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The Imagery Debate. by Michael Tye

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*THE IMAGERY DEBATE*. By MICHAEL TYE. Cambridge: MIT Press, Bradford Books, 1991. Pp. xiv, 172.

The other day a friend of mine was recounting a dream—a classic traveller's nightmare about having a suit made in Hong Kong. Going from shop to shop, he found himself lost in a maze of alleys and sidestreets, unable to ask directions or, on finding a tailor, to explain what he wanted. "By the way," I said, kidding him, "what color of suit did you finally decide on?" "Color!?" he said, puzzled. "I don't dream in color; in fact, I don't even dream in black and white. You see, for me, dreaming isn't *visual*—there aren't any *images*, any *pictures* at all." Then he paused and a sly smile came over his face. "Or perhaps I should say that it doesn't *seem to me* that I dream in images—at least not after I've woken up!"

In *The Imagery Debate*, Michael Tye attempts a quick traverse across the difficult territory of mental imagery. His organizing principle is the current dispute in experimental psychology—between those researchers who advocate a "pictorialist" account of mental imagery and those who favor a "linguistic" or "descriptivist" view. In the first half of the book, the reader is given an admirably clear survey of that landscape. The first two chapters offer a short historical introduction to the problem of mental images (plus a denunciation of introspection as a reliable means of access to their nature); the third and fourth chapters explain and evaluate the empirical adequacy of the leading theories from both camps, namely Kosslyn's "pictorial" hypothesis and the "linguistic" hypotheses of Pylyshyn and Hinton. In the second half of the volume, Tye presents his own theory of mental imagery (a hybrid account based loosely upon Marr's theory of vision) and then turns to a number of outstanding philosophical issues.

Tye's view of mental images is that they are "interpreted symbol-filled arrays"—"functional pictures" that occur in a "visual buffer" shared with normal visual processing to which sentential interpretations (for example, "This is an F") have been appended.

More specifically, Tye's notion of a functional picture turns on three interrelated ideas: a functional picture is pictorial, functional, and representational. First, in explaining what makes a neural representation *pictorial*, Tye improvises on Kosslyn's notion of a "quasi-picture": a representation of an object, as seen from a particular viewpoint, is pictorial if and only if a sufficient number of spatially adjacent points on the object (visible from this viewpoint) are represented by parts of the representation (pixel-like structures called "cells") that are themselves "adjacent." (Unlike Kosslyn, however, Tye does not require that *all* parts of the representation correspond to the spatial parts of the object, for his model includes symbols, placed within the cells, that represent surface properties of objects.)

Here, “adjacency” between the cells of the array—and spatial relations between such image parts in general—is not to be read literally, as implying that the cells themselves stand side-by-side in neural space or that they instantiate any other particular spatial relations. Rather, such spatial relations are said to obtain if the cells are *manipulated*, during image transformations, *as if* they stood in such relations. This is the second characteristic of a *functional* picture. Third, this rough definition of a functional picture presupposes a more primitive concept of *representation*—the relation in virtue of which any of the elements of the array, cells or symbols, represent at all. Unfortunately, Tye’s views on mental representation are a bit thin on the ground here, but he does briefly refer to “registration” relations between symbols and external properties; additionally, he suggests that the content of a representation is fixed by those properties that under normal viewing conditions (relative to an appropriate group of individuals) would be causally sufficient to bring about an instance of that representational type. Let us say, then, that functional pictures require, first, *a one-way mapping between visible parts of the object and cells of the representation* and, second, *a manipulation of those cells “in accordance with” the spatial relations represented* and, third, *that the elements in the array stand in a particular kind of registration relation to those properties normally sufficient to bring them about*. Prima facie, then, the definition of a functional picture contains three very different kinds of criteria—syntactic, “formality,” and semantic constraints. Although Tye does not say how these criteria are interrelated, note here that trouble will arise if an independent notion of syntax is not forthcoming. If we cannot assume that neural syntactic elements are simply “plain for all to see”—that is, if individuating neural representational parts requires semantic or formal considerations—then there will be a complex interdependency between the three criteria. Certainly, then, a good deal more needs to be said about these constraints if the notion of a functional picture is to become clear.

As I said above, Tye postulates that the functional pictures of mental imagery are “interpreted symbol-filled arrays” which share the common machinery of normal visual processing. (In fact, given Tye’s view of representational content qua perceptual registration, there seem few other options.) Appealing to Marr’s theory of vision, Tye associates these arrays with representations at the level of Marr’s 2.5-D sketch (albeit a slightly modified one), and the visual “buffer” itself with whatever visual processing site(s) the 2.5-D sketch occurs. On Marr’s theory, recall, there are four levels of representation in image processing: first, an image that represents light intensity at points in the retinal image; second, the primal sketch that makes explicit intensity changes and their spatial organization; third, the 2.5-D sketch that represents edges, depth, and orientation information; and fourth, the 3-D model that represents shapes and their spatial orga-

nization in terms of stick figures and volumetric primitives (for example, generalized cylinders). The visual array, according to Tye, contains Marr-like symbols for orientation, depth, the presence of an edge or a ridge, plus some other symbols of Tye's own making—symbols for color, light intensity, and texture, plus one special symbol, 'O', that specifies the presence of an object surface. Note that because Marr's 2.5-D sketch does not contain any information about object segmentation or object identity, Tye believes that a *sentential interpretation*, "This is an F," must be appended to produce a given mental image. Such interpretations, on his view, either come with the array as generated from memory or else are produced "on line," by scanning the array and, on that basis, assigning a new interpretation.

To see a central problem with Tye's association of visual images with interpreted 2.5-D sketches, note that Marr's (unadulterated) theory of vision makes a fair amount of sense *when viewed as a theory of shape recognition*—and this is so even if, at the end of the day, it is not correct. As an explanation of *visual phenomenology*, however, Marr's theory presents us with a kind of paradox. When we experience visual phenomenology, say, when we look out the window to the garden below, we do not *see* little dots and arrows affixed to "cartoon" outlines (the primitives of the 2.5-D sketch), nor do we *see* stick figures or generalized cylinders (the primitives of shape recognition); on the other hand, we *are* aware of "pixel by pixel" intensity information, information that is no longer explicitly represented even in the second stage of processing, the primal sketch. *Starting with the photographic image, that is, the more processing steps taken—each one serving to make explicit more information from the environment—the less "like" our visual phenomenology the representation seems to become.* How then could such a process possibly give rise to the known phenomenology? What is the relationship between the representational primitives of the various levels of representation and *what we see*? This is the paradox (call it "Marr's paradox") that arises if one simply appropriates a theory of shape recognition for use as a theory of visual phenomenology. In Tye's case, much the same paradox will arise for the phenomenology of imagery. If a mental image is identified with an interpreted 2.5-D sketch, how can the representational primitives of the 2.5-D sketch possibly account for the kind of visual imagery that we experience?

Tye's response to Marr's paradox—or at least his implicit response, for he does not discuss the relation between the vehicles of representation and conscious experience—is to incorporate every representational type that is intuitively part and parcel of our conscious phenomenology into the "new and enriched" 2.5-D sketch, while leaving out all those representational primitives that seem to bear little obvious relation to our phenomenal experience. Thus, the intuitive properties of visual phenomenol-

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ogy that, on Marr's scheme, are represented explicitly only at levels *prior* to the 2.5-D sketch now reappear, represented by symbols in the individual cells (hence the inclusion of texture, intensity, and color symbols) while the lower-level representational primitives of intuitively "nonvisual" properties have simply been omitted from the new 2.5-D sketch (Marr's "blobs" or "bars"). Similarly, those intentional aspects of images that are (or would be) discerned further upstream on Marr's theory are now merely appended in the form of "sentential interpretations." In this way, the embarrassing machinery of shape recognition (for example, the cylinders) and object segmentation (whatever it might be) are discreetly hidden behind the scenes. In effect, Tye's answer to Marr's paradox is to collapse together the various levels of visual representation and thereby produce a representational construct that, according to our intuitions, bears an intuitive "resemblance" to our visual experience. The paradox of vision is not answered. It is merely avoided.

Recall the epigraph at the beginning of this review. It demonstrated much of what is puzzling about mental imagery—that the phenomenology varies greatly from person to person; that there is no clear inference from "how it seems" to the subject to the form of the underlying representational structure; that mental imagery, even when it does seem clearly "visual," has many peculiar, "un-picture-like" qualities, ones that are not explained by adverting to the properties of ordinary public images nor even to the properties of our ordinary visual perceptions. Whatever the true nature of the beast, understanding mental imagery requires us to address most of the persistent problems in the philosophy of mind—the problem of intentionality, the nature of consciousness and its relation to the vehicles of mental representation and their contents, the role of introspection, and so on. In sum, while Tye's book gives a clear and intelligent survey of the psychological literature on mental imagery, it does not provide a satisfying philosophical account of the most basic issues surrounding mental imagery.

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*SPRINGS OF ACTION: UNDERSTANDING INTENTIONAL BEHAVIOR.* By ALFRED R. MELE. New York: Oxford University Press, 1992. Pp. ix, 272.

*Springs of Action* is a densely argued, extremely valuable essay on the theory of action. In the first place, it serves a badly needed function. It brings together and instructively assesses a range of the best work, done over the