

THE RELEVANCE OF VISUAL IMAGERY TO THE PROCESS OF THINKING. II

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So many interesting and important points are raised in the preceding contribution to this symposium that it will be quite impossible for me to deal with them *seriatim* in my own. I shall accordingly limit myself strictly to those which have a direct and immediate bearing upon the subject of our discussion as indicated in its title. If it should thus appear that I am neglecting outstanding trees which I ought to examine one by one, I shall plead that I am envisaging the wood as a whole, as I see it through the wealth of Prof. Pear's detail.

Unlike Prof. Pear, who appears from the careful introspections which he gives to be singularly privileged in this respect, I do not normally enjoy visual imagery in thinking; nor can I call it up at will. Yet I feel I have some right to take part in this symposium; for I may say that I know what it is to experience visual imagery, since the dreams I remember are often sufficiently vivid to be confused with actual visual perception; and, moreover, of imagery of other kinds I possess a fair abundance.

But it is not, I take it, merely by reference to Prof. Pear's imagery or to my own lack of it, that the whole question of its relevance to thought process can be definitely decided. For relevance is an ambiguous term; and our problem resolves itself not merely into one of the relativity, applicability, pertinence of image to thought, but also into that of assistance or helpfulness. These two meanings of the term are not infrequently confused with results disastrous to clear thinking. If, when we think an object, we have also an image of it, obviously we can say whether the thought and the image are relevant one to the other in the first sense of the word. That is, we can educe the relation of applicability or pertinence from the two fundamentals, thought and image; or we fail to educe it. But it is quite another matter to say, on the strength of introspection alone, that the image helps the thought; or, for the matter of that, that the thought helps the image. This is a question of function; and I do not think that introspection throws much light here.

Indeed, both parts of our problem—the pertinence of visual imagery to thought and (as I conceive it) the far more important question of the rôle played by imagery in thinking—require more than the introspections of one, or even of several individuals for their solution. These, it seems to me, are matters for statistical investigation. The occurrence of visual imagery, with regard to which there are great individual differences, is one thing. Its relevance, in the sense of pertinence, to thought is another; and here again individuals may greatly differ. Its precise function in relation to thought is yet a third. Perhaps individuals differ also in this respect; but, in any case, this point seems to call for an objective method of investigation. Introspection is necessary, but not sufficient for its elucidation.

It may be that visual images are not only pertinent to thought processes, but even that thought cannot proceed in their absence—that they are a condition *sine qua non* of all our thinking.

Such a view, at any rate, has been held by a numerous and quite respectable body of philosophers which has shown a very remarkable continuity since the time of Aristotle—indeed, allowing for differences in theory, one might even say Democritus. If it be the case that we are incapable of thinking without images, then clearly the images are relevant to the thoughts, whether they actually *are* the thoughts themselves or only the instrumental causes by the help of which thoughts are produced. In either case, I should be obliged to explain my own personal experience of thinking by reference to imaginal processes so weak as to be unintrospectible. Indeed, many modern psychologists do explain thinking precisely in this way. Thought, for them, is the incipient awakening, or sub-excitement of images.

Both the ancient philosophical doctrine and the modern psychological explanation in question are *ex parte* hypotheses made to fit in with metaphysical views as to the nature of perceived and thought objects on the one hand, and of the conscious subject on the other. They can be properly understood only in the light of the historical ideology of which they are the offspring, and with the surmise that those who framed and defended them were what we now call ‘visibles.’ Were I a ‘visible,’ like Democritus, Aristotle, Aquinas or Prof. Pear, the view might appear to me to be plausible. But, unless in my own case I am to begin my psychology with an epistemological postulate, I must take consciousness simply as I find it. And, if I discover no visual images in the course of my normal thinking, clearly for me visual images can have no pertinence to my thoughts, nor can they be said to function in their regard. On the

other hand, I know what pertinence is, for example, as between a kinaesthetic image and a thought; and I am quite ready to admit that there may be an extremely high degree of relevance of this sort between visual imagery and thoughts in a similar manner.

To show, however, that there is relevance of the other sort I believe it would be necessary to carry out investigations in which one could obtain objective records of the products of thought in those cases respectively in which visual imagery was present and absent. Moreover I should not consider such investigations to be complete until they had been carried out with regard to all the characters of visual imagery—such as frequency, intensity, determinateness, etc.—some of which Prof. Pear has distinguished. To some extent investigations of this kind have, of course, been carried out. Two outstanding ones (criticized by Professor Pear on the ground that the material used in them was already more than half-way to complete abstraction) conclude in general that, apart from inner speech, spontaneous imagery is negligible, that it arises often only after the thought, that it is frequently irrelevant (Betts); that in school studies imagery may be detrimental, and that there is a tendency to inverse correlation between some of the higher mental processes and imagery (Carey). These investigations are admittedly not exhaustive; but as far as they go they do seem to point to irrelevance in both the senses in which the term is used.

Though he offers criticism, Prof. Pear is inclined to concede many points; for he states that in some of the stages at least of its development the visual image is disadvantageous for efficient abstract thinking. And he says that it is often easier to solve problems, which could be solved either visually or verbally, by using words. Indeed, in a passage which has greatly puzzled me, he seems to go still further when he refers to an image as having 'surmounted' inner speech or even imageless thought. Far from functioning here as relevant or ancillary to thought, the image seems to be the product of the thoughts. It can be said to be relevant in the first sense, but certainly not in the second. I cannot at all agree, if I understand it aright, with the transition made by Prof. Pear from this account of the genesis of the image in question to what follows: "Far from being a lowly hanger-on, it (the image) may even, like a commanding officer on parade, 'take over' when words (the N.C.O.'s) and thoughts (the captains) have completed their subordinate tasks of collection and formation." I shall not cavil at the use of the terms 'lowly hanger-on' or 'subordinate tasks' in this connection, any more than I have cavilled at the idea of solving problems by words or images. But

I cannot see that this highly picturesque description helps the point that is being made. For I should regard the image resultant from such a process of thinking as at most merely illustrative of it.

There is another way in which I believe imagery may helpfully be investigated—the indirect way, namely, of investigating some ‘higher’ thought process and ascertaining the manner in which imagery enters into it. In so far as I may claim to have studied imagery experimentally, this is the method that I followed in obtaining the data for my *Consciousness of the Universal and the Individual*. The conclusions I was able to draw in that work have largely been corroborated, and in one very significant respect traversed, by the results of a similar, and quite remarkable research lately carried out by Stevanović in the laboratory of King’s College. This research is now in press, and will shortly be published as a Monograph Supplement of this *Journal*.

My own work and that of Stevanović were both concerned with judgment. In both researches, after associating nonsense words with sets of pictures by learning them together, these nonsense words, now having acquired some meaning (viz. meaning the associated pictures) were used as grammatical subjects to which the observers were required to fit appropriate predicates. Apart from the differences in aim of the two researches, one of the chief differences between the two pieces of work lay in the nature of the material learned. In both cases it was visual material; but in my own research this consisted of pictures of familiar objects—small children in movement, fruits, and the like. Stevanović worked with what might almost be called nonsense material. He used ‘pictures’ obtained by throwing shadows of cards held at various angles to the source of light. These shadows he outlined and washed in with colours to most of which names could not readily be given. The resultant ‘pictures’ thus consisted of coloured shapes sufficiently dissimilar to cause a real difficulty when one attempted to derive a common concept from them, yet sufficiently alike for this derivation to be possible.

Now, before citing any conclusions from these two researches with regard to imagery, I wish to say that I consider the percept itself as the most perfect kind of visual image. This involves a view which I need not develop here. Further, if I am thinking about the percept, this image seems to be entirely relevant, both as pertinent to the thought and as helping it. It seems to be a $\pi\omicron\upsilon\ \sigma\tau\hat{\omega}$ for the thought, to arrest or hold it in its process of perpetual becoming. It is, then, in reference to the percept or direct image, that images and their relevance must be judged. When an object seen is recalled in a sensorial manner, the image is known

to be complete or fragmentary, vivid or obscure, and the like, by comparison with the original experience, which is now a thought and not an image. Its relevance (in the first sense) is judged accordingly. It is a copy or picture, a schematic representation, a symbol, or the like. Belief in relevance in the second sense, we may surmise, is a consequence of knowledge of relevance in the first sense. We are thinking about an object; at the same time we are experiencing an image which we know to be a copy, representation or symbol of it. But we do not, when thinking an object or about one, always experience such an image. Or, we may think an object or about one, and experience the image of another. It seems to me clear that, just as one may have an auditory image (say, of a tune) while thinking of a place, so one might have a visual image of one thing while thinking of another. Indeed, we can actually perceive objects (experience direct images) while thinking of others. Such images and percepts could only be held to be relevant (in either sense) by way of some association, or in some such 'psycho-analytic' manner as that to which Prof. Pear makes appeal. But, in that case, everything in the way of imagery could be held to be relevant to anything in the way of thought; and there would seem to be very little chance of a scientific determination of the matter. For it might be said—as, indeed, it has been said—that any content of consciousness can mean anything whatever. I do not wish to minimize the importance of association, or to speak with the slightest disparagement of the excellent work of the psychoanalysts; but I do believe that we must find somewhere within consciousness the complete grounds for all the concepts which we frame to explain its processes. And I believe further that, from the standpoint of consciousness, it is easier to accept the frequent apparent irrelevance (both as pertinence and helpfulness) of thought and image than to call upon association or the unconscious to establish a relevance where there seems to be none.

To return from this digression and mild polemic to our researches, I may say that my own conclusions as to the presence and relevance of imagery with regard to processes of thought were as follows: Thoughts may or may not be accompanied by sensorial elements (images), and they remain unimpaired while the imagery tends to become fragmentary, obscure, and even to drop out of consciousness altogether. Images, accordingly, are not relevant to thought in the sense of being necessary to it; though they may be relevant as associated with thoughts or illustrative of them. Further, the 'universal' tends to be present to consciousness as imageless substantive content; the 'individual,' on the

contrary, tends to be present as a concept in connection with sensorial contents (images). Finally, I concluded that the image best securing 'individual' thought is the direct image or percept. Possibly here, in using the term 'securing,' I was going beyond my data; for this term indicates function, and my data were mainly introspective. But even here I had the objective products of the acts of judgment made to serve as a guide to interpretation.

In the main, as far as imagery and thought are concerned, Stevanović's findings are similar to my own. The unfamiliar character of his material and the difficulty of learning it with the nonsense words, however, were calculated to be more favourable to the emergence of visual imagery when the nonsense words were presented, either for the observers to recall their 'meanings' during the learning period, or to fit predicates to them in the judgments. Ordinary meaningful words could less easily be used to designate the 'pictures' than in my own research, because the observers had no obvious words at command for this purpose. To recall any one of the particular coloured shapes exactly one would have supposed that visual images would have been even more necessary than was the case in my own research; and that Stevanović would have corroborated my finding that when we think 'individuals' we tend to have imagery of some sort. But this was not the case. Stevanović found, even in the case of observers who were 'visualizers,' that "the visual images help them very little in determining their individual meanings. The images are for most of them signs that the meanings which arise are individual; but when they came to draw the respective individual pictures they did not rely upon the image, but rather upon a knowledge of the structure and of the details of the picture in question.

In watching the observers while they were drawing the pictures, the experimenter often noticed that the execution of the drawing involved the whole series of eductions and reproductions of parts of the picture out of its relations (system, plan, symmetry, etc.). One observer... described the image he had when he obtained the individual meaning for a picture as a 'patch of green colour'; and then he proceeded to draw the whole structure of the picture with all its details. But, on the other hand, the same observer reported, *e.g.*, the meaning of an individual picture because he had a coloured image of a particular one. He further explicitly stated that the image was clear and well defined—but when he came to draw the picture, his drawing represented a merely schematic shape, which could have been taken for any picture of the group. In

some cases the schematic image did not represent any particular picture of the set at all.”

It will be noticed that Stevanović does not draw his conclusions merely from introspective data, but from the thought products as shown in the observers' drawings of the pictures. This is an important point, as it satisfies the criterion given above as to the method of investigating the function of images with regard to thought. Mere introspection might have suggested another conclusion, as indeed it did to most of Stevanović's observers. They, so he writes, “with one exception (a non-visualizer) tend to ascribe this ‘individuality’ to a meaning when they obtain a visual image, especially if a relevant image appears in consciousness prior to the appearance of the general meaning.”

The foregoing citations are taken from Stevanović's notes on the learning period. He is no less explicit when he comes to deal with the way in which the ‘individual’ meaning is present to consciousness when the nonsense words were presented as part judgments to be completed. Here, while again generally corroborating my own results, he finds (with the single exception of judgments of the type in which the subject is indicated by an adjective denoting colour, etc.) that “the meaning of the subject in ‘individual’ judgments tends as frequently as in ‘universal’ ones to be present as a knowledge without any accompanying sensorial contents at all.” This conclusion is of great interest in relation to our symposium. In the one case in which, if anywhere, imagery would seem *a priori* to be necessary for thought, it is not found in greater abundance than in any other. There need be no relevance, for there need be no image. But, when images are present in consciousness while the judgments are being made, they “serve best to indicate which individual is meant.” Images answer the question ‘which?’ but “were not found to determine the meaning of individuals by their intrinsic characters.” To answer the question ‘what?’ knowledge is required.

I believe these experiments of Stevanović and my own, together with those of Betts and Carey, within the range of their application, may be taken as providing suitable, and even conclusive materials for an answer to the question of relevance. Visual images are not necessary in processes of thinking such as were investigated. But, when they occur, they may very well be relevant in the sense of agreeing with, related or pertinent to, the thought going on, just as they may be illustrative of it.

I may permit myself one remark in bringing this paper to an end. Thought, in the last analysis, always has to do with things and the relations of things. If I have a visual image of a thing remembered, it

can, as I have said, only be known to be such by being compared with that thing (percept), not now an image but thought. The thought object, or relation, must thus be independent of the image, since it is the standard by which the image is judged. This consideration, it seems to me, definitely disposes of the relevance of imagery as necessary or helpful to thought or processes of thinking. But, again, where visual imagery occurs, it may be relevant in the other senses distinguished.

Though, as I said I should be obliged to do at the beginning of my paper, I have been envisaging the wood rather than the separate trees of our problem, I trust my examination of it may have started one or two hares which will run during the discussion.