physically not spatially discontinuous and there is no more difficulty in imagining minute discrete bodies than in the perception of discrete masses appreciable to sight. Aristotle's other objections to an atomic theory are to be found mostly in the De Coelo and the De Generations et Corruptione (Cf. Zeller, Aristotle and the Earlier Peripatetics, Vol. I. pp. 430 sqq. pp. 445 sqq.) As Zeller says, without the modern theories of chemical, molecular and gravitational attraction it was difficult to see how discrete atoms could cohere in a solid body, and hence Aristotle's criticism of the ancient atomists was justified. At the same time also, the arguments in the Physics form a valuable corrective to such modern thought as regards all the individual things of sense as really discrete in structure and only apparently continuous. They are only discrete from one point of view; relatively to the molecule or the atom they are discrete relatively to other composite structures water and iron are continuous. To be continuous is to be thought of merely as a magnitude so far as internal structure is concerned. So elastic balls may have many properties and many forms of action on each other and on other things; but these are relations to external things that affect them as a whole; when regarded in this way
they are considered as being internally merely magnitudes i.e. as continuous. The atom itself relatively to which they are discrete must itself relatively to them be regarded as merely a magnitude i.e. as continuous. One does not inquire what makes the parts of the atom cohere together and, if one did, one would have to think of the atom as being composed of smaller atoms which again must be continuous. But there comes a point where this continual division and subdivision of matter ceases to have interest. Hence we cannot look to the discreteness of matter for its reality. The reality of objects must be as Aristotle said in the 'form' or, as modern theory would put it, in the law of the combination of their elements and the qualitative difference to which that gives rise.

The passage where we find the doctrine expounded is in the Posterior Analytics I ch.20, 82a21 sqq. (Cf. also ch.22, 84a29). There however it is set forth in another connection. Aristotle shows that the number of terms to be interposed between the subject and predicate of any proposition which we desire to demonstrate, is not infinite. If it were, the proposition could never be proved, as it is impossible to traverse the infinite. All the terms in the series must be contiguous, with nothing intervening between them --- ἐξεμεριζομένη ἀρχὴ ἡ ἀξίωσις (82a32). If there were an infinity of terms to be inserted at any point in the series it would
constitute a break and the terms would not be contiguous.

(For the definition of \( \chi_{\omicron\nu\omicron\omicron\nu} \) cf. Phys. V ch.3, 227a6 --- \( \chi_{\omicron\omicron\omicron\nu\omicron\omicron\omicron\nu} \), and 226b23 --- \( \chi_{\omicron\omicron\omicron\nu\omicron\omicron\omicron\nu} \).

There is some difference, however, between a series of terms bound together by the identity of the subject of which they are predicated and a number of specifically diverse but generically identical qualities. According to Aristotle, in both cases they are to be considered as a series arranged between two extremes. In the case of qualities these extremes are the members of the series with least specific resemblance and, if one takes seriously the spatial designation (\( \tau\alpha\nu\tau\alpha\nu \)) applied to them, the intermediate members of the group must be thought of as being arranged in accordance with the amount of the resemblance they each possess to the extremes. We have seen however (chapters 3 & 4) that Aristotle does not prefer to think of them as forming a continuum like a line but as being formed by different proportions in the admixture of the two fundamental extreme qualities e.g. black and white, sweet and bitter. Though forming a linear series, they do not constitute a uniformly continuous line. Thus though he may, as here, talk of opposites (\( \tau\nu\nu\nu\nu\nu\nu \)) in terms of spatial relation and call them \( \nu\nu\nu\nu\nu\nu \) (cf. Categ., ch.6, 6a17: \( \tau\alpha\nu\nu\nu\nu\nu\nu \) \( \nu\nu\nu\nu\nu\nu \)), qualitative difference is really other than
spatial diversity. It is this that causes the number of species in a genus to be limited in number. If a genus were really a spatial whole, its parts, the species, would need not merely to be \( \gamma \delta \mu \nu \) --- contiguous, but \( \sigma \tau \nu \gamma \) --- continuous, and hence capable of resolution into an infinite number of subdivisions (cf. note 11). If the members of the series were not merely contiguous but had a common boundary, as things continuous have, it would mean that there was no reason for drawing the boundary between any two at one point rather than another. The only common boundaries are spatial existences, --- point, line, surface and these can be drawn anywhere. It is magnitude that is per se continuous, but in so far as genera are not magnitudes they are not per se continuous (\( \pi \alpha \theta \), \( \tau \sigma \nu \gamma \) 1. 28) and besides do not present this aspect of infinite divisibility.

Division into unequal parts is, Alexander tells us, progressive division of the parts which the first division yields into the same fraction as that which they are of the whole e.g. the division of a line into two and again the half into two and so on. This is the special example of 'unequal division'
which Aristotle in *Physics* VIII ch.3, 263a3 sqq. in reply to
Zeno, shows to be infinite—ἐνιαύτης γὰρ τὸ πάντα, ἀλλ' ὁ δὴ ἄρα ἄνευ τοῦ παντὸς ἀνάξιον.

(263b28). Any actual division of a continuum into distinct parts is finite. In order for the parts to be distinct the termini of adjacent parts must be, at least, reckoned as distinct. Hence the whole, which was continuous, by the division ceases to be so and *ipsa facta* loses that capacity for infinite division which, as continuous, it possessed.

True the parts again can be divided, but any division of them into distinct elements which can actually be realised is once more finite.

All this seems to point to the conclusion that the very spatial determinants by which we are able to construct a continuum e.g. a line, and to consider it as resoluble into distinct parts, is itself a qualitative distinction (e.g. direction right or left) which exists over and above the characteristic of magnitude, which is the universal attribute of spatial quantity.

Aristotle goes so far as to say (263b7) συμβασθεὶς γὰρ τὸ ἁρμονικὸν τὸν οὐκ ἔσται χαρακτηριζόμενον ἀμείζων. Thus not only has a line (with all other figures) a non-quantitative aspect, but the possibility of determining it as a quantity depends on this qualitative character.

(Cf. also for the general doctrine III. ch.7, 207b10; ἐνιαύτης γὰρ τὸ διαμορφωμένον ἀμείζων.) The result however of this is that anything considered as a continuum divides into a limited number of units (ἀμείζων can mean little else than units;
all things considered as units are held to be equal) but an infinite number of diminishing fractions. Units are the constituents of a continuum, species of a genus.

Spatial quantity or μῆλον ὁμολογών ὑφή ἐν ἐν μορφῇ. Cf. also De An. III ch.3, 428b24: πίνακας παί μήλον ἐν συμβολή τοῦ στάθμου τοῦ.

There is a somewhat similar passage in Physics VII ch.5, 250a20 sqq. The sound which one single grain of millet makes in falling exists, as a separate sound, (μαθ. αὐτο) only potentially in the whole i.e. it is not actually a separate sound — ὁ ἀκοή ἐν τῷ ὁπλίμῳ ἐν τῷ ἄλλῳ 

ιόμαλῃ ἐν ἐν ὅλῳ (250a24). For the general question as to how far Aristotle by his distinction between potential and actual settles the difficulty about "petites perceptions" and subconsciousness generally cf. Introduction sec. viii.

A quarter of a tone was the least interval taken notice of in Greek music. Hence I fancy in τῷ δύο διστόξι τὸ δοκιμαῖο must be a sound with difference in pitch from that of the one before it is within i.e. less than a quarter-tone. Aristotle and seems to be thinking of a series of ascending and descending notes made by sliding the finger up and down the string of a musical instrument. Thus in this case can hardly be a

in intervals, quarter of a note is not upright resembles an instrument. The parts of an interval are not however sensations.
At the same time this interpretation makes the phenomenon hardly parallel to that of the illustration from sight or that quoted in note 10 from the *Physics*. In those instances the sensations which per se are not actually appreciable exist concomitantly and are perceptible in the whole of which they are elements.

In *Metaph. XIV* ch.1, 1087b35 it is called δυνατόν ἐν δύναμιν. λήμβανος. Hence there seems to be no ἔννοια; the notes seem to be ἀνάλογα ἀλληλου ἰ.ε. contiguous but separate, and hence the continuity of the whole is broken up.

The difficulty in this obscure passage is increased by the discrepancy between the MSS. *EMY* read οὐκ ἐν γὰρ ξωρίσ τῇ ἐπανάλημμα, is the reading by Alexander and most others. I have followed that of *EMY* which is supported by the ancient Latin translation, because of the difficulty of giving any sensible interpretation to the following sentence, if we read χωρίσ τῇ, the sense it gives does not really conflict with what is said later on.

Aristotle says that the very remote parts of the objects of sense, if not separated, are perceived only potentially and not actually. But this does not commit him to the statement that if severed from the whole they are actually perceptible.
This is no doubt the general rule; an object like a one-foot measure which has only potential existence in a larger whole is made actual by being marked off. It then becomes an explicit object of consciousness, not merely a potential one. But, he goes on to say, very minute fractions cannot exist in isolation from the whole as the larger parts of a whole can when broken off. They lose their identity (cf. note 25 below, De Gen. et Corr. I ch. 10, 328a24 sqq.) and become parts of the new substance into which they are absorbed, and increase its bulk. As such they cannot merely be even potentially perceptible as parts of the substance to which they belonged originally. They are, no doubt, potentially perceptible parts of the new substance but, if they have lost their ὀς, as Aristotle says in De Gen. et Corr., loc. cit., they cannot be on the same footing as elements which have entered into a true mixture and which, on resolution of the mixture, become actually what they were before.

These considerations make it clear that, when in I. 10 ὁ ὁ is mentioned Aristotle means the minute sensation which can be even potentially ἐρε, only when coming from a part of the object which is not separated from the whole. He argues, --- the minute ὁ ὁ which has only existence in a more distinct sensation (ὁ ὁ ὁ ὁ ὁ ὁ ὁ and as such is only potentially in its individuality ὁ ὁ ὁ ὁ ὁ ὁ ὁ ὁ and sensation, is not ἐρε actually perceptible and hence capable of isolation; hence the similarly minute object of
sense (νωρίσθηναι δεξιώτατα), which causes it must be in the same case. It is not per se actually perceptible, but added to and taken along with the other parts of the whole it is actually perceptible and, since that is so, it, even in its individuality, must be thought of as being only potentially an object of sense.

It is, I suppose, προ-γραμματίνων (1.14) which has prompted some interpreters to think that Aristotle is considering the fortunes of the minute part of the grain of millet in (it were here potentially perceptible when in actual isolation) actual isolation from the whole to which it belongs, one would expect that the change caused by addition to the whole would be to raise it as such to actual perceptibility; but this Aristotle will not allow. προ-γραμματίνων as we see from 1.18 below and Physics 250a24, just means ἀναφέρει. There is no reason why it should not be used of intellectual as well as of actual addition.

τὸ διάθέτην χωρίστην δεξιότατα (1.13) does not imply that the διάθέτην exists χωρίς; it means, practically to perceive it πεπρωθίσαι. Similarly things that exist χωρίς —χωρίστην—are identified with ἀναφέρει, the independent existences which are the subjects of predication and which Aristotle in Anal.Post.I ch.4, 73b9 calls καθ᾽ ἀναφέρει. Cf. Metaph.VII ch.3, 1029a28: καὶ χωρίς ἀναφέρεται ἡ ἀναφέρει μελετήσαι τὴν ὁδὸν.

We can easily explain the substitution of χωρίστην for χωρίς by an editor who read on and found that χωρίς the
minute parts of objects were not actually perceptible and indeed could not exist and retain their previous character, if his logic lead him to believe that 'if not separate then not actually perceptible' contradicted the statement 'if separate not perceived' (μετακειμενον). Such statements are only apparently in opposition. If we retain μετακειμενον we shall have to translate 'they are potentially perceptible but not when in isolation actually so.' [This is different from the case of] the one-foot measure which exists potentially in the two-foot rule and actually when that is divided bisection is made. But the ellipse to be supplied is so extraordinary that one might justly, with Biehl, suspect the authenticity of the whole clause if μετακειμενον is to be read. The genuineness of μετακειμενον is here equivalent to μετακειμενον if it is to make any sense. It is not the one-foot which is bisected but the two-foot measure. Hence one would expect διεκκέφισθαι or διακοίλονται. But perhaps the sense of διεκκέφισθαι is here equivalent to διακοίλονται, if it.

In addition to being so very minute as to surpass (μικροτερον) the discrimination of the sense, they lose their self-identity on being isolated.

is, as the commentators notice employed in rather a different sense from the usual. It naturally means excess in greatness; cf. chapter 3, 439b50.
For the doctrine of the minute fraction of substance in isolation from the rest is not perceptible at all. Aristotle goes on to discuss what happens when we do perceive it in some way, when 'ιτιληθοθενεν ἔρημον'. We are not now discussing the separate existence but the separate perceptibility of the object, but in the sensation to exist and to be perceptible is the same; hence it is indifferent which of the two we assert to be potential.


29. Cf. note 22.

15. ο'νοσερασιν means practically to form a constituent; cf. Metaph. V. ch. 13, 1020a 7: ποσὸν ἄγαλμαιν τὸ διαφορὲν τὸν ῥιερίστην ὅπως ἐνορθησάτων and Anal. Post. I ch. 26, 84b14 sqq. "odd" ἐνορθησάτω in the definition of number, while number ὅπως ἐνορθ ὥσπερ belongs to,
or is a predicate of, odd. Cf. also the definition of \( \gamma \) in
\[ \gamma \nu \gamma \nu \alpha \nu \tau \iota \varepsilon \nu \omega \kappa \alpha \nu \tau \sigma \kappa \varepsilon \]
\( \kappa \nu \lambda \nu \).

Hence it is probable that Aristotle is thinking of the \( \gamma \) as the subject here which compose finite bodies, as \( \gamma \nu \gamma \nu \alpha \nu \tau \iota \varepsilon \nu \omega \kappa \alpha \nu \tau \sigma \kappa \varepsilon \)
is generally used of that which stands to anything in the
relation of \( \gamma \).

Perhaps, however, he is thinking of \( \chi \rho \omega \alpha \nu \alpha \nu \) etc. as the
subject. In that case the translation will run --- 'But when
determinations of colour, taste or sound, existing in the
concrete are so related to each other as to be also actually
perceptible and perceptible, not merely in the whole but in-
dividually, they must be limited in number.'

This would mean that he is talking once more of the
\( \gamma \nu \gamma \nu \alpha \nu \tau \iota \varepsilon \nu \omega \kappa \alpha \nu \tau \sigma \kappa \varepsilon \) of sense-qualities. But they have already
been accounted for and this seems to touch on the only case
left undescribed --- the distinguishable parts of a continuum,
which are \( \gamma \nu \gamma \nu \alpha \nu \tau \iota \varepsilon \nu \omega \kappa \alpha \nu \tau \sigma \kappa \varepsilon \) perceptible not merely in combination
but in isolation. If this be the interpretation the argument
is that, in the case when the constituents of the objects per-
ceived are distinct and individually perceptible and hence
limited in number, the qualities presented by them must have the
same limitation. \( \chi \rho \omega \alpha \nu \alpha \nu \) etc. are but items of \( \gamma \nu \gamma \nu \alpha \nu \tau \iota \varepsilon \nu \omega \kappa \alpha \nu \tau \sigma \kappa \varepsilon \) determination, though, no doubt, Aristotle is thinking of the
different colours and sounds etc., as presented in the form of
different continua.
Alexander reads ὑπὸ ὑποτευκτικὸν which perhaps, if understood as meaning 'of sufficient size or intensity', i.e. ὑπὸ ὑποτευκτικὸν, improves the sense. We must not understand 'sufficiently numerous', i.e. ὑπὸ ὑποτευκτικὸν, as no multiplication of the numbers of the insensible parts of objects makes the parts any the more perceptible per se. ὑπὸ ὑποτευκτικὸν can, however, quite well mean 'to each other'. Cf. ἀναφερόμενον below ch. 7, 447b29.

may be taken either with the clause before or with ὧν ἄρουντα.

which is defined in terms of this phenomenon in local movement in Physics V. ch. 3, 226b23; ἀναφερόμενον, which refers to the multiplication of ἀρχέων ἀφειδοτεμαχων ὑπὲρ ἀναφερόμενον συνειδητόν συνειδητόν.

Aristotle goes on to say that it is to ask too much to wish us to believe that light passes from east to west across the whole sky without the movement being detected. It was, of course, impossible without modern scientific methods to discover the movement of light. For the Empedoclean theory cf. chapter 3. Cf. also R.P. 1120, Zeller's Presocratic Phil. (Eng. Trans.)
II p. 158. According to Philoponus, light was a ὅμοιον issuing from the illuminating body; vide below 446b27.

Cf. Metaph. XII ch. 1, 1063b26 and Physics X. 5, 1174a 30, and Phys. VIII ch. i, 242a32.

Time is infinitely divisible like motion and magnitude; cf.

Physics IV chs. 11.12, VI 1.2.3 etc.; VIII ch. 8, 263b28; ὅμοιον ἐκ τοῦ ἀνάλογον ἄρα ἀναφέρον.

This is equivalent to saying it is instantaneous. An act of perception is in this characteristic distinct from local movement which cannot be instantaneous; cf. Physics VI ch. 1, 231b30: θετων ἐμπεσάς τοι ὁ χρόνον ἀναφέρον.

Perception is an ἀντίγραφον, i.e. being no ἀντίγραφον. cf. Alex. p. 128 which as such has no γνώσις cf. Alex. p. 128 and above, Introduction, Sec. IV.

The construction here is defective. Instead of ὅμοιον ἐκ τοῦ ἀνάλογον, ὅμοιον ἀναφέρον should have been written, but it was natural to say ἀναφέρον when denying that they possessed the aspect of process any the less on account of the instantaneousness of the act of perception considered as a psychical event.

Perhaps, indeed, a mistake was made in writing ἀναφέρον for ἀναφέρον, by overlooking ἀναφέρον was.

Thomas and Simon, however, punctuate after γνώσεως, making the apodosis begin at ἀναφέρον. This is very ugly and besides it makes ἀναφέρον ἀναφέρον simply, repeat over again the assertion of the previous clause —-
It will translate -- 'but sensation is devoid of process, yet none the less [there is a lapse of time] as in the case of sound etc.'

Aristotle means that the instantaneousness of the psychic act does not detract from the lapse of time in the psychical process. Though there is no γραμμή in the former, there is in the latter. Hammond conjectures ομόκος for ομός and translates 'Also if everything at the same moment hears and has heard, and in a word perceives and has perceived and there is no time process in sensations, nevertheless they lack this process in the same way in which sound, after the blow has been struck, has not yet reached the ear.' But I fail to see how a sound which is on its passage to the ear can be said to 'lack process' and how, if this were so, it would help Aristotle's argument. Moreover Aristotle does not say that we are unaware of the lapse of time which takes place while a sound is being transmitted. He implies the opposite. He only says that in the psychical act there is no process.

\[\text{is a change of shape: cf. De Coelo II ch.7} \]

305b29 (γ(γυτηθέ)) τη μεσασα ραματισι, παθανορ ού κοσ
αναν ηπεριλ γύνοιτ εν τραπα και πάσης. μεσασα ραματισι
is also conjoined with (though differentiated from) ἀλλαξο, ὀσ.

It consists in the rearrangement of elements which retain the same nature while ἀλλαξο, ὀσ. indicates qualitative change.
is that form of \( \gamma\nu\rho\iota\sigma\zeta \) that would specially suit an atomic theory and hence Aristotle applies it to the propagation of sound, which he conceives of in quite a mechanical way. He evidently thinks of the \( \chi\nu\mu\nu \) taking an a different \( \chi\xi\mu\nu \) for every different articulate sound. These are subject to alteration in proportion to the distance we are from the person with whom we are talking. He is evidently thinking mainly of mistakes in following some one's words, not merely of inability to hear at all. That would rather be accounted for by the absence of definite \( \chi\nu\mu\nu \) than change of \( \chi\nu\mu\nu \) in the air which communicates the motion or the motion transmitted.

Alexander interprets \( \tau\varepsilon\mu\zeta \) \( \sigma\chi\iota\sigma\nu \). He distinguishes three classes of relatives:

1. those which are \( \varepsilon\gamma\zeta\iota\nu \), e.g. \( \iota\kappa\alpha\iota\zeta \), \( \iota\mu\xi\zeta\zeta \) etc, in which the mode of their relation (the \( \sigma\chi\iota\sigma\nu \)) does not depend upon the relative position in space.

2. those which are \( \varepsilon\gamma\zeta\iota\nu \) but where the \( \sigma\chi\iota\sigma\nu \) consists in spatial relation (\( \iota\nu \pi\omicron\iota\delta\varepsilon\omicron\lambda\zeta\omicron \)) e.g. \( \delta\varepsilon\iota\nu \).

3. those e.g. \( \alpha\gamma\iota\zeta\theta\omicron\zeta\omicron\zeta \) and \( \alpha\sigma\theta\iota\gamma\iota\omicron \), which, though requiring some \( \sigma\chi\iota\sigma\nu \) which consists in spatial relation (\( \alpha\gamma\iota\zeta\theta\omicron\zeta\omicron\zeta \)) are not strictly \( \gamma\nu\iota\sigma\zeta \), like \( \tau\zeta\delta\varepsilon\iota\omicron\gamma \), but require a \( \delta\nu\alpha\lambda\omicron\iota\nu \) \( \alpha\nu\iota\nu\) on the part of the \( \alpha\gamma\iota\zeta\theta\omicron\zeta\omicron\zeta \).
Light might travel from object to eye on account of the spatial relation of the two, but vision would not result unless the eye were endowed with a certain faculty. This, in the minds of certain other commentators e.g. Simon and Thomas, seems to connect with the distinction drawn between certain classes of relata, in Metaph. V ch. 15, 1021a26 sqq.

In this chapter there are likewise three main divisions of relata.

(1) ἀλλὰ καὶ ἐφιδρομεῖν λογοῦν ἐκ τῆς ἔννοιας Things are equal of which the quantity is one. (Ἀριστ. Metaph. 1021a12.)

(2) ἀλλὰ καὶ ἐφιδρομεῖν λογοῦν ἐκ τῆς ἔννοιας ἐκ τῆς ἔννοιας

(3) Such as ἀλλὰ καὶ ἐφιδρομεῖν λογοῦν ἐκ τῆς ἔννοιας

In the first two classes (cf. Bonitz, Metaph. p. 261) the whole notion of the relata can be discovered in the relation. A is understood by being referred to B, and B by being referred to A. In the third class, however, the relation is not mutual; one of the terms requires independent explanation; τὸ ἄρτικον can be explained by referring ἀρτικὸν to it, but ἀρτικὸν requires other definition than reference to τὸ ἄρτικον. We advance no further by saying that vision is relative to those things of which there is vision, ἀπὸ γὰρ ταδείου ἐπὶ τούτῳ ὑπάρχειν ἀπὸ τούτῳ.

Aristotle's meaning however is no more than this, that ὁ ἰδὼν is not explained by being regarded as relative to τὸ ἐπίστημον.
but if we refer it to χρωμα it can very well be defined and we obviate any useless repetition. Hence the distinction does not affect the real relation of the object of vision (χρωμα) to vision (ευτος) but only the mental way of relating them when the former is styled not χρωμα but the object of vision - τα διερμηνευον.

Thus there is no justification for Simon's attempt to connect this distinction with that here. He says, the 'ratio' in relation of this kind pendet ab alio and hence there must by activity on the part of το αιτιον γεγονη which, hence, must be at a distance.

Nor is there necessarily a reference to the Δινωνας δινοληγησθη of sense as Alexander conjectures.

Aristotle simply states that seer and thing seen must occupy definite positions; their relation must depend to some extent at least upon their relative Θερας. They are not like things of which the relation is purely non-spatial like equals. It is not the manner and mode of their being which relates them as in the case of equal quantities, but something else which entails a definite spatial position.

We cannot translate ὡς indefinitely as 'anyhow'. Things that are equal do not exist 'anyhow' but 'somehow'.

The result of the argument is to establish the necessity of determinate spatial position for seer and thing seen and hence it advances a plea in favour of the transmission of light in
the same way as sound is carried to the ear. The last argument had shown that the object which sounds and the hearer must be in determinate spatial positions.

If we do not read 

The air which is ὑαθὴρος (and water, cf. above 4, 441a25) is made continuously by being struck by an object that is smooth of surface and so continuous, and it is thus that sound is transmitted, cf. De An.II ch.8 passim. Sound is caused by a movement (a blow which involves ὄρθος or spatial movement, occasions it cf. 419b10-13) which is quick enough to strike the air and make it continuous. If the movement is too slow the air disperses (419b20 sqq). It is hard and smooth bodies which, when struck, have this effect upon the air, though apparently the air itself when imprisoned in any closed or partially closed space can function in the same way --- as in the case of the echo (419b25 sqq.).

Sound is this movement (κατὰ γὰρ δυσφόρος κίνησις, τὸν δυνατὸν περιπλάνητον ὀρθός ἐκ τοῦ πρῶτου ῥοήν ὁποῖον ἐν τὸν ἄλογον ὁμοίως ἀπεικονίζει — 420a23) or rather this movement is sound, for Aristotle does not like the modern
physicists think of sound as being merely a movement when outside the ear; its peculiar quality seems to exist objectively though entirely relative to the act of hearing (cf. Intro. and De An. III ch. 2, 425b26 sqq.)

At the same time it will not do to go so far as Rodier (Traité de L'Ame, Vol. II p. 286) and say that sound is not to be identified with the motion that causes it but an objective quality in the same way as, according to Aristotle, colour does, and that its transmission to the ear is not a movement any more than the transmission of light is.

(Rodier appears to me to misunderstand μεταφοράς; it is not qualitative change and, even if it were, his argument would not be advanced any the further. Aristotle distinctly says above (1. 9) that in the transmission of sound, the air experiences φορά and if in 6-9 Aristotle were describing the increase in faintness in sound (which he is not) it would be only caused by a transition of the air from a state of motion to some other condition).

At the same time there is a difficulty here. In the De Anima Aristotle describes the φορά, the movement which causes us to hear, as a rebound and quivering of the air all in one mass — ἡσοῦται ἀνάφεραι ἀνθύφων τῆς ἀρνητικῆς (420a25) and again in 420al he says ἐξίσου (when struck) ἔσεται γίνεται ἡμα. This would make this φορά have the same characteristics as that species of ἀλλοωτικά which, below in 446b29 sqq. he wishes to distinguish from φορά.
(26)

(and among them the 
which constitute sound) as being in-
stantaneous. It seems then that in the De An. Aristotle
is simply emphasising the assertion that the air is rendered
one and continuous throughout the whole extent of the space
between the sonorous object and the ear --- 
need mean no more
than this, but 
, if by 
is meant 'at the same moment',
(vide Rodier ad loc.cit.) is putting the point too strongly.
Here he plainly affirms that though the medium is continuous,
the movement (in which it becomes continuous) falls into suc-
cessive parts, just as qualitative change may also betray suc-
cession as appears from the passage below and Physics VII. 4 & 5 (v. 3)

esp. 250a sqq.: — καὶ ἐὰν ἀκοῦσαν ὁικὴ ἂν ἀκοῦσαν ἄνθρωπος καὶ οὐκ ἔκαμψαν
ἐν τῇ πόσει κατὰ τὸ ἀκοπεῖν καὶ θύειν
ἐν γενομένῳ ἡλικίασθαι, πιά ἐν οἴνῳ ἄρειν, ὡς διήλαθον
It is indeed necessary to grant this as ἂσφαλές is an ἀληθούς
and occupies successive times in propagation.

446a 47b cf.

On a theory which reduced all the senses to ἀγιος this could
not be so; each person would perceive only the tangible things
that impinged upon his own sense-organs. 
---
continually means 'in one sense --- and another'
not 'at one time --- at another' as Bender and Hammond take it.
Cf. 378a 32 and cf. 
Physics III ch. 4, 266a 13,
Hammond seems to regard this as a new problem. But τοῦτο naturally refers to what has just been said.

There is no need for adding ὅπως the same way' as Hammond does; τὸν καταλύτην cannot bear such an unqualified assertion a meaning. The doctrine controverted is that the same thing can only be perceived in one way. It seems to be an echo of nominalism. It was left to Aristotel to resolve the difficulty by pointing out that there are different ways of perceiving the same thing.

Alexander explains this as τὸν προσώπου χώραν ἐκ τῆς κυριαρχίας, and so Simon also. It is the part of the medium in contact with the sense-organ --- what he might have called τὸ κυριαρχημένον (cf. De An.III ch.12, 434b33) as opposed to the sense object which is τὸν προσώπον (καταλύτη 

The meaning is, that this nearest part of the medium is numerically different in each case, but it is qualitatively identical in all; the qualitative change or motion produced in the medium by propagation outward from the sense object must be numerically a different μέτοχος or a different μέτοχος of the προσώπος when moving to the right and to the left and when near and far, but
it is of the same kind. Aristotle it must be remembered, thinks of the same quality, and that is to him αὐτὴ ἰδέα, as existing objectively in the medium. The word to be supplied after ῆφητον is no doubt ἀρκετός and, as a sense quality is an ἀρκετός to him, perhaps he is thinking of ῆφητον more as quality --- the quality relative to the special sense, than as the portion of the medium which is nearest. We might paraphrase his meaning thus --- "The qualitative affection of sense proper (τὸ ἀρκετός) is numerically different for each person though specifically, i.e. qua quality, identical, while an object numerically one and identical is perceived by all." ἀρκετά αὐταῖς ἐστι are among the contributions of νευτὸς ἴσης. Hence perhaps Aristotle is obscurely hinting that as τὸ ἀρκετός gives an object numerically different in each individual it is the function of νευτὸς ἴσης to introduce numerical identity and hence real objectivity into the perceptible world.

This is an additional point; if perception is due to ἴσης of the medium, and numerical difference in the ἴσης directly affecting the sense does not necessitate difference of τὸ ἀρκετόν ἴσου, perception of it --- τὸ ἀρκετόν ἴσον --- may be simultaneous in different people.

If sound etc. were ἄκουσα then, in perception, the object would really be 'divided from itself' as a body can only be
in one place at the same time. According to the áπαροινον theory, the sound, scent and light are σώματα — material particles. The κινήματα or κινείσθησις which is propagated in different parts must be the πάθος of a σώμα (which has μόρια). The plurality of the sense experiences depends upon the medium having μόρια and hence being σώμα. Thus this sentence refers merely to what goes before. As we shall see it makes no sense if taken with what follows.

I have here followed Alexander and cod. P. as no other reading seems to give an adequate meaning. Alexander connects this with the doctrine in De An.II ch.3, 418b1 sqq. where light is defined as the προσώπα — περίς τοιούτου περπατάσσειν. Cf. also above 3, 439a19: ὅπως γὰρ ἐὰν ἄλλο περπάτω δέν τῶν συνελάβοι σημεῖα προσώπα. The argument, then, is, that though light is due to the presence of something yet it is not, as one might expect, a movement set up by it. It is hence, if not if not a movement, an οὐσία as said before (418b9). οὐσία in the proper sense is not κινήσεις: cf. De An.II ch.6, 417a16 even ἠλλοστόμον. Compare also Physics VII ch.3, 246a10 where it is said that bodily and mental ὄργανα are not ἠλλοστόματα. Light is described as a οὐσία in De An.II ch.7, 418b19 and III ch.5, 430a15. The change from οὐσία to οὐσία in the proper sense is not mere alteration from one quality to its opposite,
but is a movement like virtue is a state which reveals the true nature of the thing which possesses it. It is Alexander's contention that light is something of this kind and is not to be described as an like odour. Hence it does not require time for its propagation. Cf. note.

If we read we shall have to render with the vet. tr. 'per esse enim aliquod lumen est' which Thomas expands into -- 'per unum aliquod esse, id est, per hoc quod totum medium sicut unum mobile, movetur uno motu sicut illuminant.' Or else we must suppose that there is some contrast between being and motion. This however is not an Aristotelian doctrine, though there were other theories which identified motion with . cf. Physics III ch. 2, 201b20: 'et non est aliquod esse, quod est in corpore illuminante.'

Bender (p. 29) renders 'das ist nicht durch ein gewisses sein' which seems to require some such explanation as the above.

St Hilaire (p. 31) gives rather a different interpretation. Light exists because it is 'un être particulier' and Hammond (p. 184) seems to follow him in rendering 'Light has a substantial nature.' may mean to be an something . Cf. Physics IV ch. 6, 21a31 . But, if it meant
that here, it would imply that light was something concrete, a σοφία, which it is not. To imagine, then, that Aristotle here declares that light is a σοφία as opposed to sound and smell which he has just declared not to be σοφία, is quite unwarranted and besides it does not in the least help us to understand how the transmission of light is instantaneous.

Perhaps we might translate τὸ ἐν τῷ τῶν ἐν τῷ (it should possibly be τὸ ἐν τῷ) as frequently elsewhere (cf. 449a17) by 'in aspect' and render 'In aspect light is something real' i.e. 'light may be regarded as something real' it is not concrete ὀσία—in the ordinary sense, but ὀσία ὡς ὂσία (as the soul is said to be in De An. II ch. 2, 414a13 sqq). Light is an ὁσία ὁσία ὁσία. If this be the interpretation and we adhere to the reading τὸ ἐν τῷ it will give exactly the same meaning as Alexander requires, who gets it by other means.

The difficulty remaining, however, is how what is said in the first clause should lead one to expect that light is a presence movement. The of ὀσία in the ἐν τῷ clause gives the Greek this sense. On Alexander's reading there is some ground for expecting light to be a περίοδος which it is denied to be; not so much according to my interpretation of the other reading. (I suggest τὸ περὶ ὁμοίως ὑπὲρ τῶν ὁμοίων τῶν. Light περὶ — stimulates — something — τι — viz. the sense, but
is not a movement itself.

The question here is --- What does Aristotle mean by κίνησις? Does he mean 'un simple mouvement' (St Hilaire) i.e. χορή, or motion generically i.e. μέτρησις? It is quite impossible, from Aristotle's use of the term, to decide whether he employs it here in its specific or its generic signification. In the Physics κίνησις is continually used in the sense of χορή but, where he has occasion to distinguish the various kinds of change, he employs the specific terms if there is any likelihood of confusion arising. Cf. Physics III ch.1 for the distinction between the four kinds of change.

They are divided according to the categories respectively of ὁμός, ποιός, ποιόν and ἐχθατο, which have nothing in common. Hence the diversity alluded to here — μένων ηῶν.1.26. If the light is to be identified as a kind of ἔκφρασις, as Thomas thinks, then this latter statement is brought forward in support of the former. The argument runs --- light is an ἔκφρασις (which may be, cf. below 447a1, 2 instantaneous) and hence not χορή and hence not κίνησις for κίνησις proper is χορή. Cf. Physics VIII ch.7, where it is contended that χορή is ἔπεμφται τοῖς κίνησις.

On the other hand, as we have seen, if Aristotle is in earnest about light being an ἔκφρασις, it cannot be even ἐκθετατο. This is Alexander's contention and according to his interpretation ῥεῇ --- χορή must come as a reply to
a possible objection --- 'Is it not true that \( \text{ἀλλά} \) is different from \( \phi \) i.e. \( \text{νίνη} \) and hence light may be an \( \text{ἀλλά} \) ?' Aristotle replies 'It is true that they are distinct, for \( \text{ἀλλά} \) may take place in all parts at once; however (ομώς \( \text{ἀλλά} \)), when the quantity is large (of substance to be changed) this is impossible. Hence light is not an \( \text{ἀλλά} \) and hence not a \( \text{νίνη} \) at all.'

As against this theory and in support of the former view we have these statements in the De Anima, viz., the medium \( \text{νίνη} \) by the object of vision and again itself \( \text{νίνη} \) the sense. There \( \text{νίνη} \) is apparently used vaguely in its generic sense without distinction from \( \text{ἀλλά} \), so that it seems necessary to hold that, if, in the stimulation of the sense by the object of vision, a \( \text{νίνη} \) in the strict sense of \( \phi \), is not set up in the medium, at least \( \text{ἀλλά} \) is. Cf. De An. II ch. 7, 419a13 sqq. 'αλλά τῷ νίνη ἄνθρωποι τῷ \( \text{νίνη} \) διαφανείᾳ, ὡς τίνι \( \phi \), ὡς τοῦ \( \text{νίνη} \) τοῦ \( \text{νόμως} \) \( \text{νίνη} \) παραμετρεί \( \text{νίνη} \) and III ch. 12, 434b30 sqq. 'ον \( \text{νίνη} \) \( \phi \) τῇ \( \text{νίνη} \), καὶ \( \text{νίνη} \) τῷ \( \text{νίνη} \) καὶ τῷ \( \text{νίνη} \). Cf. also Physics VII ch. 2, 244b10 sqq. esp. 245a6.

The explanation of the difficulty seems to be that Aristotle
regards light in two different ways which are not properly reconciled (1) according to his own peculiar conception it is the ἔσχησις τοῦ διαφανοῦς caused by the presence of fire. This is the concept of the objective nature of light. It is a qualitative determination of certain objects and considered as such it has absolutely no connection with any such thing as motion or transmission. Light is the colour of the medium realised, its true activity, just as the soul is the true activity of the body. This is its teleological definition. But Aristotle likewise inherited from previous philosophy and popular thought the theory that light was something passing between seen thing and seer or vice versa. Now Aristotle allows that there must be some action whether mechanical or qualitative by the object directly upon the medium and, indirectly upon the sense.

According to the popular idea this exactly was light. So, when the question is raised --- "does light take time to travel?" Aristotle, if he had wished to identify light with the ρήματα or ἀκούοντα that stimulates sense should have answered in the affirmative and admitted that it was at least possible. But instead he recoils upon the teleological definition of light to which the notion of movement is irrelevant. Hence his doctrine really is, not that it is an 'instantaneous movement' but rather (what that really is) no movement at all.

But, as his opponents mean by light a movement between
the eye and the object it appears as if, in denying that light is a movement, he were denying his own theory that an actual movement of some kind did take place between object and eye. Without doubt too there was a confusion in his own mind on the subject. His raising it in connection with sound and odour shows this. Naturally the fact that there is no noticeable interval between the production of any object and our seeing it led him practically to contradict his previous assertions.

We cannot say that qualitative change proceeds continuously (συνχάσεως) or is συνήθες in the full sense of the word which is explained in Physics V ch.3, 226b27 sqq. It is not sufficient that the time should be continuous but that the action should be continuous also (μη τὸν αὐτὸν ὁ συνόλον τοῖς ἐρασιν διαλύειν, παί τοι ἑπί ἐνιαυτῆς τὴν διάνυσιν θείας ἀλλιaturas ἀναγκαίως). Themistius (Paraph. ad. Phys. loc. cit.) explains that movement such as the galloping of horses is not continuous, though the time in which the movement takes place is. Qualitative change seems to be more comparable to this and to take place by a series of successive bounds. There seem to be ultimate sections in the process which are instantaneous and not divisible into smaller sections each diverse in point of time.
So it is too with $\delta\varepsilon_\gamma\sigma_\iota\varsigma$ $\pi\eta\xi_\omega$. If a drop wears away so much of a stone in a given time, the half of it does not perform so much of the attrition in half the time. It does it in no time. What is washed away is divisible but its parts were not moved separately but altogether.

In Physics VII ch.5, 200a28 sqq. it had been admitted (cf. above) that, in general, qualitative change falls into different time sections just like $\pi\nu\eta\varsigma\omicron\delta$ proper; yet the half of the cause of change need not cause a change of half the extent. But this is true also of $\pi\nu\eta\varsigma\omicron\delta$ proper. Though two men push a boat so far in a given time, one man need not be able to move it at all. The point here is different. It is, as said, that change either in quality or bulk proceeds in sections.

$\gamma\iota\omicron\omicron\iota\varsigma$ is congelation of any kind (cf. Meteor.IV chs.5-7) and is produced either by heating or cooling. $\Theta_{\iota\rho\mu\upsilon\nu\iota\omicron\upsilon\omicron\nu\omicron\sigma}$ and $\gamma\omicron\pi\varsigma\delta\chi$ are examples of $\zeta\lambda\lambda\iota\omicron\omega\omicron\omicron\iota\varsigma$ (cf. Phys.VII ch.3, 246b7 sqq.). Compare also Phys. 253b25 quoted above.

By $\gamma\omicron\pi\varsigma\delta\chi\nu\omicron\nu\omicron\nu\omicron\nu\omicron\nu$ (cf. note to 443b6 on the function of $\pi\vartheta$) no doubt the thickening of milk and some such substance by heat is indicated.

$\beta\omicron\omicron\omicron\sigma\omicron\upsilon\omicron\omicron$ seems to be propagated by an $\xi\zeta\lambda\lambda\iota\omicron\omega\omicron\omicron\iota\varsigma$ and is admitted not to be instantaneous (1.9 beneath). The instantaneousness of the sections of qualitative change does not make the $\xi\zeta\lambda\lambda\iota\omicron\omega\omicron\omicron\iota\varsigma$
as a whole instantaneous in this case. Obviously there is 'much' to be changed. If light is conceived of as an ἀκτίνες then the whole distance from object to eye must be thought of as being one section. How this can be reconciled with ἀκτίνες ἄλλης ἀρκεῖος. it is difficult to see, for, if a considerable quantity of water cannot undergo qualitative alteration all in one moment, a fortiori the vast extent of medium intervening between eye and object should require a long time to transmit the light. If the words ὁμοιότατον ἄλλης only affect such qualitative changes as θεία μάρμαροι, Aristotle should have pointed out in what respect those differ from the ἀκτίνες involved in light and should have ascribed the slowness of the change in these cases to those peculiarities. 


is brought in as a qualitative change too which would be perceived in the same way as odour if we were surrounded by water. As we have seen, Aristotle does not distinguish between the diffusion of a quality in that which serves it as a vehicle and its transmission through a medium. The difference between the mediated sense-qualities and the others is, that in the former their vehicle is a medium always in contact with the sense organs, in the other cases it is not so. Special contact has to be affected between the body possessed of the quality and the sense. Hence they are both called tactual senses.

Aristotle's declaration here is interesting, because from
it we may infer what we already know from ch. 4, 442a29 sqq.,
that he did not conceive even taste to be a diffusion of the
actual particles of the flavoured substance, since he would not
allow that to be the means of producing smell and the only
difference between taste and smell is that we do not live in
water.

Hence we must lay stress on the fact that diffusion is
only a metaphorical term for the process by which odour and flavour
alike are propagated; cf. 441b15 — ὡσπερ ὄντων ἁπακοδύνων,
443b7: ὁπο ἀπο πλούσιων, 445a14: ὑπο βαρύτης τοι ἑαν
πλούσις.

As we have seen, his customary way of stating the matter is,
that χρώμα causes sensation, while without φως, which is
the ἀβακος of the medium colour cannot stimulate the sense
(De An. II ch. 7 passim). That ὁ δραμά is should be il-
luminated is a precondition of the perception of colour.
(Cf. Rodier op. cit. Vol. II p. 231) In that sense it could be
said ποιν τὸ δραμά. From another point of view φως
is the χρώμα τὸ δραμά and as such is the object of
sense itself and ποιν τὸ δραμά. Thus Aristotle might
use this expression without thinking of light as the χρώμα.
exactly which produces sight (cf. above note 44). \[\text{—d} \] 446b25. 

Both the quality spread over the medium and \(\text{—d} \) 446b25. it itself. Cf. above note to 446b25.

But in so far as the same object which causes sensation is a quality and hence \(\text{—d} \) 446b22. and hence also an \(\text{—d} \) 446b22. means cannot be imitated at all. Though due to an \(\text{—d} \) 446b22. it is not. Hence, an \(\text{—d} \) 446b22. it is as an \(\text{—d} \) 446b22. something which cannot only be described in terms of mind. But all these qualities may be so regarded and hence there would be no grounds for supposing that in the case of one sensor there was not the form that prevails naturally by which the objective quality was realized in the particular sense-instance, in the case of the others.
DE SENSU

Commentary (CHAPTER) VII.
Alexander explains that this is not an absolutely atomic time, for such according to Aristotle does not exist, but a time which, when divided, does not yield one part qualified by one sensation — another by another: cf. beneath 448b19.


Cf. note to ch. 1, 431a5 for the sense of interpretation of ἐπιστήμη θεωρεῖν.

This seems to be a self-evident principle with Aristotle, but perhaps it might be held to be in antagonism to such passages as De An. I ch. 1, 402b21 sqq. ἀλλὰ καὶ γὰρ ἄλλα ἀπὸ τῶν βασιλευτικῶν συμβασιλεύοντα μέγα μήρος ἑρεξεῖ τί ἐστιν. Aristotle would, however, distinguish between the two cases. The entering of one sensation into relation with another by means of combination alters the essential nature of the sensation. You no longer have the same sensation to investigate but a new one — a compound. Hence we may say that the original sensation may be more adequately...
perceived per se when in isolation than when in composition.

... is a δύναμις κριτικὴ (cf. An.Post.II ch.19, 99b35) and by it we recognise a thing as what it is. We must, as Alexander points out, remember that α'σθενείς has two aspects, one of πάθος, the other τόνωσις. Its function as κριτική is the function of mind in general and hence, as e.g. above in ch.6, 445b15 sqq., we get the terms applicable to mind in general (κρινοῦσα, γνωσάνθροπος) applied in the special case of sense perception. Cf. also De An.III ch.9, 432a16, τὰ δὲ τὰ κριτικὰ, ἐς τίνας ἐγγυος ἐπὶ τοῦ ἀσθενείας.

i.e. in the case of harmony when the two tones combine to form a third thing -- a concord. Aristotle is arguing against the simultaneous perception of two things which remain diverse. His point is that if they are to be perceptible at one and the same time, they must combine or, in some way, form a third thing. The combination is obvious in the case of harmonies.

Aristotle goes on to argue that where the combination is not obvious, as it is in harmony, still the result of the simultaneous presentation of the two sensations must result in a modification of the stronger, if one is stronger than the other.

Aristotle is arguing from the case of the objective mixture of things to the intermingling of subjective sensations. He may do this in virtue of his realism. To a modern sensationalist
who holds that complex things are simply fused sensations this would not be possible; the argument would need to run the other way. For Aristotle's doctrine of υ/ε/σ/α s cf. notes to ch.3, 440a29 sqq.

Alexander explains that he is excluding such cases as those mentioned in ch.6, 446a7 sqq: where there is no proper mixture but an absorption of a minute volume of one thing into the substance of the other. χρ'ε would give the sense required more easily than ρε.

Cf. below also in 449a7 sqq. esp. 1.2: εδιν γ' ρώπικης τω τοβιν 

τοκετόν = objects of different senses. There is no qualitative union as in the combination of tones and, on his theory, such as occurs in colours, tastes etc.; the union is κατα συμβαζον ποσ --- co-existence in one thing (τα γρανα 

ευς ἀριθμο 1.44). How the perception of such union is possible is discussed in that passage and in De An. III ch.2, 426b5 --- 427a16.


3 note 10: This is a case in which the perception of the object of one special sense may be effected indirectly, through the instrumentality of another. Cf. De An.III ch.1, 425a30 sqq. --- τα δ' ἐν τας δεκα κατα συμβάζον ποσ αἰσθανόμενα 

αι αἰσθήσεις, κατ' ἀνάλογον τοῦ προδ ναξαν θε. The union is union in one thing not a qualitative union of the sensations.
He is arguing once more from the absence of objective unity to the absence of subjective unity.


By the πίπτωσις is evidently meant the sense affection or the stimulus. We may also translate — "the stimuli are more closely located." This clause forms a premiss on which the previous one rests. It, itself, seems to be an accepted topical maxim which connects the possibility of simultaneous functioning with the physical connectedness of the two elements; they are both πίπτωσις in the same organ and hence δ' αια in space. Aristotle means more than that they are similar, as Alexander interprets.

Reading χρίσι with Biehl we should have to regard this clause as an explanation of the reason why we can argue a fortiori from the case of objects falling under a single sense to the case of heterogeneous senses. It is not a confirmation merely of the previous clause.

If we read χρίσι with Alexander and L S U, the sequence of the argument is not so clear but the possibility of connecting this with the previous clause too intimately is removed.

This contention — that if not combined two things cannot be simultaneously perceived i.e., if simultaneously perceived they combined — is not proved by
the clauses which immediately follow but by the section from καὶ καὶ 1.14 -- α ὅλως 1.16. Lines 10-14 rather prove the simple converse — that, if combined sensations are perceived συνέ.

The argument runs — A mixture is a unit. Perception of a unit is unitary and a unitary perception occurs in a unitary time i.e. δύναμις. For support of the statement that perception of a unit is unitary last premise we get δύναμις μία in lines 12-14. The perception of a unit with which we are concerned, the perception that occurs in unitary time, is explicit perception — (Πνεύμα) — and the explicit perception of a unit is numerically one i.e. unitary; it is the potential perception which is merely single of a specific unity.

(This is the very idea of Πνεύμα — to be complete in one and the same moment, not to be a κόπωμα which varies from moment to moment. Cf. De An. II ch. 5, 417a16-17 and Rodier, ad loc. cit.)

By saying that an implicit perception is specifically single Aristotle means that the perception of various white objects is specifically identical. It is the same qualitative affection; but actual perception is the perception of this particular white object here and now; it is numerically different from the perception of any other white object. It is only as a faculty that the sense of white colour is a unity
and its unity is the specific unity of the various sensations of white. Again, relatively to black and white numbers taken as units, the sense of sight itself is a specific unity. Here the proof of the proposition first laid down begins. The sequence of the argument is best seen by beginning at the other end—1.19 μια τον δυναμικ. We are, by agreement, considering the case of a single faculty e.g. sight. The act of vision must occur in a unitary time. The faculty is single and the time an unit, the act of sense or vision must be unitary—1.17 τον λόγον ἐνα μία δυναμικ. Going back to 1.16 λαθεὶς we find it further stated that if the act is single the objects perceived by it must be single. We still lack the completing premiss that if two things are perceived as one they must be combined. This is not explicitly stated unless, instead of θεό̄ before ἅγγι in 1.16, we read γλυκός. If we read γλυκός we make the train of reasoning complete and much improve what is at best a very ill-arranged argument.

Cf. above 1.6 and beneath 449a3.

Consciousness is here an adequate interpretation of ψυχή, though the term ψυχή has generally a wider meaning.

This sentence — ἀνίκητος γλυκός — seems merely to support the argument generally or rather one of the previous
statements viz. that if you perceive simultaneously it is a unit which must be perceived. Unfortunately Aristotle seems to have stated the converse --- that if you perceive a unit (numerical) it must be in a single moment of time. Aristotle no doubt meant the relation to be convertible and held that momentary perception and the perception of a unit were the same thing.

Alexander will have it that here Aristotle includes generic identity. The different qualities falling under one sense are specifically distinct, merely generically identical, (cf. l.27), and according to Alexander it is these which have their relative identity recognized by the same sense, while it is a single sense functioning in a certain manner which recognizes actual specific identity. This latter contention is correct, but Alexander can hardly be right in saying that here generic identity is included in specific. The train of thought is rather as follows --- Specific identity is perceived by a single sense functioning in a certain manner (Cf. De An.III ch.1, 425a20. ἐκατοντάκολον ἕν ἀποθεμάτων ἀριθμόν). I add the latter qualification, says Aristotle, because a single sense without specifying the manner of its functioning merely recognizes generic identity (the identity e.g. of black and white) not specific; (The function of a single sense is to discriminate the specifically diverse. Cf. De An.III ch.2, 426b8 sqq. esp. 10: ἔνα ῥήμα τὸ ἐπὶ χρόνῳ ἀποθεμάτων ἀριθμόν.)
But in recognising various white things as white i.e. as possessing specific identity, it operates in a definite different mode, and one other than that by which it recognizes the contrary quality black. There is a corresponding difference of mode in which each sense recognizes the corresponding positive qualities e.g. white and sweet and the corresponding negative qualities like black and bitter.

Thus the conclusion is, that it is the same sense functioning in a definite manner which is different in the case of each of two contraries, though corresponding in the various senses according as the contraries are &

As Alexander points out, numerical difference of the sensations can be discerned only by temporal difference of the perception, specific difference by the difference of the manner, generic by the difference of the sense-faculty.

Cf. Beneath 448a15-16. Cf. Bonitz, Ind.p.736b61, "ea quae in eadem serie continentur." The series (σειραί) need not be a genus; generally it is not. Aristotle here ranks the opposed qualities of all the generically different senses under the two heads of ἰδιότητες and ἰδιότητας. It is these which form the titles of the two series. Cf. Metaph.IV.ch.2,1004b27: τὸ ἰδιότητας καὶ ἰδιότητας. Cf. also the Pythagorean distinction of two σειραί, the one headed by τὸ ἰδιότητας the other by τὸ ἰδιότητας. Metaph.I ch.5, 986a23 sqq.
For the use of ἔφυλε 1.30 cf. above ch. 6, 446a17;

This section further shows that the opposition of the 

of the respective sense-affections which are specifically

distinct makes simultaneous perception of them impossible.

Cf. De An. III ch. 2, 426b30; ἀλλὰ μὴν ἀνατρέποντα ἡμᾶς ῥα 

ἐνάντιας προσεισθέντας τοῦ πόρου ἢ ἐκάθευσαν πρὸ ἡν ἐν 

ἀναφερομένης ἐκλογῆς. οὐ ὅτι ἐν τῇ οὖν ἡμᾶς ἡ μέθοδος 

θαυμάζων. This comes in the De Anima

in a different connection; there he is proving that there must

be something unitary which distinguishes the opposed sense

modifications, something which is only in aspect divisible

(cf. beneath at the end of the chapter).

Cf. also De Coelo II ch. 13, 295b14; ἔργα ὡς ὁ πορευόμενος πὸς 

ἀναφερόμενης μνήμης. Alexander understands

χεῖνω after ἀνατρέπω. The whole discussion, he thinks, is one

about time. We are not at present raising the question of

the unity of what perceives as in the De Anima. But this

restriction of τὸ ἀνατρέποντα to time is impossible. It must be

one thing that is diversely affected if there is to be any

controversy as to the possibility of the two affections being

simultaneous ( ἔφυλε ). Aristotle denies as a general principle

that they can be so.
These are evidently the intermediate qualities. It is not quite clear whether the theory about them here is quite the same as that presented in earlier chapters. There they are held to be mixtures of the two extreme qualities and, if by saying that some can be assigned to one extreme others to the other, Aristotle simply means that there is a greater proportion of the one element in one case, of the opposite one in another, then the two theories can be reconciled. This is Alexander's explanation.

On the other hand, it seems to be introduced in 1.8 as a fresh class and are explicitly illustrated only by musical examples.

But probably there is no real discrepancy between this chapter and previous ones. By ῥάμιν and ῥὰ δὲ in 1.6 he probably refers to ῥά ἄρτιαν ῥάμιν and ῥά μίλρδν which are assigned to white and black respectively, ἀλβοῦμ and λευκός ἀργοῖ, which are claimed by προβός and γλώσσα (cf. ch. 4, 442a17 sqq); and by τὰ μετάμεθα in the other qualities. Though τὰ μετάμεθα are illustrated only by musical examples, Alexander thinks that the words in which he describes the ratio between the components of these compounds make it evident that he is thinking of colours and tastes as being composed by the intermixture of various amounts of two original components. Cf. 6.116; ῥάμιν ὑπαρχοῦ ἔποδο καλόγυέο - ῦ - ῥαμίν θέλον ἔποδο νόον. But this is to confuse the matter. When Aristotle says it is impossible to perceive τὰ μετάμεθα
unless as one he does not mean that we cannot perceive their components simultaneously unless as one. He has already said that contraries cannot be perceived simultaneously unless perceived as one i.e. unless they form an intermediate colour, taste, etc. Aristotle is here asserting that we cannot perceive two intermediate colours simultaneously unless they coalesce.

By this Aristotle merely means the harmony of the fifth with the tonic and of octave with tonic. It is difficult to see how the different notes of the scale could be regarded as mixtures.

This is, in fact, the case in connection with which a difficulty is raised beneath in 448a19 sqq.

The chords in question are, in modern terms, composed of two sets of vibrations one of which is in the case of the octave concord, twice as rapid, in the case of the fifth, \( \frac{3}{2} \) times that of the other.

Aristotle's point is that two blended sounds, e.g. the chord of the fifth or the octave, themselves depend upon a relation between tones of different pitch and hence cannot themselves be simultaneously perceived unless they form a new combination. If they do there is a single ratio formed once more, but if not we shall have the impossible task of presenting together two incompatible relations that of the fifth --- 3 to 2 --- i.e. odd to even --- and that of the octave --- 2 to 1 or even
to odd; and this is impossible.

The only difficulty left is to explain why Aristotle seems to identify the former relation with that of much to little and the latter with little to much. But probably he does not mean to identify them. The explanation will be, as Alexander suggests, that by the mention of the ratio of much to little he is indicating the composition of some mixed colour e.g. red, which contains a large proportion of one quality e.g. white and by the relation of little to much, another colour, in which the proportion of white is small compared with the other component.

Alexander and most of the commentators seem to think that Aristotle is in this passage discussing not the simultaneous perception of qualities themselves composite but of the components in composite qualities. Thus (cf. note 2) is erroneous and makes them distort the sense and take τον as explaining the τό ον \( \gamma \) \( \nu \) \( \nu \), \( \lambda \) \( \chi \) \( \nu \) \( \nu \). As explaining the τον \( \gamma \) \( \nu \) \( \nu \) \( \lambda \) \( \chi \) more (see p. 10), not the τον \( \gamma \) \( \nu \). They would translate "Thus and not otherwise we get a ratio between the extremes, for there will be in the one case the simultaneous presentation of the relation of odd to even etc. in the other case of even to odd etc." As Alexander explains, Aristotle is referring to the difference of the single ratio in each case. But the point is, that the simultaneous presentation of two such diverse ratios is impossible. Besides the other interpretation requires us to
take ἀνα as applying separately to both clauses Ἰν and Ἰνυ

But there is no sense in saying that the relation of odd to even is simultaneous; the simultaneity must apply to the two ratios.

In my interpretation I am on the whole in agreement with Hammond.

It is wrong to confuse specific and generic difference as Hammond does. The point is that, if specific difference renders simultaneous perception impossible, a fortiori generic does.

We now proceed to a still wider divergence. Sweet and white, though heterogeneous, are still in the same Ἰνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυ

It makes this clause merely an instance of the principle quoted above and not an advance on it. Bekker's reading of Ἰνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυ

Bekker's reading of Ἰνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυνυ

allowed to stand can only be translated vaguely in the manner given. Still it is quite in Aristotle's manner to change from one chord to another, but of the two tones in one concord. The theory put forward is that really the perception is not
simultaneous but only apparently so. With the first part of
the conclusion Aristotle does not disagree, if it be meant
that the two tones cannot be heard together as two separate
units. But, on the other hand, when they form a συμφωνία
they have coalesced and are heard simultaneously. Thus his
argument becomes an attack on the doctrine that the coalescence
is not real but apparent merely.

The contention is, that the union of tones is merely apparent,
just as it was contended in the juxtaposition theory of colour
in ch. 4, 440a26 sqq. that the union of elementary tints to
produce an intermediate one was of the same nature, —- that
it was affected by a mixture τοῦ ὁμοώνιου merely (cf. notes
ad.loc.cit). The means by which such an apparent union can
be obtained is in both cases the same; it is owing to the
interval between the sensations being imperceptible that this
happens. Without this being granted the theory will not hold
and, accordingly, Aristotle proceeds to argue against the existence
of a Χρώμα διαστολῆς.

If the theory, that imperceptible moments of time exist, is
true, it will be as possible to have simultaneous sensations
of sound and colour as of different tones. But this conclusion
is repugnant to Aristotle. Sensations of different senses
cannot combine —— hence cannot be simultaneously presented.

This is the first ground on which he rejects the theory.
We must remember the principle laid down in *Physics* IV ch.14, 223a16 sqq., that apart from χρόνον time cannot exist. Hence a time in which we are not conscious is not time. A χρόνος ανόσθητος is strictly a time in which we are not conscious for, as Alexander points out, time is not perceived Ῥᾳθραίας but by means of the events which happen in it. Aristotle expresses this frequently when he says e.g. *De Gen.et Corr.* II ch.10, 337a23, that time does not exist apart from change.

The argument here is derived from the continuity of time (cf. *Physics* IV. ch.11, 219a13 etc.) which itself depends upon the continuity of the change apart from which it cannot exist. If in a single continuous time there are sections in which no consciousness occurs, the continuity of the consciousness will be broken; but when one is continuously conscious one is not aware of breaks.

Alexander apparently reads ἡ ὀρίζει ἡ γλώσσῃ αἰσθάνεται
(1.29), the latter words merely repeating the sense of ἄνθρωπον ἐν (1.28).

Simon follows the reading καὶ ὂν ἀντιλαμβάνεται ἡ γλώσσῃ αἰσθάνεται which simply states more explicitly the contradiction implied above.

The ancient Latin version does not translate ἂν Ῥᾳθράιας (1.26) nor does Alexander read it. It is probably a gloss. In that case we should have to remove the comma after χρόνον.
making the sentence start with that word.

If we retain the clause, the sense will be --- "But if there are no breaks in our consciousness and we still perceive whatever object is before us during the whole of the time even though certain sections of it are imperceptible, then we shall have to say that perception throughout any whole time is really always effected by perception in some part of it only." Thus, as Alexander says, we do not perceive this time απὸ τοῦ αὐτοῦ, but only indirectly. We do not perceive a whole as a whole. The argument then goes on to show how by subtracting the χρόνοι ἀναληπτημονίᾳ from any whole and from the remainder successively ad infinitum you could show that no time however small was per se an object of consciousness.

Bound up with and illustrative of the proof we have just outlined (note 37) of the non-existence of insensible moments of time, there runs a parallel proof of the non-existence of insensible magnitudes. Alexander explains their conjunction by making out that it is the supposed ἀναληπτημονία ἢ ἡ ἡμέρα which have motions in imperceptible times. These have already been disposed of in chapter 6 and in the Physics etc. But it is obvious that this proof which shows that there are no χρόνοι ἀναληπτημονίᾳ will equally well get rid of ἢ ἡ ἡμέρα, indeed of insensible magnitudes of all kinds, for the discussion is carried on wholly in terms of ἡ ἡμέρα.
Here the two cases are argued out concurrently and so closely interwoven that they seem to get confused.

It is absurd to make this refer to \( \gamma \tau \nu \gamma \eta \) (1.7) as Bender and Hammond do. How can \( \gamma \tau \nu \gamma \eta \) be taken away from the whole earth? Alexander correctly explains that Aristotle is illustrating both magnitudes, the temporal and the spatial, by a line \( \overline{AB} \) and the feminine inflection here refers to the \( \gamma \rho \alpha \mu \mu \). \( \gamma \rho \alpha \mu \mu \)

The contention of the whole passage leads to the conclusion that here, as in many cases, our text consists of notes either written for or taken from a lecture in which there were many cursory explanations and asides which have not come down to us. Probably by this stage in the proof Aristotle had already drawn the line on something analogous to our blackboard and this explains the sudden appearance of the feminine inflection in the adjective without the previous introduction of any feminine substantive for it to agree with.

If we make the apodosis begin at \( \eta \) we must say that Aristotle explicitly if not implicitly, identifies perception of a whole time with perception during a continuous time i.e. during the whole of it. That is in fact what he means by the latter and what he frequently expresses, e.g. in 448a by \( \gamma \rho \alpha \mu \mu \). \( \gamma \rho \alpha \mu \mu \)

cf. also 1.7, \( \gamma \rho \alpha \mu \mu \) during a whole year, and \( \gamma \rho \alpha \mu \mu \) during a whole year, and \( \gamma \rho \alpha \mu \mu \) during a whole year.

For this way of translating \( \gamma \nu \gamma \) to \( \gamma \nu \gamma \) cf. \( \gamma \nu \gamma \) to \( \gamma \nu \gamma \). Phys. 5
In order to carry on the parallel proof affecting an extended magnitude he should have added to \( \frac{1}{\sqrt{2}} \cdot \frac{1}{\sqrt{3}} \). The reference to the extended magnitude appears once more, however, in the next clause --- \( \frac{1}{\sqrt{2}} \cdot \frac{1}{\sqrt{3}} \).

Remember that the same line is representing indifferently either a temporal or a spatial magnitude.

Simon and St Hilaire rightly say that this is the reductio ad absurdum of the theory that, by perceiving a part, we can perceive the whole. On this interpretation we must render --- during the whole year, 'totum annum'

Simon, p. 257.

Alexander does not give quite the same interpretation. He thinks that \( \frac{1}{\sqrt{2}} \cdot \frac{1}{\sqrt{3}} \) is an illustration of how we may have indirect (\( \frac{1}{\sqrt{2}} \cdot \frac{1}{\sqrt{3}} \)) perception of a whole. We may, in an improper and unqualified way (\( \frac{1}{\sqrt{2}} \cdot \frac{1}{\sqrt{3}} \)) say, that we perceive the whole earth by perceiving a part or assign the Olympic contest to such and such a year because it occurs in a certain time falling within the year.

Whichever interpretation we follow, the result is the same. Such perception is only indirect perception of a whole not of a whole per se, and, if there are imperceptible moments, it alone is possible and we can never have perception of a whole as a whole.
This is doubtless put in as a reply to an objection that the line A B by which he was illustrating was perceived as a whole (A —— C —— B). He reminds the objector that they have agreed that C B shall represent the imperceptible part.

The doctrine involved in both passages is the same and the conclusion the same, viz. πάντα μεγάλα ἵνα εἰσέλθη ἐν ὑπόστασιν. This should probably be connected with what is said in De An. IIIch. 3, 428b29 sqq. about the falsity which may attach to παράστασις. παράστασις may be exercised along with sensation (παράστασις τῆς παράστασις). In the case of the perception of size (and the other παράστασις) which may itself be erroneous, the παράστασις which results from this perception may also be false, whether the perception is present or not, καὶ ἴσως ἐν τῷ παράστασις ὁ παράστασις τῆς παράστασις. If, with Freudenthal (Ueber d. Begw. d. Wort. p. 12), we take παράστασις as referring to spatial distance, as παράστασις...
does here (but cf. Rodier, Vol.II p.433) then Aristotle instancing the error which attaches to our idea of distant objects.

Cf. also 428b3; οὖν παράσκευα μα ο εὐκλείστος ποδιαρός and De Insom. ch.1, 458b28 and ch.2, 460b18. But though in the above passages the discrepancy between παράσκευα and belief (πίστις) is discussed we nowhere meet with an explanation of any conflict between imagination and perception of the common sensibles which goes as far as to assert that something which is imperceptible is yet imageable.

Hence we may conclude that, when Aristotle says that magnitudes sometimes appear to be indivisible, he would not probably refer the act of mind to παράσκευα in the strict sense defined in De An.III ch.3 (ποιημα τρητος αισθησεως γιγνομενη 429a1) or as the faculty of images (cf. 428a2). It is rather to be classed as a mistaken opinion and to be ascribed to πίστις. In fact παράσκευα is here used vaguely and κατά μέτρον (cf.428a2) but in a sense which is very common (cf. above 448a20 and frequently elsewhere) as implying 'appearance' in the medium sense, as opposed to reality. (For a discussion of the minimum visible—cf. Introduction, Sec. IX.)

I hold (following Alexander's second alternative) that this refers to ch.6, 445b10 ἱησοῦνος γὰ λυσον ὄν ἔργοι ἀπ' οὐσιας, not to the subsequent discussion (cf. note 44), for the principle involved is not πίστις but
This passage from 448b13 to 449a20 presents very serious difficulty. In the first part of it the text has been practically reconstructed by Biehl who attaches great authority to MSS. Consequently the interpretations of Alexander and most commentators who follow a very different version have to be in many places discarded. This in itself is small loss, as it can hardly be said that those interpretations were consistent among themselves or with the previous parts of the treatise. But the difficulty still remains of extracting the exact drift of the argument from the crabbed Greek of the reconstructed and, it is supposed, more ancient version. Down to 449a10 runs an argument to which we can find no strict parallel in the De Anima and it is here that the textual reconstruction takes place. From this point onwards we can trace an identity between the reasonings here and those passages in De An.III ch.2, 426b8 —- 427a16 and ch.7, 431a19 sqq., which are themselves already so famous for their obscurity. Consequently the advantage resulting from a greater unanimity as to the text is annulled by a greater divergence of opinion as to the purport of the argument.

In order to arrive at a conclusion as to the general meaning of the passage we must, as it were, take our bearings and recapitulate the results attained in the previous part of the
chapter and the main conclusions arrived at in the De Anima.

The solution already given of ἀρνητικός λόγος is, that consciousness of two sensations simultaneously is only possible when the two combine to form a unitary product (447b9). Only sensations, however, belonging to the same sense can give a unitary product (447a29 sqq) and as an illustration of this unitary product, he gives the concord which two different tones compose and, though Aristotle does not explicitly mention them, (cf. notes to 448a sqq) everything points to his having in his mind the composite colours, odours and flavours which in previous chapters he asserted to be formed by the combination of the two qualities which in each sense are most opposed to each other (ἴσαν μὲν γὰρ κατὰ ἀντίθεμα τῆς κατὰ τὸ ἑξάρτημα). Qualities of diverse senses do not combine (ἐκ τῶν ἐπεξεργασίων ἐν γίνεσθαι τοιαύτα δὲ τὰ συνεργάσια μάλλον ἢ ἐν γίνεσθαι δίδυμοι ἥν γίνεσθαι ἑλλείπον συμβαίνειν τοις). This statement is repeated again in the passage we are to discuss 449a: ὥσπερ γὰρ ἐν τὸς ἑξάρτημα [γλυκυτὸς ἀλλ' ἄπλαυτος] ἰν.

The conclusion then is that sensations of different senses cannot be simultaneously present in consciousness while those belonging to the same sense escape the same disability only by sacrificing their individuality and merging in a compound
(μίμησις) in which they are not ἰντρηγίᾳ, actually, discernible.

Now, in view of the opposition between this conclusion and the passages in the De Anima as well as the solution finally come to at the end of this chapter, (Στομὴ νομοθέτου ἐπὶ ποιεῖν, τοῦτος ἐπὶ νομοθέτου ἐπὶ ποιεῖν, 449a19) which is evidently Aristotle's final opinion; how are we to treat the arguments in the earlier part of the chapter? Are they merely dialectical? Or do they merely emphasize a point of view which, while so far legitimate, is modified and transcended by the final presentation of the subject? To us who have followed Aristotle's method of developing an argument in previous chapters, this seems the more likely answer, but whether he has made the relation between the two points of view quite plain and whether indeed he was clear about it in his own mind is another question.

In the passages in the De Anima there is no mention whatsoever of the sensations coalescing with each other. The question is raised how we distinguish the various sense qualities and the word chiefly used for this action is ηπίνωγη, which is paraphrased once (426b14) by ἴπεθος ἐνεχθήντοις, Ἰη, Ἴρα θραγμάτισς, τὰ ἐντολήματι. The reply is that they must be distinguished by something unitary and in a unitary moment of time (Ἀνα). If the first condition were not fulfilled, consciousness would be divided into dependent parts separate like the minds of different individuals; if the moment of their distinction were
not a unit, qualities could not be pronounced to be distinct at one and the same moment.

Obviously Aristotle is there not discussing qualities which have merged with each other and be indistinguishably commingled in their product. It is noteworthy also that apparently he finds greatest difficulty with explaining the simultaneous distinction of contrary qualities, not of those belonging to diverse senses. (Cf. Rodier, Vol. II pp. 388 sqq. and pp. 501 sqq. On the whole I follow Rodier and Alexander.)

The first explanation proposed is that what perceives is in aspect or mode of existence (α ὢν ὧν) diverse, though a numerical and spatial unit (τὸν ὦν ὦν οὐ καὶ ἴδεται ἀνάρθρως) just as things have various diverse qualities but yet are numerically and spatially one (cf. beneath 449a14, τὸ γὰρ αὐτὸ ἡμᾶς ἀναφέρεται καὶ ἡμᾶς ἀναφέρεται).

I agree with Rodier and Alexander in identifying the second solution in this chapter of the De Sensu with the former of the two explanations in the De Anima in III ch. 2.

But it is only potentially that unitary qualities (as distinguished from those merely diverse) can form a unity. When actual they cannot be realised in the same subject. Hence we must think of the soul not as being analogous in this case to a thing in which diverse qualities are combined, but rather to something incorporeal, e.g., a point which is at one and the same time actually one or two according to the way in which
it is viewed. A point per se is a mere unit and indivisible, but viewed as the end of one line and the starting point of another, it is two. In the line A B which is intersected at the point C A — C B C is employed in two ways at the same time, as the terminus of A C and the starting point of C B. (§ 366, § 388, § 408, § 427a12).

This is without doubt the same solution as that mentioned briefly below in 449a16 sqq. 'In so far as that which perceives sweet and white is actually indivisible it is one, in so far as actually divisible it is diverse.'

Note that in the De Sensu Aristotle applies the explanation, which he had reserved in the De Anima for contraries, to mere differents like white and sweet, afterwards returning to the more general solution which he had given in the De Anima (§ 407, § 417, § 427a12-14) and which seemed to be inadequate to account for the perception of contraries. This need not mean a recoil on Aristotle's part from the teaching in the Psychology. From the discussion in III ch. 7, it appears that he thought the case of contraries and of differents not to be fundamentally diverse. (I follow here Rodier's text and interpretation.) Vide 431a21: ἢ οὕτως ἢ τί, οὐκέτι ἢ ναὶ ὡς ὅροι. παρά τούτου ὡς ἐν ἀνάλογοι καὶ ἐνάρετοι ὡς ὅροι πρὸς ἑαυτοὺς, δεινόνει δὲ τὸ ἄνθρωπόν τις ἄνθρωπον τοῦ τοιοῦτον ἔφανεν ἢ τὸν ἄνθρωπον τοῦτον εἰς τῇ ἑαυτοῦ, ὡς ὅροι καὶ ἐνάρετοι κ.τ.λ.
Here we find (1) that that which discerns the sensibles is ὁ ὅφα, as it were a limiting point (cf. ὃ ὅφα in the previous passage); (2) that the sensations (τοῦ ὅφη) are, in virtue of this principle, related to each other as the qualities (ἐνσώματα) are among themselves; (3) that this numerically identical consciousness relates the various pairs of ἐνσώματα in an analogous fashion (as we can gather also from De Sensu. ch. 7, above 447b29 sqq: ὡς ἐν σώματα ἐνσώματα ἀν τῷ σώματι ἀλ. ). Hence if white bears to black the relation that sweet bears to bitter, the proportion will be transposable, as we may say that white is to sweet as black to bitter. Here now we are relating to each other ἔνσωμα ἐνσώματι and hence it follows that the mode of distinguishing them is not essentially different from that in which we discriminate contraries.

It follows, then, that Aristotle's final opinion contained both elements and that the two are really complementary to each other (cf. Rodier II p.501) viz. 1. that the relation of sensations in consciousness is the same as that of objective qualities in things 2. that the only parallel we can find for the relating consciousness is the mathematical point with its double function of oneness and duality.

Notice that Aristotle is confident that this perception of two qualities is simultaneous, while it must be different
from the only kind of simultaneous perception of qualities yet accounted for (up to 448b7) in the De Sensu. This was the perception of qualities in fusion; that is the distinction (κατά συγκέντρωσις) of the different sensations. It is true that in De Sensu, ch. 7, 447b25 sqq. Aristotle says it is the function of a single sense to discriminate specifically different and opposite qualities like white and black. But there is no indication at that point that this discrimination must be instantaneous; the drift of the argument seems rather to be that what is perceived at a single instant must be a numerical unit. Alexander (De Sensu p. 167 (W.) 10 sqq., (Th.) p. 352, 10 sqq.) professes to find the account given of the perception of contraries here, unsatisfactory. It is merely, he thinks, the same as that first hazarded in the De Anima and there set aside. The something cannot be both white and black and hence, if the union of sensations in the soul is similar to the union of qualities in things we have left the case of contrary sensations unexplained. Hence, he thinks, that either discrimination of contraries can only be effected by means of memory, not present sensations, or that it is by the central organ (the heart) being affected in different parts simultaneously, just as it must be different parts of the same object that have contrary determinations, that we can at the same time distinguish different sensations. Hence, though the simultaneous experience (μάθησις) of two opposite qualities is not possible, simultaneous
discrimination (κρίσις) is.

This seems to me to be an untenable position. Though in perception there can be distinguished the two different aspects of discrimination and experience or reception of the sensations, yet they cannot exist apart from each other; at any rate the discrimination of the diversity cannot exist without the presentation of the different aspects simultaneously. The different cannot exist without simultaneous specification to some extent, it is difficult.

Besides, this theory seems to be exactly that which Aristotle, in anticipation of his final solution is going to disprove below in the passage from 448b14 — 449a9. This is impossible, he says, even though the different parts belong to one continuous whole — ὁ δὲ τὰς ἀναμνήσεις τῆς ἑνώτητος (cf. infra. 20 sqq. and notes). This would be a good description of the central organ functioning by means of different parts.

The way out of the difficulty is found by paying close attention to the conclusion established in De An. III ch. 7.

There is no essential difference, he says, between the discrimination of different and of contraries. Similarly we might add there is no essential difference between the way in which both classes of qualities are realised in things. Incompatible qualities must, if realised in one thing, meet in a common point which is two or one according to the way of looking at it, just as much as a particle of matter which is both sweet and white have both a dual and a unitary aspect.
If this is Aristotle's final opinion, what is to be thought of the purport of the earlier part of this chapter? It might be suggested that in the De Sensu he is talking of \( \alpha \nu \theta \nu \sigma \nu \) in the sense of \( \pi \rho \iota \nu \tau \nu \), in the De Anima as \( \pi \rho \iota \nu \tau \nu \). But this can hardly be accurate; the final verdict in the De Sensu is the same as in the De Anima, while there is no indication that he is at the end thinking of \( \alpha \nu \theta \nu \sigma \nu \) merely as \( \pi \rho \iota \nu \tau \nu \). As we have seen, there cannot be simultaneous \( \pi \rho \iota \nu \tau \nu \) without simultaneous \( \pi \theta \nu \tau \nu \), while again sensation is always with him a \( \delta \nu \gamma \alpha \nu \alpha \iota \mu \zeta \mu \nu \), always cognitive. Perhaps the meaning to be extracted from the discussion is as follows ---. Sense-qualities as such cannot be perceived simultaneously. True, if the sensations they give rise to can combine, as they may do if they belong to the same sense (since the corresponding stimuli are in closer proximity than in other cases --\( \alpha \alpha \lambda \iota \nu \gamma \iota \rho \iota \nu \sigma \nu \) \( \pi \iota \nu \sigma \varsigma \) 447b9\), they can both be experienced. But in combination they cannot be discriminated, hence not perceived. But since, as we learn in the De Anima, to be discriminated they must be simultaneously apprehended, it is to their objective realisation in things, to their unity \( \pi \iota \nu \sigma \varsigma \) \( \sigma \mu \iota \nu \iota \nu \)\( \iota \)\( \theta \alpha \mu \nu \sigma \nu \), that we must look for the grounds of the possibility of their discrimination, while their discrimination is effected by a consciousness which has a unity not like that of different spatial parts in a whole but like that of the different qualities in one object.
If this be the meaning of our author, it forms a remarkable foreshadowing of the psychological doctrine that discrimination and objectification go together and, if objects can only exist only in space, it is an argument for the necessity of the spatial form of things for the development of knowledge.

Aristotle says that this faculty which distinguishes the sense qualities belonging to the different genera is still a form of sense, for the qualities distinguished are sense qualities ("γνωστα" De An.III ch.2, 426b15). Yet it cannot be "διαφθορωτικα" which merely discriminates qualities belonging to a single sense. It is not located in the organ of any special sense, nor in the flesh. Its organ he calls "πνευματικον" which is evidently to be identified with what he elsewhere calls "πνευματικον" De Som. ch.2, 455a33, and "πνευματικον" De Juvent ch.1, 467b28 ibid. ch.3, 469a12, which is the heart or some constituent of it. This is the organ of the "νοηματικον" one function of which we have already discussed, namely the perception of the "common sensibles," --- number, figure, magnitude, motion and unity.

If we look however to De Som. ch.2, 455a13 sqq. we find that the faculty by which we distinguish the various genera of sensations e.g. white and sweet is also called "πνευματικα" and this it is too, which enables us to be not only conscious but self-conscious ("αισθητα και σωφρονα"). It
resides in the ἀνωτάτης ἐπιρροήν (τινὶ ποιεῖται ὑπὸ τῆς ἀνωτάτης ἐπιρροῆς περίτων).

Hence we come to the conclusion that the faculty by which we discriminate and hence objectify sense-qualities is also the same as that in virtue of which we are self-conscious, a striking anticipation of Kant's doctrine of the objectifying function of the 'transcendental unity of apperception.'

Cf. note to ἀπάθεια above 447a14; this has been the sense in which Aristotle used 'individual time' throughout. Cf. Physics VIII ch.3, 263b27: ὅπως ἐν τῷ ἐστὶν ἐκδόνους ἐκ θύμους διηρρησθεῖν, τὸν ἐκδόνον, cf. also VI ch.9, 239b8.

This seems not to be exactly the theory rejected in De An. III ch.2, 426b17 sqq: ὅτι γὰρ κακωρίσθηναι ἐν τῇ κρίσει, ἐν μὲν τῷ γίγνεσθαι τῷ διάνοιᾳ τῶν ἀνωτῶν κ.τ.λ.

There it was shown in general terms that it is not by separate organs or faculties that the soul discriminates diverse sensations. Here it is proved that not even though the different organs were to form a continuous whole could it be said that through them the distinction of the sensations is effected.

In short, both arguments are directed against the contention that it is by means of spatially different parts that the simultaneous presentation and discrimination of two different sense-qualities is rendered possible. In the De Anima these different parts seem to be regarded as the various end-organs, but as it might have been objected that they need not be regarded
as separate in that way since, on Aristotle's own theory, the various sense-organs all connected with the heart, and the real organ of discrimination might hence be the various parts of that member, Aristotle here refutes this second version of the theory.

This is omitted by MSS. L S U and also by Alexander who reads, instead of the subsequent ῥύγος ἰδρύομαι, ῥύγος ἰδρύομαι ἦ γὰρ ἐν τῷ ἁρματίῳ ὅρων. This he takes to refer to the ἀμα in 1.19 above and to be a second attempt to define the sense in which it is individual (Alex. De Sens. 157 1.17 sqq., (W.) 331 1.7 (Th.)). This reading and interpretation is supported by Thurot and also Bümker (Jahrb. für Class. Philol. 1886 p.319) who, of course, assign the ῥύγος ἰδρύομαι to dit.tigraphia. But, if the interpretation is to be supported and ῥύγος ἰδρύομαι is to be referred to time, we must read either ἐὰν ἔν ῥύγος with Thurot or ἕν ῥύγος with Bümker. However, it is impossible that ἔν ῥύγος ἔν διναι can elucidate the meaning of ἀμα or be a relevant description of the atomic time mentioned above (cf. notes 48).

That is a time which relatively to the two sensations is atomic, which is such that the two sensations are not subsequent to each other, but both experienced concurrently throughout the whole duration of the time. But, though the time is continuous, one sensation may quite well be subsequent to another, for the time uniting two events in immediate succession is con-
It is true that the time in which the sensations are presented must be continuous i.e. must be capable of resolution into still briefer times: cf. the general discussion of continuity in the notes to ch. 6, 445b2 and 29 sqq.

But, to point this out, in no way shows how the sensations are \( \dot{\alpha} \nu \alpha \); on the contrary, it would lead one to believe they were not really \( \dot{\alpha} \nu \alpha \) i.e. \( \dot{\alpha} \nu \tau \rho \omega \nu \gamma \dot{\alpha} \xi \rho \nu \) (Physics IV, ch. 10, 218a25, Categ. ch. 1, 14b25) in the sense of being concurrently present in all parts of it, but that one was \( \tau \sigma \tau \rho \rho \nu \), the other \( \pi \rho \delta \tau \rho \nu \). Cf. Physics, loc. cit. – \( \dot{\alpha} \nu \alpha \mut \nu \kappa \rho \eta \pi \rho \nu \) \( \chi \rho \nu \nu = \mu \gamma \tau \pi \nabla \theta \epsilon \rho \mu \nu \kappa \sigma \tau \rho \nu \) \( \tau \rho \nu \) \( \lambda \nu \mu \mu \) \( \dot{\alpha} \nu \alpha \) \( \dot{\alpha} \nu \alpha \) \( \dot{\alpha} \nu \alpha \).

Hence, if it was said that the individuality of the time in which two sensations were presented consisted in its being composed of continuous parts and that they were 'together', \( \dot{\alpha} \nu \alpha \), merely in the sense of occupying different parts of this continuous whole, this would contradict the definition of their simultaneity given above in 1.19, which Alexander explains as not being merely immediate succession in time.

In short, if it can be asserted that a time of continuous parts is atomic in a sense (i.e. in the sense that no division in it has been made, i.e. it is atomic), yet this is not the sense in which the time in which sensations are
simultaneously perceived, is atomic.

Hence if \( \sigma \tau \omega \alpha \theta \gamma \) refers to time it is a misleading irrelevancy. It must refer to the organ or faculty of reception (for the sense in which \( \tau \omega \alpha \theta \gamma \) is a unity, ch. Mat. 8, 16, 19, 19).

The ancient translation runs 'et non indivisibili, sic antem in indivisibili ut omni existenti continuo.'

Biehl's conjecture \( \eta \alpha \iota \varepsilon \tau \gamma \delta \omega \nu \rho \) seems to give no visible improvement.

All MSS. except E M and all the editors except Biehl read \( \tau \alpha \beta \gamma \). Accordingly, following that reading we should have to interpret 'there will be a plurality of organs specifically alike.' Not only the interpretations but the readings also which we are to accept in the subsequent passage will depend upon our decision here.

Firstly, it is clear that whatever reading we accept we must not have the temerity to translate \( \gamma \nu \nu \) in this line 'species'. Hammond reading \( \tau \alpha \beta \gamma \) renders: 'it will then have parts specifically the same? For its repeated sensations belong to the same species.' This is certainly to cut the knot and leave the difficulty unsolved.

Supposing that \( \tau \alpha \beta \gamma \) be read, then we may, throughout the subsequent lines also, follow pretty closely the version of the class of MSS. which gives us that reading.

Bekker gives \( \eta \alpha \iota \varepsilon \tau \gamma \delta \omega \nu \rho \) \( \gamma \nu \nu \), which we may render 'for the objects of a single sense belong to the same genus.' This does not seem to be a con-
confirmation of theunless we remember, that, though the actual sensation is identical with the sense-quality as actually perceived and that though, hence, as the latter are specifically diverse so are the former, yet as a the sense is specifically an unit. The perception of black and of white is specifically one. What has a generic unity has specific unity potentially. (cf).

The senses considered as faculties are only specifically distinct. Now the sense-faculty and the sense-organ are from many points of view one and the same thing. They are, of course, relatively to each other and the of the particular organ: (cf.) but they are often referred to by the same term; is often equivalent to (cf. above ch. 3, 440a) and is even used for (cf. ch. 2, 438a) and so for the ear, for the organ of smell (cf. De An. III ch. 1, 425a: cf. De Sens. ch. 2, 438b and note).

Hence we might argue that corresponding to the specifically identical faculty which perceives objects specifically distinct, there were, if it requires a separate organ to apprehend every separate determination, a corresponding plurality of sense organs which yet were specifically identical, for, if the
faculty is specifically one, so are the organs.

Hence we should have to interpret ı רי וּֽשָׁלֵ֣מָה יְמָ֣עֵר וְיהוָ֖ה תֹּלֶל
וּֽשָׁלֵ֣מָה יְמָ֣עֵר וְיהוָ֖ה תֹּלֶל
1.26 sqq. in some such way as this ---, 'If it be said that this may very well be the case because e.g. the eyes are specifically alike and so the soul may have a plurality of similar organs, it must be observed that the cases are not parallel.

'The two eyes have an identical function, not two images but one alone is present when we see; but the case you try to explain is that of the perception of diversity. (This would require to be the sense to be arrived at, whatever reading we follow).

'Once more, if the organs are specifically alike, so will the faculty of perceiving black, white etc. be specifically identical, i.e. you will have different sense faculties only numerically distinct (οὐσίως καὶ ἀνάλογα γνώσεως ζῶνται
1.36) which is like saying that there may be different sciences of the same subject.'

But this last argument is sufficient to throw suspicion on the whole proof. If it is the case that, as the authors of this interpretation would themselves admit, the perception of black and the perception of white are only as actualised specifically different and μόνον οὐκ οὐσίως or as a faculty they are specifically identical only numerically to be distinguished (as different possible acts of the same sense), (cf. Alex.
De Sens. p.158, 1.15 (W.), 333, 1.6 (Th.): Alexander, however, shows some unpleasant hesitation between δύναται and δυνατά, then it is clear that Aristotle would not have the least objection to saying that the same sense faculty may be reduplicated provided one understands what this means. If it mean, as is the only view consistent with the reading ταύτα, that it is one sense faculty which is particularised and made determinate in the perception of black, white etc., then this is precisely his theory.

(Compare 447b25 sqq. above. There he cannot maintain the unqualified assertion that, corresponding to a specifically identical object, there is a single (specifically identical) sense. A single sense corresponds to and discriminates specifically diverse objects (cf. 447b25). It is the single sense functioning in a determinate manner which gives specific identity in the object.)

Hence it would be Aristotle's own theory that the different organs by which we perceived white and black, if there were any, must be specifically alike, just as the eyes are alike.

But his argument is this —- "If you postulate a diversity of organs, you will have to make them specifically unlike each other. Where we have different organs, as is the case with diverse senses, the unity of the senses is only generic; hence here too, within one sense, if you are to have separate organs,
they will only have a generic resemblance to each other. You object and say there are the two eyes, specifically alike, but yet serving the one sense—sight. I reply that these have a single function; the sensations given by each combine to form one product. So too the different sensations mediated by specifically identical \( (\frac{1}{2}) \) parts of the same organ may form a compound e.g. black and white and sounds of various pitch, which combine. But, when that is so, the different sensations are not discriminated. Your proposal was to account for the perception i.e. discrimination of the sensations by the diversity of the organs by which they are apprehended. If, as shown, a mere numerical difference in the organ does not render that possible, you will have to try specific disparateness. The different organs must be specifically diverse.

"But if so, contained within each sense there will be diverse faculties, distinct from each other as the various sciences are distinct and as the admittedly different senses are distinct. Distinct sciences have each an appropriate \( \delta \omicron \rho o\omicron \mu \omicron \varsigma \) and so have distinct senses. The perception, then, of e.g. different colours will, because \( \pi \omicron \nu \omicron \kappa \omicron \lambda \omicron \) has, as shown, its appropriate \( \delta \omicron \rho o\omicron \mu \omicron \varsigma \), be distinct in the way that the sciences are.

This carries us down to 449a7, after which the argument takes a new turn.
Cf. 51 and 447b25; where you have different organs you have only generic identity in the sense.

If we do not read ὅδε τὸ κρίτημα ἐν τούτῳ as governing ᾧ ἀλλοιούσθαι in this way as falling within the apodosis, there is an ugly anacoluthon. This however is not an impossibility with Aristotle. If, as from its position one would be inclined to, one takes it as governing ᾧ, the following ἂς ὅμως clause can hardly be an argument against the suggestion that we may have different organs specifically alike, as in the case of the eyes; it will rather be in support of it. Alexander however wishes to take ἂς ὅμως as an objection to a different thesis (cf. note 51). If it is intended as an argument in support, it can only be the plea of an unintelligent supporter. He (the supporter) says --- 'here you have two eyes of identical construction functioning alike and cooperating in the act of perception.' Aristotle in the next sentence replies "that is exactly the point, the objects they perceive are numerically one not diverse as is required in the organs which are to perceive both white and black simultaneously."

Bekker reads ᾧ ἀλλοιούσθαι as governing ᾧ ἀλλοιούσθαι in this way as falling within the apodosis, as ἂς ὅμως following LSUP and Alexander.

Biehl's text is ἂς ὅμως ᾧ ἀλλοιούσθαι in καὶ ᾧ ἀλλοιούσθαι ἀναφέρεται ἐπὶ τὰ ἁπάντα; he bases his restoration on readings
in E M Y. This would give us — "But it makes a great difference whether consequent to the unity of the product, the perceptive organ (?) faculty ?) is single and whether it is double." This is capable of two interpretations (1) that if that is so, then refers to the two eyes. But this leaves out of account that it is not a means for perceiving unity but for perceiving duality we are discussing. We may extract a meaning out of it somewhat like that which Alexander gets from the other reading — viz. that in the case of the two eyes you have really a single psychic faculty functioning through the two organs and not two as is claimed. This will give a sense satisfactory to our argument; but it is difficult to see how could be said to be numerically single when it is quite as naturally an epithet for the eye as for the faculty and the eyes are manifestly double.

Hence I propose while following Biehl and the older class of MSS. to read instead of in 448b28, and interpret as in note. If, however, the continuation of both forms an unit, then that which is perceived will be an unit, and if they remain uncombined, then the result will likewise be uncombined.

For Alexander's interpretation cf. note to 6.25 above. It seems to be the universal practice to take .
as referring to ἱνθροθία in 1.1. True, we thus get a syllogism — if ἢς ἔστιν then ἱνθροθία, if ἢς ἔστιν then ὁνίσθα ὅναυσασ; hence all ἵς ἔστιν have their ὁνίσθα ὅναυσασ. But there was no need to prove this.

Whether we read θανάζτω or θανάζα in 448b25, both arguments require ἱπποθήκη here to be taken in the sense which it has in 448b60 — as a distinct sense (not as sensation as Hammond interprets). Now a sense is by definition a ὅναυσασ (cf. and De An. III ch.9, 432al) *more accurately* a ὅναυσασ in the sense of ἵς (cf. De Sens. ch.1, 436b5, and note to ch.4, 441b25, and De An. II ch.5). A sense is like a distinct science, a determinate potentially; the actual exercise of both alike depends upon this, which may be called the ὁνίσθα ὅναυσασ of the ἱνθροθία in each case. It is of these principles that Aristotle reminds us here. It has already been shown that, if the organs by which we perceive white and black are distinct, they and therefore the faculties which reside in them must be distinct. Hence they are distinct in the sense that sciences are distinct. The two clauses οὐ πολλαὶ ὅναυσασ ὡς ὁνίσθα ὅναυσασ form only a single premiss in the argument that proves that a distinct sense is like a distinct science.

Unless οὐ be read before ἵς ἔστιν we get a shocking piece of bad reasoning; though if B can be perceived, *a fortiori*
A can be perceived, we cannot infer that if A then B. (B = ἐν τῷ ἀγαθῷ ἔστερον. A = ἔνασκάριον) Besides the presence of ἁν ὤ does not incommode the argument, in fact improves it.

The best defence of this emendation, (which though authorised by no text is seen to be necessary by Alexander in his ἐκ τῶν ἀπειρωτικῶν ἐκ τῶν ἀπειρωτικῶν i.e. heterogeneous objects, ἄνωτερον = ὄμορφος) is by Baumker in the Jahrb. für Class. Philol. 1886 p.320. He points out that though in Classical Greek if ἁν ὤ is read we should expect ὄτε not ἁν ὤ after ἐν in the next clause yet we find instances of the contrary usage in Aristotle e.g. De Coelo, I ch.11, 281a16: ἐνεκτέλεσα μὴν ὑπάρχαντος, ἐνέργον ἐστιν, ἄνωτερον ἁν ὤ.

The presence of the ἁν ὤ, being necessary to common usage, probably led to the omission of the ἁν ὤ.

For the principle compare above 447b3 and 448a13 sqq. ἐντολή ἁν ὣ ἀνέλειμμα must refer to time (cf.448b19-21 and notes). It is the simultaneousness of the perception which is under discussion, and which cannot be accounted for by the theory that the faculty or organ is diverse.

From ἀντικείμενον 1.6 to ἐν τῷ ἀγαθῷ ἔστερον, 1.8 the passage is almost hopelessly obscure. ἐν τῷ ἀγαθῷ 1.6 must surely refer to ἔνασκάριον and ἄνωτερον.
The phrase τὸ ἐν τῷ ῥῆμα τοῦ ὑπ' ὑμῖν continually refers to a compound, cf. De An. II ch. 1, 412a9, where αὐταὶ καταργότας — consisting of ἀλήθεια and σὲ ὑμῖν is so designated. Thus if here τὸ ἐν τῷ ὑπ' ὑμῖν refers to the organ or faculty of perception, it can hardly imply that it is a substratum or ὄργανον ἐν τῷ ὑπ' ὑμῖν as Alexander (De Sensu p.162, 1.23 (W.), p.343, 1.6 (Th.)) and Rodier (II p.390) take it.

However, apart from this, all except Simon (Simon, De Sensu, p.261) admit that τὸ ἐν τῷ ὑπ' ὑμῖν in 1.8 refers to a compound of qualities or sensations and it is hardly likely that in three lines Aristotle would employ the same expression to refer to two different things. Moreover the memory of τὸ ἐν τῷ ὑπ' ὑμῖν in 448b28 above, as well as τὸ ἐν τῷ ὑπ' ὑμῖν in 447a21, 447a22, 447a29, etc. all point to this phrase referring to a fusion of sensations and so St Hilaire takes it. On the other hand Alexander, Thomas, Simon and Rodier wish to take it as referring to the soul or the central organ, the heart. The only advantage resulting from this is that the connection of ἀλήθεια ἐν τῷ ὑπ' ὑμῖν and ἀλήθεια ἐν τῷ ὑπ' ὑμῖν is quite clear, but it leaves the connection between the latter clause and those which follow it absolutely unexplained.

Simon is more consistent than others in thinking that the reference may be to the central sense and its organ throughout.

If we take τὸ ἐν τῷ ὑπ' ὑμῖν as referring on both occasions to a product of sensations, then the argument will be clear
except as to the connection between άλλως ἀραγγήν α' and ἡν γεύσεις ἐν ῥήματι ἐνθώσ. The only way I can see for explaining this is as follows, 'It is claimed that we perceive black and white simultaneously by means of a single organ with spatially diverse though continuous parts. But in such a case the two sensations must coalesce and form a unity and hence, if it is by the same means that we perceive sweet and white, then they too must form a unity. But such a unitary product does not exist. Hence it is not by the spatial diversity of the organ that those qualities are perceived simultaneously."

The question is still as to the means of perceiving the two simultaneously, (which he is sure can take place) and the objection to the solution proposed is not that there are different organs, for he admits that they exist (αλλως, άλλως, γευσις σε αριστοτέλει 1.10.) but it is through a spatial diversity of the organ that it is supposed they are related in the same moment of time.

Thus, in the whole of this section from 448b17 onwards Aristotle has been working up to his own theory. He rejects the solution proposed in the form in which it is offered but, mere suo, abstracts from it the legitimate part. There are different faculties, but it is not qua located in different physical organs that they are able to allow their different contributions to be correlated in a single consciousness.
If Aristotle is still discussing the solution hazarded in 448b20-22, as he must be, this is proof positive, that according to that theory the soul must be a unity of a kind and so our interpretation of οὐκ ὅμοιον in 448b19 is confirmed. If it were under dispute whether what perceives is something unitary or not, Aristotle could not bring in without proof the very statement which was denied --- εὖ γὰρ ἐστὶ. Indeed if he knew this to be true and to be excluded by the other theory --- καὶ ἐν τοῖς γόμοις ὁ ζῷος τὸ ἄλογον ὑποτελεῖται ἐν τῷ ψυχῇ ἐστι --- he would need to start with a direct proof of it.

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60. Cf. note 58.

Biehl proposes to read ἢ τί instead of ἢ τίνη, no doubt because, apparently, all that has been said is in opposition to what follows. But, as we have seen (note 58), what precedes is directed not against the doctrine of a unitary principle, indeed that has been affirmed in 1.7, but against the interpretation of it given.

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The meaning of this is elucidated in De An.III ch.2, 427a10 sqq.

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64. Cf. also note 47.
Alexander reads 1.15, \( \gamma \in \chi \omega \nu \) \( \chi \omega \nu \) \( \chi \omega \nu \). The sense then is -- 'One and the same thing numerically can be white and sweet and have many other qualities for, though the qualities do not exist in separation from each other, yet in mode of existence they are different from each other.'

Bekker and Biehl both reject \( \gamma \in \chi \omega \nu \) though Rodier accepts it. The latter also translates \( \tau \rho \tau \rho \) by 'essence'. Cf. next note.

\( \tau \rho \tau \rho \). Alexander seems to countenance Rodier's translation of 'essence' by giving as equivalents \( \lambda \gamma \varphi \) and \( \tau \rho \tau \rho \). But though not so far from \( \lambda \gamma \varphi \) in meaning, \( \tau \rho \tau \rho \) is hardly as a rule equivalent to 'essential nature' or 'real being' which is the special force of \( \tau \rho \tau \rho \). It is rather 'aspect of existence'; we might almost say 'existence for consciousness'. \( \tau \rho \tau \rho \) almost = 'notionally'; cf. note to ch.6, 446b27 and for a typical case De An.III ch.2, 425b27, where it is said that though the \( \nu \gamma \nu \) of the sense object and that of the sense faculty are one and identical, yet in aspect of existence i.e. as related to an external object in the one case and the human organism in the other, they are different -- \( \tau \rho \gamma \nu \) \( \rho \sigma \alpha \delta \alpha \gamma \nu \).

We may take \( \lambda \gamma \varphi \) in 1.20 (with Bonitz Ind. p.221a60) as equivalent to \( \tau \rho \tau \rho \) and translate 'but notionally not the same,' or we may take \( \lambda \gamma \varphi \) here as equivalent to 'ratio' and say "but not by means of an identical relation [to them]"
i.e. to the two sensations.

Aristotle cannot mean that the point from which a thing ceases to be visible is infinitely far away. Of course the point from which it ceases to be visible is potentially is infinitely far away i.e. is non-existent. This is a consequence of the doctrine that every magnitude is sensible discussed in the first part of chapter 6. But here we are discussing the converse proposition which answers the question raised in ch.7, 448b15 and mentioned in ch.6, 445b10. Simon (p.256) is wrong in thinking that it is this issue which is raised in ch.3, 440a27; it is the other statement of Aristotle.  

Alexander at first takes as ηόλια μώκειον but later on gives the correct interpretation: ού γάρ ἐστι ἡ μέγιστον ζάσθημα οὔτε οὔτε ἀλλ' ἀلا σταθμὸς. (De Sens. p.168, 1.27 (W.), 356, 1.6 (Th.)).

The argument is worked out in terms of sight but applies to all other senses which employ a medium. It is as the distance between object and seer increases, we arrive at last at a point beyond which the object is invisible, though short of it vision is still possible. This is a single mathematical point and the object, as it diminishes, will, if indivisible to sight anywhere, be indivisible when this point is reached. But this point is the first in the series from which vision is possible the last where it is impossible. Hence when at
this point, the object will be both visible and invisible; which is impossible.

Alexander takes this to refer to the mean point when vision begins and invisibility ceases. Thus all others too. But, if we interpret it so, it is difficult to construe. The indivisibility of the point seems to be implied strongly enough in the last clause --- and, at any rate, whether expressed or not, it is a necessary part of the argument that an indivisible will be found at this point if anywhere.

For this sense of cf. ch. 1, 436a7.
DE MEMORIA: I.

NOTES.

Commentary
DE MEMORIA I.

NOTES.

τιμολογεῖν is simply the verb corresponding to τιμή and means to have something (consciously and at the time) in one's memory. It is paraphrased by εἰσπράξει τῇ μνήμῃ in 450a19 beneath. It is to be distinguished from ἀναμνῄσκοντα which implies the active search for the memory of some particular item of one's past experience. Though we employ 'to remember' for the former, 'to recollect' for the latter, the English words are hardly so sharply contrasted as the Greek; in fact, in ordinary use they are hardly to be distinguished as is natural considering that both contain the prefix corresponding to the Greek ἀν.' But even in Greek and sometimes in Aristotle himself the terms are not used with perfect precision. Cf. Freudenthal in Rheinisches Museum, 1329, p. 403.

This is the subject of chapter 2.

This is one of the characteristics enumerated in Aristotle's hardly complimentary list of the peculiarly feminine qualities.

ληπίδωv = we must make an assumption. Aristotle is going to show grounds for this assumption, but he could not say ἔτοχον, because that would imply that the grounds had been
already shown. Cf. note to *De Sensu*, ch. 1, 436a5. This seems to be the distinction generally maintained between ἐπισκέψεως and ἐπιστήμης.

οὐκ ἐπιστήμης, as a faculty means generally the power of forming opinions and thinking, in the widest sense of the term. When defined more closely, however, it takes rank as the lowest of the rational faculties; it is practically equivalent to ἐπιστήμης, in its most restricted application and is opposed to ἑνώμενη, which has for its object necessary truth. Cf. *De An.*, III ch. 3, *Anal Post.*, I ch. 33; *Metaph.*, VII ch. 15, 1039b32 sqq.

There is a special treatise on supposed prevision of the future by means of dreams. Aristotle accounted for the phenomena in question by means of natural agencies.

Here Aristotle agrees with Locke (*Essay*, Bk. IV ch. II 14 and ch. XI.) with whom 'sensitive knowledge' occupies pretty much the same place as ἐπισκέψεως with Aristotle.

Though only the present is known by perception, this does not mean that only perception knows the present. In 1.17 beneath θ' ὃ ὑπόθεσιν is given as an example of ὁ ἑργάτης.

Biehl prefers ἡ 1.15) instead of ὁ, the reading adopted by all other editors. This is an improvement, because the point to be made out is that qua present an object of con-
consciousness is not an object of memory. One might remember while he was looking at a white thing that he had seen it before; but he cannot remember that it is now present. This is the only point to be made out here—that memory is the apprehension of a thing not as present but as past. How this is possible is discussed in 450a25 sqq. That which is present to consciousness when we remember, is not the object remembered but its copy (ἐμνήθη). When the present object of consciousness is recognised as a representation of something in the past, then we have memory.

Thenistius explains thus — ὅπως ὑπάρχει συνειδησία ὑπάρχει ὁ παρόν τις ὑπάρχοντας ὡς παρόν ἔχει, ὑπάρχει μόνον ὁ παρὸν ἐμνημένον τίς ὡς παρόν ἔχει. i.e. as practically equivalent to ὑπάρχει τίς = the real things. Whatever the reading be, the sense must be the same; ὑπάρχει must mean the actual operation of the real objects, or something similar; ὑπάρχει cannot mean 'without actually having knowledge or perception,' which would imply that only the ἀπειεύρετοι providing for knowledge or perception existed, for these may persist throughout unconsciousness e.g. in sleep. There really is perception or knowledge of something present whenever we remember; an ἀπειεύρετος is present cf. 450b27; ὁ ἐμνημένος ἑαυτὸς κ.τ.λ., but it depends upon whether or not this ἀπειεύρετος is referred to something else (SCII 1.30) existing in the past.
What is actually present in the act of memory we shall find to be a ἀποκρήσιμα; a ἀποκρήσιμα is a persisting sensation or sense-content. Now though it is true that this is in most cases the intermediary employed by memory, yet that intermediary might in certain cases be an actual perception as e.g. when we see a thing for the second time and remember we have seen it before.

Biehl and Freudenthal (Reinisches Museum, XXIV p.394) wish to delete the intermediary but remember it only as a persisting sensation. Now though that true that this is in most cases the intermediary, yet that intermediary might in certain cases be an actual memory as e.g. when we see a thing for the second time and remember we have seen it before.

Freudenthal quotes Themistius who paraphrases "he remembers that the angles of a triangle are equal to two right angles and that Socrates is white, in the one case because he learned or thought of it, in the other because he heard or saw it. But Freudenthal points out that we cannot have sensuous knowledge of any mathematical principle according to Anal.Post.I. ch.31 esp. 34 sqq. (Themistius II p.233, 1.12 sqq.) The writer of the paraphrase, he thinks, felt the same difficulty and accordingly inserted
as an example of sensuous memory.

This is however not convincing; it is not a case of knowing in the full sense of having scientific knowledge of a fact but of remembering it. Perception is of the particular but there is no reason why we should not perceive in a particular case and without proof that the angles of a triangle are equal to two right angles; cf. Anal. Post. I. infra: we can perceive that the moon is eclipsed without knowing the reason. However, an additional reason for rejecting \( \lambda \sigma \varepsilon \) (which is such a common Aristotelian example that it might easily have crept into the text); it is the necessity of translating \( \zeta \nu \beta \) before \( \varepsilon \mu \alpha \tau \beta \) and \( \gamma \nu \omega \tau \) by 'that', not by 'because.' The point to be brought out is that memory refers to the past; we are not here explaining why memory takes place. Cf. next clause -- \( \delta \gamma \chi \varepsilon \) -- \( \chi \nu \gamma \varepsilon \), \( \nu \iota \rho \theta \iota \rho \iota \). The disputed words are probably \( \chi \nu \gamma \varepsilon \nu \), \( \theta \iota \rho \iota \rho \iota \) that has crept in at the wrong place. Some null expression inserted after \( \theta \iota \rho \iota \rho \iota \) would be quite in harmony with the thought here. \( \eta \rho \lambda \gamma \psi \) is here used in its widest sense as equivalent to conceptual thought. It seems to indicate \( \Theta \nu \rho \rho \beta \lambda \gamma \) : cf. 450b28, 35 etc. The present objects of consciousness are objects either of \( \eta \rho \lambda \gamma \psi \) or \( \eta \rho \lambda \gamma \psi \), sense or thought, \( \lambda \delta \gamma \mu \alpha \nu \) or \( \nu \iota \rho \mu \varepsilon \).

In its more restricted application \( \eta \rho \lambda \gamma \psi \) is the poorest of the intellectual faculties. Cf. De An. III ch. 3, 427b17, 25, 28 and Anal. Post. I ch. 33, 88b37, and cf. Rodier, II
Freudenthal (1.1. p.395) rejects ηαί ηγομαν ρ ορισμόϋ because these words cannot refer to a statement which immediately precedes, while here it is simply to the previous paragraph that reference is made.

Themistius, the ancient translation and L M S U also omit the two words.

As we have seen (note 1) ὑπολογία also deals with the present; but Aristotle is here talking generally and, in fact, a sensuous element is always involved in knowledge of the present, because the object of thought, as we shall see, is always accompanied by imagery which, again, depends upon sense.

The heart (or according to Neuhäuser, cf. Intro. Sec.VI, the σύμπαθος ἡμών contained in it) is the organ of the ἀφορίζεις: cf. De Juvent ch.3, 45 b: all, cf. also beneath 450a 11-89 and notes.

At ἀνάλογοι begins a protasis, the apodosis corresponding to which is not reached till 450a15. οι τρόποι της ῥήσεως. φαντασία is treated in De An.III ch.3. There it is defined as a (psychic) change due to sensation (κινήσεις ήπο γράφειν ρητικής παράγοντας γιγονόμενης 429α1). Again we find in ch.8, 432a9: ῥέ γάρ φαντασματικό χωρίον εἰς ἡγεμονίαν ἐστιν ἡ γνώμη i.e., an image is identical
in character with a perception except that in the former case the real concrete thing which contains $\phi\nu\chi\alpha\iota\sigma\iota\alpha$ is absent; only the $\tau\nu\iota\omicron\omicron$ of the sensible object is present. As Themistius (Xen. p. 237, 1.18) says, it is that which is left over, (after perception) and remains even though the sense object is not present, which is called $\varphi\rho\alpha\gamma\alpha\sigma\sigma\iota\alpha$. Besides the fact of the absence of the real object in $\varphi\gamma\alpha\alpha\sigma\sigma\iota\alpha$ the only other difference between it and sensation seems to be its greater liability to error (423a26 sqq) and that it is weaker in intensity: cf. Phet. I ch. 11, 1370a28: $\gamma^1 \varphi\rho\alpha\gamma\alpha\sigma\sigma\iota\alpha \varepsilon\omicron\beta\gamma\rho\sigma\tau\omicron\omicron\nu$ $\delta^{15} \alpha\tau\omicron\nu\omicron\nu$. It is like Hume's 'idea' as opposed to his 'impression'.

On the other hand it does not seem to be perfectly necessary that the real object should cease to be present; e.g. in 428b2 the appearance of the sun as of a foot in diameter is given as a case of $\varphi\gamma\alpha\alpha\sigma\sigma\iota\alpha$ and again from 428b28 it is clear that $\varphi\gamma\alpha\alpha\sigma\sigma\iota\alpha$ and $\varphi\chi\omicron\omicron\sigma\iota\omicron\sigma\iota\nu$ can synchronize. But the $\varphi\gamma\alpha\alpha\sigma\sigma\iota\alpha$ is probably to be distinguished as the $\pi\tau\omicron\nu\omicron\nu$ which has penetrated to the heart --- the $\delta^{15} \chi\iota\alpha$ of De Insom. ch. 3, 461b12, 461a6; cf. also ch. 2, 459a23 sqq. Sensations or stimuli travel from the end-organ to the central one and persist after the exciting object is removed, $\eta\iota \upsilon \delta^{15} \chi\iota\alpha\nu\omicron\nu$ $\kappa\rho\omicron\omicron\nu\si\nu$ $\nu\iota\omicron\omicron\nu\iota\omicron\nu$ $\varphi\chi\omicron\omicron\sigma\iota\omicron\sigma\iota\nu$. It must be the former which is the $\varphi\gamma\alpha\alpha\sigma\sigma\iota\sigma\alpha$ proper for we have 450a10 below that it belongs to the $\pi\tau\omicron\nu\omicron\nu$ and the $\kappa\rho\omicron\omicron\nu$ $\alpha\omicron\iota\omicron\sigma\iota\nu\iota\omicron$ $\gamma\iota\omicron\omicron\nu$ (cf. note 1).
This all goes to emphasize the sensuous character of imagination, but however they are to be related to each other, we must not go so far as Themistius who practically makes φαντασία a genus which is known as αύθηγος if the object is present, if absent αυθηγος and makes the φαντασία in both cases the presentation of a θυσία or imprint left by the external object in the sensorium — the heart. But, after all, θυσία is only a metaphor to Aristotle. The αύθηγος (sensation) is not strictly a θυσία; it is rather the κόσμος of the ἀναπαυσία and the φαντασία present in memory is not per se a θυσία but only in so far as it represents the original perception. Even then it is only ἐφον ἐν γράφεται ἅρφοσ.

Themistius himself sees that, according to his theory, only the very vaguest sense could be given to θυσία (238, 1.10: θυσία καὶ τοῦ τῆς ἔνας φαντασματε διορθοῦν).

The reasons which Aristotle adduces for this contention seem to be twofold (1) firstly that brought forward in chapter 8 of De Anima, III, that nothing self-dependent or 'isolated' (μὴ υφήγον, 432a4) exists beyond the extended things given...
by sense-perception; knowledge can occupy itself only with the \( \varphi \rho \alpha \nu \chi \rho \alpha \mu \alpha \) forms of or concepts realised in sense-objects. Hence, when the actual object is not present, thought is possible only if the \( \varphi \alpha \nu \chi \rho \alpha \mu \alpha \) originated by perception is present to the mind. Secondly (2) there is the reason obscurely implied in ch.7, which culminates in the statement in 431b10 that truth and falsehood, the distinctions applicable to theoretical consciousness (cf. 431al4: \( \tau \varepsilon \nu \delta \nu \gamma \varepsilon \omega \nu \chi \rho \alpha \mu \alpha \)) are generically the same as good and evil, the objects of pursuit and avoidance in the practical life (cf. also Eth.Nic.VI ch.2, 1139a23); cf. Rodier,II p.515; affirmation and negation are at bottom the same as pursuit and avoidance. Now, it is by means of sense that animals are able to distinguish between the pleasant and the unpleasant (cf.431a10). Hence the pursuit of truth which is distinguished from the quest of the good merely by having an absolute as opposed to a relative end, (431b12) will employ the same sensuous images as the latter.

This doctrine seems to be implied in Aristotle's statements and we must remember that it in no way conflict but in spite of it and in spite of the first argument, we must remember that elsewhere he teaches that there are entities capable of existing in isolation from the things of sense. There are \( \chi \rho \alpha \mu \alpha \nu \chi \rho \chi \rho \alpha \mu \alpha \) the knowable natures of the heavenly bodies (cf. Alexander of Simplicius De An. 284, 23; Rodier,II p.524) which seem to be referred to by \( \tau \varepsilon \mu \iota \chi \rho \alpha \mu \alpha \nu \chi \rho \alpha \mu \alpha \) beneath (450a8); Again \( \tau \varepsilon \mu \iota \chi \rho \alpha \mu \alpha \nu \chi \rho \alpha \mu \alpha \).
--- Reason --- is said to be $\chi\omega\rho\iota\sigma\varsigma$, but we need not understand this of the human reason but as applying to the mind of God, who is held to exist beyond the confines of the world and to stand to it in the relation of $\nu\beta\varsigma\varsigma\iota\varsigma\omega\lambda\nu$ --- the source of change in it. His activity is $\nu\beta\varsigma\varsigma\varsigma$ and, if he exists in isolation from things sensible, one would expect that the contents of his thought --- would be likewise transcendent and would not exist merely as realised or realisable in the world of change and decay; but whether, if that is so, the object of the divine consciousness is a differentiated scheme of distinct intelligible entities existing apart from the material world, or whether the activity of God, the $\nu\beta\varsigma\varsigma\varsigma\nu\beta\varsigma\varsigma\varsigma$, is merely the affirmation of a blank identity --- the eternal assertion of 'I am I' --- it would be difficult to decide.

On the one hand any assertion of the real separability of certain concepts seems to be indistinguishable from the Platonic doctrine of transcendent $\nu\beta\gamma$, which is so consistently attacked by Aristotle. On the other hand he continually talks of $\kappa\nu\omega\sigma\sigma\iota\nu\alpha$, or $\nu\beta\varsigma\varsigma\varsigma\nu\beta\varsigma\varsigma\varsigma$, as being the objects of metaphysical science (De An.I ch.1, 405b15; Metaph. VI ch.1, 1026a8 sqq.) and though we must decide that these require to have an existence other than the merely conceptual, we cannot positively say that they are not to be regarded as concepts (of things mundane) existing separately in the mind of man. In the passage in De An.III ch.8 Aristotle
by sense-perception; knowledge can occupy itself only with the ψήφος forms of or concepts realised in sense-objects. Hence, when the actual object is not present, thought is possible only if the ψήφος originated by perception is present to the mind. Secondly (2) there is the reason obscurely implied in ch. 7, which culminates in the statement in 431b10 that truth and falsehood, the distinctions applicable to theoretical consciousness (cf. 431a14: ἡ ἀνοητικὴ ψήφος) are generically the same as good and evil, the objects of pursuit and avoidance in the practical life (cf. also Eth. Nic. VI ch. 2, 1139a26); cf. Rodier, II p. 515; affirmation and negation are at bottom the same as pursuit and avoidance. Now, it is by means of sense that animals are able to distinguish between the pleasant and the unpleasant (cf. 431a10). Hence the pursuit of truth, which is distinguished from the quest of the good merely by having an absolute as opposed to a relative end, (431b12) will employ the same sensuous images as the latter.

This doctrine seems to be implied in Aristotle's statements and we must remember that it in no way conflict but in spite of it and in spite of the first argument we must with what elsewhere he teaches that there are entities capable of existing in isolation from the things of sense. There are άληθεία ἥμων ὑπάρχειν --- the knowable natures of the heavenly bodies (cf. Alexander of Simplicius De An. 284, 23; Rodier, II p. 524) which seem to be referred to by τά μὴ ἐν ψήφῳ ὑπάρχοντα beneath (450a8); Again ήδη
into the soul when we perceive but the ἀφθονία of the thing
(cf. De An. III ch. 8, 431b29 : ἀφθονία δὲ ἡθονία ἔχει τὴν ὑποστάξειν). But this perceptual form itself constitutes
a matter for the higher concept e.g. in mathematics. The
pure mathematical concept is not τὸ στραμματικόν, the
straight line or the curved, but τὸ ὑπάντησις and ροή---
straightness or curvature (cf. 429b18 and
ch. 7, 431b12 also Metaph. VI ch. 1, 1025b30, X ch. 8, 1058a23 etc.).
But these concepts cannot exist apart, though they are for
mathematical purposes assumed to exist apart (τὰ μαθηματικά συνεχεία ὑποστάξεις).
The general expression for this matter 'matière logique' without
which these concepts cannot exist is τὸ στραμματικόν (cf.
429b19 ὑπάντησις καὶ φύσεως καὶ Philos. De An. 531,15; ἡ
λαμπρενσία, ὡς φαίνεται, ἐν τῇ συνεχείᾳ τὸ στραμματικόν).
Aristotle is here mentioning a class of objects from the mathe-
matical entities referred to in the last clause. He seems
different in particular to mean the heavenly bodies (cf. note 18) which
he continually refers to as αἰτία and ὑποβολή (cf. Phys. III
ch. 12, 221b3) and as not being in time. They differ from other
bodies in not having a σμήνα which admits of growth and decay,
but one which admits of motion only. Cf. Metaph. VIII ch. 4,
1044b7.

One may say with Freudenthal (1. 1.396) and Hammond
that Aristotle here refers to 'eternal laws.' He does not, however,
talk of laws or principles as existing apart from the
objects which obey them. They are arbitrary.

To suppose him to do so would be to impute to him the
Platonic theory of ἐξ ὀρθον (cf. Metaph. VIII ch. 5) or the infinite
(cf. Phys. III ch. 5, 204a23 and Metaph. XI ch. 10,
1066b13 sqq.) are ὁμοιότατοι. Again ἐπίκεισθαι and ἄνευ
are not ἐξ ὀρθον. Though in the case of some concepts
their essence and their existence is identical (De An. III ch. 4,
429b12 and Rodier, ad loc., pp. 442 sqq.) this does not mean
that these are to be regarded as substances (as according to
Spinoza's definition of substance the οὐσία), but that their
existence is a purely conceptual one. When Aristotle talks
of ὁμοιότατοι being the objects of metaphysical science he
must mean either the divine beings — ἔθνων and the heavenly
bodies that have a substantial nature and are not mere con-
cepts, or else the concepts in thinking of the things of sense
considerate as separate. The ὁμοιότατοι mentioned in
De An. III ch. 6, 430b30, which are the ultimate simple con-
stituents of intellect or objects of ὁμοίωσις (ἀσκοῦσαι, ἔφωνο
συμπόλεμοι, ἐπὶ τὰ καταλήπτες, De An. III ch. 8, 432a13) and which
are to be identified in part with the categories (cf. Rodier,
II p. 474 and Metaph. VIII ch. 6, 1045a33 sqq.) partly with such
vague conceptions like the Good, Being and the One, or again
with ὁμοίωσις, ἀλήθεια, ὁμοιόμορφον etc., are not to be regarded as
existing apart from sensible things. If Aristotle says that they have neither ἡλεῖα ἀπαθεία nor ὀντότης ἀπαθεία (Metaph., loc.cit.), that simply means that they are ultimate and simple and are not formed by a complex of constituents, even mental constituents. These concepts must in fact be the constituents out of which the complex ones are formed. In that sense they themselves must be ἀρχαῖα but they are not ῥεόμενος nor ῥεόμενος in the sense in which the individual is ῥεόμενος.

The connection with the thought here and the main contention --- that thought cannot function apart from φάρμακα --- is not quite plain. Why should the impossibility of a thing being thought apart from time require the presence of a φάρμακα when it is apprehended? Doubtless it is because of the continuous nature of time which accrues to it owing to its connection with change. Cf. Phys.IV ch.11, 219a12: καὶ γὰρ ἐκ ἐνσαυκὰς συναγίσθαι καὶ ἐν κίνησις ὅταν συναγίσθαι, καὶ τὸ καὶ τὴν κίνησιν ἄλοιπας. ὅταν γὰρ τὴν κίνησιν, τὸ σύνιον ἀλλὰ ἄλοιπον ἅπαντα ἃ ἐπεξετάσθη. Time is the 'measure' or 'number' of change. Cf.ch.12,204b7,11 (though not number in the proper sense, for that implies discreteness) and change is the great characteristic of the sensible world. No doubt it is because the heavenly bodies are ἄγνωστοι and participate in κίνησις though merely κίνησις ἄνω τοῦ ἀφαίρετον that they must be represented as in time a characteristic of the sensible world and that they must be apprehended only
by means of ραναγού (cf. note 15).

By this, as we have seen, Aristotle refers indifferently to the faculty or the organ and there is no ground for Freuden-thal's refusal to think that the organ is here referred to. ομορομ αγόρ αριστοτέλους is certainly here not the simple equivalent of τὸ ὑορομορ αριστοτέλους above; it is, rather, a particular example of quantity. Aristotle in this clause is merely particularising what he had said before more universally of ομορομ in general and at the same time the mention of ομορομ and Χρόνος carry us beyond the particular example of spatial quantity which was indicated by the triangle. Μέγιστος, Χρόνος and Χρόνος are all united (cf. note 15) as species of τὸ ὑορομορ αριστοτέλους and it is pointed out that, in consequence, it must be the same function (and hence faculty and organ) which apprehends them all. If we keep the following sentences in the order given in the text, the argument will then be, 'Magnitude, motion and time are perceived by the same faculty. But they (being continuas, cf. previous note) form the sensuous and hence imageable element in consciousness. Now imagery belongs to the sensus communis. Hence the apprehension of these determinations of quantity belongs to the organ of the common sense—the primary sensorium. But memory, even that which deals with concepts, implies imagery. Hence it is a function of the primary organ of sensation directly, though indirectly it conceives the faculty of thought.'
The whole argument as it stands is not well arranged and hence Freudenthal proposes to remodel it, but it is not much more confused than many others in the Parva Naturalia and the want of order can be explained. There are two conclusions to prove, (1) the minor premiss of the final conclusion that thought must employ imagery, enunciated first in 449b32, (2) that, since that is so, even the memory which deals with the objects of thought must be a function of the organ to which imagery is due. Involved in all this there is also the briefer argument that memory in general employing imagery must be attributed to the primary organ of sensation.

It is the involution of these three difficult discussions which causes the apparent want of coherence. There is moreover one premiss which is merely implicit and never formulated — that which identifies the imageable element — τὸ παρασοώριον with τὸ ζύον χρόνον. Aristotle simply assumes their identity as obvious and any arrangement of the passage would have to fall back upon this principle as a constituent in the proof. Freudenthal proposes (1.1.397) to pass from \( 1^\text{st} \) to \( 1^\text{st} \) and insert the clause ἅπα τὸ παρασοώριον after παρασοώριον τὸν, 1.12. For this he doubtless has the support of Themistius. Accordingly he gives the following as the sketch of the argument — 'Every memory is bound up with a perception of time, every concept accompanied by a φάραγμα. To perceive time is identical with the
perception of magnitude and motion and is provided for by the eel; Memory also uses concepts, but not apart from imagery and this belongs to the eel. Hence memory belongs to it also.

But this does not do justice to the real complexity of the argument or bring out the main point --- that even conceptual memory is a function of the primary sensorium. To prove that memory which does not specially deal with is a sense-function would not cost so much argument.

Freudenthal seems to have been led astray by his misunderstanding of the reference to \( \rho \nu \sigma \) in 11.8 and 10. He thinks that there Aristotle is referring to memory as a sense of time, as in 449b28. But there is no particular reference to this here. Aristotle is forced to talk of \( \rho \nu \sigma \) because he wishes to illustrate the objects of thought which cannot be apprehended without an image in the mind, not only by the concepts of mathematics, e.g. to \( \pi \nu \rho \mu \), the scientific interest in which does not affect the matter in which they are realised, but by the external substances which, though appearing in time are not conditioned by it.

So Biehl relying on the vet. tr. 'intellective'. Simon translating the former renders 'facultatis intelligentis'.

Of De Incer. pessim and note 15 above. The texts all have which must be a mistake instead of \( \rho \eta \gamma \).
Cf. De An. III ch. 3, 428a10, 11, where θαραξια is attributed to the ant and the bee but not to the worm. Themistius brings in the dove (τριφτη ραχα) also.

The reading of all MSS. is θαραξια but Rassow, Prog. d. Joachimsthal Gym. 1858, suggests θηριοι, which Biehl accepts. Most of the commentators certainly take θαραξια as referring to the lower animals. Themistius writes άλφα. If Aristotle meant to refer to them certainly θηριοι is the more suitable term.

But Simon (p. 287) who also leans to the view that by θαραξια 'bruta' are meant, suggests as an alternative an interpretation which gives its proper sense to θαραξια. --- If Memory belonged to the faculty of pure thought it would not belong to many animals (for few possess reason) and perhaps to none that have a perishable body (which requires their thinking to be mediated by imagination). --- Relying on the famous passage at the end of De An. III ch. 5, where the impassivity of the eternal ρ.ο. is set forth, and it is declared that we have no memory of a previous state of existence, because our thought depends upon the perishable reason which alone can experience impressions, he contends that, in Aristotle's opinion, memory does not belong to the superior and divine reason but only to the human, being exercised by the latter only through the instrumentality of ραραξια.

Whatever be the exact interpretation of the passage in the De Anima referred to, it is clear that according to the Aris-
Aristotelian teaching, in the sense of a faculty of pure thought cannot exercise memory. Its function is the (De An. III ch. 6, 410a26) which must be something totally different from the apprehension of time in which there is no part which is indivisible. Again, in its characteristic sense, it is not a faculty of synthesis (ibidem) such as human thought and memory must be. (When we remember we must affirm that the image is like the real object i.e. there must be synthesis: cf. below.)

Simon however takes the next clause (τινι συγγενείς ὁ ἑαυτῷ to refer to the lower animals which have not even got παραστάσις (cf. De An. II ch. 3, 415a10: τινὶ συγγενεῖς ἀλλὰ τὸν ὄγδον οὐκ ἔχει παραστάσις); but if that is so, it is difficult to see what it has to do with the previous statement. Even though we read θηρίων or interpret θηρίων as θηρίων, we should have to render --- ! If memory were an affair of the intellect not many, perhaps none, of the lower animals would possess it and, as a fact, as things are, (memory being not an affair of the intellect), not all the lower animals do possess it, seeing that they do not all have the sense of time. But can hardly carry this meaning and even if it did, the latter clause adds nothing to the argument. That some animals, being without παραστάσις, do not remember, does not in the least show why, if memory were a matter of pure thought, none would remember.

Yet it must be in some such way that Rassow and Biehl, reading θηρίων, take the sentence and Simon, taking the last clause as he does rather inclines to give up his first
interpretation and follow the other commentators.

Hammond (p.198) translating Riehl renders 'perhaps in none of the brutes, seeing that they do not, as a matter of fact possess it, because they all lack the sense of time.' This is an impossible rendering of ἐνδυνάμωσιν καὶ ἐν τοῖς ἄγαλμιν and, besides, contradicts 1.15 immediately above where memory is said to be found in certain other animals.

Rassow, defending his emendation, maintains that it could not be said that if memory depended on thought it would be absent in man, one of the θανάτου. But that is not so: memory exists in man only because he possesses the faculty of ἐνδυνάμωσις; if he were a being whose sole activity was pure thought he would not remember. It should be clear from De An. III. ch.5, that, if memory depends upon the τὸ ρῆμα τοῦ θανάτου (which involves ἐνδυνάμωσις and ὁμοθύμωσις), a being whose reason is not similarly to be described as passive will not remember.

Hence the solution of the difficulty is to take ὁ τῶν ὀστῶν ἀνθρώπων, as referring to that being or those things whose sole activity is the exercise of ὀστᾶ — ὁ ρήματος, i.e. ὁ θεός — God, or the heavenly bodies. Hence, after ἔχειν we are not to understand τὸν θεόν, but ὁ θεός.

It is not at all unprecedented for θανάτον to refer to living beings generally, nor is it impossible for it in this wide
acceptation to include Θησεύς and the heavenly bodies. Cf. De An. II ch. 3, 414b15 sqq. --- By the latter Simplicius (De An. 106, 27) tells us the stars are meant; cf. also De Coelo, II, 12, 292a, 20 sqq. and ch. 8, 290a32. The stars are in the last passage called θυρών. Cf. also De An. I ch. 1, 402b7, where it is implied that θησεύς is a species or particular example of θυρών. Cf. also Metaph. XII ch. 7, 1072b21. Since the activity of God is ἀμαθής (1072b18) and since, being ἀμαθής and θυρων, he is not in time, it would be a safe deduction that he has not the χρόνον ἀμαθῆς, which is indispensable to memory.

Hence the sense of the passage is clear --- Memory is not a function of pure thought for, if it were, none of the living creatures that are mortal i.e. have perishable bodies and think by means of the sensuous images which are bound up with bodily changes (cf. De An. I ch. 1, 403a43 sqq. The psychical changes we experience are χρόνοι, 403a25.) would have memory. In fact certain living beings, which are freed from the conditions of human life do not possess it. /8

Rassow (1. 1.) proposes to read (1. 21) η ἡμαθαὶ η ἡμαθῶν.
and make ᾠδ-άνεια govern ἔδωκεν θεῷ. The chief ground for the change is that ἐν θεῷ seems to be a ἐν τῷ ἱλαρόν. But Biehl lets it stand, reading ἐν θεῷ as equivalent to ἐν θεῷ καὶ as possessing ἐν θεῷ. The question is whether there are any which can. Cf. previous notes.

Freudenthal (1. 1. p.401) proposes either to omit τοῦ ὀφθαλμοῦ (1.28) or to read it after τοῦ ὀφθαλμοῦ 1.28. Certainly the words seem out of place and Rassow (1. 1.), who proposes either to delete τοῦ after τοῦ ὀφθαλμοῦ or read τοῦ, interprets the sentence following an order which places τοῦ ὀφθαλμοῦ after τοῦ ὀφθαλμοῦ 1.28.

Aristotle uses the metaphor of the seal-ring in another connection in the De Anima III ch.12, 435a2. The object as it were stamps an impression on the air which as it were transmits it onwards until it meets the sensory organ. Again in II. ch.12, 424a19 the impression on the organ produced by the sense-object is compared to the impression left by a seal-ring on a surface. But cf. above note 25; p. 469 b.27. (7)

This, in consonance with the common use of ὁ διάφανον (cf. Bonitz, Ind.), seems to refer both to the aged and the young. In both the mind seems to be too 'fluid' to retain impressions beneath. θέλει. Themistius renders by τοῦ ὀφθαλμοῦ. Cf. De An. III ch. 3, 429b7.
This may be another simile for the minds of the aged and Aristotle may have in view the crumbling condition of an old stone surface. But its conjunction with 
perhaps refers to the inner walls of a building that had originally a prepared surface in which design was cut, but which gets worn off and leaves nothing but the hard layer beneath. This is suggested by a perusal of the famous passage in Theaetetus 191 C sqq. especially 194 C sqq. from which Aristotle seems to have got almost all the illustrations here employed. There the heart is compared to a waxen tablet (νηρίνον ἐκ μαγγίαν) on which impressions are stamped. The surface must be neither too soft nor too hard, for, in the former case, the mind, though easily receiving an impression, soon loses it (ἐπὶ μὲν γὰρ ἐξαναγιαγίαν νυμφή, ἐν οἷς ἐγραφότας ἔχει ἥπει) while, with the hard surface, the opposite is the case. For a mind of good capacity, the waxen surface must be not only of the proper consistency but deep (πεπληροομένην καὶ ἀργυράρασθαν τοῖς ἐπὶ σομίνοις). People with such an organ are both ἐμμαθητεύεις and ῥυηματιστοί.

Now an ἐμμαθητεύεις or prepared surface need not be composed of wax; it may consist of gypsum (cf. L. & S.) and probably the decorated parts of Greek houses and buildings (where marble was not employed) may have had a layer of plaster imposed on the stone, with bas-reliefs cut thereon.

Cf. also ch. 2, 453b4.
Freudenthal proposes to read ἰ ἀλήθεια instead of ἰ ἀλήθεια with Themistius (p. 239, 25 \(\text{παρόμοια})). The change is not important.

Biehl brackets θεόματι, while Freudenthal (1. l. p. 401) deletes both it and φάντασμα, on the ground that if we read ἰ ἀλήθεια the next line ἰ ἀλήθεια forms a tautology and, if we read ἰ ἀλήθεια, is contradictory.

Biehl has the support of L S U, Themistius and the ancient translation, in omitting θεόματι. If we read θεόματι it will be better to follow ἰ and read ἰ αλήθεια ἰ φάντασμα ἰ φάντασμα --- "is both an object of consciousness per se and the image of something else."

Then the next sentence goes on to explain and correct this statement. "Per se it is an object of consciousness or an image; so far as it is the appearance of something else it is a copy and souvenir."

The contradiction, or rather the duality, in the use of φάντασμα here, which causes Freudenthal to expunge it from the former clause, is really one which goes right down into the heart of the concept of φάντασμα and φάντασμα. What is at once a sensuous image posited like a simple sensation or a fundamental concept before the mind and, at the same time, it claims to represent something objective. In its first aspect, as a simple element in the content of consciousness, it has nothing
to do with either truth or falsity; in its second capacity it falls within the domain of synthesis in which truth and error reside. Cf. note on φανερώ above.) Here Aristotle uses it first in the second of the two above senses, but immediately reminds us that properly per se the φανερώ has no reference to the object, that so far as it does this, it is considered in a new light --- as an ἰδή.

Hence, if Aristotle is in the second sentence really guarding his former statement, it would not be out of place to repeat that part of the former statement with which part of the second is identical. Hence we may retain θερασμαί. It is no doubt used to signify the direct, immediate object of consciousness, something that is present as if to the senses (cf. Bonitz, Ind.). It would include a present perception and so cover the case, never separately treated by Aristotle, of the recognition that an object in present perception has been seen before.

On the other hand ὁμοίωμα is substituted in 1.29 which makes it appear substituted for it as though it meant rather a concept. But probably this change is not significant.

Freudenthal proposes to omit ὁμοίωμα after ἐκάλεσα, tr. 'a memorial after the fashion of a copy.' ἐκάλεσα is a χάρα γνώμων in Aristotle.

It is not hereby implied that we can remember without a prior
sensuous experience. That would contradict what has been already said (cf. 400a20 above). \( \text{\textit{τις ρυθμός}} \) must mean --- without having then had present to vision the veritable Coriscus.

All commentators from Michael Ephesus to Freudenthal notice that this paragraph is mere repetition. If more condensed and obscure it is not thereby less Aristotelian.

Cf. chapter 2.
DE MEMORIA: II.

NOTES.

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Themistius (Sp. p. 240, 17) says ἡμικρύματας ἐν οἱ προβλήματας and if we trust Diogenes Laertius R.V 23-24 there was more than one work falling under the first title, viz. Ρωμαίων ἡμικρύματα ν' ἀν ἡμικρύματα ν' ἢ. Hence it is probably to them that we are here referred. Michael Ephesius thinks rather that the Problems are indicated, but in the extant Problems no such discussion is found.

An ημικρύμα is defined in Topics, VII ch. 11, 158a16 as συλλογισμός διαλεκτικός. Now Aristotle frequently, even in the same book prefaces his proper scientific treatment of a subject with a 'dialectical' account. This seems to be necessary in his view in order to attain a preliminary clearing up of notions and hence we may conjecture that he wrote several popular tentative tractates (the literal sense of ημικρύμα is to attempt, seems to enter into ημικρύμα on various matters, and that these, owing to their tentative character, have been dropped out of the canon. Compare his use of
Certainly we cannot here translate with Hammond's treatment on Argumentation. A reference to Recollection could only occur as an illustration in a logical work, and λόγος could not be discussions on dialectical argumentation but discussions of a dialectical nature.

We may set aside Simon's theory that by λήφων is here meant not λήφων μνήμης but the acquirement of fresh knowledge. There is no evidence that that is an Aristotelian usage nor will the Greek bear the interpretation.

At the same time it is difficult to see what relation this statement bears to the following one. Having asserted that recollection is neither the reacquisition nor the first acquirement of memory, he goes on to point out that in μνήμης, the first acquirement of knowledge, there is no such thing as recovery or acquisition of memory.

The doctrine that recollection is to be thus described is, as Freudenthal, Rheinisches Museum, p. 404 points out, not a Platonic but, of course, the teaching that μνήμης is ουδέρνησις is the famous tenet set forth in the Meno and other dialogues: cf. esp. Meno, 85 A: τό δέ οὐκ ἔρι 

Hence the tortuous argument here seems to be --- 'When you recollect, you do not reacquire or acquire memory. If you take ουδέρνησις with the Platonists as equivalent to μνήμης.
it is certainly not so (3.124a 3.25) nor when taken in the ordinary sense, as the remembering again of something forgotten, is it strictly defined either as the acquisition or reacquisition of a memory (3.124a 3.25 3.27).

Freudenthal (loc.cit. p.403) points out that Plato really anticipated the Aristotelian distinction between ἡμετέρα and ὑμήν (cf. Phaedo, 77 C sqq.) Recollection is a knowing again of what has been forgotten. It is to be reminded by oneself or another of something; cf. Phaedo, 73 B, ἱμήν ὑμετέρα = commenial; ἡμετέρα = memini. Recollection implies ἱμήν Μeno, 81 D. But the scientific discrimination of the two functions belongs to Aristotle.

(Plato also noticed the three ways in which ideas may be associated: cf.451b19 infra. similarity, contiguity and contrast.
Cf. Phaedo, 73 (1) A lyre or garment belonging to the beloved one puts the lover in mind of him and from seeing Simmias you may remember Cebes (2) From seeing the picture of Simmias you may remember him. (3) Recollection may be derived either from things like or from things unlike.)

If we translate ἓκ ἤ ἅ μήν as 'from the beginning', then this argument becomes practically identical with the next and Freudenthal will be right in saying that we have here a repetition of a single thought.

But the sense is rather --- 'when we learn, we neither have a memory reinstated in us, nor derive it (as a memory), from
some origin i.e. some other experience. Once the present experience is produced you may remember it; qua present experience it is not remembered. To start memory you need present experience and hence you cannot derive the present experience from the memory.

Aristotle is dealing here not with the temporal but the logical priority of present experience. If this were not so the reasoning from ἐὰν ἔγγυση ἐμικτή ἐς ἂν ἔτος ἐκμένα ἑκτῇ to ἐς ἄμαρτα ὧδε ἔστε ἐγγύση ἤκτῃ would not be clear. When you have an experience then, at that time you have memory, and hence you do not have memory at the same time as the experience.

It is in the next paragraph that he goes on to show that memory requires, in addition to the originating experience, a period of time to have elapsed before it can be called memory.

In addition, this is now brought in when he is dealing with ἀνάφατον in the customary sense not as identical with ἀναφέρομαι, and hence the point of view is different.

The employment of this term here is confusing, because memory itself (cf. ch.1) is a ἀναθεμ. But Aristotle wishes to include among the originating sources of memory not merely individual sense experiences but the dispositions produced by scientific training. It is, however, somewhat misleading to think of them as sources of memory in the same way as ἔνθα. Qua ἀναθεμ nothing is an activity (ἔνθα) of consciousness.
and all memory must start from a present activity.

Freudental proposes to insert \( \gamma \gamma \gamma \gamma \\) after \( \gamma \gamma \gamma \gamma \) in order to provide it with a subject, \( \tau \delta \eta \tau \delta \gamma \) being taken adverbially.

All commentators take this as referring to time and that would be the most likely meaning of the Greek if we read \( \epsilon \nu \tau \rho \alpha \tau \omega \) with L S U. But the dative which \( \gamma \gamma \gamma \gamma \) governs should rather indicate the real \( \delta \pi \sigma \eta \iota \nu \lambda \nu \nu \) in which the \( \eta \eta \eta \) originates, not the time. Hence perhaps we should interpret \( \tau \rho \gamma \beta \eta \mu \epsilon \rho \iota \) as referring to the \( \alpha \iota \tau \gamma \) which is the primary seat of sensation, and which we learn in De Sensu 7, is \( \alpha \iota \tau \gamma \) \( \eta \eta \) \( \beta \tau \iota \) and is also elsewhere called \( \tau \delta \eta \tau \rho \alpha \tau \omega \alpha \iota \tau \gamma \rho \). De An. III ch. 7, 431a19 and 2, 426b16. This is also Neuhäuser's interpretation: cf. Intro. Sec.VI.

The argument then is, that the mere realisation of the impression in the primary organ of sensation — the heart— or its \( \sigma \iota \nu \eta \iota \nu \nu \eta \iota \nu \) is not memory. There must be lapse of time before it can function as an \( \eta \iota \nu \nu \) of the absent object.

If we take \( \alpha \iota \tau \gamma \) as referring to time, it is difficult to interpret \( \eta \iota \nu \nu \). We should have to
translate 'in the same individual and proximate moment of time'. But the proximate is not the same moment, unless in the improper sense in which the same thing may be said to be proximate to itself.

Michael Ephesius thinks that the reference here is to the moment after complete perception and that this is here distinguished from the moment of perception mentioned in the last sentence. Freudenthal finds this too 'spitzfindig' and accordingly chooses to regard this passage as another version of the former one (cf. note 2).

Unless we accept ἑκάτερον with Freudenthal the sentence will not construe.

The interpretation of ἔμνησθαι here does not conflict with that in 451a25. The ἐμνήσθη is not merely the starting point in time but the original experience from which the continued consciousness known as memory is derived.

Here at last is the distinction between ἐμνήσθη (in the proper and customary, as distinct from the Platonic sense) and ἐμνήσθη.

Recollection is the reproduction of a previous experience
(7)

(apart from sense perception, of course) which has passed out of the mind, quæ content, not quæ memory. The memory i.e., holding the present experience as the ἐμνημοσύνη of the past, can be produced either by the continued presence in consciousness of the previous experience or by its reinstatement through recollection. It is a consequence (ἡμερινία 1.6) that, when we reinstate an experience identical in character with the previous one, we should remember, i.e. that it is an ἐμνημοσύνη of the previous one. But it is the act of reinstatement which is accurately to be described as ἀναμνησία, not the referring of the reinstated experience to the past.

Michael, (132a), Simon (p. 301) and Gesner (apparently) read τὸ ἐμνημοσύνη τοῦ ἐμνημοσύνην ἐν ὑπολογίαν. This Freudenthal (1.1, p. 407) approves of, objecting to the absolute use of ἡμερινία in the other reading and trying to make out that we should, if we kept it, have to distinguish as different from each other (1) ἀναμνησία, (2)μνημοσύνη, and (3) μνήμη. That is surely captious, and on the reading which he approves we should have (with Gesner) to interpret μνημοσύνη as ἀναμνησία; but Freudenthal admits (p. 403) that where Aristotle is distinguishing the two functions, he never employs a term, which refers to remembering merely, to designate the act of recollection, however much he may depart from this rule on other occasions.

Themistius says - ἀναμνησία ἐμνημοσύνης ἐστι.
understanding by recollection apparently (as if there is any sense in his explanation) mere logical implication. He explains 'recollection implies memory because, to recollect, you must remember something connected with the thing which you are trying to recollect --- the starting point in the $\xi\eta\gamma\sigma\tau\varphi$ which is recollection,' (cf. infra. 22 sqq.). Not only, however, is this a strange interpretation of $\sigma\omicron\mu\nu\sigma\alpha\iota\rho\iota\omicron\omicron\nu$ and $\lambda\nu\lambda\tau\omicron\omicron\ph\iota\omicron$ but, if recollection may start $\aleph\nu\tau\omicron\nu$ (1.13 infra.) it is not necessary for its starting point to be an object of memory.

$\rho\omicron\sigma\tau\alpha$ refers vaguely and inclusively to $\omicron\nu\mu\omicron\nu\nu\omicron\omicron\omicron\omicron\omicron\omicron\omicron$ and $\omicron\omicron\omicron\omicron\omicron\omicron\omicron\omicron$. The sense is --- 'you do not get recollection and memory every time an experience which has lapsed from the mind is repeated. It may be repeated without your remembering you had it before. In such cases the repetition of the experience is not recollection.' This is pretty nearly Simon's interpretation. St Hilaire, evidently basing upon Themistius's interpretation of the preceding sentence, thinks that here Aristotle is making explicit his distinction between the revived and the non-revived elements in consciousness in the act of recollection. (St Hilaire p.123.) "Ce ne sont pas du reste des choses antérieures qui se reproduisent complètement de nouveau dans l'esprit; mais il y a alors une partie des choses qui se reproduit et une partie que ne se reproduit pas;
car la même personne pourrait très-bien deux fois découvrir et apprendre la même chose." But this interpretation can only be come at by reading ἡγηομένη, l.7, (impossible Greek) or by supplying it after ἡγηομένη; further ἡγηομένη would have to refer to ἡγηομένη etc., l.7, which is rather too far back and would suggest the use of ἡγηομένη; thirdly the thought is still more elliptical and loosely arranged than on the interpretation I give. 'The previous experience is not wholly reinstated for, if it were, it would be a case of ὑπηθός not ὑπηθός.' This renders ἡγηομένη equivalent to 'partly — partly' and makes us refer ἡγηομένη not to the clause immediately before it but to the previous one.

Hammond (p.204) gives a totally new rendering 'Neither do the phenomena of recollection, if their occurrence is the repetition of a previous recollection (sic) follow absolutely the same order, but sometimes they occur in one way sometimes in another. It is possible for the same individual to learn and discover the same thing twice. Recollection then must differ from learning and discovery, and there is need of greater initial latitude (sic) here than is the case with learning.' He elucidates this in a note 'In the case of learning and discovery there is a definite and exact process by which a given result may be twice arrived at. ' (what Aristotelian doctrine is this?)' — In the case of re-
recollection, on the other hand, there is not the same fixity of procedure. There are not only many forms of suggestion and association, but a given suggestion may not effect the same result in two instances.' This is to introduce a point mentioned in 452a25 below but not relevant here. It is in no way apparent that Aristotle ever meant to compare the acquisition and the revival of knowledge with regard either to the relative fixedness of the processes or the fixity of the starting point.

St Hilaire quite fails to see that ῥῆτον refers to μεταδοσία, and so completely distorts the sense. On the whole this favours my interpretation of the previous passage rather than St Hilaire's. On his theory, re-learning a thing implies complete reinstatement of everything in consciousness and it is difficult to see how there would be any ἀπορία at all in that case.

It is Aristotle's theory that in learning (either for the first or second time) as well as in recollection there is an ἀπορία from which we set out. We find no contradiction to this in 451a23 above; there he simply says that in the act of learning you do not derive the experience as a memory from any source. Here he simply distinguishes learning and recollection according to the amount of the ἀπορία involved; but we can gather his doctrine from other passages. We learn either by deduction or induction (Anal.Post. I ch.15, 81a32)
and, in either case, we must have some previous knowledge which is the starting point of our deduction and our induction.

(Cf. Anal.Post.I ch.1, 71a1 sqq. and Metaph.I ch.9, 992b30 sqq.).

In the one case we must know the premises of any particular conclusion and ultimately the constituents of the definitions of the terms (which enter into our premises). --- ὡς γὰρ ἐστὶν ἐν διάστασιν προηγούμενον ποίημα, γνώμη (992b32).

In the latter the knowledge of particular cases which are given in perception (ὡς γὰρ ἐστὶν ἐν γνώμῃ ἐκτίθεμεν τῇ ὁδῷ, ἀφοῦ, Ἀναλ.Ποστ.Ι ch.2, 72a2,3) and which are less intelligible naturally (ὡς ἐκ τῆς γνώμης ἐπιστῆσαι τὴν ὁδὸν, Μεταφ.ν.Ι ΠΙ ch.4, 1029b4), is required before we can gather from them the universal law.

But in learning by induction we do not have previous knowledge of the universal law nor in deduction have we a prior acquaintance with the particular case. (It is only in so far as the particular is implicit in the universal that it is previously known. In its particularity and in the full sense of the word it is not known:ἐπιλεγόμενη δ' οὖν ἡ γνώμη 71a28).

If it had been explicitly thought of previously, then we should have a case of recollection not of ὁμολογία, which must be distinguished from ἡμετέρως and is thus to be distinguished.

Another point of difference is that mentioned below in 452a1 sqq. Learning requires a teacher; the process of recollection is self-originated.

There is also a sense in which the act of learning is not
a process. Cf. Phys. VII ch. 3, 247a10 sqq. Cf. also De An. I ch. 3, 407a32\frac{1}{2}. This however comes to no more than the familiar doctrine that per se the intellectual life is not a \( \text{σωματίς like} \) memory and recollection. But in this sense it cannot apply without qualification to the functioning of the \( \text{διανομή} \) which is realised in finite individuals.

Hamilton (Reid, p. 894) points out that Locke too, in Essay II ch. 33 \& 5, distinguishes between those ideas which are naturally connected by an "union and correspondence which is founded in their peculiar beings" besides those that are associated "through chance or custom." By those necessarily connected Aristotle means notions which objectively imply one another, like centre and circumference. As Hamilton indicates, it was typical of the empirical English school (other than Locke) to ascribe all collocations of ideas to custom.

Freudenthal's reading (1.1, p. 407) --- \( \text{σωματίς} \) --- \( \text{ἀκόλουθος} \) --- \( \text{πολλακός ἔργῳς} \) --- seems unnecessarily to anticipate the doctrine of 452a3 sqq. infra.

Freudenthal's conjecture of \( \text{τυχα} \) instead of \( \text{τυχα} \) 印 makes the reading smoother, 'we experience a number of previous changes conducting to the stimulation of that one etc.'

By this Aristotle cannot mean merely 'a time present or otherwise.' It is difficult to
see how one could start a process of reflection otherwise than from the present time. The idea is that the object, the thought of which starts the train of recollection can be given either in present perception or in memory.

This describes the character of the object or content of the notion which starts the process.

It is the first recorded formulation of the celebrated laws of association though they are all to be found instanced in the Phaedo. Cf. above note.

This evidently is capable of being illustrated by the \( \varrho \delta \alpha \varepsilon \iota \alpha \mu \eta \lambda \) which, being affections of a single sense organ, must be \( \nu \mu \omega \) cf. De Sens. ch. 7, 447b4. \( \nu \theta \varepsilon \varepsilon \iota \alpha \mu \nu \tau \sigma \tau \iota \) \( \nu \iota \kappa \tau \omicron \nu \tau \eta \omicron \) \( \sigma \tau \iota \) \( \theta \omicron \omicron \). Here of course the \( \nu \iota \kappa \tau \omicron \nu \tau \eta \omicron \) seem to be regarded as existing in the central not in the end organ, but evidently the characteristic of being \( \nu \iota \kappa \tau \omicron \nu \tau \eta \omicron \), which distinguishes \( \nu \iota \kappa \tau \omicron \nu \tau \eta \omicron \) in the end organ is regarded as attaching to them when they are transferred to the heart.

If this interpretation be correct, Association by Contrast is to be assigned to 'Continuity'.

Freudenthal, G. A. Bekker. The change is immaterial unless with Themistius, Leonicus, Simon we take the \( \omega \omicron \nu \sigma \iota \) with \( \gamma \tau \omega \omicron \nu \tau \omicron \) and translate 'and we re-
recollect even though we do not search in this way.' But we see that Aristotle does not limit ἀραμένος to the volitional process which reinstates an idea from 453a16 sqq. below. Recollection is said in some cases not to be ὑποτελεῖται i.e. subject to the will in certain circumstances.

Cf. also Hamilton *op.cit.* p.902, note.
still being made to the case of voluntary and involuntary reminiscence, and that it is the manner of occurrence of these two which is said to be identical. But ἐν εὐθείᾳ and ἐν ὑπάρξει cannot distinguish intentional as opposed to unintentional recollection. (What can 'pre-intentionally' mean?) It is the method of recalling τις ἐν εὐθείᾳ and τις ἐν ὑπάρξει which is the same. As the remoteness of two distantly connected ideas can be bridged over by inserting intermediate ones, it is the mode of connection of these latter that we have to consider.

31-32

γνώσεως — γνώσεως 112.27.28. A gloss according to Freudenthal. But, if we let it stand, it simply points out the fact that the order of the series of psychic changes is not determined by any previous act or record of recollection, but by the way in which they are accustomed (τὰ γάφ 1.28) to be experienced together.

This is simply the term for efficient cause used in Physica II ch.7, 198b1; Metaph. I ch.3, 984a27 etc. Here we are dealing with that class of efficient causes or sources of change which are themselves motions or changes. The series of changes in conscious process is conceived by Aristotle quite in the same way as all other changes occurring in the world of generation and decay. The whole series is a μερος which is made up of parts which are themselves μερος. Hence Themistius's
illustration of the series of mental sequences by a chain in which, if one link be lifted, the next will also be moved, (Sp. p.243,12). The links in the series are themselves nothing static but processes also.

So far as we have gone, the πηνηγίας which are stimulated in the act of recollection seem to be dormant in the soul or its organ the heart prior to stimulation and this is apparently the view maintained through the De Memoria. In De An.I.ch.4, 403b15 sqq., however, a rather different attribute is taken up. In recollection the πηνηγίας is said to pass from the soul to the affections (also πηνηγίας ) or their traces (ωντίς ) existing in the sense organs, as opposed to sense perception where the πηνηγίας proceeds in the reverse way. In neither case is the process in the soul.

By this however Aristotle probably means no more than to emphasize the fact that in the higher faculties the mind is an originating cause. Of course, in all cases the soul is an ἀρραξιος (cf. De An.I ch.1, 402a7) and to be regarded as an efficient as well as a final cause (De Part.Animal.I ch.1, 641a28). But, just as none of its modifications, even a primitive one like perception, is mere passivity (cf. De An.II ch.5) so we seem to find a progressively greater absence of passivity as we pass from lower to higher faculties; e.g. scientific knowledge --- ἰηνηγίας , is not passive change of the type ἀλλαξοις in the proper sense at all (§17b6).
A mechanical determination of psychic processes by each other may go on and be beyond the control of the individual in whom they occur (cf.453a15 infra.). This is held to show the corporeal nature of such changes or rather their dependence upon corporeal conditions. Hence it is suggested by implication that a function which was exclusively psychical would not be determined in this mechanical way but would be completely under control (ἐν τούτων : 453a20). Notwithstanding Aristotle's determination to make out all human faculties to be conditioned by the bodily organism, and thus establish a thorough-going parallelism of psychical and corporeal changes, notwithstanding the fact that he declares the human ψυχή to be ἡμινήμακα, there seems to be this tendency to free itself from bodily conditions which manifests itself in that which is not characteristically psychical. It is significant that in this passage where Aristotle talks of the process in recollection proceeding outward from the soul, he immediately goes on (as if impelled by association of ideas) to talk of the ψυχή which is impassive and imperishable, and practically identifies σωφρόνελο with it. The decline of the mental faculties is just like the dimness of sight in an old man, due to the bodily organ becoming impaired. It is not the ψυχή which suffers change but its organ (ἐστὶ δὲ γὰρ ἡ μακρὰ ἡ ἐν τῇ ἑσπερίᾳ ἡ τρέχουσα ὑπέρ τῆς ψυχῆς τοῦ παλαιοῦ ἀτόμου, 408b22). Hence the ultimate core of the ψυχή seems to consist of this imperishable
νοσ which, no doubt, relatively to the body will be like the divine νοσ in its relation to the world, the prime source of movement.

Aristotle, however, does not state this explicitly and though, indeed, he tells us that the νοσ enters the living being from outside and its activity has nothing in common with that of the body, (De Gener. Animal. II ch. 3, 736b28) yet the relation of this to the other mental faculties is most obscure in his philosophy and really leads to difficulties much the same as those surrounding the relation of the Platonic ἐν συνείδεισιν to the things of time and sense.

The series may be either temporal or not.

Referring a reinstated process to the past is a characteristic of recollection as distinct from learning a second time: cf. 451b5. Hence Aristotle is justified in using memory as the generic term to include recollection.

This surely refers to many different starts not to many different items in a single series.
The act of memory cannot be the merely potential existence of a process in the mind.

But we do not elsewhere hear of a special \textit{μνήμη} \textit{μνήμων} in the mind. It is an actual process which functions in recollection.

This surely, as the illustration below bears out, refers to the \textit{μνήμων} common places of thought in general which Aristotle defines in their most universal sense in \textit{Rhet.} I ch. 2, 1358a12; of \textit{μνήμων} of \textit{κοινοῦν} \textit{περί} \textit{προσωπικοῦ} \textit{πως} \textit{προσωπικοῦ} \textit{πως} \textit{προσωπικοῦ} \textit{πως}

\begin{itemize}
\item cf. also 1.32.
\item The \textit{μνήμων} is a rule or general statement that will readily recur to one and hence it may be used as the \textit{άρχη} of a train of ideas in recollection. E.g. it is a \textit{μνήμων} of the Aristotelian philosophy that air is damp; and apparently from \textit{Meteor.} III ch. 4, 374a2 that it is \textit{λευκὸς}, that milk is white and the autumn damp are given by ordinary perceptions.
\end{itemize}

Unfortunately Aristotle in illustrating the use of \textit{μνήμων} in recollection by those drawn from his own philosophy gives a series of ideas which would hardly with plausibility be used in the purposive recall of an idea. Hence Hamilton (followed by St Hilaire) proposes to read \textit{άρχη} \textit{μνήμων}. But if the series is an absurd one still less likely is it to be employed in voluntary recollection which is now being discussed.
Themistius (Sp. p.247,3 sqq.) gives a variety of alternative explanations to ἀποκαθέσθαι. ἀπόστισιν τε ἢ τὰ ἀρχαῖα ἔργα ἡ ἁγιομένη έγγυσ, ἣ τοῦτο τε ἀναστρέφῃ σὲ τὰ ἡμέρα τοὺς ἡμέρας τοῖς ἄλλοις τέων. Thomas interprets it as meaning the latter merely. In that case, the reference would be to the art of memorising objects by attaching each to a special point in a spatial arrangement—an art said to have been invented by Simonides of Ceos and referred to by Cicero in his De Oratore, I. c. 86.

So Hammond and Freudenthal, loc. cit. p.409 (who indeed in consequence wishes to read ἀποκαθέσθαι instead of ἀποκαθάσθαι). But it is strange that Aristotle after mentioning this method of memorising should give an example which has no reference to it.

τὸ ἀποκαθάσθαι is read by L S U Y Themistius and Michael. Both those commentators however, render it by ἢ ἀρχαῖα ἔργα ἡ ἁγιομένη, a meaning which, according to Freudenthal (Archiv. für Gesch. d. Philos.II 1887 p.11) ἀποκαθάσθαι can certainly have. They thus interpret τὸ ἀποκαθάσθαι as though the τὸ were inessential. Siebeck however in Philol. 1881 pp.350-2 and his Untersuchungen zur Philosophie der Griechen, p.155+ wishes to retain τὸ and to make it essential. He thinks that here Aristotle identifies the middle of a series of terms employed in reminiscence with the τὸ ἀρχαῖα of logical inference which is an universal...
and furthest from sense. The connecting bond in recollection is a universal concept which binds together various particulars by means of their implication in it.

This comes to pretty much the same as Mr Bradley's doctrine that "Association marries only Universals," or more simply, that there is a bond of identity between the thing remembered and the thing that brings it to mind. This however has been already made clear enough in 451b19-22 above, and it is strange that Aristotle should confuse that implication of a predicate in the middle term of a syllogism which accounts for the truth of the conclusion, with that relation between psychical states which causes the presentation of the one to entail the presentation of the other. In the latter case you are accounting for a process, in the former for a connection which is independent of process. Moreover the 'universal' which connects different ideas in reminiscence is hardly the universal of logic --- that which is 'furthest from sense;' it is often of the most sensuous character. Once more, it would be unfair to represent it as a separate member in the train of connected ideas; it is rather the identical element pervading any two.

In the details of the subsequent passage Siebeck's interpretation is beset with at least no fewer difficulties than Freudenthal's.

Cf. also next note sub.fin.
Biehl's text, which I print, follows Freudenthal's reconstruction of the passage. I have translated it as it stands. But it can hardly be said that all difficulties have been removed even by this radical alteration of Bekker's text. The general drift seems to be that the middle term of a series of connected ideas seems to be of unique importance because from it you can go in either direction to the other members. If you have a series of ideas A B C D E F G H and want to remember F or G and are not able to do so when you think of H by thinking of E you may be able to recall them. Then from E you can get either to D or F or from C you can pass to B, the term before it.

But this is not at all persuasive. Why should the final possibility of recall be the starting from A, which is an extreme in the series, if it is the employment of the middle term which he is illustrating? Bekker, as Freudenthal himself points out, there is no single middle term in a series of eight.

Again Freudenthal does not seem to give sufficient weight to the objection that this makes Aristotle talk of recollection as proceeding in a reverse order with equal facility.
Now, perhaps Aristotle only means that, after all, it is the connecting link, the intermediate term, which accounts for and must universally account for the recollection. If one does not remember by thinking of another term in the series, one does so by coming to it. It is the proximate and universal (κα θέλω λαμβάνον 1.17) cause of the recall of the idea in question. Hence I propose to read and translate as follows, 482a19 sqq.

If one has not remembered at Ε at G one does remember H. The reason why one does not remember at Ε is that from that point one can pass to both G & F. If one does not want to remember he will remember by going to C if he is seeking for D or E; if he is not seeking for these he goes to A. This is universal.

MS. Y reads το θ. The omission of the το before θ would easily occur. For the other changes of letter no MS. authority is available, except that the vet. tr. reads Z in 1.22, a change approved by both Siebeck and Freudenthal. The other
But another interpretation has been suggested to me (by Rev. W. P. Romilly of Dulwich College). It is proposed to adopt the following text instead of that of Bækken:

452 a 19 seg. εἰ γὰρ μὴ ἴνα τοῦ Αὐτοῦ ἵνα τοῦ Εὐαγγελίου ἢ οὕτως γὰρ ἔστων ἔργον ἡγησάσθαι καὶ ἐν τῷ Αὐτῷ ἢ τῷ Ζ. εἰ δὴ μὴ τοῦτο τί ἦς τί, ὅτι τοῦ Τάχθων μεταφέρσαι, τί ἦς τῷ Θεῷ ἢ τῷ Ἐμφάνισεν εἰ δὴ μὴ τῷ Αὐτῷ.

The only changes made for which there is no ms.
authority are A in e. 19 and Z instead of F in e. 22, while the other variations from Bækken and Romilly follow the text in 58.

The translation will then be as follows:

If one does not remember at A lie remember at E, for from that point he can pass in both directions—both to D and to F. But if he is not looking for one of these (D or F), by going to F he will remember if he is looking for G or H; while if he is not looking for G or H, but those in the other direction (C or B) lie near to D.

In explanation of this interpretation it is maintained that A is not included in
the series of terms of which to about
which is said to be the 2.774 (hence
they form an odd number and E becomes
a real middle term). A is rather term
immediately outside the group in which
the idea to be recalled is contained.
Aristotle is held to be illustrating the well-
known process of recall in which, when we
wish to revive an idea, we must first fall
to the group of former presentation with which
we must already know it to lie. E, then,
will symbolize the central idea which
lies within from which it is possible
to pass, in more than one direction, to
the idea lying in the outset of the group.
This interpretation is ingenious and gets
rid of minor difficulties as it does not
require that Aristotle should be held to commit
himself to the statement that we can recall
an idea by proceeding backwards among terms
experienced in a linear series like the letters
of the alphabet. Through Aristotle symbolises
his term by the letter of the alphabet be in
the thinking not of a series following the direction
of the time process but of a group of terms formed
by time motion being frequently thought of together
and centered around one thinking topic.
alterations are mild in comparison with those made by Freudenthal.

The point is that it is the term just before the one to be recalled that you must get. There is no intention of dealing with a fixed middle term of the whole series. When Aristotle says the middle term may be considered as the  ἡ ἔκ τοῦ ἴθανατος, means in a way it is really ἡ ἔκ τοῦ ἴθανατος. It is ἡ ἔκ τοῦ ἴθανατος in the sense of being the proximate cause. Now it is anything ἡ ἔκ τοῦ ἴθανατος in this way that is universally (ἡ ἔκ τοῦ ἴθανατος) a cause.

Hence ἡ ἔκ τοῦ ἴθανατος may be read in 1.17 and its normal meaning 'universally' gives to it, if my conjecture as to the meaning of the subsequent passage is adopted. It is the intermediate link between any two terms which is universally the cause of the transference from one to the other, just as it is the proximate cause which universally produces an effect or as it is qua triangle, the middle term, that we can universally predicate equality of the angles to two right angles of any figure. Cf. Anal.Post.I ch.4, 73b25 sqq.

Freudenthal, in conformity with his interpretation of the above passage, proposes to read E instead of τ (τ). The associative process may go in either direction. But the meaning is quite satisfactory and does not involve the special difficulties of this contention if we keep the MS. version. Aristotle has just been saying that the intermediate term is universally the
ground of recollection. But it is objected that from a given term sometimes you pass to a certain other one and sometimes not. That will be true he says of the remoter terms in the series, for sometimes from C we pass all the way along to F, sometimes to the next member only. Again the particular series C D E F may become obliterated and the association branch off in some other direction that has become more familiar. Hence though starting from C, we may not arrive at F.

All editors except Biehl, following L S U, read ἵνα ὥσπερ ἔχετε ἰδία καὶ ἰδιότητα and Freudenthal wishes to follow the same text with the omission of μη). All difficulties however vanish when we take ἵνα as 'lately' a sense which it often bears in Aristotle (cf. Bonitz, Ind. p. 559 a 19: ἰδία ἰδίας ὑπάρχει, ὅτι δὲ τὴν δοξὴν refert ἦν ὑπάρχει quae antea in eodem libro exposita οὐκέταίρ) and in other writers.

One may not have lately experienced the succession C D E F and hence when C occurs he goes off on some more familiar route.

L S U and all editors before Biehl read ὥσπερ, especially since the explanation is based upon the frequency of the repetition; cf. l. 30 below: ὥσπερ ἐφεξής ἔχετε ὑπάρχει ἰδία καὶ ἰδιότητα. But the idea of frequency or continued action is contained in the imperfect term ὥσπερ ἐφεξής.
Mr. Cook Wilson (Journal of Philol. XI p. 120) conjectures εὐνηθής; but this makes the sentence simply a repetition of 1.26 above. Though Themistius reads ὁμολόγως ῥήματι, that is no guide. It is just the practice of the commentator to reduce significant statements to idle repetitions.

Every one of those who read ἵνα γίνη τὸ λόγον will have it that the reference is to the activity of mind and, as it is the function of intellect which is most appropriately styled an ἱστορία, the term may perhaps be used absolutely as referring to that without further qualification. But the meaning will not be, as some think, that the order of connection of things in nature must be reproduced in the mental process of recollecting. That would only be the case if the order of recall was always identical with the order of notions in science, which is admittedly a reproduction of the objective order. (Cf. De Interp. ch. 9, 19a33; διουχος ου μαθητικος θαύματος το παθήματα and Metaph. IX ch. 10, 1051b3) It is only the order of experience, though at times that might coincide with the scientific order, which is reproduced in association and it is doubtful if it could be said that that takes place χρόνος. The meaning would then rather be that, just as in the order of nature things succeed in a definite sequence, so it is in the functioning of thought. It is the occurrence of a particular order which is common to both.
Perhaps, however, the meaning is much wider than this. One of the MSS. (M) inserts ἡ ἀποθεωσις after φιλοσοφία and this, which seems to be a gloss, may however give us a clue to an interpretation. "Things when actually produced in a definite order do so by virtue of a natural disposition (or ἀποθεωσις) to do so. Now frequency of repetition produces this φιλοσοφία and hence you explain the way in which we actually associate such and such ideas, since the ἀποθεωσις produced by frequent repetition is a kind of φιλοσοφία. This φιλοσοφία might well have been called a ἀποθεωσις, as the tendency to virtuous action produced by practice is called in the Ethics. This ἀποθεωσις, it must be noticed, a ἀποθεωσις; though determinate, and from φιλοσοφία you can never dissociate the idea of potentiality. Thus it can quite well be opposed to ἀποθεωσις. In fact φιλοσοφία as the world of Nature is apart from actual sensation, merely the potentiality, a ἀποθεωσις. Cf. Metaph. III ch.5, 1010b30 sqq. esp. 1010b11 ὅπως οὖν ἐστὶ ἡ ἀποθεωσις ἀπὸ τῶν ἀρχῶν ἐκ τῆς ἀρχῆς ἡ ἀποθεωσις ἀπὸ τῆς ἀρχῆς ἀπὸ τῆς ἀρχῆς. Something must exist to cause sensation, but it is a ἀποθεωσις. Cf. also De An. II ch.5, 417a12 and III ch.2, 426a15 sqq.

The one sense of φιλοσοφία is not totally dispervered from any of the others. It is not a homonymous term. Here in 32 φιλοσοφία is used in a way which would suggest 'natural tendency' or 'constitution' as a translation and it is used in the same...
connection as ἐν τοῖς φεύραι καὶ παρὰ φέραι (452b1) which imply a reference to the world of Nature.

Cf. Phys. II ch. 8, 219b35 sqq. and III 215a2, etc. τὸ ὀνόματι ἤ χαί ἥ is the source of what we should call exceptions to the laws of Nature. Those deviations from the normal which we should ascribe to the operation of special subsidiary and counteracting laws Aristotle did not regard quite in the same light. As the action of Nature is not merely according to law but purposive, Aristotle seems to consider these deviations from the general rule as being opposed to this purpose which aims for the best and as thwarting it. Hence the expression τὸ μὲν φέραι. Cf. Zeller Arist.I pp. 451 sqq. (τὸ ὀνόματι ἢ and τὴν γλυκίαν) may be distinguished, the former being specially that tendency to produce the unexpected found in natural phenomena.)

Cf. Bonitz, ad Metaph. XI ch. 8, 1065a30.

which Christ suggests, would make the reading smoother. But Aristotle continually works with an exceedingly indefinite subject especially when discussing mental phenomena (cf. Rodier ad De An. III ch. 5, 430a25.); it is, indeed, possible for the subject to be changed between τὸ ὀνόματι and τὰς γλυκίαν.

Christ: BY have σύνημαι ἀπό μεταξὺ τῶν θεῶν. I am aware of the presence of God.

This is not a special characteristic of recollection but is common to it and memory; cf. ch. 1, 449b29 et passim. From
here up to 453a Aristotle deals with the perception of time, a common function of both activities and thereafter goes on once more to contrast the two.

This is evidently the common sense or its organ, the \( \alpha \gamma \), mentioned in De Sensus, 449a. To perceive time is a function of the common sense: cf. De Sens. ch. I, 450a10 and notes.

Compare the way in which the perception of time is illustrated by the perception of a spatial magnitude in De Sensus, ch. 7, 448b sqq.

This would be a device for effecting thought by contact. Plato suggests in the Timaeus that thought is effected by contact (cf. De An. I ch. 3, 406b26 sqq and Rodier, ad loc.). But thought would thus be itself a \( \alpha \gamma \), \( \varepsilon \). Cf. Timaeus, 34 C sqq. and esp. 37 A. Aristotle however does not disdain to speak of the activity of intellect as a contact with its object — which is itself. Cf. Metaph. XII ch. 7, 1072b21: \( \Theta \gamma \alpha \varepsilon \nu \omega \nu \eta \iota \lambda \iota \omega \delta \varepsilon \nu \).

Plato though making thought be effected by contact does not suggest that it issues from the body and reaches out to the things thought of, but as we see in De Sensus, ch. 2, he, along with Empedocles, holds this to be true of sight.
This is pretty nearly the traditional version of the commentators and it seems to have given rise to the interpretation descending from Themistius, which is to the effect that Aristotle is comparing the relation of external magnitudes and objective time to subjective processes by some relation between a whole and its parts. The inner processes in the subject are ἔλαττον, but so are the parts contained in a whole. Themistius takes the νρος as referring to the parts which are contained in the whole not, apparently, as referring to ἐν ἀρχῇ ἡ ἀρχή (τοῦ ἐν γόροι) 1.12. Nevertheless ἀντὶ ἰνρος -- the parts contained in the whole -- do correspond to the subjective processes but, when they are described as ἔλαττον, that primarily characterises their relation to the whole (ἡ ἀρχή) and only secondarily the relation of inner process to the external reality.

The argument then is (Themistius, Sp. II p.250) that, if you know the whole, the knowledge of the part is annexed to it, but that knowledge first attaches to the parts (τὸ ἰνρος) and then, because they are analogous to each other, and to the whole, proceeds to the whole. The relation between whole and parts is like that in the Timaeus between the demiurge, or rather the animal of perfect figure which is to contain all others (Timaeus, 33 A), and the created gods which are within it and yet like it.

It looks as though Themistius, having consulted the Timaeus
in connection with the passage above, has been led on by some similarities of expression in the two works (τινος, ονοματικόν and the notion of figures containing one another) to introduce as a parallel something perfectly irrelevant. As Freudenthal points out, though a whole contains its parts, the parts do not contain the whole and it is impossible merely from the relation of part and whole to understand how a part can represent a whole. Among the commentators Simon and Thomas discuss all this construction and take τινος as referring simply to the inner psychic affections which correspond to the external objects and periods of objective time. It might seem at the first glance that τινος which reside within the soul or its organ are what correspond to the external spatial magnitudes, the τινος what answers to the periods of real time, but this distinction can hardly be maintained. All internal states must be τινος those by which time is apprehended must themselves be spatial i.e. capable of being represented by figures. The relation of inner to outer is represented by similar triangles, the one including the other (cf. 17 below), and though Themistius employs such triangles in his elucidation of the passage, the one does not represent the psychic states, the other the external realities, but one is held to symbolize time and its smaller parts the subjective processes apprehending time, the other the objective thing, with its parts representing the concepts by which we
know the objective, and what is asserted is not merely a proportion between the inner elements of each triangle and the whole, but between the two triangles as a whole and consequently between the inner elements of each triangle. Cf. Themistius, Sp.III p.250, 1.23: έν τῷ ἀλαττῷ τὸ σώμα πρὸς τὸ ἔντερον ἕναν, παρὰ τούτῳ τὸ ἔντερον πρὸς τὴν ἑξάγωνον δύνατα, όντα τῷ μικρῷ τὸν μεγάλον αὐτοῖς, έν τῷ σώματι πρὸς τὸ σώμα τῆς ἑξάγωνος παρὰ τῷ μικρῷ τῷ μεγάλον. (Sпегел conjectures πάς before τὸνά). But Themistius has completely missed the point, which is --- how can the internal represent the external? He is continually using τὸ σώμα and τὸ σώμα as interchangeable (cf.1.21 loc.cit.); but the question is --- how is it possible to use the τὸ σώμα instead of being in actual contact with the τὸ σώμα? How are they related to one another?

Freudenthal, in Rheinisches Museum p.415 conjectures practically the identical reading which Biehl reproduces and which makes quite plain to what τῷ σώμα τῷ μικρῷ and τῷ σώμα τῷ μεγάλον refer. We must however depart from Biehl to some extent and delete before ἀλαττῷ τῷ σώμα τῷ σώμα τῷ σώμα which obscures the sense and may have easily crept in from the subsequent line. We read πάς with Freudenthal.

St Hilaire and Hammond take γραμμὴ to mean figures (mathematical); 'just as a figure may contain a proportionate one within it so with distances.' But πάς is never used as identical with γραμμὴ -- figures; and besides, since the sides of geometrical figures are ὄνομα, in comparing the
relation of \( \chi\pi\rho\omicron\nu\tau\epsilon\rho\omicron\mu\iota\zeta \) to those which exist between the order of proportionate figures, Aristotle would only be comparing a thing to itself.

Bender translates \( \textit{Bildern} \) by 'Bildern' and this may be founded on an illustration which Simon gives when he compares the psychic states to statuettes of equal size reproducing on the small scale the lineaments and features of two different men. Simon however seems to agree with Thomas that \( \textit{Bildern} \) (4.15) refers not to the \( \chi\rho\omicron\nu\omicron\omicron\omicron\omicron \) as Bender seems to take it (--- 'in der Sache'---) but that would rather be \( \chi\nu\alpha\omicron\omicron\omicron\omicron \) (4.15) but to the perceiving subject --- 'in der Sache' --- \( \chi\nu\omicron\omicron\omicron\omicron\omicron\omicron \) cognoscente', and thinks that Aristotle is comparing the function of the internal quantum \( \chi\rho\omicron\nu\omicron\omicron\omicron\omicron \) representing external quantity to the function of the internal \( \chi\rho\omicron\nu\omicron\omicron\omicron \) in representing that which exists in the objective universe. In both cases the internal is analogous to the external. This account of the \( \chi\rho\omicron\nu\omicron\omicron\omicron \) in the soul is rather different from the usual one. He generally says that the \( \chi\rho\omicron\nu\omicron\omicron\omicron \) of the object gets into the soul. For example, sense is a faculty for receiving the \( \chi\rho\omicron\nu\omicron\omicron\omicron \) --- the form without the matter; cf. De An. II ch.12, 424a16, and so of \( \chi\rho\omicron\nu\omicron\omicron\omicron \) in III ch.4, 429a15 and similarly in 429a27 the soul is said to be the \( \chi\rho\omicron\nu\omicron\omicron\omicron \) of the sensible object only exists actually (\( \chi\nu\omicron\nu\omicron\omicron \)) when it is perceived or thought of, the \( \chi\rho\omicron\nu\omicron\omicron\omicron \) in the soul will
be identical both numerically and specifically with that in the object so far as the latter exists \( \nu \n
in the following lines while I adhere to
one of the emendations which Richel
adopted from Freudenthal (1917) I disagree with
the letter in his interpretation of the passage.
My interpretation enables us to read
AT with Behkian and all other editors + Jas.
in 7 A 7 in 1. 24 and I instead
of M in 2. 22, a section supported by
msr. 8 v. y

The figure given in illustration of
the text differs from that
suggested by Freudenthal equally
as from the one found in Lemmata,
it will be found to be simpler than
either and open no further objection.
my contribution is that Christ the sole
point in is shown here external
experience and miry grams may be
reproduced in parts in the physiological
organs. The explanation is that the
internal organs and my grams are
analogous to the external ones, just
as the side of a small triangle are
in the same proportion as those of
one any number 7 times larger obtained by producing the side to any distance and drawing the base parallel to the base of the small one. We accordingly draw the triangle A1-1 with B E near the apex and parallel to F A. (That this is the first figure to be drawn is evident from the fact that the letter round it succeed each other in the order of the alphabet.)

The internal objects of this figure then represent the external just as the side, A B, B E, represent A F, F A by being proportional to them.

But the question arises, when should the internal objects of this figure be A B, B E, represent the external A F, F A, when then, A Z, Z H (obtained by producing A F and A A and drawing Z H parallel to F A) which are equally proportional to A B, B E?
will not an internal optical which represents a distance of one foot at a certain distance represent one 1/2 inch feet at double the distance? Aristotle replies that that is so, but that in the two cases we are conscious of a different proportion between the external and the internal. We have some standard by which we measure real size, we are conscious of the real distance outward from the eye of the various objects, and hence to state the case in modern terms, we know that any affection of this retina, which may mean a size of two inches in a certain object, may mean two miles in a distant one. This is what Aristotle means when he says that $AG$ is to $AB$ in the proportion of $\Theta$ to $I$, but $AZ$ is to $AB$ in the proportion of $\Theta$ to $L$. This interpretation requires us to regard $\Theta$ as the names of single lines, not as referring to points at the ends of lines, as Freudenthal and Thunberg would have it. This usage is common in Euclid, on the other hand it is impossible that $\Theta$ to $I$ to $K$ to $A$ could refer each to single lines.
on Frendental that man must not only anything in the passage be quoted (Phys. VIII ch. 10, 266 a 16, Meteoro. III ch. 5, 6, 7, 8, 9, 11) to show that Aristotel could, by $\Theta = M[I]$ etc. 28, here refer to a single line by means of a point at one end. If the difficulty is increased by the fact that his interpretation requires the full designation of the former line to the $[M] \Theta$ $[K]$ the latter $[M] \Theta$ of the letter $[K] M$. This is

Frendental that in RhemistAnn. loc. et al.

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Prüfer constructs two diagrams.

\[ \triangle \gamma \] and \( \gamma \) are two similar triangles one inscribed in the other and both are intersected by a line \( \eta \) drawn parallel to \( \theta \) so that \( \Delta \gamma \) is also drawn parallel to \( \Delta \gamma \).

Then the following result will hold:

\[ \frac{\alpha \gamma}{\beta \gamma} = \frac{\alpha \gamma}{\beta \gamma} = \frac{\alpha \gamma}{\beta \gamma} \]

Also \[ \frac{\alpha \gamma}{\beta \gamma} = \frac{\alpha \gamma}{\beta \gamma} \]

Finally \[ \frac{\alpha \gamma}{\beta \gamma} = \frac{\alpha \gamma}{\beta \gamma} \]

According to Freudenthal, \( \alpha \gamma, \beta \gamma \) represent inner affections; \( \alpha \gamma, \beta \gamma \) concepts; \( \alpha \gamma, \beta \gamma \) are objective magnitudes, while \( \alpha \gamma, \beta \gamma \) represents our idea of time, \( \alpha \gamma, \beta \gamma \) actual objective time.

This scheme is not wholly unlike that of Themistius whose outer triangle represents time and its subjective apprehension, while the inner one symbolizes objects and the ideas by which they are thought.

But as the whole point of the argument is, that the internal \( \alpha \gamma, \beta \gamma \) and \( \alpha \gamma, \beta \gamma \), though much smaller, are still analogous to the external magnitudes and periods of time, it is strange to find the internal \( \alpha \gamma, \beta \gamma \) which is the means of apprehending time symbolized by lines in the external triangle.
If there is any point at all in drawing inserted triangles to represent the relation in question, the inner one should certainly represent the subjective and 'smaller' process. A series of similar triangles the one enclosing the other would be a much better means of bringing out Aristotle's contention. It would thus be shown that differences in magnitude are non-essential; the proportions in the sides of the smallest interior triangle are still analogous to those of the largest exterior one. There is no need for Aristotle to represent objective time by different lines and symbols from those which represent external spaces (cf. De Sensu, ch.7, quoted above), nor need the internal \( \pi \nu \eta \gamma \varsigma \) be distinguished by different letters from the internal \( \chi \nu \alpha \). In fact, the internal state corresponding to both spatial and temporal magnitudes must be a \( \pi \nu \eta \gamma \varsigma \) (and perhaps it is this that Aristotle means when he says in De An. III ch.1, 425a17,18, that we know both figure and magnitude by means of \( \pi \nu \eta \gamma \varsigma \) ). But this \( \pi \nu \eta \gamma \varsigma \) can be represented by a figure, i.e. it is spatially determined; it is a kind of \( \nu \rho \alpha \), and it is as such that it can represent the objective magnitudes whether of time or space. What the difference is between the \( \pi \nu \eta \gamma \varsigma \) which represents a magnitude which is itself a \( \pi \nu \eta \gamma \varsigma \) (as in time) and that which represents a space, Aristotle does not say; he seems merely to be bent on describing everything internal in
terms of ἰδή

Again, it is difficult to believe that here Aristotle is distinguishing inner affections 'innern Affectionen,' (Freudenthal in Rheinisches Museum p. 417) from concepts (Begriffe). In the previous sentence (ll. 15-17) he had (by implication) distinguished the apprehension of ἰδή from that of ὧν ὁσὶς ἄποιής, holding that in both cases there is something analogous in the soul which corresponds to the objective ὧν ὁσὶς or ἄποιής. Now the distinction between ὧν ὁσὶς and ἄποιής—magnitude or spatial figure generally—is quite different from that between inner affection (ὠρθοτικά?) and concept. Further, ὧν ὁσὶς is not a psychological term; it could not be used to mean concept as opposed to image. Though the ὧν ὁσὶς of a thing means the concept or knowable character of a thing, it is used only in the epistemological reference not in the psychological. The appropriate term to designate the concept as a psychical entity is ὧν ὁσὶς not ὧν ὁσὶς. Compare the usage all through this treatise as in De An., esp. 432a12, 430a28. Further, even though one did take ὧν ὁσὶς in the sense of ὧν ὁσὶς and held that the lines γ, γ represent ὧν ὁσὶς or ἰδή, yet as they are not of the nature of spatial quantity, what is here said about their analogy to the objects they represent will be the merest metaphor. A concept represents the external reality by having the same ἰδή or in fact being the ὧν ὁσὶς of the external thing (cf. De An.II ch.12, 424a24) but that
V703 is not a spatial proportion, neither in the external object (for that would be the Democritean theory) nor, consequently, in the soul. On the other hand the Φάρασμα is spatial in character; as we saw in ch.1, 4508, not to be able to think without Φάρασμα is just the same as not being able to think Χρίστου τοσούτος. (This συνήκρισις, as we saw, forms the Υλή-νημα of the concept). Hence the analogy between the Φάρασμα (or Φάρασμα which is equally a spatial Φάρασμα) and the objective magnitude whether temporal or not, can be adequately symbolized by spatial figures e.g. by the identical ratios which may be found in similar triangles of diverse magnitudes, whereas the analogy between the Φάρασμα proper and its external object must be something very different.

Hence, though keeping Freudenthal's figure, we need not appropriate special lines to the symbolization of particular classes of psychical states. The point seems to be merely that within a triangle of the same apex the shorter lines may be proportional to those obtained by producing the sides, and that, even when we go outside this triangle, the same proportions may be reproduced in one of greater area described about it.

2. Freudenthal gives another illustration with three triangles, the smaller progressively inscribed in the larger, but the alteration is not material. I have followed his interpretation of the symbols in the text.
Belker gives a ψ instead of ψ in 1.17; the plural article ψ 1.21 ψ (K 1.22), can refer to different points as here, as well as to different lines.

The only reason for following Themistius's explanation of the passage --- the alleged correspondence of the 'triangulum res' and 'triangulum temporis' --- would be the difficulty of accounting for ψ at the beginning of the next paragraph (1.23) by any other. "Hence, (since the process corresponding to the time and that corresponding to the thing may themselves correspond) we may explain memory. When they occur together we remember etc." But the alleged correspondence of time-apprehending and object-apprehending processes does not account for the fact of remembering. It is their coincidence that does so. It is also difficult to see what sense there is in making out a correspondence between an object and the time in which it is apprehended or between the subjective processes produced by each. Both may be illustrated by the same lines and figures as above, but that need not imply an analogy other than generic between the two classes of processes. The ψ does not imply that the act of memory is explained by the previous passage; all that has been accounted for is the possibility of an internal process representing external reality whether that be spatial magnitude or temporal process. Memory, as such, is accounted for by the coincidence merely of the two subjective processes.
Bekker reads ὅτι τρίτην ὕμνησαν δύο ἀκούσαν στις ἀκούσαν. This gives no material difference. But Freudenthal (י.ס.ס.ח. 419) pointing out that τρίτην ὕμνησαν makes one think of an exact interval of time and hence can hardly be employed as an instance of indeterminate time, wishes to read ὅτι τρίτην ὕμνησαν, ἐπιμετροῦντες τρίτην δύο ἀκούσαν. ὅτι ἀκούσαν is read by L S / V Michael and yet.tr.

The change is surely not essential. I take ὅτι τρίτην ὕμνησαν to be an example of remembering ἀκούσαν. Aristotle says that sometimes one does not remember the exact interval, as e.g. that it was an interval of three days, but sometimes one does.

Freudenthal's objection against ὅτι ἀκούσαν is not convincing. The indefinite expression may be used because Aristotle does not want to give a definite illustration; it need not imply that one does not remember exactly what one did. The indefiniteness of the subject acting need not entail any indefiniteness in the act performed.

Evidently to have recollection proper one must remember ἀκούσαν. The reading of L S U ὑμνήσαν is perhaps a little smoother.

This would point either to Siebeck's theory or to the one I have given as to the meaning of 452b7 sqq. Beginning with your present thought as it were with a minor premiss you
develop it further by a series of middle terms which finally lead to the idea you are in search of, just as your middle terms in a deduction finally bring you the ultimate predicate which is to be attached to the subject.

Here Aristotle is laying emphasis on the purposive character of ἀρκετή. He is treating it as a ἐπτελείον depending on will. It is evidently as such only that it is the exclusive possession of man. Cf.451b26: ἐπτελείον ἐπί τῆς ἀρκετῆς.

οὸς is also a species of ἐπτελείον: cf. Eth.Nic.VI not Met.ch.9, 1142a32 and again we have in 1142b1: ἐπί τῆς ἀρκετῆς ἐπτελείον ἐπί τῆς ἀρκετῆς. Cf. also III ch.1, 1112b20 sqq.

It is a search for means to an end and means which are in our power. There is another kind of ἐπτελείον — theoretic, such as in mathematics is a kind of ἐπίκλωσις or, as he calls it in Metaph.IX ch.9, 1051a2 (at least he says διαφορικά ἐπίκλωσις. This is of course not the Platonic διαφορικά.). The process involved is well explained by Mr Burnet in The Ethics of Aristotle, p.XXXV. "Figures are resolved by making actual the divisions into other figures which are there potentially. If they were already actually divided the proof would be plain; as it is we must make a construction which is always in the long run some form of division. For instance, why are the angles of a triangle equal to two right angles? It is because the angles about
one point are equal to two right angles. If the line parallel to the side were already drawn, the truth would be plain at first sight.

This process is obviously just demonstration or συνήθος, the finding of the middle term. Scientific analysis and demonstration are just the same thing, as is borne out by the name of the treatises on demonstration -- γνώμη. Recollection is then like a syllogism in being an analysis, though a psychological one, corresponding to the logical analysis involved in scientific reasoning.

Cf. De An. I ch. 4, 406b17 and above, note to 451b30 καθαρὸς. For this Christ is responsible. If we read ἔχουσα with the MSS. and Bekker we must place a comma after ἔχουσα and, taking the ἔχουσα along with οὖσα, translate it "and though they restrain their thoughts." The vet. tr. however, though taking it along with ἔχουσα has "adhibentes intelligentiam."

After οὖσα ἔχουσα I understand with Simon παρεξηγεῖτον. It is this which it is the purpose of the proof to maintain. So Thomas also. Themistius explains that the search still goes on. This is not far wrong though it is difficult to
see how what is against one's will can be a δυνατός (cf. Themistius, II 253, 1.29[38]). Hammond and Bender wish to have it that people remember when they are not trying and in fact trying not to. This does not suit the Greek so well and is hardly the point. Aristotle does not attempt to show the bodily nature of recollection by its occurring involuntarily. In fact he has lately understood by ἀναμνήσθαι the voluntary recall of an idea. He wishes rather to show its corporeal connection by pointing out that it may stimulate bodily disturbances beyond the control of the will. This is the meaning of τὸ 
μὴ ἠμαλλοθυμήσαι τῇ ἀναμνήσει (2.20) and the subsequent illustration.

The heart according to everyone but Neuhäusser: cf. Intro. sec.VI. Aristotle. In De An. ch.4, 408b18 talks of the νευρῆς stimulated in recollection as being in the sense organs (ἡ νοστὶ ἁπάθητος) but that is probably only a vaguely worded statement.

We have seen above in ch.1, that the organ of μὴ ἠμαλλοθυμήσαι and ἀναμνήσθαι is the heart or is situated in it. Cf. also 469a12. These νευρῆς or ἀναμνήσεις are καταλείπονται.

Michael, Themistius and almost all editors read ἐνακόλουθη which does not give the sense of returning which is involved in ἐνακόλουθη and seems to be required.

Another proof of the bodily nature of memory and recollection.
Dwarfs are people with the upper parts of their bodies more developed than the lower extremities just like young children.

Cf. ch.1, 440b sqq.