

**§II.C.5. 'Propositional' Representation and Aristotle's Problem.**

In §II.B.2 we considered how well a quasi-pictorial theory of imagery could be generalized to account for the other mental functions which are normally ascribed to the imagination. These included, in particular, the function of 'seeing as' or 'aspect seeing', which, we have argued, probably underlies that range of human activities - from children's play to creative insight in the arts and sciences - to which we apply the term "imaginative" (1). We concluded that if mental imagery were quasi-pictorial in its nature then it could have little to do with such 'higher' aspects of imagination, and that our notion of imagination would thus have to be split into two (or more) parts - the rather trivial and dull matter of imaging and the glamorous but thoroughly mysterious matter of imaginativeness.

It is an advantage, I think, of 'descriptive' theories of imagery that they do not force us to multiply faculties in this way. The representational structure underlying both a percept and an image will consist in a set of descriptive 'propositions', and by suitable additions, deletions or changes to this set we could freely change either our image or what we seem to see. Consider the example from Ryle which we used before: the child who imagines a smile onto the face of her unsmiling doll. Perception of the doll's face will presumably result in the

formation of a description in the child's Short Term Memory, the supposed seat of consciousness. This description, among other things, will implicitly or explicitly describe the face as unsmiling. However, the child deliberately adds to this description further 'propositions', taken from her Long Term Memory, which specify a smiling face (perhaps she also deletes or suppresses those perceptually derived propositions which specify unsmilingness - or perhaps she can live with the contradiction). The continuity of such a process with the case in which a 'pure' mental image is built up entirely from 'propositions' derived from LTM is plain enough, and more veridical cases of 'seeing as' or 'aspect seeing' can also surely be accounted for in related ways, in terms of just which true descriptive 'propositions' find their way into the perceptual description, and which do not. Both pure seeing and pure imaging will be closely related in that they both involve building up a propositional description in STM, and intermediate processes will be imaginative inasmuch as the description arrived at derives from internal sources rather than directly from the senses.

Another criticism which we made of quasi-pictorial theories of imagery is that they seem to imply the need for quite separate imagery systems for the various sensory modes. First of all, this contradicts the traditional Aristotelian identification of the imagination with the 'common sense', the faculty of spatio-temporal perception. Descartes certainly still wants to believe in this

identification {2}, and even Kosslyn lays great stress on the spatial properties of the image. Furthermore, we have seen in §II.B.6 that the image effects and general spatial abilities demonstrable in the congenitally blind argue strongly for a more Aristotelian picture, for a spatial imagination not tied to particular individual sense modes. Again 'descriptive' theories of imagery score here. 'Propositional' descriptions may contain information derived from different senses all in the one description, and propositions concerning spatial and temporal relations need not specify any sensory origins at all.

However, if 'descriptionism' scores by being able to preserve the traditional connections of the concept of imagination with imaginativeness and with the 'common sense', in other respects it is quite at odds with the tradition. For Aristotle, for Descartes, for Hume, for Kant, and for all those following in their footsteps, the imagination is, effectively, the faculty which mediates between the senses and the reason. To conceive of imagination as entirely a matter of the entertainment and permutation of sets of descriptive 'propositions' is to assimilate it entirely into the faculty of reason. We are thus confronted afresh {3} with the problem which Plato thought insoluble and which, we have argued, Aristotle introduced the twin concepts of *sensus communis* and *phantasia*, the joint ancestors of our "imagination", in order to overcome. The problem may be put as: how can the reason, which deals in immaterial 'ideas', or in

propositions and their logical relations, gain knowledge of reality through the senses, which are material organs interacting with the world purely causally. 'Descriptive' theorists of imagery effectively deny that there is a separate faculty of imagination, and they thus cannot invoke imagination as a solution to this problem.

One might be tempted to retort that this is no great loss, for all the use that anyone has ever been able to make of "imagination" here has been just to invoke it; no-one has ever managed to explain how it could carry out its designated function of mediating between matter and mind. There is justice in this, but it is only the justice of hindsight, for surely Descartes and Locke {4} did think that they had at least the beginnings of a satisfactory account of how imagination, conceived along quasi-pictorial lines, manages the trick. It took Berkeley to show that these accounts were unworkable. Only Kant seems to have invoked the image forming faculty (under the name of "schematism") in the full realization that he lacked an account of how anything could fill the epistemological rôle for which he required it {5}. As Berkeley showed, pictorial or quasi-pictorial images are particulars, and thus cannot intrinsically represent the universals with which rational thought deals {6\*}. This argument applies as much to contemporary versions of quasi-pictorialism as it did to Locke, and in practice these contemporaries have acknowledged its force {7\*}. Fodor (who does conceive of imagery pictorially) is quite explicit that what an image

represents does not depend on the image's own properties (such as what it looks like) but on what we describe it to ourselves as representing {8}. This description will be expressed in the innate, unconscious language, the brain's computational 'code', which Fodor calls "mentalese". This is meant to be the same language-like representational system in which 'descriptive' theorists of imagery take their descriptive propositions to be expressed, and in which Kosslyn also believes.

So it seems that contemporary quasi-pictorialists, although they do place the imagination in a mediating position, do not give it the rôle of *sensus communis*. Modern quasi-pictorialists and 'propositionalists' both see the 'propositional code' as the primary carrier of meaning, of intentionality. Even if imagination is a separable faculty it is formulae of this internal code, operations of the reason, which tie images to real world categories. However, both sides of the dispute also see themselves as empirical scientists (or philosophical allies of empirical science) and certainly do not wish to be subjective idealists. After all, a major attraction of the Artificial Intelligence approach to the mind, which inspires both groups, is surely that it gives fresh purchase to a thoroughgoing materialism. Some account of how the "mentalese" language connects to the world, of how its terms or formulae come to refer, is thus very much called for. Aristotle's problem must still be solved. The question is, can it be solved without invoking the imagination,

under some name or other?

Psychologists have generally paid little attention to this problem. Those who believe in 'propositional' representation clearly do believe that the mental 'propositions' refer to external things, but they generally show scant interest in just how this could be, and treat it as unproblematic. Often they are not even interested in what the primary referring terms might be. For example, Olson & Bialystok, who explicitly represent themselves as exploring the spatial aspects of Fodor's "mentalese" or Pylyshyn's "propositional representation" (9), announce that they will make

no effort to recover the primary predicates (the primitives) from which all others are generated nor the explicit rules for relating such predicates. (10).

Many other psychologists simply ignore the matter altogether. Fodor has argued that they are justified in this (11). He seems to take the view that how 'mentalese' terms refer is an important question for philosophers (12) but of no relevance for psychologists. However, his argument against the psychological relevance of the question depends on his acceptance of the idea that mental processes are, for the most part, computational operations upon quasi-linguistic representations. My purpose here is to call that view into question. If Fodor is right that:

Nobody has the foggiest idea of how to connect this [quasi-linguistic] system to the world (how to do the semantics of internal representations) (13)

(a view whose gist he has continued to repeat (14)), then

surely this provides at least a *prima facie* reason for suspecting that the notion of such a system as the primary carrier of intentionality is mistaken. I say the primary carrier because, if any of our mental contents can refer to external things (and I take it that some do) then presumably we cannot rule out *a priori* the possibility of an innate unconscious quasi-linguistic system which gains its intentionality derivatively from mental contents (perhaps images) which do refer in their own right. However, this is clearly not what Fodor, Pylyshyn, or even Kosslyn intend when they speak of "mentalese" or "propositional" representations; and if some other "non-sentential" form of mental representation is in this way fundamental then it is not at all clear that there will be any need to postulate quasi-linguistic representations at all {15}, whether to explain imagery or anything else.

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Despite Fodor's insouciance, it is possible to find suggestions in the literature as to how 'propositional' representational systems might come to be able to refer to external things. These suggestions tend to be very sketchy and tentative, but I believe that two or three types of theory have been adumbrated. Few scientific psychologists, surely, would wish to follow Fodor in boldly embracing a theoretical construct without any understanding, or even an inkling of an understanding, of its fundamental basis. It is not Fodor's defence of "Methodological Solipsism" {16} which makes 'propositional' representation seem a viable option, it is the (acknowledgedly) half-baked ideas that

are around about how it might be avoided, of how such representations could come to represent. But I shall try to argue that none of these suggestions, when we start to look closely, is really any too promising.

In their widely used textbook **Human Information Processing**, Lindsay & Norman suggest that "propositional" mental representations refer to external things through their relationships with "sensory images and motor control images" (17). Clearly this view is not compatible with the notion that images are themselves descriptions in the 'propositional' format. However, there is a closely related view which perhaps can be reconciled with description theories of imagery. Perhaps the primary referring elements are not complex images of scenes, but the elementary sensations out of which the scene is composed. Anderson & Bower, for example, who were among the first to propose a theory of images as descriptions in a 'propositional' format (18), speak of the "sensationalistic bias" (19) of their theorizing, and explicitly align themselves with the tradition of "associationism" which they characterize as descending from Aristotle through Hobbes and the British Empiricist tradition from Locke through to Hartley, the Mills and Bain (20). But, although Anderson & Bower profess to believe that all mental contents are based on "sensationalistic" perceptual descriptions, in practice their theory and their computer model are concerned only with the analysis and the memory storage and retrieval of English sentences (21), and they shed little light on how a

"sensationalistic" account of the inner code is supposed to work.

Another proposal for a "sensationalistic" account of reference in a 'propositional' system is to be found in the book *The Representation of Meaning in Memory* by Walter Kintsch {22}. Again, this book is concerned almost exclusively with verbal memory, and with meaning in the sense of how words relate semantically to one another. Kintsch proposes that to know the meaning of a word is to have encoded in our memories a

lexical description that specifies its meaning and use. (...) We shall concentrate entirely on the semantic component of lexical descriptions. Semantic descriptions are not in terms of semantic primitives but in terms of other lexical items. Each word is thus defined by reference to other words. {23}.

Clearly such 'verbal' definition (whether the 'words' in question be English or "mentalese") does not speak to our problem of how a linguistic system can be related to non-linguistic reality. However, Kintsch has the following sop for us (although he does nothing more with it):

Lexical descriptions may contain sensory information (e.g. as part of the lexical entry RED), or motor programs (WALK), as well as linguistic information (the relationship of RED or WALK to other words). (...) The sensory and motor parts of the lexical descriptions permit an escape from the inherent circularity of such [purely 'verbal'] descriptions: They provide the interface between the real world and the semantic structure. {24}.

The fact that Anderson & Bower and Kintsch hurry us quickly past their avowals of sensationalistic allegiance,

and that others are not willing to own up to such an allegiance at all, is perhaps not surprising. After all, the idea that our understanding of the physical world can be entirely derived from our experienced sensations must be one of the most thoroughly discredited notions in all philosophy. As Fodor remarks:

the historical affinities of this program are all too clear. They lie, of course, with the Empiricist assumption that **every** nonlogical concept is reducible to sensation concepts (or, in trendier versions, to sensation plus motor concepts) via coordinating definitions. I do not want to comment on this program besides saying that, Heaven knows, the Empiricists tried. Several hundred years of them tried to do without 'thing' language by getting reductions to 'sense datum' language. Several decades of verificationists tried (in a very similar spirit) to do without 'theoretical' terms by getting reductions to 'observation' terms. The near-universal consensus was that they failed and that the failure was principled: they failed because it can't be done. {25\*}

The reasons why this can't be done were first clearly set out as long ago as 1764 by Thomas Reid {26\*}, who pointed out that sensations, of themselves, carry no spatial reference, but are mere feelings within us which could never give us a sense of spatial relations unless we **already** had a grasp of a spatial framework in which to place them. He applies similar arguments to efforts of voluntary motion - which have become in modern terms the "motor control images" of Lindsay & Norman {27} or the "motor programs" of Kintsch {28}. Reid was probably the first philosopher to draw a sharp distinction between sensation and perception {29} and thus to make these points clear. Sensation is a relatively clear and simple concept

when it is considered as merely the subjective counterpart to the stimulation of sensory nerves, when it is equated to what Quine {30} calls "nerve hits". But "sensation" gains this clarity at the expense of being unable to explain to explain our knowledge (or even our mere beliefs) about an outside, physical world. Perception, which perhaps can bring us such knowledge, is considerably more complex and mysterious. I find Reid's demolition of sensationism very clear and thoroughly convincing, but it is beyond my powers to summarize it satisfactorily. I can only recommend that the reader examine the original.

What is not so convincing, of course, is Reid's positive suggestion that a conception of space is innate in us, and it is no doubt the continuing lack of really convincing alternatives which has given sensationistic Empiricist theories a continuing life, despite repeated refutations from Reid's time onwards. But it is certainly clear by now that such theories cannot provide us with a workable account of how we get in touch with the material world. What they lack, of course, is a proper theory of the imagination, the 'common sense'. Pursued consistently they can only lead to the idealism of a Berkeley, the scepticism of a Hume or the relativism of a Quine {31\*}.

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An alternative idea about how an inner language might come to refer to outer things is that there is a parallelism of structure between the representational system and the things represented. Palmer speaks of these

two realms as the "representing world" and the "represented world":

Each world consists of objects that are characterized by relations that hold among them. These relations are operationally defined. The function of a representing world is to preserve information about the represented world. We can tie all of this together by assuming that the information contained in the two worlds is the set of operational relations among objects. Preserving information, then, is equivalent to having corresponding relations in the two worlds.

The nature of representation is that there exists a correspondence (mapping) from objects in the represented world to objects in the representing world such that at least some relations in the represented world are structurally preserved in the representing world. In other words, if a representing relation,  $R$ , holds for ordered pairs of represented objects,  $\langle x, y \rangle$ , then the representational mapping requires that a corresponding relation,  $R'$ , holds for each corresponding pair of representing objects,  $\langle x', y' \rangle$ . {32\*}.

Similarly, we find Hofstadter comparing the meaningfulness of human language and thought to the "isomorphism" (not to be confused with Gestalt isomorphism) which can obtain between formal symbol systems {33}. Physical reality, he suggests, may itself be construable as a formal system, with elementary particles as the 'symbols' and the laws of physics as the 'syntactic' rules {34}.

There seem to be two ways of construing these suggestions that such formal 'isomorphisms' are the basis of referential meaningfulness. The relevant isomorphism can be construed as being either 'local' or 'global'. To a considerable extent, of course, the one implies the other, and the distinction is not normally made explicit. However,

I suspect that it is an unacknowledged sliding between these two levels which allows the isomorphism theory to look plausible. Where it breaks down on one level the other can be appealed to, explicitly or implicitly. By a 'local' isomorphism I mean that a particular symbolic formula or set of formulae would refer to a particular, limited state of affairs through being isomorphic with it in the relevant sense. This is closely akin to how pictorial images were traditionally thought to mediate reference, by resemblance, until the notion was exploded by Berkeley and by Wittgenstein {35}. In this case, however, the resemblance is not merely between the spatial layout of a scene and of a picture, but between the logical structure of a state of affairs and that of the propositions describing it. I believe the early Wittgenstein's "picture" theory of meaning {36} had this sort of form, but, of course, he later repudiated it. Heil {37} draws on arguments derived in part from the later Wittgenstein in his criticism of the use of such accounts of representation to vindicate 'computational' theories in psychology {38\*}. As he points out, the notion of "structure", in any context, essentially involves the interrelationships of parts, and there does not seem to be any uniquely privileged way in which real world objects or states of affairs are to be divided into such parts {39\*}:

What is senseless, I think, is not the notion that things may be divided - structured - but that there is one right way to divide them. If it seems more 'natural' to divide things one way rather than another, this seems to be a fact about us, our needs and interests, rather than a fact about states of affairs. How many

