

## II

# A NEW LOOK AT ARISTOTLE'S THEORY OF PERCEPTION

Terrell Ward Bynum

## I. INTRODUCTION

Aristotle's theory of perception is often thought to be 'of merely historical interest'. This misconception derives, in part, from the fact that Aristotle employed physical and physiological theories that are now outdated. It is relatively easy, however, to replace Aristotle's physics and physiology with modern theories and still preserve his basic account of perception.

More importantly, the mistaken 'merely historical interest' view derives also from a belief that Aristotle lived too early in history to have been aware of certain crucial conceptions or distinctions. So it is sometimes said, for example, that Aristotle's 'pre-Cartesian' philosophy could not take proper account of the subjectivity of experience; and Hamlyn, for example, in his history of the philosophy of perception (Hamlyn 1961, p. 28), claims that Aristotle had no distinction between 'passive sensation' and 'active perception'. Contrary to such pessimistic views, the present article shows that Aristotle had a powerful theory of perception which can rival any that is currently in vogue.

## II. THE ARISTOTELIAN CONTEXT

In order to understand Aristotle's theory of perception, one should initially 'see it in context'. That is, one should call to mind some key ideas from Aristotle's metaphysics, physics and physiology.

For example, one needs to keep in mind his distinction between *matter* – the substrate which persists through change and can 'take on' different characteristics or 'forms' – and

*forms* or qualities that matter takes on. Form and ... together – form (in the sublunary world, at least) is always 'emattered'. Individual composites of matter and form Aristotle calls 'composite substances'. The least complex substances are earth, air, fire and water, which, when 'completely mixed', form the 'homoeomerous bodies' such as minerals and the tissues of plants and animals. Combinations of tissues form organs, and organs combined into wholes form organisms.

The distinction between matter and form enables Aristotle to explain change. Every change involves three things: *a privation, a form, and a substrate*. At the beginning of the change, the substrate lacks the form in question (although it does have a different form); at the end of the change, the substrate has taken on the form. This general analysis applies whether the change is *quantitative* (change in size), *qualitative* (change in colour, for example), or *locomotive* (change of position).<sup>1</sup> It also enables Aristotle to introduce the key notions of potentiality and actuality: *change can be seen as the fulfillment of a potentiality*. Prior to the change, the substrate *potentially* has the form in question, afterwards it *actually* has it. Actuality must always precede potentiality, since potentiality is *for* an activity or state of affairs. The fulfillment of the potentiality can be brought about only by the action of something that is already an actuality.

In addition to his physics and metaphysics, Aristotle's physiology should be kept in mind if one is to understand his account of perception. He believed, for example, that the brain is a mechanism for cooling the body, while the heart is the seat of perception, emotion and thought. Blood vessels, on the other hand, he took to be channels of communication between the heart and all parts of the body.

Aristotle, of course, was not troubled by post-Cartesian puzzles about how mind can interact with body. For him, mind (soul) 'is the form or functional organization of a certain kind of body and ... the various "parts of soul" are functional states of matter' (Nussbaum 1978, p. 146). Soul, therefore, is not a substance that can exist apart from body (with the possible exception of intellect, which will not concern us here):

The most important attributes of animals, whether common to all or peculiar to some, are, manifestly, attributes



of soul and body in conjunction, e.g. *sensation, memory, passion, appetite and desire in general*, and, in addition, *pleasure and pain*.

(*Sens.* 426a 8-9)<sup>2</sup>

Many post-Cartesian philosophers consider such attributes to be 'mental' – therefore 'subjective' and 'private' – therefore puzzling and troublesome. Aristotle deals with them simply as the activities and functions of a living body, sometimes describing them in physiological language, sometimes in what is today called 'mental' language. (And, as we shall see below, he can easily account for their 'private' and 'subjective' nature.)

### III. THE KEY ELEMENTS OF PERCEPTION

Aristotle starts by accepting the commonsense assumption that the senses provide reliable information about objects in the environment. This is the kind of '*phainomenon*' (i.e. a generally accepted belief or one taught by 'the wise') that serves as a starting-point for Aristotle's 'dialectical' method of philosophy. Since even the lowest forms of animal have perception (indeed, this is what distinguishes animals from plants), Aristotle does not assume that information comes in through the senses in a form that is propositional. That would require linguistic capabilities that most animals lack.

Aristotle's way of solving the problem is to have the 'forms' of the external object causally transferred into the animal in the process of perception. Once inside the animal, the forms can be discriminated and reacted to 'automatically' by animals with no intellect, and raised to consciousness, described and reasoned about by animals that do have intellect. (Today we would describe these things as 'transferring and processing encoded information'. More on this below in section XII.)

According to Aristotle, every case of perception involves four key elements: an object perceived, a medium that causally connects the object to a sense-organ, the sense-organ itself, and the central faculty of sensation (the *sensus communis*). Perception, in each case, is a causal process in which a form is transferred from the object through the medium into the sense-organ and from there to the region of the heart. (Today, of course, we would say it goes to the brain.) The form in question

is the perceived quality, which initially is actualized in the object, but not the sense-organ. Aristotle describes it as 'the power of acting upon the sense-organ' thereby becoming actualized in the organ, which previously had that form only potentially. This 'power of acting' is a result of what today would be called the 'microstructure' of the object of perception. For Aristotle this would be the specific combination of earth, air, fire and water that composed the object in question. (We can replace this today with our own account from physics and chemistry.)

Aristotle describes the perceptual process as 'receiving the form without the matter':

Generally, about all perception, we can say that a sense is what has the power of receiving into itself the sensible forms of things without the matter, in the way in which a piece of wax takes on the impress of a signet-ring without the iron or gold.

(*De An.* 424a 18-20)

Thus, before the signet-ring makes the impression, the ring has a particular shape which the wax does not have. Afterwards, the wax has taken on the shape, but not the iron or gold of the ring. Analogously, prior to perception, the object has a form which the sense-organ does not have. Afterwards, the organ has taken in the form of the object without its matter.

The paragraphs below contain a closer look at each of the four components of perception – object, medium, organ, perceptual centre – and the processes in which they engage. Although all the senses are dealt with, vision is used as the prime example, with the others covered in less detail.

### IV. THE OBJECT OF PERCEPTION

As indicated above, Aristotle assumes that the objects of perception are external things in the world (therefore, *not* 'sense-data' or other internal, 'subjective' entities). Strictly speaking, what are perceived are the 'sensible qualities' of the external objects. Aristotle divides such qualities into two kinds – those which can be perceived by one sense only and those which can be perceived by more than one sense. The former qualities he calls 'special objects', the latter 'common sensibles' (*De An.* 418a 11-19).<sup>3</sup> The special object of sight is colour, that of hearing is



sound, that of taste flavour, and that of smell odour. Touch has several special objects, including, for example, texture and temperature. The common sensibles, which can be perceived by more than one sense, are motion, rest, number, figure and size.

Each single sense is unerring when it comes to the presence of its special object. It 'never errs in reporting that what is before it is colour or sound (though it may err as to what it is that is coloured or where that is, or what it is that is sounding or where that is)' (*De An.* 418a 14-16, parenthetical material in original).

The senses are unerring about the presence of their special objects because the sense-organs are *completely passive and highly selective*. Nature has so constructed sense-organs that they passively take in the appropriate forms when acted upon by the sensible qualities of objects in the environment. Thus, the ears take in only sounds, the nose only odours, and so on. Once the internalized form reaches the region of the heart (the perceptual centre), however, the animal – using the faculty of *phantasia* (see section IX below) – *interprets* it as a perception of a certain sort, and this process of interpretation can be mistaken.

The sensible qualities of external objects result from their particular 'microstructures' of earth, air, fire and water. As Theodore Tracy explains:

The material objects surrounding the animal and constituting its environment are, as we have seen, composed of earth, air, fire and water blended in the fixed proportions demanded by the nature or form of each object. The form of each object, then, is contained or embodied in the material elements so blended, since it is the principle which fixes their proportions and determines their structure in the total blend. The nature or form of each object, therefore, is manifest materially in the elemental structure of its body. Aristotle's problem is to explain how the animal can assimilate the forms of these objects without their proper matter, so that it becomes aware of the objects and can distinguish one from the other.

(Tracy 1969, p. 201)

Aristotle views the basic elements (earth, air, fire, water) as combinations of four causal factors – the hot, the cold, the moist and the dry. These have the power of stimulating responses

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in animals, and when blended in various proportions in objects they constitute the active causes of sensation, that is, the sensible qualities of the objects. (See, e.g. *Meteor.* 384b 24-385a 4.)

And since the particular combination of sensible qualities possessed by each material object depends upon the proportion in which its ingredients are blended, i.e. upon its form, this particular combination of sensible qualities, when assimilated by the animal, will at the same time convey the form of the object, enabling the animal to distinguish it from other objects.

(Tracy 1969, p. 202)

To summarize our account of the object of perception: it has a specific microstructure which gives it certain causal powers – sensible qualities – which act upon the sense-organs of animals.

## V. COLOUR

As an example of 'microstructure analysis', let us consider Aristotle's account of the nature of colour. Vision is somewhat more complex than the other senses, however, because it requires a fifth item beyond the usual foursome of object, medium, sense-organ and perceptual centre, namely light. To explain light, Aristotle introduces an additional nature or 'power', which he calls 'the transparent' or 'the diaphanous'. This does not have an independent existence, but is always found in other things, most especially air, water, and the eternal fifth element that comprises the highest heavenly body. All bodies contain the diaphanous to some extent. (See *De An.* 418b 5-10 and *Sens.* 439a 20-5.) Now light is simply the activity of the diaphanous when in the presence of fire. When fire is not present, the diaphanous is only potentially active. This is darkness.

In a transparent body such as air or water, when fire is present it activates the diaphanous, which is then visible as 'brightness' or 'daylight'. This creates the proper medium in which to see colour. It even creates a colour within such a medium, as can be seen in the atmosphere or the sea.

In a body with definite boundaries, the diaphanous is blended in with other components in various proportions, depending



upon the nature of the body in question. The proportion of the diaphanous in the body causes the colour that it has (*Sens.* 439b 9-10) – that is, it causes the body's power of acting upon the eyes of animals through a transparent medium in the presence of light. The proportion of the diaphanous at the surface of the object causes the colour that an animal sees when looking at the object. If the internal proportion of the diaphanous were different, the inside of the object would be a different colour from the surface.

When the proportion of the diaphanous is highest, the object is white; when it is lowest, it is black. All the other colours are caused by proportions that lie between the two contraries. In chapter 3 of the *De Sensu*, Aristotle considers three theories of how the various proportions can be created: (1) very tiny patches of white and black occur side-by-side mixed in various proportions; (2) black and white layers appear 'through' each other like the paint in some works of art; and (3) the black and white matter is thoroughly blended so that the very tiniest speck has the same colour as every other part. At the end of that chapter, he appears to opt for the third of these theories.

Aristotle also provides detailed accounts of other sensible qualities such as sound, flavour and odour. In each case, the 'microstructure' of the object in question gives it the power to act upon sense-organs through an appropriate medium. Also in each case, the sensible qualities occur as intermediates on a continuum between two opposites. For sound, the opposites are high pitch and low pitch; for flavour and odour (which is related to flavour) they are sweet and bitter. Touch has a number of contrary pairs, including, for example, hot and cold, moist and dry, rough and smooth.

## VI. THE MEDIUM

Having considered the *object* of perception, including an example of 'microstructure' that accounts for the sensible qualities of the object, we may now move on to discuss the medium. According to Aristotle, in *all* cases of perception a medium is necessary. In the case of vision, for example:

The following makes the necessity of a medium clear. If what has colour is placed in immediate contact with the

eye, it cannot be seen. Colour sets in movement what is transparent, e.g. the air, and that, extending continuously from the object to the organ, sets the latter in movement. (*De An.* 419a 11-15)

Democritus claimed that vision requires no medium at all; and indeed, if the space between us and 'the vault of the sky' were absolutely empty, he said, we could distinctly see an ant crawling on it. Aristotle objected that 'it is indispensable that there be *something* in between – if there were nothing, so far from seeing with greater distinctness, we should see nothing at all' (*De An.* 419a 19-21).

This case, and any one in which the object of perception is at a distance from the animal, can be explained by Aristotle's principle of 'no action at a distance'. (See *Phys.* VII, 2.) But what about cases in which the object perceived is actually *in contact* with the animal – cases of touch or taste? Why should a medium be necessary here? And what is the 'medium' anyway? Aristotle's answer is that the *real* organ of perception in these cases is not the skin or flesh, but the heart or the region of the heart that he says contains the *sensus communis* or 'primary sense faculty'. Also, he speculates on the possibility that in water two bodies 'in contact' actually always have a thin film of water between them; and in air two bodies 'in contact' are actually separated by a thin film of air or moisture (*De An.* 423a 22-b 11).

Each sense, then, functions via a medium between the object and the sense-organ. That medium must be so structured that it has the potential to take on the forms of objects in contact with it and transfer them to sense-organs also in contact with it. For vision, the medium must be a transparent one containing light; for sound it is air or water; for smell also air or water; and for taste and touch the flesh itself is the medium (or possibly a thin film of water or air).

## VII. THE SENSE-ORGAN

Much has already been said about the nature of a sense-organ. In particular, it must be so structured that it can potentially take on many different forms from the objects of perception. In effect, the organ is a 'passive patient' ready to be acted upon through an appropriate medium by an appropriate quality of an



object. Such actualization of potential is dramatically described by Abraham Edel as follows:

materials are so organized at a given stage that only some precipitating or moving cause is required for the activity or actuality to be realized in a given determinate shape or form. It is, as it were, the shape of what is to come, all set and ready to go in the constitution of the present.

(Edel 1982, p. 83)

But how can anything be so constituted that it can take on many different forms? Aristotle, of course, uses the analogy of wax taking on the impress of a signet-ring; but this is a mere analogy. His more specific and informative answer is that each sense can be viewed as a 'mean' lying between opposites and able to change in the direction of either (*De An.* 424a 4-9). If the organ of touch is midway between hot and cold, then something hotter can make the organ hotter too, while something colder can make it colder. Touch, therefore, can discriminate a whole range of temperatures between hot and cold. Each sense can be viewed as such a mean.

Because the sense is in form a [mean], a single equilibrium which responds in one direction or another according to the quality presented and then returns to its original 'middle state' when the stimulating cause is removed, the sense organ is capable of 'judging' between one quality and another. . . . Like the balance arm of a scale, it constitutes one and the same standard that responds now one way and now another, thus registering the differences in the objects that move it.

(Tracy 1969, p. 207)

Each sense also has important limitations, however, for if the object perceived has a quality that is too extreme, it can damage or destroy the sense organ (*De An.* 424a 28-32). This could happen, for example, if an animal touched something too hot, or looked at something that was too bright.

### VIII. THE SENSUS COMMUNIS

Even though each sense, being a 'mean', can distinguish different qualities within a certain range, it cannot distinguish the

'special objects' that belong respectively to the *other* senses. Thus, sight cannot distinguish or even detect smells, tastes, sounds, and so on; and a similar point can be made about each of the other senses. Because this is so, each sense, considered by itself, is isolated from the others. This isolation must be resolved and the senses integrated if the animal is to be a whole organism, rather than a disjointed set of parts or faculties. How is this integration accomplished? According to Aristotle, it is achieved via the *sensus communis* or 'primary faculty of perception'. (See, for example, *Mem.* 450a 11-13; and *De An.* 426b 8-21.) As J. L. Ackrill describes it:

If an animal is to act discriminatively to its environment, moving to get food and to avoid harm (the point and purpose of sense perception), information about its environment must be conveyed to a unitary centre which can receive and coordinate the input from the different senses, and which can initiate the necessary reactive movements. Aristotle argues persuasively that the very notion of an animal – a single, self-contained mobile organism – requires there to be such a single centre (which he thinks to be the heart) at which all perceptual chains terminate and all reactive chains begin.

(Ackrill 1981, p. 67)

According to Aristotle, when a form is transferred from a medium into a sense-organ, it becomes a percept (*aisthēma*) – Aristotle sometimes calls it a 'movement' or 'change' (*kinēsis*) or an alteration (*alloiōsis*) – which is transferred through the body (probably in the blood) to the region of the heart, where the *sensus communis* faculty is located. Thus according to Aristotle 'actual perception is a motion through the body in the course of which the sense is affected in a certain way' (*Phys.* VII, 2, 244b 11).

The *sensus communis*, being the primary perceptual faculty, receives percepts (*aisthēmata*) from any of the sense-organs, then discriminates and 'judges' them: 'to perceive is to judge, and it is possible to judge rightly or wrongly; thus in regard to perception . . . rightness and wrongness must be possible' (*Top.* II, 4, 111a 16-17).

In animals without intellect, the entire process (including the discriminating or 'judging') is automatic – resulting from the



natural physiology of the animal and the particular physiological state that it is in at the time. The information processed in such a case is not propositional, since there is no language capacity in such an animal. In animals *with* intellect (and therefore language), on the other hand, the discriminating and judging process can include or generate various linguistic entities such as beliefs and knowledge.

#### IX. THE FACULTY OF PHANTASIA

The discrimination and judging that occur in the region of the heart are accomplished by the faculty of *phantasia*. This crucial cognitive faculty, according to Nussbaum (1978, Essay 5), has normally been misunderstood and incorrectly explained by commentators on Aristotle. For this reason, it is worthwhile here to summarize Nussbaum's very persuasive account of the nature of *phantasia*.

Commentators usually assume that *phantasia* – which they typically call 'imagination' – is just the capacity to retain and manipulate perceptual traces (*phantasmata*) – typically called 'images'. These 'images' – or, better, 'phantasms' – are faint or 'decayed' percepts that linger in an animal after perception. But this retention and manipulation of perceptual traces is only *one* of the capacities that Aristotle attributes to *phantasia* (he uses *phantasms*, for example, to help explain memory, dreams and hallucinations). He also uses the term *phantasia*, however, in contexts where images make no sense (Nussbaum 1978, p. 223). Most commentators, it seems, have mistakenly fastened upon the 'image' passages (like *De An.* III, 3) and construed them as Aristotle's canonical theory of *phantasia*. In reality, he has no canonical theory, but rather describes *phantasia* as playing several different roles.

Nussbaum notes that Aristotle's use of the term *phantasia* 'seems to be closely tied to his usage of the verb [*phainesthai*, 'appear'] and [this] suggests a very general interest in how things in the world appear to living creatures' (ibid., p. 222). Thus, 'the most fruitful approach in determining what is meant [by *phantasia* and *phantasma*] in any given context is always to remain aware of the connection with the verb *phainesthai* and to find images only where there is concrete evidence of their presence' (ibid., p. 231).

When we follow Nussbaum's suggestion, and note the role of *phantasia* in perception and action contexts (like *De An.* III, 9-11 and *De Motu Animalium*), we discover that no images are needed to make sense of these passages, and indeed some of them would become nonsense if so interpreted. Instead, *phantasia* in these passages plays the role of 'the faculty in virtue of which the animal sees his object as an object of a certain sort' (Nussbaum 1978, p. 255). Thus:

We are always passively receiving perceptual stimuli; but when we actively focus on some object in our environment, separating it out from its context and seeing it as a certain thing, the faculty of *phantasia*, or the *phantasia*-aspect of *aisthesis*, is called into play. (Nussbaum 1978, p. 259)

Since how something appears to an animal depends, in part at least, upon its own point of view, desires, history, and so on, Aristotle's inclusion of *phantasia* in the process of perception commits him to the view that *perception is a fundamentally interpretative process*. As Nussbaum puts it, for Aristotle there is 'no distinction . . . between the given, or received, and the interpreted' (ibid., p. 261). Of course, whenever an animal is awake, the heart region continually receives *aisthēmata* that are passively (and infallibly) taken in by the sense-organs. But unless they are interpreted by *phantasia*, the perceptual stimuli are not seen *as* anything – they have no 'meaning' or significance to the animal who has them.

If, following Nussbaum's suggestion, one rejects the view that the 'image' interpretation of *phantasia* is canonical, and if instead one looks at each context to see what role *phantasia* actually plays, one finds at least three different capacities:

1. The capacity to interpret percepts and thereby perceive an object as an object of a certain sort.
2. The capacity to retain perceptual traces after the object of perception is no longer present, plus (in some animals, at least) the ability to manipulate and combine them in various ways.
3. The capacity to interpret perceptual traces and their combinations representing possible or actual objects and states of affairs.

Aristotle calls all of these things *phantasia*; and at times it is



unclear which one he is using or discussing. Sometimes, however, he calls the first kind 'sensitive' *phantasia* and the third kind 'deliberative'. The first kind, he says, is shared by all animals, even the 'imperfect' ones which have no sense but touch (*De An.* II, 433b 31-434a 6). Only animals with intellect, however, have the third kind of *phantasia*. (Aristotle explains in *A. Prt.* II, 19 how the perceptual traces come to be interpreted the way they are, but this issue need not concern us here.)

Not all animals, according to Aristotle, have the second kind of *phantasia*. Thus in *De An.* III, 3 he says 'it is not found in ants or bees or grubs' (428a 10). It is this kind of *phantasia* that one could most reasonably call 'imagination', since it involves having and manipulating 'images' (*phantasms*). But even this use of 'imagination' is misleading, since the 'images' include perceptual traces of smells, sounds, flavours and other things that are not much like 'pictures in the mind'.

The kind of 'deliberative' *phantasia* discussed in *De An.* III, 11 seems to be a combination of types 2 and 3 above, requiring both the manipulation *and* the interpretation of *phantasms*. Presumably, it is this kind of *phantasia* that, according to *De An.* III, 3, is combined with 'judgement' to yield 'thinking' (427b 28-9). Thinking, then, would involve two things:

1. combining and manipulating interpreted *phantasms* in order to envisage or imagine various objects and states of affairs; and
2. 'judging' the imagined things by asserting, denying, inferring, and so on.

This account of thinking commits Aristotle to the view that thinking requires the presence of *phantasms*. Thus in *De An.* III, 7 he says, for example: 'To the thinking soul images [i.e. *phantasms*] serve as if they were contents of perception. . . . That is why the soul never thinks without an image' (431a 15-17). And also: 'The faculty of thinking then thinks the forms in the images' (431b 2).

#### X. SENSE-PERCEPTION - A 'CRITICAL' FACULTY

The above account of *phantasia* explains why Aristotle considers perception and thought to be 'critical' faculties that 'discriminate'. (See, e.g., *De Motu* 6.) Perception includes the

first kind of *phantasia*, which discriminates one object from another by interpreting it as an object of a certain sort. Thinking, on the other hand, includes the third kind of *phantasia*, which discriminates by interpreting *phantasms as representing* certain sorts of objects or states of affairs.

Since the present article is concerned with sense-perception, rather than thought, let us analyse in more detail the discriminating aspects of perception, and leave discussion of thought to another occasion.

Even the simplest animals have sense-perception. Indeed, this is how they are distinguished from plants. Let us start by considering a very simple animal, an 'imperfect' one (as Aristotle would say) which has only the sense of touch. How does it discriminate among the objects in its environment?

First of all, since it has *only* touch, it automatically singles out only those objects with which it is in contact, for it cannot sense objects at a distance. Second, as was said above, 'the sense-organs are *completely passive and highly selective*'. Nature has so constructed sense-organs that they passively take in the appropriate forms when acted upon by the sensible qualities of objects in the environment.' Thus the organs of touch are so constituted that they fail to detect - and they consequently automatically eliminate - such things as colours, sounds and odours as means of discriminating objects. The *sensus communis* of an 'imperfect' animal, therefore, receives only 'touch-percepts' like hot, cold, dry, moist, and so on.

It follows, then, that even before an 'imperfect' animal employs the faculty of *phantasia*, its passive sense-organs have automatically selected from the environment only objects in contact with the animal which have such properties as hotness, coldness, dryness, wetness, and so on. So a significant amount of 'discrimination' has already been achieved. In addition, however, the faculty of *phantasia* makes a further discrimination. At the very least, it determines which objects are pleasant to the animal and which are painful, as well as which ones are food and which ones are non-food:

If any order of living things has the sensory [faculty], it must also have the appetitive. . . . now all animals have one sense at least, viz. touch, and whatever has a sense has the capacity for pleasure and pain and therefore has pleasant

For Bynum, h.A. SC and Phantasia  
 justify! Redd SC ⇒ overstates  
 phantasia ⇒ account in Aq.



and painful objects present to it, and wherever these are present, there is desire, for desire is appetite of what is pleasant. Further, all animals have the sense for food (for touch is the sense for food; the food of all living things consists of what is dry, moist, hot, cold, and these are the qualities apprehended by touch).

(*De An.* II, 3, 414b 1–8)

When a touch-percept, then, arrives in the region of the heart, sensitive *phantasia* interprets the object as being pleasant or painful, food or non-food. Now this does *not* mean that the animal must employ 'concepts' like 'pleasant' or 'non-food'; and indeed, according to Aristotle, this is not possible because the animal in question has no intellect. It need only mean that the percept causes pleasure or pain which leads the animal to pursue or avoid the object in a characteristic way. Such an interpretation of Aristotle's point is confirmed by the following passage:

when the object is pleasant or painful, the soul makes a sort of affirmation or negation, and pursues or avoids the object. To feel pleasure or pain is to act with the sensitive mean [i.e. with the *sensus communis* in the region of the heart] towards what is good or bad as such. Both avoidance and appetite when actual are identical with this.

(*De An.* III, 7, 431a 8–12; bracketed material added here)

So the faculty of sensitive *phantasia*, then, is the capacity to 'feel pleasure or pain' and thereby initiate characteristic kinds of pursuit or avoidance. If the pursuit activity initiated is ingestion, then the object has been interpreted as food; if the avoidance activity initiated is flight, then the object has been interpreted as an enemy; and so on. Now, nature has so constituted animals that they get pleasure from things that help them flourish and pain from things that harm them:

Each animal is thought to have a proper pleasure, as it has a proper function; viz. that which corresponds to its activity. If we survey them species by species, too, this will be evident; horse, dog, and man have different pleasures; as Heraclitus says, 'asses would prefer sweepings to gold'; for food is pleasanter than gold to asses. So the pleasures of creatures different in kind differ in kind.

(*EN* X, 5, 1176a 4–8)

But what precisely is it to 'feel pleasure and pain'? In the *Physics* (247a 15), Aristotle says 'pleasures and pains are alterations of the sensitive part'; and in the passage cited above, he says: 'To feel pleasure or pain is to act with the sensitive mean towards what is good or bad as such.' Thus, to feel pleasure or pain is to have, in the region around the heart ('the sensitive mean'), an activity which initiates some sort of pursuit or avoidance of what is good or bad for the animal. Nature has endowed each animal with just the right physiology to react towards the good and bad in the proper way – to feel just the right pleasures and pains, and thereby pursue and avoid just the right things in just the right ways. With this 'instinct' (as we would call it) nature helps animals to flourish. (The story gets much more complicated when animals, like humans, acquire intellect and reasoning, and so become capable of a wide variety of pleasures, pains, pursuits, desires, and so on. These matters do not concern us here.)

To summarize what we have said about sense-perception: the sense-organs send percepts to the region of the heart; these 'motions' or 'alterations', in turn, combine with other physiological processes and states to produce characteristic kinds of pursuit or avoidance activities; these activities result from the physiological endowment of the animal, together with the particular physiological states and processes that it happens to have at the time – other perceptions, other pains and pleasures, and so on. In this way, it 'discriminates and judges' objects in its environment from its own point of view, pursuing some and avoiding others, ingesting some and rejecting others, and so on. The more complex animals have more kinds of perception and more sophisticated pursuit and avoidance behaviours.

## XI. THE INTENTIONALITY OF PERCEPTION

At this point in our discussion, it seems appropriate to say something about the so-called 'intentionality' of perception. This term is an ambiguous one and seems to be used in different ways by different authors. Three of the standard uses concern the *privacy*, the *subjectivity* and the 'aboutness' of intentional states and processes. Let us discuss each of these in turn.

*Privacy*: An intentional state or process is said to be 'private'



because it is impossible for any other being to have the *very same* one. Thus, *my* perception of a particular object at a particular time is different from *yours*, even if we are perceiving the same object at the same time, and even if yours is 'just like' mine. They are numerically different because yours is within you and mine is within me. You cannot 'jump inside my skin' and have my perceptions. Even if you could somehow 'perceive my perceptions', or receive percepts from *my* sense-organs, the resulting perceptions would be different, since mine would be in my perceptual centre and yours would be in yours.

Given Aristotle's account of perceptions, they are indeed private in this sense. Thus, perceptions within one animal could *not* be within another, although different animals could have similar ones. Even in a case of 'Siamese twins', if there were separate heart regions receiving separate percepts, then each of the joined animals would have its own private perceptions. If, on the other hand, there were only one heart region, the so-called 'twins' would actually be a single – though very deformed – animal. In this case, though, there would not be *two* animals sharing the same perceptions. (See *De Gen. An.* IV, 4, 773a 8–12.)

*Subjectivity*: Intentional states and processes are said to be 'subjective' because they essentially involve the animal's own point of view or interpretation of the world. Now this is certainly true of perception as Aristotle describes it, since it involves the faculty of sensitive *phantasia*. This rules out the possibility of an 'innocent eye' which views the world without interpretation. Given Aristotle's theory, an animal's perceptions are what they are – play the specific role that they do play – pick out and 'judge' what they do 'judge' – because they are interpreted from the animal's own point of view – because they are part of the unique configuration of internal states and processes that result from the animal's own history and position in the world.

*'Aboutness'*: The key to intentionality, according to some philosophers (see, for example, Searle 1979), is 'aboutness', the ability of an internal state or process to 'be about' or 'directed at' something other than itself. Perception is intentional in this sense, for even though it is *internal* to the animal, it is 'about' or 'directed at' *external* objects.

As Searle (1979) has pointed out, this sense of 'intentionality' can be explained in terms of 'conditions of satisfaction'. Thus, if I seem to perceive an object in my environment, the would-be

perception could not be genuine unless there really is such an external object there causing the perception. Again, if an animal desires to eat a piece of meat which it perceives nearby, that desire has the condition of satisfaction that the animal eat the meat in question.

Aristotle's account of perceptions makes them intentional in this sense too. Thus, when the heart region of an animal receives a percept from an external object, and *phantasia* 'judges' the object to be food, this perception has the condition of satisfaction that there really is such a food-object there causing the percept. And when this perception causes a desire for the food, the resulting desire has the condition of satisfaction that the external object be eaten by the animal. Thus, the perception and desire really are 'about' or 'directed at' the external object.

It is, perhaps, of interest to note here that Aristotle's theory of perception is 'purely physiological' and does not require the existence of Cartesian 'spirit' or 'mindstuff'. Nevertheless, it is able to account for 'mental' properties like privacy, subjectivity and 'aboutness'. This is a notable philosophical achievement that contemporary materialists would do well to investigate. (See Bynum 1985.)

## XII. ARISTOTLE'S THEORY IN THE TWENTIETH CENTURY

The above discussion has shown that Aristotle developed a very sophisticated theory of perception with great power and subtlety. It was carefully worked out in remarkable detail, and fully integrated with the rest of his philosophy and psychology, as well as his physics and physiology.

As a piece of physics or physiology, of course, his theory is now quite outdated; but as a piece of philosophy and psychology it remains a significant contribution to on-going research. This is especially so because one could easily 'update' it by replacing the heart with the brain; blood vessels with nerves; earth, air, fire and water with the elements of modern chemistry; and so on. The result would be a powerful causal theory of perception integrated with modern science.

One of the most important aspects of such a theory would be a contemporary version of 'receiving the form without the matter'. In what sense do causal traces of sensed objects contain



or convey information about those objects, and how can such traces 'represent' the objects?<sup>4</sup> Answers to such questions might be developed by combining Aristotle's theory with modern information theory and computer science; and, indeed, a number of scholars have begun to think along these lines, as indicated by the following passages:

Electrical impulses carried over a telephone wire are not much like the audible sounds they convey, but such impulses do correspond to sounds in a certain way. Again, coded messages and translations may not look at all like their originals, but they can carry the same content . . . .

The idea is now familiar that in sense-perception the changes that go through the nervous system to the brain convey in a sort of coded form the characteristics of perceived objects, messages which the brain decodes. This may be regarded as a refined version of Aristotle's account. (Akrill 1981, pp. 66-7)

The nonmaterial form found in Aristotle's view, which is serially transferred until it is in a state useful in sensation and perception, is discovered again in current theorizing. We speak of information instead of form and of encoding and decoding instead of substances taking a form without themselves being changed in the process. But we still conceive of sensation and perception as a process in which the form (information) is preserved as it passes from one box in the flow chart to another. (Baumrin 1975, p. 258)

Aristotle's theory of perception, it is clear, offers much more than something of 'merely historical interest'; and, indeed, it might even contribute to new developments in psychology, robotics, information theory, and related fields.<sup>5</sup>

## NOTES

1 The analysis is more troublesome when applied to change of *substance*, but this problem need not concern us here (see Edel 1982, pp. 58-9).

2 All quotations of Aristotle's works are from *The Complete Works of Aristotle: The Revised Oxford Translation* (see 'References' below).

3 He also has a third kind of quality which he calls an 'incidental sensible', but such qualities are not actually perceived in the strict sense. Thus, the quality 'being the son of Diaries' is not perceptible, although one could perceive the whiteness of a thing which happened incidentally also to be the son of Diaries (*De An.* 418a 20-3).

4 Such questions plunge us into thorny topics regarding contemporary 'causal' and 'representational' theories, but space does not permit us to investigate them here. See Bynum 1985 for an examination of some of these issues.

5 The present paper owes much to Baumrin 1975 and 1976.

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## APPENDIX: NOTE OF LATER RELEVANT PUBLICATIONS

Bynum, Terrell Ward (1986) *Aristotle's Theory of Human Action* (Ann Arbor: Michigan University Microfilms).