in virtue of the fact that it is a particular and a substance that it is nutritive, for the creature preserves its substance and persists just as long as it is fed. It is also productive of generation not of the thing being fed but of something like it – for its own substance already exists, and nothing produces, but only preserves, itself. This principle then of the soul is the faculty that preserves that which has it as of the kind that it is of, while nutriment prepares it for activity. Thus, deprived of food, it is not capable of existing. Since, then, there are three things involved, the recipient of nourishment, that by means of which it is nourished and the nourisher, that which nourishes is the primary soul, that which is nourished is the body which has this, and that by means of which it is nourished is the food. But since it is right to label everything on the basis of its end, and the end here is to generate something like itself, the primary soul would be the soul generative of its possessor's like. Now that by means of which it is nourished is in two ways, as with that by means of which a boat is steered, which can be both the hand and the tiller, the one moving as well as being moved, the other only being moved. And it is necessary that all nutriment be capable of being digested, and this is effected by heat, for which reason all ensouled things have heat. What nourishment is then has been said in outline – we must get clear about it later in a special treatise.

Sense-perception

Chapter Five: Sensation

With this chapter we move to the discussion of the perceptive faculty which continues until Book III, Chapter Two and has rightly been identified as the principal business of the De Anima.[51] *Some of the problems introduced here are taken up again in the* De Sensu, *the first treatise of the* Parva Naturalia. *Chapters Five and Six discuss sense-perception in general and they stand to the subsequent discussion of the particular senses in much the same relation as the general remarks about the soul stand to the treatment of the particular faculties.*

Sense-perception is here presented as a kind of alteration. It is not clear how this is to be reconciled to his subsequent treatments of it as being the reception of Form without Matter from the object and judgement in virtue of a critical mean. The explanation offered here, however, shares with the two other thoughts about perception an exclusive concentration on physiological aspects. Aristotle reveals throughout this discussion no clear interest in the modern notion of consciousness. He is clearly more concerned, as Hamlyn has pointed out,[52] *to achieve conceptual clarification in this area. This is in keeping with the general scope of the* De Anima *within the biological works of providing a schematic account of the common properties of living things. As in the previous chapter, there is a digression, in which Aristotle reminds us of necessary refinements in his conception of the potential–actual distinction. The cardinal idea here is that of the* hexis, *habitual state, which is, as explained, more active than a mere capacity but more potential than activity itself.*

Chapter Five

Now that these things have been defined, let us talk in general about all perception. Now perception arises, as we have said, in the animal's being moved and affected – for it is held to be a kind of alteration. Now some would add that it is the like that is affected by the like, but we have stated the way that 417a
this is possible or impossible in the general account of action and affection. But there is a difficulty as to why it is that there is not also a sense *of the senses themselves*. There is also a difficulty as to why the senses do not produce sensation without external bodies, there being in them fire, earth and other elements, which are objects of sensation either in themselves or by their accidents. But it is clear that the perceptive faculty is not in activity, but only in potentiality and for that reason does not perceive on its own, just as the combustible thing is not burnt in itself without the thing that burns. (Otherwise it would burn itself and have no need of that which is in actuality fire.) And since we speak of perceiving in two ways (for of that which potentially hears or sees we say that it hears or sees even if it happens to be asleep and we also say this of that which is in fact in these activities), perception

too would be spoken of in two ways, both as in potentiality and as in activity. And in the same way the sense-object too will be spoken of both as being in potentiality and as being in activity. At first, then, let us speak as if being affected, being moved and being active are the same thing. (As we said in another work, movement is a kind of activity, but incomplete.) But all things are affected and moved by that which is productive and in activity. There is then a way in which things are affected by their like and a way in which they are affected by their unlike, as we said.[53] For it is what is unlike that is affected, but on being affected it becomes like what has acted on it.

But we should draw some distinctions as regards potentiality and actuality, for up to now we have been talking rather simplistically about them. First then there is, say, a knowing thing just in the way that we would say that a man is knowing in that man is one of those things that know and have knowledge; and then there is a knowing thing in the way that we (in fact) say that a man who has learned grammar is knowing (but each of these two is potentially knowing not in the same way, rather the first is so in that his genus and matter are of the right kind, the other in that he has the potentiality to contemplate whenever he will, providing no external factor prevents him); and thirdly there is the man who is in fact contemplating, being in actuality and in the truest sense knowing the particular before him. Now both of the first two, being in potentiality knowing, become so in actuality, but the first one does so by changing his state through learning and through often changing from the opposite condition, and the second by changing from having
417b arithmetic or grammar, but not employing them, to the employment of them, a different change. Being affected is also not simple; on the one hand it is a kind of destruction by the opposite, on the other rather a preservation of what is in potentiality by what is in actuality, and of what is like what acts on it in the way that a potentiality is like its actuality; for that which has knowledge becomes that which contemplates, and this is either not to change state at all (for the progression that occurs is towards the thing itself and towards

its actuality), or is another kind of change of state. And for this reason it is not right to say that that which understands, whenever it is understanding, is changing its state, any more than it would be right to say this of the builder whenever he is building. It would be right, then, that to take what has intellect and understanding from a condition of potentiality to one of actuality should not be called teaching but have some other name, while we should say either that that which from a condition of potentiality learns and takes knowledge from what is in actuality and teaches is not affected at all, as we said, or that there are two ways of changing state, the change to privative dispositions and the change to natural states. Now in the case of the perceptive faculty the first change occurs through the father and when the creature is born it already has perception and knowledge in one way. And actually perceiving is spoken of in the same way as contemplation. Yet there is a difference between them in that those things that are productive of actual perception are external, the visible and the audible and in the same way all the other sense-objects. And the reason for this is that perception in activity is of particular things, knowledge of universals, which are in a way in the soul itself. Thus it is for a man to think, whenever he will, but not so for him to perceive, because for that the presence of a sense-object is necessary. And this applies in the same way even to our knowledge of the sense-objects, and for the same reason, namely that the sense-objects are among the particular and external things.

But there will be another opportunity to get clear about these matters later on. For the moment let the following definition suffice, that, just as that which is spoken of in potentiality is not simple, but is on the one hand spoken of in the way that a child is potentially a general, and on the other in the way that we would say this of someone of the right age, so is it with the perceptive faculty. But since in this 418a case the difference has no name, though we have defined about it that the ways are different and indeed how they are different, we must use the terms 'affection' and 'alteration' as though they were the right ones. And, in the way we have said, the sense faculty is like the actual sense-object – it is

affected as being unlike but on being affected it becomes like and is such as what acts on it.

Chapter Six: The Types of Sense-object

This chapter is much shorter than its predecessor, but it contains an important classification of sense-objects into the three kinds – special, common and incidental.[54] *The discussion of the particular senses will obviously treat of the sensation by each sense of its special object, but Aristotle will return thereafter to this framework in order to elucidate some general problems about perception. Here Aristotle draws a distinction between the two sense-objects that are essential and the one that is incidental. Both the special and the common sense-objects are essential in that they contribute to the definition of the sense or senses to which they correspond. The special sense-objects, especially, are conceptually integral to their sense faculties. In their case Aristotle seems open to the accusation that out of love of theory he has assimilated too much the heterogeneous objects of the various senses.*[55]

Chapter Six

Now in the case of each sense we must speak first about the sense-objects. The sense-object is spoken of in three ways, of which we say that we perceive two in themselves and one incidentally. Of the first two, one is that special to each sense, the other that common to all. Now I call that sense-object special that does not admit of being perceived by another sense and about which it is impossible to be deceived, as sight is connected with colour, hearing with sound and taste with flavour. (Touch, on the other hand, has a wide range of objects.) Each sense then judges about the special objects and is not deceived as to their being a colour or sound, but only as to what the coloured or sounding *thing* is or where it is. It is, then, such objects as these that are called special to each sense. The common objects, on the other hand, are movement, rest, number, shape and size, such being not special to any one sense but common to all. For of course a movement will be perceptible to both touch and sight. Finally, those sense-objects are called incidental that are like

the white thing's being the son of Diares. For this we perceive incidentally, for it is incidental to the white thing we perceive. And for this reason we are not affected at all by this sense-object as such. And of the things perceived in themselves it is the special ones that are most strictly speaking sense-objects, and it is in natural relation to them that the formal substance of each sense stands.

Chapter Seven: Sight

We now embark on the survey of the particular senses, which are less confusingly known as the special senses as their objects are general qualities. In these chapters the tone of the discussion is even more markedly physiological than before. The only nod in the direction of consciousness is the suggestion at the very end of the Book that the nose's reaction to the smell might be distinguished from that of an inanimate thing by its possessor's consciousness. This, however, is no more than a nod at the very most.[56] *Most of the conceptual analysis of sense-perception has already been done by Chapters Five and Six, and neither they nor the continuation of the general discussion after that of the special senses can be said to encourage the consideration of sense-perception from the Cartesian, first-personal perspective.*

Unfortunately, as an essay in physiology, Aristotle's account of the special senses is only too obviously antiquated. The notions of the actuality and potentiality of the sense-organ are consistently employed, and in the case of the remote senses (sight, hearing and smell) the need is stressed of a medium between object and sense-organ. In the case of sight the medium will be light, which Aristotle accordingly discusses.

Chapter Seven

That which is the object of sight is the visible, and this comprises both colour and something which though it can be given by an account has no name. (What it is that we are referring to will become clear as we proceed.) For the visible is colour and colour is what is on the surface of the thing visible in itself, and that not from its rationale but in that it has within itself the cause of its being visible. Now all colour moves that which is transparent in actuality, and this is its 418b

nature. Thus colour is not visible without light but the whole colour of the particular thing is seen in the light. We must then first say what light is. We can take for granted the existence of something transparent. And I call that transparent which is visible but not, to put it simply, visible in itself, but through the colour of something else. Of such a kind are air and water and many of the solid bodies. For it is not *as* water or air that these things are transparent but in that there is within them a nature that is the same in both these and in the eternal upper body.[57] And light is the activity of this thing, of the transparent as transparent. And wherever this is there is potentially also darkness. But light is as the colour of the transparent, when it is rendered transparent in actuality by fire or something of the same kind as the upper body (for this too has one and the same property). We have said, then, what the transparent is and what light is, that it is not fire or in general a body or an effluence from any body (for in this case it would still be a body of a kind), but the presence of fire or something like it in the transparent. (Also since it is not possible that two bodies be in the same place at the same time, and light is believed to be the opposite of darkness, darkness is in fact the removal of the condition in question from the transparent; so it is clear that it is the presence of this that is light.) Empedocles, then, and anyone who may have followed him in this, was wrong to say that light is conveyed and arrives at some time between the earth and its surround and that we do not notice this. This is counter both to clear reason and to appearances. Over a short distance we would not notice this, but it is too much to claim that we would not notice it the whole way from East to West.

Now the uncoloured is the recipient of colour, and the unsounding of sound. The uncoloured comprises the transparent and the invisible or scarcely visible, as the dark is believed to be. And the transparent is of such a kind, not whenever it is transparent in actuality, but whenever it is so potentially. For the same nature is at one time darkness, at
419a another light. But not all visible things are in light, but only the proper colour of each particular. For some things are not

seen in the light but produce the sensation in darkness, such as fungus and horn and the heads, scales and eyes of fish. But it is not the proper colour of any of these that is seen. For what reason these are seen requires another account; for the moment this much is clear, that that which is seen in light is colour. And for this reason it is also not seen without light – for this was what it was for it to be colour, to be productive of movement in that which is transparent in actuality. And the actuality of the transparent is light. And there is a clear indication of this. If someone puts what has colour on the sight-organ itself, he will not see it. In fact, colour moves the transparent, the air, say, and by this if continuous the sense-organ is moved. Democritus got this wrong. He thought that if the medium was void then we would see clearly even an ant in the sky. This, however, is impossible, because it is from the perceptive faculty's being affected in some way that sight arises and it is impossible that it should be affected by the observed colour itself. The remaining possibility is that it be affected by the medium, so that it is necessary that there be something as a medium. If the medium becomes void, so far from a thing's being seen as accurately as possible, nothing will be seen at all.

We have now given the reason why it is necessary that colour be seen in light. Now fire is seen in both darkness and light, and this of necessity, as it is by this that the transparent becomes transparent. And the same account can be given in the case of sound and smell. For none of them produces the sensation by touching the sense-organ, rather it is the medium that is moved by smell and sound and each of the sense-organs by this. And when anyone puts the sound or smell source on to the organ itself, this produces no sensation. It is the same situation, only not so apparently so, with touch and taste, and for a reason that will be clear later. Now the medium of sounds is air, but that of smell has no name. For there is a common affection in air and water which relates to that which has smell just as the transparent relates to colour, and this is present in both of them. For it seems that even those of the animals that live in water have the sense of smell. Man, however, and as many of the land 419b

animals as have respiration are unable to smell without breathing, and the reason for this too will be given later on.

Chapter Eight: Hearing

Here, as with sight, so with hearing, the apparatus of potentiality and actuality is central to Aristotle's account. He digresses to discuss the subject of voice, but although he distinguishes this as a sound with meaning, he does not investigate at all what the consequences of this may be. He is a long way from the problems of intentionality, the difficulty of accounting for our understanding of sentences without existential import.[58]

Chapter Eight

But now let us first determine about sound and hearing. Now sound is in two ways, one in actuality, the other in potentiality. For there are some things that we say not to have sound, such as sponge and wool, and others which we say to have a sound, such as bronze and everything that is hollow and smooth, so as to be able to give sound, that is to produce sound in actuality between itself and the hearing-organ. Now sound in actuality is always of something and against something and in something. For it is a blow that produces it. Thus it is impossible for sound to occur if there is only one thing, for that which strikes is different from that which is struck. The sounding thing, then, sounds against something, and no blow can come about without movement. But, as we said, sound is the striking of the right kind of things. For wool, if struck, would make no sound, but bronze would, and the things that are smooth and hollow. Bronze, by being smooth, and hollow things by reverberation produce many blows after the first one, as the air that has been moved cannot escape. The sound is also heard in air, and also, though to a lesser extent, in water, but it is neither air nor water that is responsible for sound; rather there must be a striking of solid bodies together and against the air. And this occurs whenever the air being struck remains in place and is not dispersed. Thus if something strikes swiftly and

hard, it makes a sound; the striker's movement must anticipate the dispersal of the air, just as if something travelling swiftly were to strike a pile, or, better, eddying cloud, of sand. And an echo occurs in the following circumstances: some air is brought together by a cavity which encloses it and prevents its dispersal and from this the rest of the air bounces back like a ball. It seems that an echo always occurs, though not a clear one, since in the case of sound the same thing happens as in that of light. For light is always reflected (otherwise there would not be light everywhere but rather darkness outside the area lit by the sun), but not so reflected as from water or bronze or some other of the smooth things, so as to cast a shadow, by which we demarcate the light. But the void is correctly called responsible for hearing. For the air is believed to be a void and this it is that produces hearing, whenever it is moved as a continuous and unified thing. But because of its discrete character it makes no noise unless that which strikes it is smooth; in this case the surface of the 420a object, which if the object is smooth will be single, makes the air come together at the same time.

That which sounds, then, is that which produces motion in such air as is one in continuity up to a hearing-organ. And air is of one nature with the hearing-organ, and since this is in air, when the external air is moved so is the internal air. For this reason, the animal does not hear everywhere any more than the air permeates everywhere. For the part which will move and produce sound does not have air all around it. The air itself, which is easily dispersed, is not productive of sound, but its movement, whenever it is prevented from dispersing, is sound. But the air in the ears is so set in as to be unmoved, so that it may accurately perceive all the characteristics of the movement in question.[59] And we can hear even in water as the water does not penetrate through to the connate air itself. Indeed it does not reach even into the ear, because of its involved structure. But whenever this does happen, the animal does not hear. Nor does it when its drum is damaged, as with the membrane over the pupil of the eye. But a sign of whether or not hearing is occurring is the persistent echoing of the ear like a horn, for the air in the

ears is always moving with a certain proper movement of its own, while the sound is the movement of other air not of the internal air itself, which is why it is said that we hear by what is hollow and echoing – we hear by that which has confined air within it.

But is it that which is struck or that which strikes which makes the sound? Or is it both, but in different ways? For sound is a movement of that which can be moved in the way of things bouncing back from smooth surfaces when someone has struck them. But as we said, it is certainly not the case that everything that is struck or that strikes produces a sound – think of a pin striking a pin – but that which is struck must be flat-surfaced so that the air bounces back bunched together and reverberates. But the characteristics of the sound-sources are revealed in the actualized sound; for just as colours are not perceived without light, so without sound the sharp and flat are not perceived. These last are spoken of by metaphor from the touch-objects. For the sharp moves the sense to a great extent in a short time, the flat to a small extent in a long time. It is not of course the case that the swift is the sharp and the slow the flat, but the movement of the one becomes what it is because of its speed, and that of
420b the other because of its slowness. And this seems to have an analogy with the tactile sharp and blunt; for the sharp as it were pricks, and the blunt as it were pushes, because the one moves in a short time, the other in a long time, so that it is incidental to the one to be swift and to the other to be slow.

Let the above account stand then for sound. Now voice is a kind of sound of an ensouled thing. For none of the things without soul gives voice, though some are said by analogy to give voice, such as the flute and the lyre and whatever other of the things without soul have the production of sustained, varied and articulate sound. For voice also has these features and so there is a likeness. But many of the animals do not have voice, such as the bloodless ones and, of the ones with blood, the fish. And this fits our account, if indeed sound is a certain movement of air, while those that are said to give voice, such as those in the Achelous, make a sound with their gills or some other such part. And since everything gives

sound by something striking and against something and in something, and as this last is air it is reasonable that only those things that admit air should give voice. We now see that nature uses what has been breathed in for two tasks – just as she uses the tongue both for taste and for speech (and of these taste is a necessity – which is why more animals have it – while meaning is for the sake of living well). And in the same way nature uses the breath both for the internal warmth of the animal, which is a necessity (for a reason that will be given elsewhere), and for the voice, so that it may have the chance to live well. And the organ of breathing is the throat, and it is the lung for which this part is there. And by this part the land animals have more heat than the others. And first of all it is the area around the heart that has need of the in-breathing, so that it is necessary that the air when inhaled go within the body. It is then the striking of this inhaled air by the soul in these parts of the body against the so-called windpipe that is voice. For it is not every sound of an animal that is voice, as we said (for it is possible even with the tongue just to make some sound and to make a sound like those coughing), rather it is necessary that that which strikes be ensouled and have a kind of imagination, as voice is a kind of sound *with meaning*, and not, like a cough, just of the in-breathed air, though it is with this that it strikes the air in the windpipe against the windpipe.[60] And an indi- 421a
cation of this is our inability to give voice when either breathing in or out, but only while holding the air, for as one holds it in one produces a movement with it. And it will also be clear why fish are without voice – they have no throat, and it is because they do not receive air or breathe in that they lack this part. And why this is so will receive separate treatment.[61]

Chapter Nine: Smell

'There is little that requires comment in Aristotle's treatment of smell (v. *further* De Sensu, *5*). *He is right about the close connection of smell with taste and about the poverty of the human sense of smell.'* (*Hamlyn*)[62]

Chapter Nine

But with smell and the object of the smell-faculty the situation is less well defined than with what we have so far been discussing; for it is not clear what sort of thing smell is as it is clear with sound and colour. The reason is that we do not have this sense in an accurate way but worse than many animals. For man smells badly and perceives none of the smell-objects except the painful and pleasant ones, as his organ is not accurate. And it is reasonable to suppose that it is in this way that the hard-eyed animals perceive colours, and that varieties of colours are not apparent to them beyond the deterrent and non-deterrent. Man, then, is in the same situation as regards smells. There seems also to be an analogy with taste, and the species of flavour are analogous to the species of smell, but our sense of taste is more exact through its being a kind of touch, the sense that is at its most accurate in man. For in the other senses man is outstripped by many of the animals, but in point of touch his accuracy exceeds that of the others by a long way. And it is also for this reason that he is the most intelligent of the animals, an indication of which is the fact that even within the race of men it is in accordance with this sense-organ that individuals are well or badly endowed by nature, and in accordance with no other. For those with hard skin are intellectually poor natured, those with soft skin the opposite.[63] And just as some flavours are sweet and some bitter so is it with smells. But some things have the same smell and flavour – I mean for instance a sweet smell and sweet flavour – and some have the opposite. And smells like flavours can be acrid, bitter, sharp and greasy. But as we said, because smells are not very clearly distinct to us, as flavours are, they have taken their name from
421b these in accordance with their similarity in reality. For the sweet smell is that of saffron and honey, the acrid smell that of thyme and such things. And it is the same with the other varieties. And just as hearing is of the audible and inaudible, sight of the visible and invisible, and so with each of the senses, so is smelling of the odorous and the odourless. And the odourless is either that which cannot have smell at all, or

that which has smell but slight and weak. And the tasteless is spoken of in the same way.

And smell too is through a medium, such as air or water. For even the animals in water are thought to perceive smell, whether they are with or without blood, as also those animals in the air. And indeed of these last, some track their prey from a distance guided by their smell. And so there would seem to be a puzzle, if all animals smell in the same way, while man does smell when breathing in, but when breathing out or holding his breath and not breathing in, he does not smell an object either at a distance or nearby, or even if it is put inside his nostril. Now the imperceptibility of that which is placed on the organ itself is common to all animals but not perceiving without breathing in is a peculiarity of man. But this is clear to those who make the experiment. The bloodless animals, then, since they do not have respiration, would appear to have some other sense in addition to those mentioned. But this is impossible as they do perceive smell, for smell is the perception of the smell-source and of the pleasantly or unpleasantly smelling thing. Furthermore, some of them seem to be damaged by the same strong smells as man is, such as bitumen and sulphur and such like. It is necessary then that they smell but without breathing in. But this sense-organ seems to differ in men from that in the other animals, in the way that our eyes differ from those of the hard-eyed animals; for some animals have the eyelids as a screen and as it were a protective case without moving or parting which it does not see. But the hard-eyed animals do not have any such thing, but simply see directly what is happening in the transparent. In the same way for some animals the smell-organ is uncovered, as with the eye, 422a while those that take in air have a covering for it which is opened when they breathe in, the veins and pores being dilated. And for this reason the animals that breathe in do not smell in water, for they must breathe in to smell, and this it is impossible to do in water. Smell is also of the dry in the way that flavour is of the wet, and the smell-organ is potentially of the appropriate kind.

Chapter Ten: Taste

Taste must be distinguished from the three previously treated senses in view of the fact that, like touch, it has immediate contact with its object and does not operate, as Aristotle puts it, at a remove. It thus becomes important to distinguish taste from touch in general, and Aristotle seeks to do so in this and the subsequent chapter.[64]

Chapter Ten

Now the taste-object is a kind of touch-object, and this is the reason for its not being perceptible through the medium of any other body, for this is not the case with touch either. And the body in which the flavour is, the taste-object, is in the moist as its matter, and this is a kind of touch-object. And for this reason even if we were water-dwellers, we would perceive if something sweet were thrown into the water. But our perception would not be through a medium, but by its being mixed with the water as though in a drink. But colour is not seen in this way by being mixed, nor by its effluences. In the case of taste, then, there is no medium; and as colour is the visible, so is flavour the tastable. But nothing produces the perception of flavour without moisture, but that which does so must have moisture either in actuality or in potentiality, as salt does. (It dissolves easily itself and together with the tongue it dissolves other things.) But just as sight is of the visible and invisible (for darkness is invisible, but sight judges of this too), and in the same way hearing is of sound and silence, of which the one is audible and the other not, and also of the great sound as sight is of the bright (for as the small sound is inaudible, in a way so is the great and forceful sound), and something is said to be invisible on the one hand generally, and in the way that a thing is said to be impossible in other respects, and on the other if despite its nature it is not visible or only weakly, as with what is said to have no foot or no kernel – in just this way, then, taste too is of the tastable and the untastable, and this last is that which has small or weak flavour or is destructive of taste. But the distinction between the drinkable and the undrinkable is con-

sidered to be the key here (there is after all a kind of taste of both, but the taste of the one is foul and inhibitive of taste, that of the other in accord with nature); the drinkable too is something that is common to both touch and taste. And since the tastable is moist, it is necessary that the organ for it be 422b neither moist in actuality nor incapable of becoming moist. For the taste is affected in a way by the tastable insofar as it is tastable. It is necessary then that the taste-organ be not moist but capable of surviving becoming moist, and that it become moist. And an indication of this is the fact that neither when it becomes entirely dry does the tongue taste nor when it is too moist. For in the latter case the tongue makes contact with the water already on it and it is as when someone having first tasted a strong flavour then tastes another, and like the fact that everything seems bitter to those who are ill because they perceive everything with their tongue full of the moisture that then occurs. Now the species of flavour, as it is with the colours, are simple and opposite. There is the sweet and the bitter, and adjoining the one the greasy and the other the salty, and between these there are the sour, rough, acrid and sharp. These are more or less all the varieties of flavour there are held to be. The taste-faculty then is that which is potentially of the appropriate kind, and the taste-object is that which makes it so in actuality.

Chapter Eleven: Touch

Aristotle comes finally to the discussion of touch. He has already told us that this is the most necessary of the senses in that, if the animal did not have it, it would not be able to preserve its existence.[65] *It has the further distinguishing feature of having no obvious organ. Aristotle is especially keen to show that flesh must be the medium and not the organ of touch.*

Chapter Eleven

But we will give the same account about what is tangible and about touch. For if touch is not a single sense but many, then it is necessary that the things that are tangible are the

objects of the many senses. But whether sense *is* many or one is a problem, as is the question what the sense-organ of the touch-faculty is, whether it is the flesh or corresponding part in other animals, or not, this being rather the medium, while the primary sense-organ is something else within. For every sense is believed to be of a single opposition, as sight is of the white and black, hearing of the sharp and flat, and taste of the bitter and sweet. But in that which is tangible there are many oppositions, hot and cold, dry and wet, rough and smooth and all of the others that are of this kind. But a solution of a kind is afforded to this riddle by the fact that in the case of the other senses too there are many oppositions. In voice, for instance, there is not only the opposition of sharpness and flatness, but also that of loudness and softness, and smoothness and roughness of voice and other such oppositions. And there are other analogous varieties in the case of colour. But what is not clear is what is the single underlying thing which is to touch as sound is to hearing.

But as to whether or not the sense-organ is within, or
423a whether it is the flesh, directly, no indication is held to be afforded by the fact that the sensation arises immediately on contact. For as it is, if someone were to make, as it were, a membrane and stretch it around the flesh, it would in just the same way indicate the sensation immediately on touch. And yet it is obvious that the sense-organ would not be in this membrane. And if indeed it were naturally attached, the sensation would come through all the more quickly. This part of the body thus seems to be in the same situation as if the air grew naturally around us in a circle; for in this case it would be by a single faculty that we would be held to perceive sound, colour and smell, and sight, hearing and smell would be a single sense. But as it is, because of the distinction of that through which the movements arise,[66] it is obvious that the sense-organs we have mentioned are different from one another, while in the case of touch this is unclear. For it is impossible that the ensouled body be composed of air or water, for it must be something solid. It remains then possible for it to be something mixed from earth and these things, after the tendency of flesh and similar parts. And so it is necessary

that the body be the ongrown medium of the touch-faculty and that the sensations (which are indeed many) take place *through* it. The fact that they are many is made clear by touch in the case of the tongue, for this perceives all the tangible objects with the same part as with flavour. And so if the rest of the flesh also perceived flavour, taste and touch would be believed to be one and the same sense. As it is, the impossibility of interchange makes them two.

But someone might pose the following problem. Every body has depth, which is its third dimension, and where there is a body between two other bodies, the two are not able to touch each other. Furthermore, the wet and the moist are not without body, but both must either be or have water. But the things that touch each other in water, their edges not being dry, must of necessity have water between them, with which their extremities will be full. But if this is so, it is impossible that anything should touch anything else in water, and this would apply in the same way for the air. (For air stands in the same relation to those things in it as water to the things in water, but we notice this less, in just the same way that the animals in water notice less if two moist things touch.) Is perception, then, of all things in the *423b* same way, or of different things in different ways, in the way that taste and touch in fact seem to work by contact, the others from a distance? But this is not the case; rather we perceive both the rough and the smooth through other things, just as with the audible and the visible objects and the smell-source. But while we perceive this last group at a remove, we perceive the first two nearby and so miss this. We indeed perceive everything through some intermediary, but in the case of the contact senses we fail to notice this. And yet, as we also said before, even if we perceived all the tangible objects through a membrane without realizing that it separated us from them, we would be in the same situation as we are in fact in as regards water and air. For we think that we in fact make contact with things directly and that there is no intermediary. But the tangible object is different from visible things and sound-sources, for these we perceive because the medium has an effect on us, whereas with the

tangible things we are not affected by the medium but at the same time as the medium, like a man struck through his shield. For it is not that the shield, when it is struck, hits the man, but that it happens to both to be struck at the same time. And in general it would seem that as air and water are to sight, hearing and smell, so are flesh and the tongue to each sense-organ to which they are connected in the same way. But neither in the one case nor in the other would sensation arise when the sense-organ itself is touched, if, for instance, someone were to place a white object on the edge of the eye. From this it is clear that the sense-faculty of touch is within. For in this case the situation would be the same as with the other senses, which do not perceive objects put on the sense-organ, while we do perceive objects put on the flesh.

The characteristics of body as body are tangible, those characteristics I mean that define the elements, the hot and cold, and the dry and wet, about which we have spoken earlier in our discussion of the elements. And the sense-organ of touch, which deals with them, and is that in which the so-called sense of touch primarily subsists, is that part which is
424a potentially like them. For perception is being affected in a certain way. Thus the active thing makes that which is potentially like it like it in actuality. And it is for this reason that we do not perceive what is equally hot or cold or rough or smooth, but rather the excessive degrees, sensation being as it were a kind of mean of the opposition in the sense-objects, and thus a judge of them. For it is the mean that judges, being the opposite to each of the two ends of the scale, and, just like that which is to perceive white and black, it must be neither in actuality but both in potentiality, and so with the other senses, and in the case of touch, neither hot or cold.

And again, just as in a way both the visible and the invisible are objects of sight, and opposites were in the same way the objects of the other senses, so is touch too of the tangible and the intangible. (An intangible thing is either what has only very slightly the characteristic of tangible things, as is the case with air, or the excessively tangible

things, such as the destructive things.) We have given our outline account, then, of each of the senses.

Chapter Twelve: Perception as the Reception of Form without Matter

It is in this chapter that Aristotle introduces the idea that perception is the taking by the subject of the Form but not the Matter of the object. This could be seen as a refinement of the idea that perception is a Form of alteration.[67] *It is far from clear, however, that Brentano was right to see here in embryo the idea that in perception the object has intentional inexistence within the subject. The idea that perception consists in the reception of Forms without Matter from its objects is connected with the idea that perception is a kind of mean between extremes and thus capable of judgement as between the extremes. We thus clearly see that Aristotle, perhaps at the price of consistency, is here stressing those aspects of his conception of sense-perception that align it best with the intellect, to be discussed after the imagination in Book III. In the present chapter, Aristotle uses the idea that the perceptive faculty receives only Form, not Matter, from the object to elucidate the distinction between the effect of a sense-object on a percipient and on a non-percipient receptor. As we have seen, this leads at the end of the Book to one of his rare flirtations in this work with the idea of consciousness.*[68]

Chapter Twelve

But we must grasp in general in connection with perception as a whole, that the sense is the recipient of the perceived forms without their matter, as the wax takes the sign from the ring without the iron and gold – it takes, that is, the gold or bronze sign, but not *as* gold or bronze. And in just the same way the sense is affected in each case by that which has colour or flavour or sound, but not as they are said to be each of these things, but as they are of a certain kind, and in accordance with the account of them. And the primary sense-organ is the thing in which this capacity is located. It is therefore the same as the capacity but different in point of what it is for it to be this. For that which perceives would be some thing extended, but what it is to be perceptive will

certainly not be extended nor the sense; rather, they will be a formula and capacity of what perceives. And it is also clear from all this why the excesses of the sense-objects destroy the sense-organs. For if the movement is too strong for the sense-organ, its formula[69] is destroyed – and it was this that was the sense – just as the congruence and pitch are lost when strings are too vigorously struck. And it is also clear why it is that the plants do not perceive, though they have a psychic part and are in some way affected by the touch-objects.
424b After all, they become cold and hot. The reason, then, is that they do not have a mean, nor such a principle as can receive the forms of the sense-objects, but are affected by the matter as well. But someone might puzzle whether that which cannot smell is affected in any way by smell, or that which cannot see by colour, and so on with the other senses. But if the smell-object is a smell and if it has an effect, then the effect that smell will have will be smelling – thus it is impossible that any of the things that cannot smell be affected in any way by a smell, and a similar account can be given of the other senses. Nor indeed can any of the things that can sense be affected except insofar as it is perceptive, as is clear from the following consideration too. Neither light nor darkness nor sound nor smell has any effect on bodies but rather that in which they are, just as the air with thunder is what splits wood. But the tangible objects and the flavours do affect them directly; for if not, by what would the things without soul be affected and altered? But will the other sense-objects also have an effect on such bodies? Or is it that not every body is affected by smell and sound, and that such as are are indeterminate, and do not persist, like the air, which smells indeed, as though affected in some way? But then what *is* smelling beyond being affected in a certain way? Or is it that smelling is also perceiving, but the air on being affected immediately becomes itself a perceptible object?[70]

BOOK III

Sense-perception

Chapter One: General Problems of Perception (I)

In the first two chapters of Book III, Aristotle continues and completes the discussion of sense-perception, and, as in the last chapter of Book II, concentrates on aspects of sense-perception that take him away from the relatively simple analysis of it in Chapter Five of Book II. Aristotle opens the Book with a piece of baroque argumentation to show that there being five senses is not a contingent matter. Hicks cites as a parallel Hegel's proof, unfortunately occurring in the year of the discovery of the first asteroid, that there must be seven planets.[71]

In the second half of the chapter, Aristotle elucidates our perception of the common sense-objects that have been introduced in Chapter Six of Book II and ignored since then. These sense-objects are not essentially available to any special sense, but are incidentally perceived by all of them though not quite in the way that each perceives another's special sense-object. But though not essentially available to any special sense, they are essentially available to a common sense, whose essential objects they are. With the perception of the common sensibles by their proper sense is contrasted the incidental perception by each sense of another's special object. This latter is only possible, it eventually transpires in the De Sensu, *Chapter Seven, in virtue of the unity of the entire sense faculty. As Block and Hamlyn*[72] *have shown, the unity of senses is to be carefully distinguished in this theory from the common sense.*

Chapter One

That there is no other sense besides the five (which I take to be sight, hearing, smell, taste and touch) the following argument might be found convincing. If we have in fact

sensation of everything of which the sensation is a type of touch (for all the affections of the tangible, as tangible, are perceptible to us by touch), and if from the lack of a sense the lack of a sense-organ in us necessarily follows, and if all those things that we perceive by direct contact we perceive by touch, which we happen to have, and all those things that we perceive not directly but through a medium we perceive by the simple bodies such as air and water, and if, further, it is the case that if more than one kind of sense-object is perceptible to us through a single medium, then he who has a sense-organ of the appropriate sort can necessarily perceive both objects (for instance, if the sense-organ
425a is made of air and air is the medium of both sound and colour), while if there is more than one medium for the same sense-object, as air and water are both media of colour, both being transparent, then he who has only one or other of them will perceive that which is perceptible through them both, and if in fact sense-organs are made from only two of the simple bodies, air and water (the eye-jelly is made of water, the hearing of air, and smell of both these), while fire is either of none or common to all (as nothing can perceive without warmth) and earth either of none or involved in a particularly characteristic way with touch, so that the possibility does not remain of there being any sense-organ made from any body other than water and air, of which are made the sense-organs that some of the animals in fact have, *then* all the senses will be possessed by animals that are neither incomplete nor deformed – as indeed even the mole evidently has eyes under its skin. Thus, if there is no other body and no affection characteristic of none of the bodies in the environment, no sense will be missing.[73]

And indeed it is not possible that there should be some sense-organ special to the common sensibles, which we perceive incidentally with each sense. Such are movement, rest, shape, size, number and unity. All these we perceive by movement. For instance, we perceive size by movement (as also shape which is a kind of size), and we perceive a thing at rest by its not moving. Number we perceive by the denial of

continuity and by the special sensibles, since it is *one* thing that each sense perceives. It is thus clear that there could not possibly be some special sense of such common sensibles as movement. The situation would be like our present *visual* perception of sweetness. This occurs because we happen to have a sense for both objects in such a way that we recognize them even in their coincidence.[74] (Were this not so, we would be able to perceive them only incidentally, in the way, that is, that we perceive not that Cleon's son is Cleon's son but that he is a white man to whom it is incidental to be Cleon's son.) But of the common sensibles we do in fact have a common sensation that is not incidental. This shows that there is no special sense for them – otherwise, there would be no other way in which we could see them except that in which it was said that we see Cleon's son. Now it is not as *themselves* that the senses have incidental perception of each other's special objects but insofar as sensation is a *unity*, and this occurs whenever there is simultaneous perception of the same object. For instance, our perception of bile is that it is 425b bitter and that it is yellow, and it is at any rate not the function of some *other* sense to say that it is one thing that is both these. This also is the reason for illusion, when something's being yellow prompts us to think that it is bile.[75]

A possible line of inquiry would be into the question for what purpose we have many senses and not just one. Is this to improve our awareness of the accompaniments of the special sensibles, the common sensibles, such as movement, size and number? Suppose we just had sight and that white-ness was its object. We would have much less awareness of the common sensibles – in fact we would think that they were all the same, as size always accompanies colour. In fact it is the presence of the common sensibles in more than one special sensible that makes clear that each one of them is something different.[76]

Chapter Two: General Problems of Perception (II)

This chapter is extremely disorganized, which is the more unfortunate in that it deals with some very important problems connected with sense-perception. It is indeed here, as in the previous chapter, that Aristotle comes closest to the modern notion of consciousness, as Block has demonstrated.[77] *There remains, nevertheless, a great distance between him and Descartes.*[78] *Aristotle's approach to consciousness in this chapter is via two questions. He asks first how it is that we perceive that we are perceiving, how, to take his example, we see that we are seeing, and secondly how we know by which special sense each special object is perceived. The answer to the second difficulty takes us back to the ground opened up in the first chapter of the Book, the unity of the sense faculty as a whole. Aristotle answers the first difficulty, that of how we see that we are seeing, characteristically, by suggesting that sight is not a simple sense but comprises both seeing itself and the sense by which one perceives that one is seeing. What is absent, as Hamlyn points out,*[79] *is any notion of a subject of perception in the modern introspective style, and the absence of this entails the absence of a modern notion of self-consciousness.*

Between these two consciousness-adumbrating problems, Aristotle devotes considerable space to further development of the complementary application of the potential–actual distinction to sound and hearing, thus in his favourite way resolving a debate among his predecessors.

Chapter Two

Now since we perceive *that* we are seeing or hearing, it must either be by sight that something perceives that it is seeing or by some other sense. But given the consequent identity of the sense that perceives sight and that which perceives the colour that is the object of sight, there will either be two senses with the same object or the one sense will perceive itself. Further, if the sense that perceives sight were some other sense than sight, the only alternative to an infinite regress will be that there be *some* sense that perceives itself. Why not let this be a feature of the first of the series?

Yet there is a problem. If perceiving by sight is seeing, and it is either colour or the coloured thing that is seen, if there is

to be seeing of seeing, then seeing in the first place will be coloured.[80] However, it is quite clear that perceiving by sight is *not* some single thing. For when we are not seeing, it is by *sight* that we discern [though in a different way], darkness and light. And anyway the thing that sees is as though coloured – each organ receives the sense-object without its matter, after all. (That is why even after the removal of the sense-objects perceptions remain in the sense-organs, and imaginings.)

Now the activity of the sense-object and that of the sense-organ are one and the same, but what it is for each to be it is not the same. Take sound in activity and hearing in activity. The man with hearing can of course not be hearing and that which has a sound is not producing sound all the time. But whenever that which can hear is activated and that which can give sound is doing so, then the activated hearing co-incides with the activated sound. The first of these one might *426a* dub 'harking', the second 'sounding'.[81] If then the movement and productive activity occur *in* what is acted on, activated sound and activated hearing must be *in* the potential hearing, the productive and motive activity being in the thing acted on (whence the possibility that what produces movement be not itself moved).[82]

The activity, then, of the sound-productive faculty is sound or sounding, that of the hearing-productive faculty hearing or harking, both hearing and sound being in two ways, and this account holds no less for the other senses and sense-objects. For in just the way that both action and affection are in the thing that is affected not in that which acts, the activity of the sense-object and the sense faculty are in the sense faculty. But while in some cases this has a name, as with sounding and hearing, in others both activities are unnamed. Seeing, for instance, is what we call the activity of sight, but there is no name for the activity of colour. Tasting is the activity of the taste faculty, but there is no name for the activity of flavour. But since the activity of the sense-object and of the sense faculty are the same but their being so different, hearing and sounding in this way must be preserved or put an end to together, as also with flavour and

taste and the others. But it is not necessary that this happen with these things as potentialities. The earlier natural philosophers, however, expressed this point badly, thinking that nothing could be either white or black, without sight nor have flavour without taste. In one way what they said was right, but in another wrong. Both sense and sense-object are talked about in two ways, as in potentiality and as in actuality. In the latter case what is claimed occurs, in the former not. They spoke in one way of things that are spoken of in two.

Now if the voice is a kind of concord, and if voice and hearing are as one (and also not as one), and if the concord is a formula, it is necessary that hearing too be a kind of formula.[83] This is also why hearing is destroyed by each excess, the excessively high and excessively low in pitch, in the
426b same way as taste is destroyed by excesses of flavouring, sight by colours that are extremely bright or dark and smell by a strong smell, either sweet or bitter. For there is a kind of ratio of sensation. Thus, although things are pleasant when brought pure and unmixed to the ratio of sensation – for in such circumstances high pitch, sweetness and saltiness are sweet – yet it is in general rather the mixture that is pleasant, the concord, than either high or low in pitch or in the case of touch than what can be made either warmer or colder. So sensation is a formula, dissolved or destroyed by excesses.

Each sense, then, is of the sensible thing that is subject to it, is present in the sense-organ *as* sense-organ and discerns the variations in the sensible thing that is its subject. (For instance, sight discerns whiteness and blackness, taste sweetness and bitterness, and in this respect the other senses are similar.) But since we discern both whiteness and sweetness and the object of each sense by contrast with an object of that sense, what is it whereby we further perceive that they are the objects of different senses? It must indeed be by sensation, as these are sensible things. In this way it also becomes clear that flesh is not the ultimate sense-organ; to suppose that it is requires the supposition that on contact with the object the sense-organ itself discerns *what is doing the discerning*.[84] No more, indeed, is it possible that it should be

by separate things that we perceive that sweetness and whiteness are the objects of different senses. Rather it must be to some single thing that they are manifest. Otherwise from the mere fact that I see one thing and you see one thing it would be obvious that those things were not the same, whereas it can only be a single thing that asserts their difference. Sweetness, then, being a different thing from whiteness, it is the same single thing that asserts them to be so, and as it asserts so does it both think and perceive this. Clearly, then, it cannot be by separate things that we discern what are separate. Furthermore, the impossibility of such discernment in separate time can be shown thus: just as it is the same single thing that asserts that the good is different from the bad, so that simultaneity is not incidental with which it jointly asserts the mutual difference of each member of the pair (incidentally simultaneous would be my now saying that they are different but not *that* they are different now), but the assertion is rather of the kind that both now (i.e. simultaneously) asserts the difference *and* asserts that the things are now, i.e. simultaneously different. The time of the assertion is no less inseparate than the asserting thing.[85]

It is, however, surely impossible that the same thing, as an indivisible, be moved simultaneously and in an indivisible time through opposing motions.[86]

Now sweetness moves sensation and thought in the appropriate way and bitterness in the opposing way, while 427a whiteness moves it in a *different* way. Is it then the case that that which discerns is simultaneous in operation, numerically indivisible and inseparate, but separable in what it is for it to be this? Thus it remains in one way the case that the divisible perceives divided objects, but in another way it does so, *as something indivisible*. It is in *being* divisible, but spatially and numerically indivisible. But can it really be so? It can, because the same single indivisible thing is both opposites in potentiality but not in being, so that it is in actualization that it is divided and cannot *be* white and black at the same time, cannot then be affected at the same time by their forms, if that is the sort of thing that sensation and thought are. Consider the parallel with what some people call a

'point'. In the way that this is both one and two, it is both indivisible and divisible. That, then, which discerns is, as indivisible, single and simultaneous, but in its divisible presence it makes simultaneous use of the same symbol in two ways. It is then insofar as it makes double use of its boundary, that it discerns two things and has separate, and separately treated, objects, while it is in treating it as a single thing that it both discerns a single object and discerns simultaneously.[87]

After this fashion, then, let our account be of that first principle in virtue of which we say that an animal is capable of perception.

Imagination

Chapter Three: Imagination

In this chapter Aristotle moves on to a disjointed but highly original, indeed pioneering, treatment of the imagination. The concept that Aristotle is discussing in this chapter seems to be rather wider than our notion of imagination – indeed it might be suggested that there is no one concept that Aristotle is here discussing at all. Certainly the treatment branches away from what we consider non-standard cases of imagination to what Schofield[88] *has labelled 'non-paradigmatic sense-perception' in general. The consequent incoherence is partly the effect of Aristotle's wish to form a bridge in the treatment of imagination between the discussion of sense-perception that has just ended and that of the intellect that is about to begin. Nor is Aristotle's general notion of imagination given any greater consistency by its use elsewhere in his works.*[89] *However, the incoherence of the treatment is surely a sign of its philosophical vitality and is certainly shared by modern discussions on the subject. It should also be noted that Aristotle's positive account of imagination as a motion arising in connection with sense-perception is firmly physiological in tone, even though the products of phantasia are to play an important part in explaining the operation of the intellect in the next chapter of the work. It is also of interest that Aristotle does not here say anything about the memory, though this is the*

subject of one of the most interesting treatises of the Parva Naturalia.[90]

Chapter Three

Now of the two features by which especially men define the soul, locomotion, on the one hand, and thinking, understanding and perceiving on the other, both thinking and understanding are thought to be something like perceiving. In both cases, after all, the soul discerns and has cognition of the things that exist. Indeed the earlier thinkers assert the identity of understanding and perceiving. Empedocles, for instance, said:

> 'For human wisdom grows by what is present . . .'

and elsewhere:

> 'Whence comes it ever
> That thought of other things is put before them . . .'[91]

And this is also the meaning of Homer's 'For such is mind . . .'[92] For all these men suppose thinking to be, like perceiving, something bodily, and also make both perceiving and understanding to be of like by like. This we set down in our opening section. They should, however, also have spoken at the same time about error as this is a more peculiar feature 427b of animals, and the soul spends more time in this state. This forces us either, with some, to accept that all appearances are veridical or call illusion contact with the dissimilar, the opposite, that is, of the knowledge of like by like. There would not, however, seem to be a difference between the illusion of one thing and true knowledge of its opposite.[93]

It is, however, clear that perceiving and understanding are *not* the same. For while all animals have a share of the former, only a few have a share of the latter. And as for thinking, which can be both correct and incorrect, correct thought being understanding, knowledge and true opinion, incorrect thought their opposites, not even this is the same as perceiving. For the perception of special sensibles is always true and is enjoyed by all animals, while thinking admits of

being false and is enjoyed by no animal that does not also have rationality. For imagination is a different thing from both perceiving and thinking. Imagination cannot occur without perception, nor supposition without imagination.[94] Now the non-identity of imagination and supposition is obvious. For it lies in our power to be affected by imagination whenever we wish – one can produce something before the eyes, as do those who make images of things and arrange them in mnemonic systems – while holding beliefs is not up to us, these being of necessity either false or true. Furthermore, whenever we hold the *belief* that something is terrible or fearsome, we at once experience the corresponding emotion, as also with comforting beliefs. But in the case of imagination, we are in just the same state as if we were looking at the terrible or comforting things in a painting. (There are also varieties of supposition itself, knowledge, belief and understanding and their opposites. But let us discuss elsewhere the difference between these.)

Thinking, then, is something other than perceiving, and its two kinds are held to be imagination and supposition.[95] In our treatment of it, then, we should first give an account
428a of imagination and then speak of the other kind. Well then, if imagination is that in virtue of which we say that an image occurs to us, and we are not using the word in some metaphorical sense, is it one of those faculties or states in virtue of which we give judgement and arrive either at truth or falsity?[96] Now those of this kind are perception, belief, knowledge and intellect. That imagination is not the same as perception is clear from the following arguments. (i) Perception is either a potentiality or an activity, as, for instance, are sight and seeing, yet there are appearances in the absence of either of these, such as the appearances in sleep. (ii) Perception is, but imagination is not, always present. And if it were in *activity* that they were the same, it would be possible for all animals to have imagination; but it is held that while the ant and bee do, the grub does not, have imagination.[97] (iii) While perceivings are always veridical, imaginings are for the most part false. (iv) It is not when we are in a state of accurate activity in connection with the sense-object that we

say 'This appears to me as a man', but rather whenever we do not clearly perceive whether it is a real or illusory man. (v) As we said above, visions appear even to those whose eyes are shut.

But then imagination will also not be one of those faculties that are always correct, such as knowledge or intellect; for imagination can also be false. It remains, then, to see if imagination is the same as belief, as there is both a true and a false variety of belief. Belief, however, is followed by conviction, as it is not possible for those that hold beliefs not to be convinced of the things in which they believe, and while none of the animals have conviction many of them have imagination. (In other words, the conviction that accompanies all belief is produced by persuasion, a task of reason, and while some of the beasts have imagination none has reason.) These points, then, show that imagination could not be belief with perception or belief through perception or a combination of belief and perception.

This conclusion is supported by another thought. If imagination is belief, the object of the belief will be none other than that, if any, of the perception. What I mean is that imagination will be a combination of belief in, and perception of, whiteness, say, and not, obviously, a combination of a belief in something good and a perception of something white. But then to be subject to an appearance will just be to believe 428b non-incidentally in what one perceives. There are, however, also false appearances, in connection with whose objects true supposition simultaneously occurs. For instance, the sun appears to be a foot across. Yet we are convinced that it is greater than the inhabited world. If then imagination is belief, there are two possibilities: either the subject has cast aside the true belief that he had, without any change in the facts and without his having either forgotten it or been persuaded to the contrary, or, if he retains the true belief, then the same belief must necessarily be both true and false. However, the belief would only really become false in circumstances in which the facts changed without his noticing. Imagination, then, is neither one of these things nor a combination of them.[98]

But it is possible that whenever anything has been set in motion there is something else that is moved by that thing. And imagination is held to be a kind of movement and not to occur without perception but in things that perceive and in connection with objects of which there is perception. Now it is possible that a movement might arise from the activity of sensation, and necessary that this would be similar to the sensation. This movement could not be without perception or be in those things that do not perceive, and whatever had this movement could act and be affected in many ways in virtue of it, and it could be both true and false.

This happens for the following reasons. The perception of special sensibles is veridical, or admits falsity to the smallest possible extent. Secondly there is the perception of the incidence to these of those things that are incidental to them, and this already admits of falsity – as to a thing's being white there is no falsity, but there is as to a white thing's being this or something else. Thirdly, there is the perception of the things that are common and attendant on the things incidental to the special sensibles (I mean such things as movement and size). And with these there is the greatest possibility of perceptual illusion. Now the movement that arises from the activity of sensation will differ in virtue of its arising from these three types. The first type of movement will, in the presence of the perception, be true; the others might be false in either its presence or its absence, and especially whenever the sense-object is remote.

429a If then there is no other thing but imagination that has the features mentioned – and this is what has been said – then imagination will be a movement coming about from the activity of sense-perception. And since sight is paradigmatically sense-perception, it is from light, without which seeing is impossible, that imagination takes its name.[99] And because of the duration of acts of imagination and their resemblance to sense-perceptions, it is in virtue of these that animals do many things, some, such as the beasts, through their not having intellect, some, such as men, through the occasional occlusion of their intellects by emotion, illness

and sleep. Let this much suffice both as to what imagination is and as to how it comes about.[100]

Intellect

Chapter Four: Intellect (I)

This is the first of the three chapters devoted to the intellect. These have always been the most discussed chapters of the work, usually in connection with the light they may throw on the possibility of the separate survival by at least part of the soul of the death of the body.[101] *Aristotle consistently maintained in this work and elsewhere*[102] *that the capacity for thought is the part of the soul most likely to survive the death of the body. In this discussion, however, the issue of whether the intellect is capable of separate existence is not expressly resolved. Rather, Aristotle seems to have felt that the question could only be answered by a division of the concept of intellect, such as is given in Chapter Five.*

The fourth chapter itself treats the intellect in a manner strikingly parallel to the accounts of the senses. This involves two major difficulties that Aristotle does not fully confront. The first is that while all the senses are closely correlated to material sense-organs, the same cannot be said of thought, the second that whereas the objects of the special senses are relatively clear there is room for controversy as to what the objects of thought are on this theory.[103]

Chapter Four

Now as to that part of the soul by which it has both cognition and understanding, whether this be separate or not indeed spatially separate but conceptually so, we must consider what its characteristic features are and how thinking occurs at any time. If, then, thinking is like perceiving, it will either be some kind of affection by the thought-object or some such thing. It must then be something unaffected which yet receives the form and is potentially of the same kind as its object but not the same particular, and the intellect must stand in that relation to the objects of thought in which the

43. 427a17 ff.
44. Book III, Chapters 4–6.
45. In his eminently readable survey of information theory, *Grammatical Man*, Jeremy Campbell concludes with an Afterword entitled 'Aristotle and DNA'. In the course of explaining the regard for Aristotle that is common among contemporary molecular biologists, he cites the remark of Max Delbrueck, a professor at the California Institute of Technology, that 'if the Nobel committee were able to award the prize for biology posthumously, they should consider giving it to Aristotle for the discovery of the principle of DNA'.
46. This somewhat vestigial work is also referred to, apparently, at *De Somno* 456b6.
47. The distinction being drawn here is that between an objective and a beneficiary, but, presumably, eternity (*to aei*) is only supposed to be the objective, not the beneficiary of the nutritive soul.
48. The Greek word here translated 'formal substance' is *ousia*, a key notion in Aristotle's general conceptual scheme, whose ramifications are explored at various points in the *Metaphysics*. The standard exposition of the doctrine of the four *aitiai* is given in *Physics*, II 3.
49. It is interesting to see here a certain embarrassment on Aristotle's part over the inherent tendencies of the elements that are part of his intellectual legacy from Empedocles. This is in fact only one aspect of the difficulties he faces in connection with the idea of the formless body that is required by his theory as a counterpart to the informing soul. It must be said that he never directly confronts these difficulties and that his talk here of the natural motions being in some sense ancillary causes of growth has an air of fudge about it.
50. I owe to Hamlyn two possible glosses of this at first sight puzzling remark, that Aristotle has in mind the advantages of using not totally dry fire wood (p. 101) or that he is thinking of oil or some other more readily combustible liquid. Perhaps the thought is really only the more simple one, here a little dressed up by Aristotle, that things are more easily converted from a damp to a burning condition than vice versa.
51. See note to Introduction, p. 110.
52. *De Anima*, Introduction, p. xiv.
53. In Chapter 3 passim.
54. Aristotle's scheme of sense-objects has been the subject of con-

siderable exegetic controversy but it is not clear that this has been wholly in order. Aristotle distinguishes three species of sense-object (*aistheton*), the special, the common and the incidental. The first two are essentially perceived, in that they are the objects of faculties into whose definitions they enter, while the last is not so perceived. The special sense-objects are each definitive of one of the five special senses of sight, hearing, smell, taste and touch, to whose discussion Aristotle is about to proceed, and the common sense-objects will turn out to be definitive of the common sense, though this is admittedly not made as clear as it might have been here. Incidental sense-objects are on the other hand not definitive of any sense faculty, not, as Hamlyn is at pains to point out (p. 105), because they are in any way indirectly perceived, but because we are not affected by them *as such*. They are features of an object not in virtue of which it is essentially perceptible.
55. Hamlyn objects to the notion of a sight-object's being definitive of sight, on the grounds that there is a difference between actual and perceived colour, but it is not at all clear that this distinction, if indeed it is to be accepted on Aristotle's behalf, is not encompassed in the distinction between actual and possible sight to be drawn later. However, the principal objection to the scheme of special sense-objects as here presented would seem to be that it does not really explain why we say only that there is one, not that there are many faculties of touch. Aristotle may be being over-generous to the disproportionate variousness of the tactile as against the visual and auditory.
56. This passage is well discussed by Sorabji (*Articles on Aristotle*, Vol. 4, p. 47). The possibility that in using *aisthanesthai* Aristotle may have some kind of Cartesian mental act in view is discounted both because a mental act would have to be a further component in an act of perception, for which Aristotle's terminology of formal causation does not allow, and because the mental act could not be other than a *pathos* and Aristotle nowhere admits non-physiological *pathe*.
57. The eternal upper body is the *aither* or upper air, which pervades the supralunary world.
58. In logic an intentional context is one such that the complex sentence can be true when the constituent sentence within the context is false, e.g. 'I believe that Napoleon was the king of Prussia.' The possibility of such contexts illustrates the extent to which language is autonomous from the environment, a

semantic feature that notoriously renders language non-amenable to biological Functionalism.

59. It is interesting to compare the immobility of the air in the sounding box of the ear with the formlessness of the Passive Intellect. Just as the ear must be able to detect all the disturbances of the outer air and so in some sense take them into itself, so must the recipient Intellect be able to take into itself the form of any and every external object.
60. In this curious passage, Nuyens, with some plausibility, detected one of the clearest traces of the Instrumentist Theory, which, in his view, came in Aristotle's development as a psychologist between primitive Platonism and mature Entelechism.
61. This matter is never directly taken up in the biological works.
62. Op. cit., p. 110.
63. This remark seems only too clear evidence of Aristotle's occasional willingness to sacrifice common sense to theory.
64. It is very doubtful that he here achieves a genuine conceptual discrimination between these two senses, rather than merely offering certain physiological observations on the apparatus of taste.
65. This whole conception of the primacy of touch, which is indeed emphasized at the very end of the work, makes peculiarly clear the standpoint of general biological Functionalism from which the work is composed.
66. This radical conservation of the unity of the faculty of touch by supposing its organ not to be the flesh is discussed and debunked by Sorabji (*Articles on Aristotle*, Vol. 4, pp. 85 f).
67. Hamlyn, in a series of articles, has established that the account of sensation offered in the *De Anima* can appropriately be called transitional, away, that is, from the crude notion of affection by the like towards the more subtle one of the reception of Form without Matter.
68. But see note 56 for a deterrence against seeing this too much as a sign of latent Cartesianism.
69. Perhaps a more satisfactory rendering here of *logos* would be 'ratio' or even 'proportion'. (I have retained the translation that stands on the ground of consistency.)
70. For discussion see Introduction, p. 75 f.
71. Hicks, *De Anima*, p. 422.
72. See Introduction, notes 27 and 49.
73. This extraordinary piece of argumentation, a worthy start to the vexed third Book, is well analysed by Hamlyn (pp. 115–

16). He is surely right to diagnose the source of the trouble as being that Aristotle is seeking to show the *necessity* of what is in fact only an empirical fact, that we have only five senses. He therefore has to take as necessary certain premises that are, at best, only contingent, viz. that there can be no elements other than fire, air, water and earth through which perception might occur, that for perception to be possible the sense-organ must be akin to its medium (in those senses, of course, in which a medium is involved), and that all sense-organs are in fact composed of air or water. As Hamlyn point out, it is clearly the case that even if we grant Aristotle the second of these premises, the first and third could turn out on experimental evidence to be wrong (even, of course, in terms of his physiology), thus denying any necessity to the conclusion of the argument. But, in any case, given that sight and hearing, two different senses, both perceive through the two media (in fact the only possible ones) of air and water, not, say, sight through air and hearing through water, then what is there to stop there being many similarly constituted distance senses equally capable of perception through these two media. In other words, Aristotle has not shown why the physical constitution of the sense-organ is the definitive hallmark of the sense. In these circumstances, the main interest of the passage becomes its virtuosity as a *tour de force* of syntactic and logical agility.

74. Aristotle is throughout this passage seeking to distinguish the incidental relation of the common sensibles to the special sensibles from two other types of incidental relation, that between special sensible and special sensible, and that between incidental sensible and special sensible. The argument as it stands is confusing because of its heavy reliance on somewhat opaque jargon and its paucity of illustrations. The latter, a characteristic Aristotelian trait nowhere more present than in this treatise, can perhaps be remedied by the following: I see before me a honey cake. What I actually see (the sight object, *to horaton*) is merely a patch of colour (*chroma*), but to this it is incidental (a) that it is a honey cake (the incidental sense-object proper), (b) that it is sweet (this sweetness is the special object of another sense, taste, but it is also incidentally *seen*), and (c) that it is at rest (its rest-state being a common sense-object which I also incidentally see but in a different way from that in which I incidentally see its sweetness).
75. It is noteworthy that Aristotle describes as an illusion (*he aisthesis*

apatatai) a situation in which on seeing a yellow patch we mistakenly assume it to be bile.

76. Aristotle's argument here is again puzzling and it is not clear that he has a valid point. His answer to the question why we have many senses, namely that it is to improve our awareness of the common sensibles, seems neither necessary nor sufficient. For it is not at all clear that with only one special sense, say sight, we would be unable to perceive the common sensibles. As Hamlyn says, 'what the plurality of senses makes clear is that the common objects are *common*, not that they exist'. On the other hand, even if the argument were valid, what need would there be of five and not just two senses?
77. See Introduction, note 27.
78. Kahn's important article 'Sensation and consciousness in Aristotle's psychology' (*Articles on Aristotle*, Vol. 4, pp. 1–31) is essential reading for this demanding but fertile chapter.
79. *De Anima*, p. 122.
80. Aristotle is confronting the question how it is that we see or in some other way perceive that we see. It is a commonplace of post-Cartesian philosophical psychology that an act of seeing is constituted by a physiological component (currently the operation of rods and cones) and a phenomenal element (an awareness of colour). Aristotle has given his account of the physiological component in some detail, but he still feels that sight has not been exhaustively dealt with. Yet he by no means introduces here a purely phenomenal component or anything very like it, and this is a most telling indication of the difference between his view and that of Descartes. In effect he merely continues the physiological account a stage further, asking by what sense it is that we detect the sense-organ of sight in the act of seeing. It cannot be by any other sense than sight, but, given that perception of colour is definitive of sight, then surely the sense-organ of sight must, at least in actually seeing, be coloured. This, however, is paradoxical, and Aristotle, rather superfluously, deals with the problem in two ways. He suggests that perception by sight might be more complex than mere seeing, of which the perception of colour remains definitive, but he also asserts that in any case the sense is 'as though coloured'.
81. I introduce 'harking' here, perhaps rather awkwardly, to denote actualized hearing, for which there is no natural English term. It should be clear that 'listening' would be inappropriate

here as Aristotle is not speaking of an act of will, such as listening is.

82. Aristotle means that if, for instance, a bell rings in my earshot, then the potential hearing faculty in my ear is actualized into 'harking' and the potential noise-giving character of the bell is actualized into 'sounding', and it is in my ear that both actualizations take place. A bell that gives unheard noise will not 'sound', for what is happening to the bell itself will not amount to 'sounding', which is more than merely being rung – it is being apprehended in being rung.
83. Here, as elsewhere, there is a strong temptation to translate *logos* not as 'formula' but as 'ratio'.
84. In this passage Aristotle is introducing his second general puzzle about sensory perception. How do we perceive that a black colour is a sight-object and a sweet flavour a taste-object? His answer will be that we do so in virtue of the fact that there is a unity of the sense faculty as a whole (once again the concept of consciousness is conspicuously absent). But first the idea that flesh itself is the ultimate sense-organ in virtue of which we make this distinction is disposed of by the consideration that, as Hamlyn puts it, 'flesh cannot be the ultimate sense-organ for all perception including the perception that what we are feeling is not an object of vision'. (A simpler construal along the lines of Ross's account would be that flesh is not the ultimate sense-organ for its special sense of touch any more than the eye is the ultimate sense-organ of sight, for in both cases there must be some anterior principle which distinguishes between their operations and this will be the unified faculty of sense-perception.)
85. It is evidently at the same time that we notice of a co-incidence of sensations that they co-incide.
86. It has been established that the unified sense faculty must be single, but here Aristotle reminds us that its functions must be diverse. Given that its being affected is constituted by its being moved in a certain way, this appears to raise the logical difficulty that it must be moved simultaneously in contrary motions. Aristotle does not consider the possibility of obviating this difficulty by supposing that the motions involved in the unified sense faculty's being moved both by whiteness, say, and by sweetness are not so much contrary as merely different.
87. The logical difficulty is resolved by an analogy between the unified sense and a point. A point is paradigmatically a single thing, and yet the same point can be the start of two different

lines. Just so the sense-perception faculty as a unified whole is both single in essence and multiple in activity, which makes possible its *simultaneous* affection by a number of movements. This whole passage should be compared with the parallel discussion in the last chapter of the *De Sensu*.

88. In his article 'Aristotle on the Imagination', Schofield puts forward a unifying principle for what otherwise seems an inconsistent concept of *phantasia* in this chapter. It is that the abstract term should be taken to denote all and only occasions on which the verb from which it derives would naturally be deployed in ordinary speech. This he seeks to extend to cover both cases of seeing-as, which Aristotle certainly seems to be considering, and even the production of mental imagery, though here he acknowledges that the conceptual unity may be over-strained.
89. The principle role of *phantasia* elsewhere in the *De Anima* is in connection with thinking. In the *Parva Naturalia* it is used to throw light on dreaming and remembering, and in the *De Motu Animalium* it is connected with animal motivation. It is connected with the discussion of action in Book VI of the *Ethics*, but plays a surprisingly small part in the *Poetics* and *Rhetoric*.
90. See Sorabji, *Aristotle on Memory*.
91. Empedocles frg. 106 (Diehls).
92. *Odyssey* 18. 136.
93. Aristotle's point, though obscurely phrased, is in essence simply that while in perceptory error we become acquainted with the opposite of the standard percept, if knowledge were similar to perception, then in being illuded as to a subject of knowledge we would still have knowledge but of a contrary subject, but no belief can be both an illusion and a piece of knowledge.
94. It is possible that this sense should be taken merely to be saying that neither imagination nor supposition is possible without perception.
95. This sentence requires our taking 'thinking' (*dianoia*) at 427b15 to be synonymous with supposing rather than with thought as a whole.
96. Aristotle here seems to be specifying *phantasia* as 'that in virtue of which we say that an image (*phantasma*) appears to us'. This has an encouragingly modern ring to it, but it is possible that we should rather take *phantasma*, as Schofield favours, to mean here at least 'appearance', in which case the concept has a wider and less recognizable look.
97. The manuscript tradition here favours the ascription to Aris-

totle of the view that neither ants nor bees nor grubs have imagination, but the text can be amended without excessive strain to avoid this unAristotelian conclusion.

98. The second argument that Aristotle brings to show that imagination cannot be, as Plato thought, a combination of perception and belief is interesting. It seems to be eminently possible simultaneously to believe truly that the sun is larger than the earth and imagine that it is a foot across. But if this is so, and if imagination is a species of belief or involves belief, then we are confronted by the dilemma that a person in this position has either cast aside his true belief for no evident reason or is simultaneously maintaining contradictory beliefs about an object immediately present to him, both of which possibilities are clearly counter-intuitive. Hamlyn, in agreement with Lycos (*Mind* (1964), pp. 496 ff.) accepts this as a valid dilemma, refuting 'any theory which attempts to analyse all cases of appearance or seeing as in terms of beliefs or judgements'. Nonetheless, he feels that cases like that of the sun's appearing a foot across can only be understood *against the background* of cases of appearing which do seem to involve belief.
99. Aristotle sees an etymological link between *phos* (light) and *phantasia*, which itself seems a little phantastic.
100. It is notable that there is no special treatise on the imagination in the *Parva Naturalia*, although, as remarked, it plays an important role in the explanation of dreams and of remembering.
101. See Introduction, pp. 91 ff.
102. What he does not make clear is how exactly this capacity is related to the rest of the soul in the case of man. This question is certainly not conclusively answered in the ensuing chapters.
103. In any case, as Hamlyn points out, there is a certain tension between the repudiation of the over-assimilation of perception and thought in early philosophers to be found in Chapter 3 and the close isomorphism of treatment that the two faculties actually receive. The two problems of the organ and of the objects of thought both stem from the transfer of an essentially physiological approach from perception to thought, which Aristotle is much less disposed to regard as a purely physiological process (as, indeed, were most, but by no means all, of the Greek thinkers).
104. The reference to Anaxagoras reminds how powerfully in-

ARISTOTLE

DE ANIMA

(ON THE SOUL)

TRANSLATED,
WITH AN INTRODUCTION AND NOTES,
BY HUGH LAWSON-TANCRED

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