

corollary of this is that the pictoriality of the image it looks at need be no more than functional also {25}. We will follow Kosslyn {26} in designating theories of this type "quasi-pictorial". On such accounts, no spatially extended layout isomorphic to the thing imaged need exist in the brain or anywhere else; as Kosslyn {27} says, mental pictures cannot be hung on the wall! What is claimed is that there should be an informational structure which could specify a picture, which is 'scanned' by the 'higher' processes in a functionally similar way to that in which an eye would scan this picture and pick out its various features. We should not take it as read that quasi-pictorial theories will either succumb, or will be automatically immune, to criticisms directed at an undifferentiated "pictorial" notion of mental imagery. They demand full discussion in their own right and in the sophisticated versions in which they have been developed by contemporary psychologists such as Kosslyn {28} and Hampson & Morris {29}.

§II.A.2. The Ancients.

Such a widespread idea as that visualization involves something picture-like is, inevitably, traceable back to the Greeks. Although there is no known discussion of imagination, or memory or fantasy images, before Plato {1} the idea that something image like is involved in

perception seems to have been widespread before. From this it was but a short step to regarding such images as the causes of the perception-like processes of imagination. As Beare {2} points out, the observation which the majority of Greek thinkers regarded as the most important for understanding vision was that of the reflection of the scene before it in the pupil of the eye. Sarbin & Juhasz {3} argue, quite plausibly, that consideration of this image of reflection lead directly to the idea that vision, and, consequently, imagery, depends on such little pictures inside the head or eye. Of course, the Greeks did not have our modern concept of optical reflection and at least for the Atomists these reflected images (*eidola*) were quite literally material objects, directly analogous to real pictures or sculptures, which had physically entered the eye. Theophrastus gave this account of the views of Democritus:

Vision he explains by the reflection in the eye, of which he gives a unique account. For the reflection does not arise immediately in the pupil. On the contrary, the air between the eye and the object of sight is compressed by the object and the visual organ, and thus becomes imprinted; since there is always an effluence of some kind arising from everything. Thereupon this imprinted air, because it is solid and is of a hue contrasting with the pupil, is reflected in the eyes, which are moist. A dense substance does not receive this reflection, but what is moist gives it admission. {4}.

Aspects of this theory seem to have passed in different directions. The idea of vision as involving some sort of imprinting process "as if one were to take a mould in wax" {5*} is taken up by Plato and Aristotle and thus

passes into the mainstream of Western thought. On the other hand, later Atomists seem to have dropped the imprinting process but retained the notion of a physical effluence from objects - layers, as it were, thrown off from a thing's surface but retaining its form - which, for them, physically enter the eye themselves, rather than their air imprint doing so (6*). Lucretius not only describes perception in this way but, as we have noted in §.II.A.1, applies the theory to imagination also. He gives an account of dreams and images of fantastical things, such as centaurs, in terms of such physical 'idols' which, floating in the air unperceived, become decayed and intermingled with one another, and may enter the head through improper routes at night (7). This is perhaps the 'true' pictorial theory in its purest form, in which it no doubt must have had an influence during the scientific revolution, when Atomism was revived.

Something very like a quasi-pictorial theory of imagery in perception was put forward by Diogenes of Apollonia, who seems to have believed that air is the stuff of life and thought (8); and the internal air, around the brain, was regarded as "the real agent of perception - being a tiny fragment of divinity" (9). More to the point, he held that the image reflected in the eye must be mixed with this air before vision can occur (this was 'proved' by the fact that inflammation of the ducts between the eye and the brain, by stopping the passage of the air, may prevent vision even though the image is

present) {10}. Diogenes may have importantly influenced Aristotle's psychology {11}.

Plato and Aristotle both take up the wax impression metaphor of Democritus. However, for them it seems to be much more thoroughly metaphorical; we have moved a long way towards the functional conception of the mental image. In the *Theatetus* {12} Plato describes memory in terms of an impression made by a seal ring in a block of wax in the mind; but it is clear that this is intended to be taken as both metaphorical and hypothetical. What is more, Plato does not link this 'wax impression' image with the processes of perception. In Plato's most extended treatment of vision (in the *Timæus* {13}) there is no mention of such impressions or images. According to Juhasz {14} Plato, in the *Republic*, was the first to use the metaphor of an "eye of the soul" {15} but this does not occur as part of an explanation of perception or imagination, but rather of our access to the eternal forms {16}. It would thus be pushing the facts too far to describe Plato as holding a quasi-pictorial theory of imagery, although no doubt he did much to encourage it by the use of these analogies. He does come a little closer to it in the *Philebus* {17}: whilst discussing the perception of things too distant to be clearly identified, he speaks of a painter (*zographos*) painting within our souls images of the things we have guessed to be there. In this circumstance at least it would seem that he believed some sort of mental picture is necessary in vision (he

seems to think, quite reasonably, that the mere opinions formed about what is there are not enough to explain the experience), but it is not clear that this has to be observed by the soul, rather than simply exist in it. There is surely even a creative, artistic, aspect to image formation here.

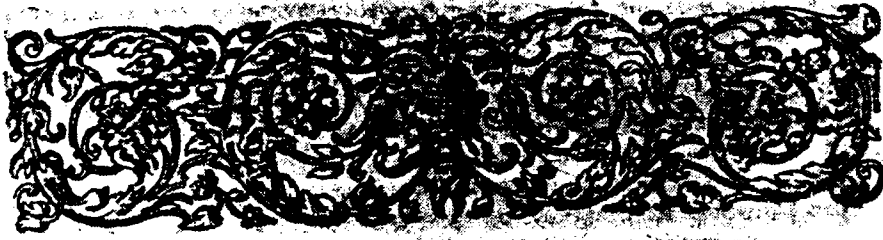
In his discussion of memory Aristotle {18} repeats the wax impression analogy used by Plato in the *Theatetus*, and he makes it quite clear here that he also regards these *phantasmata* as at least metaphorically pictorial (aspects of his terminology which tend to be obscured in translation further emphasize this {19}). Also he does use the same analogy in his explanation of ordinary perception. Combining this with his making fully explicit for the first time the mediating function of imagination between the sense organs and the understanding or reason {20}, and Aristotle has provided all the main ingredients of the quasi-pictorial theories of imagery which are still with us today. Indeed, if we interpret the *sensus communis/phantasia* after the manner of Brentano {21} as a sort of internal sense of sensation Aristotle will not seem too much at odds with Kosslyn. However, we found reason to reject this interpretation of *sensus communis* in §I.A.1, and Rees {22} argues that *phantasia* sometimes has a propositional character (such as being truth valuable) for Aristotle, which would not please Kosslyn at all! In fact Nussbaum {23} has recently argued that the pictorialist elements in Aristotle only occur in the few

places where he makes gestures toward physiological explanation and may be at odds with the main thrust of his theory of *phantasia* and *phantasmata*. Such terms, she argues, are generally used by him to get at notions like subjective appearance, 'seeing as' and active perceptual interpretation. This fits well with my own views on imaging, as we will see, but there is no denying (Nussbaum does not deny) that there are pictorialist elements in Aristotle, or that these have had a definite influence on later ages. Juhasz seems to hold the traditional pictorialist interpretation of Aristotle on memory, and he is against all forms of pictorial theory, but even so he sees modern versions as a sad descent from the Aristotelian original:

This sort of memory is quasi-pictorial. This is the Aristotelian pictures-in-the-mind theory as it was handed down through the British empiricists to the early experimental psychologists like Titchener, Galton, Külpe, and others. The theory, reasonable enough as propounded by Aristotle, underwent some undesirable changes, in particular as regards the thing-ness of the pictoriality of the images - the *phantasmata* slowly turned into *sidola* in some mythical place introspected to by psychologists. Their creative, sculpted, three-dimensional character was lost, and a mechanical, receptive nature was ascribed to them.

In fact, of course, Aristotle's "picture in the mind" was no *sidolon* (24*) but a *picture*, a creation, a work of art, a product of the highest, most mysterious form of *mimesis* - whereby a likeness is formed to enable man to cope with his environment. (25)

Even if Aristotle is properly regarded as a pictorialist I doubt if he is a quasi-pictorialist, in our sense (26*). After all, *sensus communis* itself is supposed



TRACTATUS PRIMI
SECTIONIS II.

PARTIO III.

De animæ memorativæ scientiâ, quæ
vulgo ars memoriæ vocatur.

A R S M E M O R I Æ.



TRA.

Figure II.A.2_1
(Reproduced from Yates [1966].)

to be the locus of perceptual awareness, without the images needing to be cognised by some higher faculty. Nevertheless, surely between Plato's painter and eye of the soul and Aristotle's representation-forming *phantasia* (not to mention Democritus's wax impression and Diogenes's receptive internal air) it became almost inevitable that later ages should arrive at the conception of a 'mind's eye' looking at pictures inside the head. When this conception first came together in the popular mind I cannot say. The frontispiece to the 1619 mnemonic system of Robert Fludd illustrating the eye of imagination regarding some mnemonic images, Fig. II.A.2_1, shows that it was fully current during the English Renaissance {27*}. No doubt it dates back much earlier.

§II.A.3. The Moderns.

Perhaps no-one trying to produce a serious account of imagery or imagination has ever taken the 'mind's eye' quite literally, but one very important thinker came extremely close to it, and can quite fairly be regarded as the direct forerunner of modern quasi-pictorialists such as Kosslyn or Hampson & Morris. That thinker is René Descartes, the man who can, indeed, be well regarded not only as the first modern philosopher, but also as the founding father of scientific psychology. It is really quite a remarkable irony that the pineal gland, which, as