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This thesis was written by the student under my supervision, Lawrence McFarlane, and it complies with the conditions and regulations of the Resolution for the degree of M.Litt.

J.E.R. Squires.

Roger Squires

This thesis embodies the outcome of my studies over the last two years. It is a record of my own work, and was composed by myself. It has not been submitted in any form for a higher degree, or been accepted as part of any previous application for such a degree.

I was admitted as a candidate for the degree of M.Litt. in Philosophy, in October, 1970.

Lawrence McFarlane.

MENTAL IMAGES. A THESIS FOR THE DEGREE OF M.LITT.

LAWRENCE MCFARLANE

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CHAPTER ONE. VISUALISING.

In this chapter, I wish to consider some of the problems associated with visualising. I will do so by discussing two articles on the subject, one by J.M. Shorter entitled 'Imagination' in Mind (1952), and the other a more recent treatment of the problem by J.E.R. Squires entitled 'Visualising'. I will suggest that neither of the accounts offered in these articles is the correct one, and will go on to suggest an analysis which I believe avoids the pitfalls which they encounter, while approximating to what I modestly believe to be the truth.

When I come to discuss after images in the second chapter, I will argue that we are really perceiving a physical object when we claim to see an after image - that physical object of which the after image is an image. However when we are dealing with visualising, this analysis is not open to us. Frequently it would be impossible to produce any object which the person who is visualising, could actually have been perceiving. And indeed often the whole point in visualising something, is that it cannot at that time be

seen, for if it could, there would be no point in trying to visualise it, and indeed if we were actually seeing it, then there would be logical difficulties involved in also claiming to visualise it. And of course, there is no conceptual problem involved in visualising something which we might not have seen for years, and which indeed may no longer exist at the time when we visualise it.

So it will not do to suggest that visualising is a form of perception. Also, although it is a purely empirical matter, I imagine that a physiologist would be prepared to say that what goes on when we visualise, is quite different from what goes on when we perceive. Also, although someone who visualises an object can tell people what it looks like, yet if he did not already know what it looked like, then he certainly could not have found out by visualising it, as he could by pecciving it. For how would he know when he had 'got it right'? He may find that visualising helps him to as it were, organise his thoughts about the object, but if he really does not know what it looks like, then visualising cannot help him. Let us go on then, to examine Squires' analysis. His positive suggestions are well summed up in the concluding sentences of his article.

'Visualising then, is seeming to see something when it is not there, and when there is nothing like it there which would account for our seeming to see it, in the way a decoy duck would explain our seeming to see a duck.

----- A final

(3)

condition is that we should believe that we are not actually seeing the thing, otherwise we should not have distinguished visualising from hallucinating or dreaming.'

Squires' thesis is that visualising is seeming to see something when it is not there. Someone who visualises seems to see what he visualises, and yet of course we know he is not actually seeing anything at all. Since he is not seeing a seeming object either, we must conclude that what he is doing is seeming to see. Visualising then, is seeming to see, and in order to distinguish it from hallucinating or dreaming, we add the proviso that one does not actually believe one is really seeing anything, since people with hallucinations frequently do believe they are actually seeing something.

This account avoids the difficulties of postulating imaginary or mental objects which people who are visualising are supposed to see. Nothing, in this account, is seen or 'seen,' instead we rely on 'seeming to see' to explain what goes on. Now how is it to be justified? Well if I am visualising some object - perhaps the cathedral, then it makes sense to ask of me the sorts of questions we may ask of someone who is actually seeing the cathedral. I can tell you what colour I visualise it, what shape, how far away it seems, and so on. I can give a meticulous description or even draw you a picture of it. But I cannot tell you what it tastes or smells like, and so on. In short, the justification for saying that visualising is seeming to see, is that someone who visualises is able to give many of the responses which are characteristic of someone who sees, and also that many of the

sorts of questions which would be inapplicable to seeing are also inapplicable to visualising. What goes on when we visualise seems similar to what goes on when we see, except of course that there is nothing present when we visualise, as there is when we see.

Now let us pause to consider what is meant by 'seems to see.' If it is foggy outside, and I am searching for a familiar land mark, I may say at some stage 'I seem to see a cathedral.' We can, I think, replace this with the approximately equivalent 'there seems to be a cathedral over there.' This use of 'seems to see,' is intended to allow the user to express doubt or uncertainty as to the presence of the cathedral.

However if I am asked to visualise the cathedral, and I say 'I seem to see a cathedral' then it no longer seems plausible to replace this with 'there seems to be a cathedral over there.' We know perfectly well there is not, and this use of 'seems to see' does not appear to involve any reference to doubt or uncertainty. I think what Squires means by 'visualising is seeming to see' is this second meaning or use of 'seems to see,' where what is asserted is that something rather like seeing is going on.

I take it then, that 'someone who visualises seems to see' is to be construed not, as 'someone who visualises believes he sees something, but is not sure' but instead 'someone who visualises does something rather like seeing.' And of course this is backed up by reference to the similarities between someone who sees, and someone who visualises.

The thesis which Squires is defending then, is that visualising is doing something like seeing, with the proviso added that of course we do not actually believe we are seeing, so that we can distinguish visualising from hallucinating. Now what are we to say of this? Well the first point to make is that, as it stands, this analysis does not offer a satisfactory means of distinguishing visualising from hallucinating, despite the inclusion of the proviso about people's beliefs. Certainly it is true that people who are visualising know they are not seeing anything. This is because visualising is quite different from seeing - it involves an act of will, whereas seeing does not. Seeings are not doings, but visualisings are. Now because of the nature of hallucinating, it is indeed true that frequently people who suffer from this do believe they are actually seeing things, though we should want to say of them, that they only think they are seeing things, and are actually seeing nothing. However it is also the case that hallucinations are sometimes accompanied by no such beliefs on the part of the sufferer. Certainly it is not a necessary condition of having a hallucination that one believes one is actually seeing anything. The medical researcher who administers a hallucinatory drug to himself probably knows full well that he is not actually seeing what he seems to see. At any rate he may well realise this, even if he does not always realise it.

Thus we must conclude that on the basis of people's beliefs alone, about whether they are really seeing anything or not, we cannot offer a proper distinction between visualising and hallucination. It is an interesting consequence of the belief that we can, that we should be advancing the first philosophical theory with

genuinely medicinal powers. For since visualising is a voluntary process, and can be terminated at will, all we have to do to relieve the drug addict of his persistent hallucinations, is to convince him that he is not really seeing anything at all, but only seeming to see it. His symptoms will then become those of someone who is suffering only from visualising, a far less virulent condition.

However although this is a real difficulty for the thesis as it stands, in fact it can be avoided by simply pointing out that visualising can be distinguished from hallucination, by its involving an act of will, by visualising being something we do, which accounts for our belief that we are not actually seeing anything. If I set out to visualise the cathedral, then I am hardly likely to mistake this for seeing the cathedral, which is not really something we can set out to do - though we can set out to look at it. Now can this distinction between visualising and hallucinating be incorporated into Squire's analysis? I think the answer is that it cannot, but let us examine his account further to see why not.

We have said that visualising involves an act of will - that visualising is a doing. This needs to be expanded now. Strangely, for it contradicts his main thesis, Squires makes this very point when he says in objection to Ryle's account of visualising - 'a rehearsal, no less than a play --- involves doing something. --- If visualising is sham - seeing, there is something which counts as the shamming' (op-cit.) Shorter also makes this point, that visualising is something we do. We can further justify it by pointing out that visualising is something we can do quickly or slowly, accurately or in detail. We can be ordered to do it or to abstain

from it, and can do it proficiently or badly. None of these are true of hallucinating, and none are true of seeing, but all are characteristic of visualising.

So we can assert that whatever analysis we come to give of it, this characteristic of visualising will have to be accommodated if we are to claim to have given a full account. Now can Squire's analysis accommodate this aspect of visualising? We have seen that he argues that visualising is seeming to see. So it will follow that seeming to see will have to be something we can do in the expounded sense of doing something. But is it? I think the answer is that it is not, and this for two main reasons. The first is that visualising is doing something, while 'seeming to see' is a phrase which does not denote an activity of the sort required. The second is that even if we get rid of the objectionable 'seeming to' element, and replace it with an acceptable equivalent which avoids grammatical problems, still visualising is just not like seeing. In short, we shall object to both the 'seeming to' and the 'see' elements of the seeming to see analysis. Let us look at the first objection.

We are objecting that seeming to see is not the sort of thing you can do, in the way that visualising is, because you cannot be ordered to seem to see, while you can be ordered to visualise. Now, when Smith gives a description of the cathedral such that it is as if he were actually seeing it, we might say - 'he seems to see it.' However this is not to suggest that 'seems to see' is a compound term denoting some sort of activity called 'seems-to-seeing.' If this were the case, 'he seems to see' would be the third person present tense of the verb, to seem-to-see, such that people can seem-to-see, just as they can watch television or play cricket.

But now suppose we see a group of people playing a game rather like cricket, and I ask 'what are they playing?' and you reply 'well they seem to be cricketing, though I am really not sure.' Now clearly this is only to say they are doing something like cricket, and not to name the activity 'seeming-cricketing' or 'seeming-to-cricket.' Of course we could invent such usage if we wished, such that whenever people may be said to seem to be doing something, we can name the activity 'seeming-to-x' or 'seeming-xing.' But this involves difficulties of its own. When you said they seem to be cricketing, you added - 'but I am not really sure.' But now it will not be true, if 'seeming-to-be-cricketing' denotes what we can see they are doing, to say we are not sure whether they are or not. For what you were not sure about was whether they were cricketing, and not whether they seemed to be cricketing. We may say that introducing this new usage then, is no help at all.

It seems to me that Squires is involved in the same sort of mistake when he represents 'seem to see' as an activity - and of course it has to be an activity if it is to account for visualising adequately. Of course we must concede that it is perfectly good grammar to say of people who are visualising, that they seem to see - even though we shall argue presently that it is untrue to say this. But we must object to the sort of use of 'seem to see' which suggests it is to be taken as the present tense of the verb 'seem-to-seeing.'

Squires says it is the ultimate absurdity of the mental image account, that if it were true, there would be no visualising. We may observe that on the basis of this objection, the same is unfortunately true of his own analysis. For it will

turn out to be the case, if we take 'seems-to-see' seriously, that what we had formerly thought was evidence for visualising, namely the answers and responses it shares in common with seeing, will now constitute the new activity of 'seem-to-seeing.' People who before were imagined to be visualising, now appear to be 'seem-to-seeing.'

Perhaps we should take this suggestion seriously - that visualising is seem-to-seeing-that is, visualising is just giving the answers etc. which constitute this new activity called 'seem-to-seeing.' This is not as ridiculous as it seems, but it is not what Squires would want to say. For if this is what visualising is, then we would no longer be able to say it was doing something like seeing - unless of course we say that seeing is just doing this sort of thing as well, except that with seeing, there actually is an object present which we are describing.

However this will not do, because we had already agreed that seeings are not doings, while the sort of things that we are considering here, are very much doings. And anyway, I think we should say of someone who was engaged in these sorts of activities, not that he was seeing, but that he was describing what he saw. And I doubt if Squires would want to say that visualising was like describing, for we can describe what we see, but we cannot visualise what we are also seeing.

I think then, that we must abandon the claim that visualising is seeming to see. But perhaps we can alter the grammatical construction of this claim, while maintaining intact its content - perhaps all we need is a more careful piece of phraseology to extract us from our predicament. We may try something like

'visualising is doing something like seeing, such that it may be said of one who is visualising, that he seems to see,' and where we go on to fill out the 'seems to see' by reference to the apparent similarities between seeing and visualising, to substantiate our analysis. However although I expect something may be done in this way, for the unhappy 'seeming to' element of the analysis, yet when we go on to say that visualising is something like seeing, even if it is not seeming to see, we are faced with our second, and I think fatal, objection. Visualising is just not the same sort of thing at all as seeing.

Now there are a number of unimportant dis-similarities between visualising and seeing, which need not concern us. Although there is nothing present which is seen, when we visualise, and we cannot ask friends for an opinion or use better lighting or glasses, and our eyes and visual system are not in normal operation, if they are operating at all, yet we can disregard these sorts of dis-similarities. They exist also in the case of hallucination, and there we might be more inclined to say something like seeing was going on. It was never the intention of the 'seeming to see' analysis to suggest that there were no, or few, differences, between visualising and seeing, but only that, although they are different, yet they are conceptually similar - they bear the same logical form. None of the differences so far mentioned disprove this thesis, any more than pointing to the figures on the blackboard disproves the thesis that the same sort of thing is going on in the mental and written calculations.

However whereas this thesis is not disproved by pointing to these sorts of differences, there are a series of differences, which completely wreck the thesis,

that visualising resembles seeing. We have said that visualising is characteristically the sort of thing we do - it involves an act of will. Now this is just not true of seeing - we cannot be told to see something in detail, or quickly, though you could look carefully or quickly. And you cannot see things easily or with difficulty, though you may find them easily and then look at them. Nor can you see things in colour or in black and white, though you can see coloured or black and white objects. And it is ^{precisely} ~~precisely~~ this feature of visualising - that it can be done in all these ways, that distinguishes it from hallucinating, dreaming, and a number of other forms of imagery.

Of course this is not to say what visualising is - merely that its logical status is that of being the sort of activity it makes sense to talk of in these ways. In as much as seeing, or, presumably, something like seeing, has a completely different logic, I do not see how we are to avoid abandoning Squires' analysis as misconceived. Certainly there is some truth in saying that visualising bears some resemblance to certain aspects of seeing. We can say what we have visualised, what colour it was, and so on. However this only means that whatever analysis we do finally accept will have to be one which can accomodate these aspects of visualising, just as it must offer a proper account of the fact that visualising is doing something in a way that seeing or hallucinating is not.

Thus I think the point has been reached at which we must finally abandon the 'seems to see' analysis. It is unsuitable both because 'seeming to x' is not something we do, and because visualising and seeing are conceptually distinct and unsimilar. Perhaps then, we may say that visualising is doing something like looking,

rather than seeing, in virtue of which we may say that someone who visualises seems to look at objects which in fact are not present. But this will not do either, for although looking is the sort of thing we can do, it is not the sort of thing we can do accurately, or in detail, or in black and white, all of which can be said of visualising. This may be better than seeming to see, but it is not good enough.

Can we instead say 'visualising is thinking about how something looks?'

This has the advantage, I think, of being partly true - we can think quickly or slowly, and about how something looks. We can think about how it looks in detail, and even perhaps accurately. But I do not think it is plausible to say we think in colour, though it does seem that we may talk of visualising in colour. And even if this thesis were entirely true, still it would not be very enlightening, since the concept of thinking is itself problematic, and we would probably find that we had to give an analysis of it in turn, in order to explain visualising. And of course if this is the case, then we might as well stick at trying to explain 'visualising.'

So let us move on to the next section of our analysis, where we shall consider briefly, Shorter's alternative suggestions, in his article entitled - 'Imagination.'

Shorter argues that the nature of visualising is not to be explicated by an analogy with anything like seeing, at all. It gets us nowhere to resort to talk about mental images, and it is not even illuminating to suggest that visualising is something like seeing. When I visualise the cathedral, there is no image involved which I see, both because seeing is not the sort of thing you can do, and because what I visualise is the cathedral, and not a picture or image of it. Just as someone

painting a picture of it, is depicting the cathedral, and not a picture of the cathedral, so it is a point about the logic of 'visualise' also, that what is involved is the real cathedral, and not a picture of it.

He argues that the logic of 'depict' is to some extent parallel to that of 'visualise,' and that if we want an analogy for visualising, depicting is to be preferred to seeing or 'seeing'. However this is not to say, of course, that visualising is depicting; Shorter says that this is merely a useful guide to the sort of thing visualising must be, and that we must not carry the analogy too far. If asked directly what visualising is, he admits he does not know, except that it is perhaps what we do, when we do mental arithmetic or recall someone's face. Of course this suggestion is no help at all. As Squire[↑]s points out, this suggests that visualising is some sort of elusive process which sometimes accompanies other activities, and sometimes not. For clearly we can do mental arithmetic without in any way visualising, thus the two cannot be identical. And if this is so, then we must amend his suggestion to read - 'visualising is what sometimes accompanies mental arithmetic' which is true, but less than a revelation about the nature of visualising, for several things sometimes accompany mental arithmetic, and without further guidance we have no way of knowing which to identify as visualising.

Shorter's main contribution to our analysis of visualising, is his insistence that an analogy with seeing is misconceived, and that depicting is more the sort of thing we want. Clearly there are good grounds for supposing that 'visualising' resembles 'depicting' in its logical framework. We can be ordered to depict or to abstain from it, to do it quickly or slowly, accurately or in detail. We can even

depict something in colour, or in black and white, and we can do it successfully or incompetently. We required that visualising be accounted for in terms of something that involves an act of will, something that could be termed a 'doing,' and clearly depicting is just such an activity.

But there are dis-analogies too of course - or at least there appears to be, - for when I depict the cathedral on canvas, there is something to be identified as the depiction - the canvas with the painting on it, while when I visualise it, there is no depiction. Also when I depict normally, I use paint and brushes, or clay, or charcoal, etc., while again this is not true of visualising. There are a number of other dis-analogies or apparent dis-analogies, also which we shall examine presently. However Shorter is sufficiently satisfied with a consideration of these more obvious ones, to reject depicting as anything more than analogous to visualising.

Now I want to argue that it is both misleading, and wrong, to suggest that visualising is analogous to depicting. It is misleading because it leads us to look for some sort of equivalent in the case of visualising, to the paintings or depictions which often accompany depicting, and it is wrong because it embodies a misconception of the nature of depicting. Let us take the first objection first.

We have seen that due to the logical structure of 'visualising,' it has been suggested by Shorter that an illuminating analogy can be found with 'depicting.' Of course this does not commit him to identifying the two activities, but it does leave it open to extend this analogy in what is, I think, a dangerous direction. And this is just what Shorter does in the following passage.

'We can speak of a picture as a thing, as when we say it is brightly coloured, and do not mean it is a picture of something brightly coloured. --- We may say 'This (picture -) hand is delicately drawn' or 'This (picture -) hand has blurred edges.' and we do not mean that it is a picture of a hand with blurred edges. --- It is a fairly well known fact that it is often difficult to visualise the faces of people we know well. We can get so far --- but the features elude us. Now when people describe this, they tend to say things like 'I tried to visualise the face, but all I got was a blur.' --- Now we may ask 'what was a blur?' What does 'his face' refer to? It does not refer to the face we are trying to visualise, nor do we mean we visualise his face as blurred. --- The blur -- is, so to speak, a feature of the image in its own right.' (op. cit.)

Now there certainly is a problem here for any analysis of visualising which conceives of it as an activity of the sort of depicting. Clearly when we try to visualise a face and get only a blur, we cannot say we are visualising a blurred face. Also it does make perfectly good sense to attribute properties to real pictures in their own right as objects, independently of those we would say were properties of what the picture is a picture of.

Given these two facts, one about visualising, the other about depictions of the picture sort, it is practically inevitable that an analogy between visualising and depicting will continue them, as Shorter does. It is very inviting to suppose that it makes sense to answer the question 'what is a blur?' when we try to visualise a face and get only a blur, with 'the image is what was blurred.' And it is ~~precisely~~ ^{precisely} because this is such an inviting answer in the circumstances, that I want to say the analogy is a misleading one. But let us take Shorter seriously for a

moment, and examine his suggestion more closely.

When I visualise a face and get only a blur, then let us suppose I draw a picture of the face as I visualise it, taking care to import into it, the degree of blurredness, which is a characteristic of my image if Shorter is correct. It follows then that just as the nose I have painted represents the person's nose, the ears, his ears, and so on, so also does the blur in the painting represent the blur in my image. But now what sense can we make of the process of representation in this sort of instance? How does this blur represent that of my image? Does it look like it, or is it in the same place in the picture? Suppose I paint a colourful picture. Could we say the colourfulness of the picture represents the colourfulness of my image? What would count as judging the degree of accuracy of this representation, and what as being mistaken in this judgement? Also if images are to be permitted features like colourfulness and blurs, then presumably they enjoy the whole range of properties which we attribute to real paintings. Just as I can have a square picture of a tower, as well as a picture of a square tower, so I will have to be able to have a square image, or a blue image, and so on. This is just like describing having hallucinations in terms of seeing a series of imaginary objects - it is the classic dualist fallacy of supposing there must be inner processes to match outer ones like writing or painting.

So if we take Shorter's suggestion seriously, and we have a right to do so, because he offered it as a solution to a philosophical problem, then we cannot consistently oppose all the other explanations in terms of seeming or imaginary or mental objects to which we have objected. Indeed there is a problem for an analysis

of visualising posed by the question 'What is a blur, when I try to visualise and get only a blur?' but it is not resolved by any reactionary analyses in terms of inner pictures and processes.

I have suggested that this error is likely to be made if we accept that visualising and depicting are analogous activities. In fact, this mistake rests not only on a 'mental pictures' concept of visualising, but also on a misconception about the true nature of depicting. Shorter appears to conceive a depicting as in some way necessarily tied up with paintings and pictures, brushes and canvasses. And if we think of producing likenesses as a necessary condition of depicting, then it is only too easy to suppose, given a readiness to accept inner process accounts, that if visualising is doing something like depicting, it must be doing something like producing real likenesses. And producing mental likenesses is only a misconception away from doing something like producing real likenesses.

I want to argue that restricting the concept of depicting to the production of likenesses, is to entertain far too narrow and misleading an idea of depicting. It is, I suggest a mistake to say that visualising is only something like depicting, because visualising is a perfectly good way of depicting, in its own right. Certainly it involves the production of no physical or mental likenesses, but there is no good reason to suppose that such activities constitute a necessary condition for depicting, though in some circumstances they may be a sufficient condition.

Before arguing this claim on its own merits, it may be illuminating to consider an analogous situation first - that of reading. Someone holding a book in his hands

and speaking the words that are written on the page before him, is reading. He can read in a loud voice or a quiet voice, he can articulate the words clearly or slur them, or pronounce them in a broad accent, but it will still be reading. Of course we will not always say of someone looking at a book and speaking the words, that he is reading. Perhaps we know he has never learned to read and is in fact merely pretending to read, having learned what the passage says from someone else and committed it to memory. We could not tell just from looking and listening of course, if it was a case of reading or not, we should have to know about the persons abilities - we have to know the context to see the action in order to know what to call it.

We can find out if someone has read a book by asking him questions about it - what the story was about, what sort of style it was written in, and so on. Even if he has not understood what he read, he can tell us why he failed to understand - the words may have been too big, the sentences too long, or the style confusing. Being able to tell us these things shows that he has read the book, but failed to understand it.

It is usually considered to be sufficient grounds for saying that someone is reading, that we hear him saying the words aloud while looking at the book and scanning the page with his eyes. Of course, he may be pretending - he may have memorised the page beforehand - but given that we know that he can read, that he has no motive for pretence, and that his eyesight is unaffected, we have perfectly good grounds for believing that he is reading. Certainly we come to understand the use of the word 'reading' by observing people in the process of reading aloud, and we learn to read by articulating each word as we come to it.

But now, suppose we give someone a book, opened at some specific page, and ask him to read that page, and suppose he does so, but without uttering a word or moving his lips. When he has finished, he claims to have read the page, and can answer questions about its contents, and has not read it before or been told of its contents. Here, as before, we would be quite justified in saying that he has read, although no words have been uttered, or any motions made with his lips. But what we should not be justified in saying, is that he has, done something like reading the page, or analogous to reading the page, for this would be to suggest that he did not actually read it, but only did something like reading it.

Shorter's error at this point would be to say that since no speaking is involved when someone reads to himself, then this is not actually reading, but instead only something resembling reading, perhaps complete with an inner or mental vocal system to take the place of the real one in 'real' reading. This mental voice, like the mental images in the case of visualising, will be attributed the same sorts of qualities of loudness, clarity of diction and accent which apply to our 'real' voice, in the same way that properties of the sort possessed by real pictures were assigned to mental images to account for visualising.

But now it is clear that we should not say that someone who reads to himself is doing something analogous to reading. Granted he is not speaking the words aloud, and neither are there any mental equivalents of the vocal system, nevertheless we are ready to say of someone who sits down with a book, and scans the pages line by line while uttering no sound or making no lip movements, that he is reading. Similarly, I suspect, we are prepared to say that someone who does sums in his head

rather than on paper, is doing arithmetic, and not just something like arithmetic. It is a mistake, a prejudice, to suppose that there must be an element of speech involved in reading, or an element of writing involved in doing arithmetic.

If it is still felt that speech is necessarily involved in reading - that is to say, that one cannot be said to read without speaking the words as one reads them, and that consequently silent reading is only an analogous activity to reading aloud, then let us suppose the following. If I decide to read from a book, I may start out by articulating each word as I come to it. But soon, for the sake of brevity, I begin to mutter the words under my breath, and then, to miss out, some of them altogether. Next I mouth the words without making any sounds at all, and finally even this ceases, and I make neither sounds nor lip movements. What are we to say of the different stages - that I fluctuated between reading and not reading? But surely what I was doing all along was reading, and if I fluctuated in anything, it was in the activities which accompanied my reading - the speaking followed by the lip movements, and so on, and not in the reading itself. Certainly I was not aware that I was slowly ceasing to read and gradually beginning to do something only analogous to reading. And is reading absolutely silently more or less reading than when I spoke some words and missed out others? Did I read only those I spoke? What did I do with those I did not speak -- certainly I did not ignore them.

What we may concede is that at some stage when we were first taught to read, speaking the words was a necessary part of reading - we were quite unable to read without articulating each word as we came to it. At this stage, speaking the words was for us, a necessary condition for reading, though the necessity was, of course,

of an empirical nature. But it does not follow from this, that there is some logical interdependence between reading and articulating the words read - it may just be that as a matter of empirical fact we are, at early stages in our development, quite unable to separate the activity of reading from that of speaking. We may suppose that the same is true of the development of the processes of addition, subtraction, division and so on, which go to make up the ability to calculate. There need be no reason to suppose that this ability is somehow conceptually related to or dependent on the writing of figures on paper or blackboard, just because this is how we first learn to calculate. (I am indebted to Roger Squires for this suggestion.)

What we are saying then, is that when we first learn to read, we do so by articulating each word as we come to it, and that this is the only way we are able to read. But it does not follow, from this that articulating the words is reading, though at this early stage we may only be able to read by this process of articulating each word. Later of course, we find ourselves increasingly able to do away with this activity, and since it is time consuming and tiring, we usually prefer to do so. Eventually we are able to read without having to resort to this process, and when this is true, speaking the words no longer has the role of sine qua non for reading, but assumes several possible roles, depending on our intention. Once we have learned to read without speech - and of course it is no good suggesting the substitution of some sort of mental vocal system to take the place of the physical one once this happens, then if we choose to read aloud - that is - to articulate the words as we read them, we may do so for a number of reasons. We may wish to show

someone how quickly we can read, or we may wish to allow them to share the story with us, or we may just like the sound of the words. But now, reading aloud, far from being the only way we can read, has become an activity which we may undertake for purposes other than that of simply enabling us to read.

This thesis immediately provokes the rejoinder - well if reading aloud is merely one way of reading, albeit an essential one for people who are learning to read, then just what sort of activity is reading silently going to be? If someone sitting silently with a book before him and making no movements is reading, then just what is reading silently?

We are resolved to deny that words like 'reading' can be taken to denote any activities which are in principle, unobservable, but what is left to us in the above case? Perhaps we could identify reading with some process in the brain, and certainly we would expect such processes to accompany reading. But the trouble with this thesis is that we want to represent reading as an activity - something we can be said to do, and can do quickly or slowly or on command. This does not seem possible, if reading is identified with certain brain processes, since these are manifestly not the sort of thing we can be said to do. Indeed they may be activities - but activities of the brain, and not of us. We can read quickly or on command, but we cannot direct our brain processes quickly or on command. And even if we could, as some proponents of Yoga can slow their heart rate or respiration speeds, yet this would not constitute directing our reading. Certainly controlling our brain processes would constitute an activity, and would qualify for consideration

as being identical with reading. But we can read quickly or slowly, and the corresponding activity for brain process manipulation would have to be, not controlling a brain processes, but rate of control. That is to say, if reading is identical with controlling the rate of a brain process, reading quickly will have to be identified with the rate at which we control the rate of our brain processes. This is not impossible or even too implausible - it corresponds to the concept of acceleration as rate of change in rate of change. However when we consider that it is possible to accelerate or decelerate our reading speed, the identity becomes implausible by requiring the manipulation of brain processes to bring about a rate of change in the rate of change of their rate of change. We might feel that this is more than most of us are ever likely to achieve, and yet we frequently comply with the request to 'slow down a bit.'

If reading is not to be identified with a brain process, then it seems we are left with the alternative of finding some other inner process which could plausibly be represented as something we do, or abandoning the claim that speaking the words, or mouthing them, are merely accompanying activities to reading, and instead identifying reading with just these sorts of activities. The former alternative is not too attractive - it requires us to find some inner or private activity - it must be private because no one sees it in operation when we sit motionless and silent while reading the book, which activity must yet only be private or unobserved due to empirical difficulties, and cannot be allowed to be the sort of thing which is in principle private.

However the latter alternative is, I believe, even more unattractive, in that

it would require us to say that someone sitting motionless and silent, except perhaps for eye movements, just is reading - that is, in a given context, what counts as reading is just sitting silently, moving the eyes slightly from side to side. Yet we know that it is quite possible to be doing this, and not be reading at all. Of course he may give answers later which make it clear that he was reading, but while we would surely interpret these as evidence that something else must have been going on besides the eye movements, the thesis we are considering merely takes these answers as criteria for re-assuring the eye movements as a case of reading.

Now we have said that reading is something we do - an activity - and yet what makes the case of simple eye movements into a case of reading, is what is termed the context in which we see these movements - in this case - the answers the person would give if asked afterwards about the book. But at the time of the eye movements, which is when the reading occurs, there seems nothing which would count as an activity, nothing which would distinguish this as a case of reading rather than just eye movements. All there is, is what we would say afterwards, if asked, and 'what we would say if asked' clearly does not denote an activity.

Thus this thesis seems quite unable to account for reading as an activity, in that it is forced to identify actions as reading, which can only be distinguished from quite different activities, if at all, by reference to what may happen in the future. This thesis can be seen to encounter similar difficulties if applied to different activities. Thus it would be forced to say that someone sitting absolutely motionless, and to all intents and purposes doing nothing, was thus visualising - that is - that what may count as visualising is just sitting still and doing nothing. But of course

visualising, we said, is something we do - an activity, and yet there is nothing resembling an activity to distinguish the person who apparently is doing nothing, and is yet visualising, from the person who actually is doing nothing, on the account offered by this thesis.

Again, if we consider hallucinations, the analysis offered by this thesis would be that having a hallucination is just saying one sees a pink rat, when there is no such creature present; staring wildly as if one really did see something, and so on. But here, the problem is that those activities which, for this account constitute having a hallucination, are all things which we could be said to do, while having a hallucination is surely not such an activity, in the way that saying 'I see a pink rat' is an activity. A similar account, in terms of reports, actions, and so on, would probably be given of seeing, and again we would feel that these were the wrong sort of things to identify with seeing, for seeing is surely not a doing, while all of these suggested components are doings.

So I think we are forced to reject this behaviourist account, both as a general account of mental activities, and in the specific case of reading. So what is our alternative? I think that the only answer we can give is that reading silently is something we do - an activity of ours, which all, or most, of us participate in. It is private and internal, but neither private or unobservable in principle - but merely in practice. We learn the use of the word 'reading' from observing cases of reading aloud, but to assert a necessary connection between reading, and speaking the words, is

unjustified for the reasons given.

I do not think we are required to go further, and attempt to say just exactly which activity in the body, is reading. It is enough to say that it must be something which we can be said to do; must not be in principle unobservable, and is separate and distinct from activities like speaking.

I want to say that it is a prejudice to insist on a necessary tie between reading and speaking the words aloud, and that it is unjustified to insist that only in reading aloud, is one actually reading, reading silently being merely an analogous activity - something like reading. And I want further to say that the situation with regard to visualising, is similar to that of reading, in that it is a mistake to argue that visualising is like, or analogous to depicting, and that you cannot have depicting without pictures or likenesses. It is wrong to say that visualising is like depicting, for the same reason as it is wrong to say that reading silently is merely like reading, and instead we should just say that visualising is depicting. Let us consider this thesis.

It is usually considered sufficient grounds for saying that someone is depicting, that he produces a likeness of someone or thing, that he knows what that person or thing looks like, and that he intended to produce a likeness of the person or thing. If someone produces a likeness, but without having set out to do so - perhaps it just happens to resemble the Prime Minister, then no matter how good the likeness may be, we will not say that he has depicted the Prime Minister, merely that it happens to resemble

him. Also, if someone sets out to depict a person, and as a result, produces a painting which only faintly resembles that person, nevertheless we may be prepared to say that he has indeed depicted the person. But now, just what is the relation of depicting, to the production of pictures, sculptures, and other likenesses? Shorter evidently considers it a necessary condition of depicting, that some such physical likeness be produced, such that any activity which does involve the production of likenesses can at best be considered merely analogous to depicting. We have seen how this leads him to consider visualising as a sort of inner creation of mental images, to correspond to the physical counterparts in depicting.

I want to say that while painting pictures, etc., is one way of depicting something, another perfectly good way of doing so is to visualise it. If it is felt that the production of physical likenesses is a necessary condition of depicting, then let us consider the following situation. We set out to depict some person we know, taking up brush, paper and paint. We begin by meticulously painting in each line in scrupulous detail. After a little while, however, we begin to leave out more and more of the smaller details, perhaps merely suggesting them with brief stroke of the brush. We are still concentrating on our task however, just as the person who does part of the sum in his head is still concentrating on getting it right. Only we do less and less of the brushwork as we proceed. At what stage are we to say that depicting ceases, and something merely resembling depicting begins?

Suppose now we turn to our audience, and instead of actually applying paint to paper, we just make the motions of painting, while saying things like 'the nose upturned, the eyes quite close together' and so on. Or suppose there is no audience, and we just say these things to ourselves. And perhaps now we slowly cease making painting motions, instead gazing at the paper and muttering to ourselves. Still, we are concentrating intently on our task just as much as before, and may even be unaware that we have stopped painting. Now assuredly, we are no longer applying paint to paper, but are we not still depicting, and if we are not, then when did we cease, and is it not strange that we seem still to be trying to get the persons' face right, with the correct expression, and so on, just as before?

But then it may be replied, 'if Van Gogh was not depicting when he painted portraits, then what was he doing?' The answer is that we are not holding that painting is not a perfectly good way of depicting, but only that it is quite possible to depict without painting, or producing likenesses, and so on. Just as reading aloud is a perfectly good way of reading, and writing the sum on the blackboard as we do it is a perfectly good way of calculating, so are painting etc. ways of depicting. But similarly, just as someone reading silently is still reading, and someone doing sums in his head is still counting, so someone who does what we call 'visualising' is still depicting. It is I think, a prej~~u~~dice to insist on restricting the use of 'depict' to those cases where paintings etc. are produced. To take an over-rigid view of depicting is, I think, also likely to lead to a restricted

view of the uses which the production of likenesses when depicting, can have.

Certainly, someone who is first learning to depict may well be unable to do so without the aid of paper and paint. For him, producing a likeness may well be a necessary condition - though we would say that the necessity was purely contingent. After a while however, he becomes able to dispense with likenesses, and at this stage the role of painting in depicting becomes considerably more diverse than the restricted view of depicting would have it. Far from being a sine qua non of depicting, we may engage in the production of likenesses to remind ourselves of how we had depicted the scene, or to show people how we would depict it, or as an aid while we are trying to depict it, and so on. A painting can thus be for something - for some purpose, as well as being, in the case of someone who is learning to depict, a necessary means to the end of depicting an object.

I think this account shows how depictions can fail to be successful. A good depiction is one which shows people what the object depicted, looks like, while a poor depiction, while it is every bit as much a depiction as the good one, nevertheless fails to show people just how the object looks, and perhaps only gives them a rough idea. There is also a sense in which a depiction can fail to be successful, however, inasmuch as we may be poor artists or sculptors, and be unable to depict the scene on paper or in clay. Yet we may have successfully depicted it to ourselves - that

is to say, visualised it. This corresponds to the case of the person who for one reason or another, is unable to write down his sums, and is forced to do them all in his head.

We must be careful to avoid the mistake, encouraged by talking of the likenesses produced while depicting with paint etc., as depictions, of supposing that it is the painting which depicts. Of course it is we who depict, and not the painting, painting being merely a way of depicting. And when we depict to ourselves - that is, visualise, then of course there is no depiction, in the sense of 'depiction' used to refer to paintings. (Though it is the dualist move, to suppose that there are such depictions, in the form of mental images).

We can now answer Shorter's question - 'what is it that is blurred, when I set out to visualise a face, and get only a blur?' The simple answer to this question is - 'Nothing!' The form of the question results from the mistake of supposing that visualising merely resembles depicting, and from the prejudice of supposing that depicting necessarily involves the production of likenesses. The question is intended to solicit an answer which involves a recourse to mental imagery, by suggesting that there must be something in the case of visualising to correspond to the pictures which are supposed to be indispensable to depicting. But we can answer the question without any recourse to mental imagery, simply by pointing out that when someone visualises a face, and gets only a blur, what happens is that he fails to visualise it successfully.

Now, if he wishes, he may demonstrate his failure by painting a picture in which a blur obscures the face. But this blur no more represents some blur on a mental image, than does the whole painting represent some phenomenological depiction. When he visualises a face and gets only a blur, this simply means that he has been unable to visualise that part of the face which he says is blurred.

Similarly, if it is asked what is black and white, when we visualise something in black and white, we shall say that there is nothing which is thus coloured, and that all that is meant, is that we have visualised the scene as if all the objects in it were coloured black and white. Any interpretation which seeks to suggest that when I describe what I have visualised, I am to be taken to be describing, or imputing properties to, mental images, runs into serious difficulties, the nature of which I will elaborate on, in the next chapter.

Roger Squires, in his article, raises an objection to the view that visualising is just depicting to one-self, when he says 'You cannot visualise what you are now looking at, though you could portray or describe what you are now looking at. Similarly you cannot pretend to be what you are-----'(Op. cit.)

This objection is intended to show that visualising cannot be a way of depicting, because you can depict something while you are looking at it, but cannot visualise it. Now I concede that you cannot visualise something while you are looking at it, since in this case visualising is

indistinguishable from seeing. However the objection succeeds only if we accept that the production of likenesses is a necessary condition for visualising. There is no reason to suppose that depicting to oneself - that is, visualising, is possible in those cases where we are looking at what is to be depicted. Squires' argument here rests on the assumption, which we are objecting to, that 'depict' entails some reference to likenesses.

What then are we to say of this activity called 'visualising'? Certainly we cannot allow that it be private and unobservable in principle, for this would effectively destroy the meaning of 'visualise' - we will go into this argument in detail in the next chapter. Nor do we wish to equate visualising with a brain process, for the reasons we considered in the case of reading. What we can say, is that visualising or depicting to oneself, is something we can be said to do, that if it is private and internal, then it must be so only contingently, that is, it is not unobservable on principle. Beyond this I do not think we can be expected to go as philosophers, any more than we can hope to say exactly what reading or calculating are. They are just things we can do.

At this point, having said that visualising is depicting to oneself - we could also say representing to oneself- perhaps to avoid the strong connotations which 'depict' has with the production of likenesses, I wish to go on to consider the problem of after images.

In 1651 Thomas Hobbes wrote of imagination 'For after the object is removed, or the eye shut, we still retain an image of the thing seen, though more obscure than when we see it. ----- And any object being removed from our eyes, though the impression it made in us remain; yet other objects more present succeeding, and working on us, the Imagination of the past is obscured and made weak; ----- The decay of sense in men waking, is not the decay of the motion made in sense; but an obscuring of it, in such manner as the light of the Sun obscureth the light of the Starres; which starres do no less exercise their vertue by which they are viable, in the day, than in the night.' ('Leviathan' Part one, Chapter two.) I have taken the liberty of changing the order of these sentences slightly, to preserve their meaning out of context.

Men are still claiming to see 'Starres' today, in the guise of after images. In 1965 K. Lycos wrote. 'Very often when I see an after image on the wall it does not seem to be part of the surface of the wall. Rather to the extent to which I fix my attention on the after image, the surface of the wall tends to come out of focus.' (Australasian Journal of Philosophy Volume 43, 1965.) Clearly then, after images still vie with physical objects for the attention of our eyesight, as much as did Hobbes' 'Starres.'

Now it is indeed true that when I stare for a time at a bright lamp, and then look away, I am left with what appears to be a fading image of the lamp before my eyes, and that this is normally referred to as seeing or having an after image. Although I hope to show that this is an entirely misleading and confusing mode of reference, yet we must acknowledge at the start, that it enjoys almost universal

acceptance, and that it is widely believed that it is appropriate to talk of after images as the sort of things we can see.

People, experts and laymen alike, even philosophers, say with the conviction with which we would defend the attribution of similar properties to tables and chairs, that after images are yellow or red, that they can be square or round or oblong, that they may be clearly outlined or blurred at the edges, and so on. If after images are threatened violence by the philosopher, then considerably more than the twenty thousand Cornish Bold in the case of Trevellyan, will know the reason why!

However before threatening any conceptual hatchet work on after images, let us briefly pause to notice a fact about the circumstances in which the term is employed. Its use is in order only when certain antecedent circumstances are known to have existed, or could have existed if we are unable to check up on them. Only when it is known that a person has been looking previously at an object of a certain sort - perhaps a bright light, or a coloured spot outlined against a contrasting background, do we permit a claim to see an after image. Even then of course, his report may suggest that he does not see an after image at all. He may report an image quite unlike anything he has just seen - may describe a chandelier, when all he has seen is a single light bulb.

However due to the framework within which the term operates, any reference to an after image will automatically involve the implicit claim that certain antecedent circumstances existed, involving us as observer, and an object of that class of objects which are known to give rise to after images in observers.

Thus the term 'after image,' involves what we may call a diagnostic element, in that by using it, the speaker is committed to making certain implicit claims about past states of affairs, rather in the way someone who claims to see a table or chair is involved, in similar claims about present states of affairs - ie - that the table or chair he claims to see, actually exists at this moment.

This conceptual framework is important in that it distinguishes after images from certain other forms of imagery such as imagination and hallucination. Also we shall be required to keep it in mind when we come, at the conclusion of this chapter; to offer a new analysis of after images; and it will be argued then, that this point about the logical status of after images is a pointer to the true nature of the occurrence we call seeing an after image.

We have here been enlarging on the framework within which the term operates, and have not been attempting a scientific account of what goes on when someone sees an after image. Indeed we could provide such an account, in terms of light rays striking the cornea and setting up a reaction which persists after the original stimulus is withdrawn. But while this would be an explanation of why we come to see after images, it would have nothing to do with the meaning of after image terminology. And it is with what people mean when they speak about after images, that we are concerned here. So let us move on to a detailed discussion of what may be meant by such statements as 'I see a square after image,' or 'after images may be positively or negatively coloured,' and so on.

Let us look first of all, at the sorts of properties people often attribute to

after images, and see whether the rather naive philosophical position thus identified, can be defended. Usually when these every-day sorts of statements are made, no philosophical position is consciously entertained by the speaker. Nevertheless important issues are involved in such statements, and we shall see presently, how an unquestioning acceptance of a philosophically confused position can lead to confusion outside the bounds of philosophy. To ensure that we are not accused of identifying a position which no thinking person would be likely to subscribe to, we shall fill out this naive position with remarks made by philosophers.

We began this Chapter by quoting Hobbes on imagination. He was not dealing with after images, which are different form of imagery from imagination, however I take this remark to be indicative of what I call the naive position manifested by common modes of reference to after images. I take Hobbes to be saying that when we see an object, it produces an image - what he calls 'the motion made in sense' - which image does not vanish immediately, but is rather obscured by other, brighter objects. These images become visible whenever there are no brighter objects around to obscure them, and they continue to exist while unseen, rather like stars in the day sky, when such brighter objects do happen to obscure them.

This, or something similar, is the view which I believe is commonly held about after images. They are some sort of faded representation which is created by our seeing an object of a certain sort, and which we continue to see for a time, after the original stimulus is withdrawn.

G. E. Moore says. 'But if we say of a blue after image, seen with shut eyes,

'it look blue to me,' that is a use of 'looks' such that from it there does follow, 'it is blue.' You can not see a blue after image without its looking blue to you.' (Commonplace Book, Page 151.) So to the description of after images that they are faded representations, we can add that they are coloured, and can be seen with closed eyes.!

D. M. Armstrong says 'As I once heard a philosopher say, 'there is something so life-like about after images.' This is a point which cannot be brushed aside. Surely when I have an after image or see myself in a mirror, there is something before my eyes. I am not just having a false belief; in some sense of the word, I am perceiving.' (Australasian Journal of Philosophy. Volume 33 1955.) So now we can add that it makes sense to say of these faded coloured representations, that they exist before our eyes, and that we do actually perceive them, and are not victims of a false belief.

K. Lycos says 'When sensory images are experienced as flat, their flatness is seen (not 'seen,') in the way in which the flatness of after images is seen.' (Op. cit.) Thus we can further add to our description, that after images are flat, and that this flatness is seen, and not just 'seen.'

Lycos defines this flatness of sensory images, in which class he includes after images, in terms of the characteristic two dimensionality of a surface bounded by a Jordan curve - that is, a surface which is bounded by a single closed curve. There is thus a mathematical formula available for determining the shape and size of any after image. This characteristic is also mentioned by Smythies (Philosophical

Review, July, 1958.,) and I shall return to it later. We may note that this two dimensionality is frequently referred to by psychologists also. Indeed the widespread use of after image terminology by psychologists is often considered to lend scientific authority to the status of after images. In giving a series of objections to Ryle's arguments against mental images, Lycos says - 'All these objections derive from the fact that psychologists have found it apt to talk about images in a way that involves treating them as entities of some sort. ----- It is significant that psychologists and, in general, people who concern themselves with the examination of mental imagery as such --- are prepared to attribute such spatial properties to visual images as Smythies mentions' (Op. cit.)

Now if psychologists, in carrying out their research, uncover empirical evidence in support of after images, then that is one thing, and needs careful examination to ensure that the evidence is properly described and presented, and that no philosophical position is illicitly incorporated either into the description of the data or the conclusions which are drawn. But it is also possible, that an uncritical acceptance of a common mode of reference, has led to ~~their~~ adopting a terminology to refer to data which is itself capable of a number of different interpretations, and favours no particular one more than any other. If this is the case, then the adoption of this particular mode of reference by psychologists cannot be considered to signify any philosophically important conclusions. Now would there here be any element of scientific authorisation for this form of terminology or its ontology.

I think there is a considerable amount of evidence to suggest that this latter possibility is the case, and I shall go on to give a specific example of an empirical

study in which the mis-description of data and an unthinking acceptance of the dualist terminology creates a great degree of confusion. However let us first sum up our picture of the naive view of after images, which we built up with the help of a number of quotations from philosophers. It should be noted of course, that we are not suggesting that any of these philosophers actually holds the naive view, as we have so far described it, and are only offering their remarks as indicative of that position.

After images then, are a sort of faded representation, which are coloured, two dimensional, are seen before our very eyes, are actually 'out there,' and so on. The naive position is strongly dualist, and has the courage of its convictions. While hallucination, imagination and visualising are phenomena to be treated with a degree of caution, even equivocation, it seems that there is some aspect of after images which makes unqualified dualists of us all. We are further assured that the weight of scientific enterprise is firmly behind a definite ontological commitment to images in general, and after images in particular.

So let us leave our consideration of the philosophical problems of after images for a moment, to see how these psychologists who are dealing with the empirical study of this phenomenon, have fared. We will consider an experiment by H. B. Barlow and J. M. B. Sparrock, two research psychologists, designed to estimate the brightness of after images. They describe their procedure as follows:-

'Crain and Vernon were thinking along these lines when they tried to estimate the brightness of after images by matching it with real light. They were able to make measurements on the after image for only two minutes, but they found that from

thirty seconds to one and a half minutes it was sufficiently bright to account for a large part of the total reduction in sensitivity. ----- However, in measuring the brightness of the after image they overlooked one of its important features - namely, that it does not move over the retina as do the images of all objects seen in the external world. The eye cannot be kept absolutely still even with careful voluntary fixation; as it moves, real images shift over the retina, whereas after images do not. --

'Techniques have now been developed whereby real images can be stabilised or stopped in one position on the retina. In the simplest method, a light-weight aluminium cup is held by suction on the anaesthetised cornea and the test object to be observed is mounted directly on the cup at the focus of a suitable lens. ----- When a well stabilised image is observed it is at first seen clearly, but after a few seconds sharply defined contours become blurred and fine detail disappears. ----- The cause of these changes is itself a matter of great interest, but what concerns us here is that the after image, being stationary on the retina, fades like a stabilised image, whereas the image of a patch of light viewed in the ordinary way does not.'

(Science Volume 144, 1964.)

Now it is interesting to note first of all, the way in which the results are described. The comparison was originally intended to be between the brightness of an after image, and that of a real light. But this is not how Barlow and Sparrock describe it. They say 'when a well stabilised image is observed, it is at first seen clearly ---- '- so that it seems now, that the comparison is between an after image and the retinal image of a real light - not the same thing as the light itself. It is important to decide whether we want to say that the sorts of things we see are

real lights, real tables and chairs, or instead that what we really see are images of lights, and images of tables and chairs. Either may be true, but they constitute radically different concepts of seeing, and it is important to keep a distinction between them.

This mis-description, I suspect, derives from assuming that talk about seeing after images can be taken at face value. The experiment does not show that the brightness of after images can be compared with that of real objects, but instead it merely pre-supposes this to be an intelligible venture. If we go on to look more closely at the proposed comparison, it becomes evident that if we take seriously the naive position's claim that we see after images, as Barlow and Sparrock seem to do, then quite radical conclusions will follow.

If we consider the comparison which the experiment is designed to permit us to make, then either we set out to compare the brightness of an after image with that of a stabilised retinal image, or we can compare the brightness of what produces the after image with that of whatever produces the stabilised retinal image - in this case the light directed at the subject's eye. Which of these two we choose will depend on the concept of perception we prefer. If we favour something like a sense-datum theory of perception, we may choose the first alternative, committing ourselves to the view that we do not see objects like lights or tables and chairs, but instead images or representations of them. Or if we favour the normal concept of perception, we will choose the second alternative, believing that we do see objects like lights, and not just images of them. But it will be impermissible however, to attempt to compare either seeing an after image with seeing the object producing a stabilised

retinal image, or seeing the object producing an after image with seeing a stabilised retinal image, since this would be to confuse the two concepts of seeing.

Of course it may be possible to break this rule, and to compare seeing an after image with seeing the object producing a stabilised retinal image, provided seeing an after image is not like seeing things like lights and so on. It may be that seeing an after image does not involve the eyes at all - we noted that it was supposed possible to see it with the eyes closed, so at least the eyes are not playing their normal role. Perhaps seeing an after image is being aware of a mental image - with a set of inner eyes perhaps. However this would seem to be outwith the scope of the experiment undertaken by Barlow and Sparrock, and since they make no reference to any such differences in seeing an after image and seeing a light or a table or chair, we may assume that by 'sees an after image' is intended the same use of 'sees' as in 'sees a light.'

Having thus clarified the two alternatives open to us in considering their findings, let us see if either lend support to the claim that it makes sense to talk about seeing after images. Well if we decide to compare seeing what produces an after image with what produces a retinal image, we avoid the 'image' theory of perception - that is, we decide in favour of seeing objects like lights rather than images of them. However this is only achieved by sacrificing after images as objects of perception. For we should have to say that what we see are not after images, but the objects which produced them. This is not necessarily unacceptable - as we shall see at the conclusion of this chapter - but it does mean that we can no longer consider after images as the possessors of visual properties, since we are resolved to deny

that we see after images. After images remain in our ontology, but they occupy a position similar to that of retinal images - they become a part of the mechanism whereby we are enabled to see things, rather than the sorts of things we actually see.

Clearly this alternative offers no support for the view that empirical studies will provide authority for the claim that we see after images, so let us consider the other one. Now we shall say that we do see after images - but at the cost of having to say that we also see stabilised retinal images rather than the light which produced them. Barlow and Sparrock seemed prepared to pay this price - we noted their comment 'When a well stabilised image is obscured, it is at first seen clearly ---' (Op. cit.)

But now, while support for the claim that we see after images has been afforded, it has only been so at the cost of denying that we see objects like lights and trees and houses. This is by no means necessarily a false conclusion - at least it has been argued, in several guises, by many eminent philosophers. But it is obvious that the 'empirical' discovery that we see after images has only been made by the device of converting all perception into perception of images. We have not discovered that we see images as well as trees and houses, but that we see nothing but images! Support has been gained for the claim that we see after images, but its' empirical content is nil, in that it relies on the device of deciding to treat all perception by sight, as perception of images rather than of objects like trees and houses.

Thus it seems that the outcome of this particular piece of scientific enterprise is the paradoxical conclusion that either no support at all is lent to the claim that

we see after images, or that support is withdrawn from the claim that we see trees and houses and so on. And it is clear that both of these alternatives are the result, not of empirical discovery, but of considerations more apt to the realm of metaphysics. To argue, with Lycos, that questions about the status of mental images in general, and after images in particular, can be settled by a recourse to the habitual modes of reference of scientific studies of these phenomena, is to abdicate a responsibility which is uniquely that of the philosopher. So let us return to our consideration of the philosophical problems posed by our enquiry into the status of after images, at the point where we left it - our discussion of what we termed, the naive position.

Let us look at some of the basic claims of this position, regarding the properties of after images, to see if they bear examination. First we shall examine the claim that after images are flat or two dimensional. George Sperling, an American research psychologist proposes the argument that after images must be flat, because while we can scan them with our eyes both vertically and horizontally, we cannot scan them in depth. (Human Factors, Volume 5, Number 1.) In short, after images are flat because that is how they look to us. (Perhaps also by design, in order to allow the eye to accomodate a large number in a relatively limited space!)

Now is it a good objection to this argument, that since after images move with the eyes - a property often remarked in the literature, this will result in their always presenting the same side to the subject, hence merely creating the illusion of flatness. We do not conclude that the moon has no other side, because it happens to rotate in such a fashion that we are prevented from seeing its other side. Might it not be that an enterprising neuro-surgeon with a television camera pointed over his shoulder will succeed in showing the world the other side of an after image,

and might we not busy ourselves in the meantime, looking for after images in the eyes of subjects with an ophthalmoscope? Might not a good close look in a mirror provide us with a glimpse of the other side of an after image, when next we are seeing one? If all this is ridiculous, then it remains to be shown why it is so. If we do see after images, if they are flat or two dimensional objects, then these search procedures should be intelligible ventures, and yet we know they are not.

But then perhaps after images are not real objects after all, but instead mental images. Immediately it seems Barlow and Sparrock were engaged in a fools errand, for how do you measure the brightness of an image when it is not physical, but phenomenological. However the holder of the naive position will reply - simple - you just compare it with the brightness of a real object. Unfortunately however, it is not at all simple - in fact it seems quite unintelligible to embark on any such comparison. But let us show this by moving on to the next claim which we shall consider, that after images are coloured.

What can it mean to say 'I see a blue after image?' The naive position represents this as a report on the colour of a mental image. When the psychologist produces a colour conversion chart showing the colour of after images which correspond with having first stared at a disc of a certain colour, the naive position says that this demonstrates the range of colours possessed by after images. Just as the brochure produced by a paint company shows prospective buyers the different colours of paint which they can purchase, so the after image colour chart shows people the range of shades which after images come in.

Now what is wrong with this - why is the conversion chart for after images unlike the paint brochure? Surely whoever produced the conversion chart for after images got something right? Well we can agree that he may have got something right, but not, that what he got right was the range of colours of after images. For if after images really are mental images - which means that they are quite private, and in principle, publicly unobservable, then what would count as getting their colours right? Getting something right implies the possibility of judgement, of appeal to agreed on criteria. But if after images are mental images, then this possibility is ruled out, of necessity. How could we know that the criteria used by someone to draw up a conversion chart were the same as those used by others, for we cannot examine each of their after images in turn, to see what criteria they are using, far less to see if they are being consistent. What if the after image which one colour chart represents by a blue disc, is the same as that represented by another chart, by a green disc, and so on. The matter of representation itself, becomes confused. Representing is a rule governed activity, and only functions, because, we are agreed on what counts as representing something. But how would we argue on how to represent after images, when none of us ever sees anyone else's after image. What I represent by a red disc may be quite unlike what someone else represents by a red disc. I may not even be representing its colour by a red disc - perhaps I mean to refer to its shape. At this point, it becomes clear that the colour chart, whatever it is doing, is doing nothing like representing the colours of after images. If it were, then it might as well be marked. 'Here be dragons,' for all the assistance it could offer anyone.

The same holds true for statements like 'I see a green after image' - if these

are offered as reports on the colour, or shape, or size etc., of after images, then they will become meaningless. My calling an after image 'green' will merely reflect a personal agreement or transaction with myself to the effect that I will call this after image 'green' in respect of this particular publicly unobservable property. But what today I call green, tomorrow I may call red, and yesterday may have called square. I cannot appeal to any external or independent criteria, for it is of the nature of after images, that none such can exist. Nothing will count as my being mistaken but unaware of it, since whatever I think is a correct usage, is for the duration of that particular whim, a correct usage. And of course in such circumstances, where correct and incorrect are decided, not by appeal to some public and independent criteria, but purely by personal fiat, then the concept of a correct or incorrect usage is eroded, and in fact there is just no use at all for such terminology.

But now, against my claim that there are no public criteria for deciding on what counts as a correct or incorrect usage of after image referring terms, the following argument is given.

'You say there are no means of checking up on statements like 'I see a green after image,' but suppose I say 'I see a green after image,' and when asked what I mean, point to a green object and say 'there - like that.' Am I not correct in my usage after all, and would there not, by the same token, be grounds for saying I was mistaken in my usage if I said 'there, like that,' pointing to a red object?'

This argument arose on the occasion of a philosophy convention at which I read a shortened form of this chapter, and it was accompanied by a fair degree of breast

beating, and outraged insistence that common sense be allowed to prevail. Its proponents took great pleasure, when confronted with the question 'What can it mean to say 'I see a green after image'?', in pointing to some handy green object and declaiming triumphantly - 'there - like that!'

Now does this argument show that we can, after all, provide public criteria for people's reports of their after images - that 'I see a green after image' is meaningful because we can explain ourselves by saying - 'there, like that.'? I think the answer is that it does not show that we can provide such criteria for after image reports. When someone says 'I see a green after image' and points to some handy green object while saying 'there, like that' what this shows us is that he knows the normal use for 'green' - he knows its use to refer to things like the green object he pointed to, and not, that 'I see a green after image' is a normal use.

If he points to something green and says 'there, like that,' this shows that he understands the normal use of 'green,' in the same way that his pointing to something red, while saying 'there, like that,' would show that he did not understand the normal use of 'green.' Pointing and saying 'like that' then, shows us that the person can use 'green' as it is normally used - the pointing and so on provides a public criterion for judging whether he can use the word as it is normally used. But the claim which was made, was that a public criterion had been discovered for his use of 'green' to refer to an after image, and not that such a criterion had been discovered for his use of it, to refer to the object to which he pointed. We will concede that a criterion is available for the latter usage, but none has yet been produced for the former.

It is as if someone says 'God is the Father,' and when we say - 'what can that mean?' he says - 'Like Mr. Smith is a father.' This shows us that he knows the normal use for 'father' - he did not say 'Like Mrs. Smith is a father.' But it does not show us what is meant by 'God is the Father' - it goes no way to explicating that usage or showing how 'father' is being used here. Similarly then, someone who says 'I see a green after image' and then says 'like that' while pointing to a green object is inviting us to suppose that because he knows how to use 'green' properly in the normal context, there must be an intelligible use for it in the context of after images. By pointing to the green object and saying 'like that,' he is regaling us with a demonstration of his ability to use 'green' correctly, in order to bait the trap of going on to use 'green' incorrectly, by applying it to after images.

If it is still felt that someone who likens the colour of an after image to that of some handy green object, is giving meaning to his report about the nature of his after image, then we can ask just how such a comparison succeeds in enlightening us about the nature of his after image. What if this after image, which he today says is like a green object in colour, he tomorrow says is like a red object? As long as he always points to a green object when he says 'green,' and a red object, when he says 'red,' he appears quite consistent in his reports. But this apparent consistency is only in picking out the correct colour of object to match his report. He may be quite hopelessly inconsistent in his application of colour words to after images, but of course as long as he always says 'like that' pointing to a red object, when he has claimed to see a red after image, then his inconsistency may be disguised. Just as before, it was possible that an after image which he today calls red, tomorrow

he may call green, and yesterday may have called square, so this difficulty reappears when we resort to 'like that' reports of after images. What today he says is 'like that' where this refers to some red object, tomorrow he may say is 'like that' where this refers to some green object, and so on. He is just as likely to make mistakes by trying to compare the colour of an after image to that of a real object, as he is to misdescribe it when applying colour words. And where there are no objective and independent criteria for judging the degree of success or accuracy of comparisons, which is the case when we are trying to compare properties of private and publicly unobservable objects, like after images, then nothing will count as a good comparison or a bad one, and the whole concept of comparing will collapse in such circumstances. When someone says 'I see a green after image' then, and points to a green object, the property of his after image which he compares with the green object could be anything or nothing, there is no way of knowing. In such circumstances, saying 'like that,' is no more helpful than just saying 'green,' because he is the only judge of what counts as 'like that.' We have no idea and could not have, what is meant in these circumstances, by 'like that,' since what is dealt with is purely private and internal. There is just no way of knowing what colour of after images, people consider to be like the colour of a green object.

However as we observed at the beginning of this argument, the person who produces a colour conversion chart for after images has surely got something right. We are agreed that it is wrong to represent the chart as showing the colours which after images come in, but clearly the chart has some use - it fulfill/s some useful purpose. It will be our purpose, at the conclusion of this chapter, to provide an account

which shows, among other things, how such charts do serve a useful function, and how we can provide an analysis of after image terminology which leaves room for colour predicates like 'green' and 'red.'

However there was one more specific claim which was advanced by the naive position, which I wish to consider. It is Lycos' claim that the size and shape of any after image can be represented by a Jordan curve, and we shall discuss it, because it offers a link with the next theses which we wish to consider with respect to the status of after images, a thesis offered by Lycos himself.

A Jordan curve is a mathematical function which defines the boundaries of two-dimensional surfaces enclosed by a single closed curve. Now if I draw such a figure on a piece of paper, then there will be a particular Jordan curve which represents it as it is situated on the paper, and it is in principle possible to find the curve which represents any two dimensional surface enclosed by a single closed boundary.

Let us imagine now, someone who sees an after image, and who wishes to find out whether a particular equation represents the perimeter of his after image. If the curve were on paper, he could carry out measurements, by superimposing an axis on the paper, to establish the proper figures for the equation. But how is he to do anything like this with an after image? Perhaps he uses an imaginary ruler to do it, but then the answer will be an imaginary one, and we wanted a real measurement. So let us try again.

Suppose I look at a piece of paper when I am seeing an after image, and by projecting my after image onto it, afford a means of measuring it with a ruler. Or

perhaps I just pick up a ruler and project the image onto it, and do it that way. But will this count as measuring? Suppose I look out of my window and hold up my ruler in line with the ruins of the cathedral which lies just outside my house. By doing so, the tower appears to be four inches high, and the walls, seven inches long. We could call this measuring, but it would be purely subjective and would yield no useful guide to the size of the building.

In order for the perspective not to make a nonsense of measuring, the object to be measured must be placed along side or against the ruler. Now of course we can see the after image as along side the ruler, but then we can see the cathedral along side the ruler also, taking great care to line up the walls with the ruler. But as we have said, this latter is quite insufficient for measurement of the cathedral, and it is argued that it is similarly impossible to do anything like measuring an after image, because it can never be brought into contact with the ruler. The best we could do would be to imagine the ruler along side the after image, and this is just now what we call measuring.

But if it is impossible to make use of the Jordan formula to discover the size of an after image, may we not yet make use of it to discover the shape of an after image? Again, this is impossible without measurement of some sort. Obviously, there will be different equations corresponding to different shapes of after image, and these will only be discovered by a process of measuring which, as we have seen, is ruled out in the case of after images. There is, in effect, no such thing as an equation which represents either the size or shape of an after image. If it is argued - but suppose my after image is circular - surely then we will know how to

represent it with an equation, since there is an established equation for the perimeter of a circle, then we can reply - how do you know your after image is circular? Surely the way to discover this would be by measurement and this is in principle impossible in this case. But it looks circular, comes the reply. Then we must argue as we did against the claim that after images are red or green or some other colour, that there is just no way of establishing any criteria for this use of 'circular.'

Thus we have argued that actual measurement of an after image is impossible, and consequently that the claim that there is a mathematical function which expresses their perimeter curve is valueless. However something like measuring is supposed to go on when someone projects his after image onto a ruler, and the claim is made by the dualist position, that if he is not measuring his after image, then he is measuring the look of his image. In effect, a move is made from discussing the properties of after images, to discussing their looks. This is the move that Lycos wants to make, and we shall discuss it as the natural successor to the naive position, presently. But let us first pay our last respects to the naive position, before taking our leave of it.

We have seen that as they stand, none of the claims of that position will bear examination. If after images are the sort of thing the naive position supposes them to be, then it is not possible to make any sense out of statements like 'I see a blue after image.' Since there does seem some use for such statements however, we are forced to conclude that the naive position is mistaken, and that its ontology embodies a conceptual error. So let us give it a decent burial and hope that the corpse is

not exhumed the minute we turn our backs on the cemetery. And let us move on to look at its successor.

We saw that if after images are private, mental objects, then there is no future in normal after image language as it stands. However when we dealt with the claim about the representation of the perimeter of after images by a mathematical function, we saw that a classic dualist move, characteristic of the sense - datum school of thought, would be to fall back on the conclusion that if we were not measuring a real object, then either we were measuring the look of a real object, or were measuring a seeming object. K. Lycos argues essentially this position, giving a new or extended interpretation to standard claims like 'I see a flat after image.'

He considers the objection to his contention that after images are flat or two dimensional, that 'flat' applies to the sort of things that after images are not - basically our objection to that claim - and rejects it. It is, he says, incorrect to argue thus, because the statement 'I see a flat after image' is what he calls 'a phenomenal description' (Op. cit. page 323.)

The content of this unfortunately phrased claim is that we are doing something different in calling after images flat, then when we call, for example, cinema pictures flat. When I say a cinema picture is flat, I am contrasting and comparing it with those three dimensional objects around me - chairs and people sitting in them. But when I call an after image flat however, I am contrasting its properties with those of three dimensional objects, not of being round, square and so on, but

of looking round, looking square, and so forth. These properties - of looking flat, looking round, etc., he calls 'phenomenal' properties. So when I call an after image flat, I compare it not with the physical properties of real objects which is of course the naive position which we have rejected but with the phenomenal properties of real objects - looking red, looking flat, and so on.

This is, as we observed, the move of saying that if we are not measuring the cathedral, then what we must be doing is measuring the look of the cathedral, only its manifestation here is in seeing 'looking flatness' or 'looking redness,' or at any rate of being able to identify and compare such properties as 'looking flat,' 'looking red,' and so on. This is the successor to the naive view, and it is certainly not naive if it is anything. It is, however, unsatisfactory for two reasons. Firstly it embodies, if possible, even greater conceptual confusion than did the naive view, and secondly, even if it did not, it is not sufficient to establish what Lycos says he has established - that we see after images.

Let us take the first point first. Lycos is arguing that it makes sense to say we see after images because the terms we use to describe them involve what he calls an analogical extension of normal terminology, such that when I say 'I see a flat after image,' 'flat' here refers not to that property of physical objects of being flat, but to the phenomenological property - he calls it a 'phenomenal' property and perhaps we should not disagree with his usage, of looking flat. It follows that if we see after images in virtue of their looking flat, then we must see real objects in virtue of a similar property - looking flat. If this were not the case, then we would not understand what it meant to say an after image was flat, since this term

would refer to something quite different - and quite private. So if this analogy between seeing an after image and a real object is to work, we must be able to perceive these properties in real objects. And indeed Lycos says:- '----- we can determine the phenomenal flatness of the image in a way similar to that we employ in noticing the 'flat looks' of photographs, cinema pictures, etc. (Op. cit. page 324.)

Now can it be correct to say that we notice things called 'flat looks?' What do they look like and which of the senses apprehends them? Lycos calls this property 'flatness,' but it is not flatness, because flatness is what flat objects possess in virtue of which they are flat. What we require in order to distinguish a phenomenological property, is 'looking flatness' or 'flat lookness.' And how is this property perceived? The whole point in the objection to saying we see after images is that you can not name phenomenological properties and that we just do not see phenomenological objects. Lycos specifically says we do see them - 'when sensory images are experienced as flat, their flatness is seen (not 'seen'.) (Op. cit. page 324.) But now, to prove this thesis, he is merely resorting to the assertion that we see a property of phenomenal flatness in real objects, which is just to assert what he wants to prove.

And how do we see the flat look of an object? Does it show up on an ophthalmoscope perhaps, or an x-ray apparatus? Now of course we can say 'I see the picture and it looks flat' - we may even say 'I see the picture looking flat,' but this is merely to say that the picture looks flat to me, and not to invent some property called 'looking flat' which we see in addition to the flatness of the picture. I think it is evidence of a conceptual error to claim that we see the flat - looks of a photograph,

as Lycos does, if this is intended to imply that we notice some phenomenological property of the picture, over and above the physical ones which lead us to say it looks flat. And if there were such properties, then it is not clear which of the senses would apprehend them. Certainly not eyesight, because this only reacts to physical stimuli.

The second objection to Lycos' analysis is that it fails to substantiate the claims he bases on it. If I see an object in virtue of its property of looking flat, then I cannot claim to see a flat object, but only a looking flat object, or perhaps an object which looks flat. I claim to see a flat object because I notice its physical property of flatness, and not the phenomenological property of 'looking-flat'. Thus since Lycos claims that it is in virtue of this phenomenological property that we see after images, it follows that we do not see flat or red after images, but only after images which look flat or look red, or which are looking-flat or looking-red. And of course this is not the claim which Lycos wants to make. He is impressed with every-day talk about after images as objects possessed of real properties, and he cannot accept an account on which the strongest claim we could make would be 'I see an after image which looks red', for we would want to say 'no - it doesn't just look red, it is red.'

Thus it seems that the successor to the naive position has fared no better, and I suggest that we are forced to reject it. Even if we permit the claim that we can see and name phenomenological properties, still this analysis is unable to account for the sorts of things we want to say of

after images - that they are red, and are flat, and not just look red and look flat.

At this point we may feel that there is no future for any analysis of after image language in terms of this being represented as a series of reports and descriptions, and that the only alternative is to follow Wittgenstein and Malcolm and reject the view that statements like 'I see a blue after image' are really reports or descriptions at all.

So let us examine Malcolm's account of after image language, to see if it offers an acceptable alternative. In his book entitled 'Knowledge and Certainty' Malcolm takes Wittgenstein's analysis of pain reports as given in 'Philosophical Investigations', and applies it to after image reports. When someone says 'I see a blue after image,' and if he has previously shown that he can use the term 'after image' correctly, then Malcolm says it is entirely senseless to suppose that he might be mistaken. That is to say, he takes reports of after images to be incorrigible - nothing will count as showing that they are mistaken.

He goes on to point out that it makes no sense to ask if I can see your after image, or indeed to ask if I see a different one either. Questions of numerical identity do not apply, he says, to after images, due to the logical framework of the concept. Nothing will count as seeing anyone else's after image, nor will it make sense to speak of after images existing unseen, for I cannot look away from my after image, nor look more closely, and indeed it is dubious if we should even talk of looking at an after image, since nothing will count as looking away from it. This,

I think, is Wittgenstein's point that it makes no sense to say we know we are in pain - or at least this is a redundant usage, since nothing will count as being in pain and not knowing it.

I am in agreement with all of these points, as long as they are made against a dualist concept of after images. If after images are a sort of private inner event, then what Malcolm says of such statements as 'I am seeing a blue after image' is correct. Does this mean then, that we must accept his conclusion, which is that after image reports are not really reports at all, but rather perhaps a sort of sophisticated piece of behaviour - a means of expressing or declaring something perhaps, but not a report or description?

I do not think we need accept this conclusion, any more than we are committed to saying something similar of other so called mental events like visualising, silent soliloquy and so on. Just as it seems highly implausible to suggest that someone in a doctor's surgery who is trying accurately to describe his pain is really just indulging in a form of sophisticated grunts and expletives, so someone giving a detailed description of an after image seems to be doing something rather different from making a declaration or confession.

Also if we are to take the position that what counts as seeing an after image is just saying things like 'it is yellow and round' after having spent some time staring at a bright light, then by the same token, we shall have to say that just sitting silently and staring at the wall is seeing an after image, in those cases where no reports are forthcoming. Of course we may not be able to say whether this

period of silent inaction constitutes seeing an after image or not, until we hear the reports which follow it. But the difficulty remains that we feel that seeing an after image is something that is going on while we were sitting silently, and in addition to sitting silently, while of course the reports of something yellow and round came afterwards. We feel that seeing an after image is something that must be occurring at the time of the silent inactivity, for which the later reports are evidence, rather than criteria. Something is going on, in the case of seeing an after image, we would want to say, to distinguish it from the case of the person who is indeed merely sitting silent and inactive, but if the only difference is in the answers which one gives after the event, then we cannot offer these answers - or the propensity to give them as something that is going on at the time that seeing an after image occurs.

There is also the difficulty for this rather behaviourist account, that the sorts of things it offers as constituting seeing an after image are all activities which we could be said to do - I sit silently, and then I give a report like 'it was yellow and round,' and so on. But while seeing an after image is something which we all experience, yet it is doubtful if we would want to say that it was something we could be said to do - an activity of ours. Certainly we would not say it involved an act of will - I cannot help seeing it, it just occurs. However saying 'it is round and yellow' is, as we have said an activity of ours, and does involve an act of will. Thus again it would seem that seeing an after image, and giving a series of answers and so on, are just not the same thing at all.

Of course, our point here is not, that people making after image statements

really are describing inner mental events, but that neither are they merely indulging in a long winded confession, or the like. Something very like a report or description is going on, and it is quite implausible to suggest that all there is to after images is a period of thoughtful silence, followed by a set of ^{properties} ~~properties~~ to make statements such as 'it was yellow and round,' and so on. Seeing an after image clearly is like seeing a real object, and the degree of accuracy and meticulous description, which people who see them indulge in, is quite implausibly represented at the level of a complicated confession or a sophisticated expression of one's feelings.

But yet we have seen, surely conclusively, that seeing an after image cannot be anything like seeing a mental image or a seeming object. If we are to persist in saying it resembles seeing, then we must find something which is publicly observable, and which it is still plausible to say is seen. My suggestion will be that what happens when we see an after image, is that we perceive the object we know to have caused what up till now, has been called the after image. We do not see the object of course - for often our eyes are shut, but we do perceive it nevertheless. I shall call this form of perception, after imaging.

However this is a conclusion which is best argued for by first indulging in a process of elimination of alternatives. So let us return to that task by considering the last of the positions which I wish to examine. This is the thesis that seeing an after image is something like seeing a real object, except that there is of course, nothing which is actually seen. This thesis is simply stated in a different context, by J. E. R. Squires in an article entitled 'Visualising' (Mind 1968.) There, he says that visualising is seeming to see; This thesis is unacceptable, for reasons which

I set out in the chapter on visualising. However this analysis of after images is in principle similar to that offered by Squires for visualising.

It is suggested then, that seeing an after image is like seeing a real object, except that nothing is actually seen at all. This approach avoids resorting to the mental images and phenomenological properties objected to earlier. It does not claim to say exactly what is going on when we see an after image but merely points out a number of similarities which justify the claim that seeing an after image is like seeing a real object. The grounds for making this claim are that people with after images can give the sorts of answers given by people seeing real objects - 'it is red,' or 'it is square' and so on, while the grounds for saying that of course nothing is actually seen, are those arguments we have brought against the positions which were in favour of entities called after images.

Thus someone with a red, square after image, is said to seem to see a real red, square object, except that of course no such object is present. If it is asked how he comes to seem to see such an object, then an explanation can be given in terms of his having stared at just such an object previously, or at least at some such object. This, of course, is not part of the meaning of 'I see an after image,' but it does explain why he seems to see a red square object.

I do not believe that this thesis can be finally refuted, in that it is quite defensible as far as it goes. Its difficulty is that it gives too restricted an account of after images - it cannot account for all of the elements of what we call seeing an after image. Suppose I ask someone to stare for a time at a bright light,

and then look away, and he does so, and then I ask him to look at a blank spot on the wall. Suppose now, I ask him if he noticed if the light bulb had a round filament, or a square one, and he answers that he did not notice, or that if he did, he has forgotten. What then are we to say, if on looking at the blank spot on the wall, he says 'I see an after image - it is round and has a square part in the centre?' What if he can even count the number of segments which make up the filament of the bulb? Or again, we may show someone a square of coloured paper, with a series of numbers in contrasting colours painted on it. We follow the same procedure as before, and discover that our subject can do what he calls reading off the numbers from his after image, even though he had forgotten them on seeing them before.

It seems that someone with an after image is informed of how the world looks, in much the same way he is provided with information by seeing something - he perceives colour, shape, and so on, and this corresponds, often exactly, with the colour or shape of the object at which he was earlier looking. It is indeed, almost as if he sees it again, in that he can tell us things about its appearance which he failed to notice when he first looked at the object.

I think this informative contact provides grounds for rejecting a thesis which represents seeing an after image as something like seeing, except that nothing is actually seen. It seems implausible to say of someone with an after image who tells us things about the appearance of the light bulb, and claims to have perceived them, that he only seemed to see these things. Indeed we might say of someone with a hallucination, that he seemed to see things, where we are suggesting by our use of 'seemed to see,' that of course he did not actually see or perceive anything. But

if we are to say of someone with an after image, that he sees nothing at all, that no perception is involved, then how are we to account for the informative content of after images?

Thus while it may well be true of hallucinations that we only seem to see real objects, and really see nothing at all, after images seem quite a different matter. It seems to the people seeing them, as if they really are seeing something, and their reports seem to confirm this, in that they can tell us of features of the object concerned - the light bulb or coloured square, which they could not remember, or perhaps did not even notice before. Another important difference in the case of after images, is that their conceptual framework restricts the use of 'after image' to circumstances in which we have just seen a real object. Thus there is a ready made link with the world around us, should we wish to represent after images as some form of perception, which does not exist in the case of hallucination.

We are not just arguing here, that someone with an after image can make deductive inferences about how the world must look, in the way that someone who sees a mirage - that is, seems to see a palm tree when there is nothing there at all, - may infer that the air is being made to behave in an unusual way by its being over-heated. We are arguing that someone with an after image does not infer from it that the light bulb has a coil with six segments, instead he actually sees or perceives the segments. He may have to infer that what he sees really is true - he may or may not believe it, but nevertheless he sees or perceives something. The dualist immediately says it is an image, which he sees, but we have rejected this approach, and consequently need to provide an alternative.

Thus I think we must reject the 'seems to see' analysis because I believe it to be inadequate to account for the perceptual nature of after images. We want to say that the person with an after image does not just seem ^{to} see something; instead he actually does perceive something. Only thus can the full nature of after images be brought out, and justice done to the strong belief that there is something there which we see, and similarly only thus can we claim to have taken note of the conceptual limitations on the use of 'after image' which as we pointed out at the start, resemble those on the use of 'see.'

But what is seen - certainly not an after image - or else we are back at the naive position. And not a seeming object either, for this is no better. And how can we say anything is seen, when the eyes may be closed and yet an after image perceived? Well let us make it clear that we do not see after images - we may take this to be conclusively demonstrated. Yet we are forced to take some notice of common usage, and to account for the sorts of answers people with after images can give which lead us to suppose that they are in some way able to perceive objects like light bulbs and coloured squares.

Let us take the case of glimpsing as an analogy. It is a perfectly good use of the term, to say ('I glimpsed the house,' by which is meant, 'I saw the house briefly.' We can also say 'I caught a glimpse of the house' which means exactly the same. We may even say 'I saw a glimpse of the house' as long as this is only an elaboration on the other usages, and is not intended to suggest that there is anything called a glimpse, which I saw, as well as the houses. Glimpses then, are brief looks, and to avoid any dualist confusions, it is better to say, glimpsing is

looking briefly. But there is nothing called a glimpse which is seen - when we talk in this way we are really only indulging in some relatively harmless mixing of concepts, which everyone understands as just that.

Now let us return to after images. I suggest that 'I see an after image' is analogous to the confused, 'I see a glimpse,' and is permissible only in so far as no one really imagines that there is anything called an after image which is seen. But now, the important question, what is, in the case of after images, analogous to 'I glimpsed the house?' I am forced to concede that such is the extent of the confusion over after images, that the correct - that is unconfused form, has never been produced. Thus we are left with the choice of continuing to use 'see,' or introducing a new term, I prefer the latter, because as we shall see presently, these are good reasons for not adopting 'see.'

The term which I suggest we make use of is 'after imaging,' where this is analogous to 'glimpsing,' and thus instead of 'I see a red after image,' we would be better off saying 'I after image a red object.' The claim we are making then, is that after imaging is a form of perception, where what is perceived is the object which the conceptual framework of 'after image' requires us to have been looking at previously. We shall no longer say 'I see a red square after image' but instead 'I after image a red square object,' where the object will be whatever it was, we were looking at earlier. This analysis would immediately collapse if no such object were identifiable, but as we pointed out at the beginning of the chapter, we may only use 'after image' in precisely those circumstances when such an object is available.

It will remain permissible to talk of after images, as we do of glimpses, but

in the interests of avoiding the widespread confusion which this usage has created, it might be better to suspend it, at least until everyone realises what is going on when we see an after image.

But now, when I claim to see a house, this claim is refuted if no house is present which I could have seen, yet we frequently after image objects which are no longer present. When I after image the light bulb, perhaps it exploded just after I looked away from it, yet this does not affect claims to after image it. However this objection is not as difficult to meet as it seems. Often we grant claims to see objects which are no longer present, or are no longer as they were. It makes no difference to the claim to see a star, that it may no longer exist. That the light rays from it took thousands of years to get here, is a scientific fact which does not affect the meaning of 'see.' It is a perfectly good use of 'see,' to say we can see objects which no longer exist, and consequently there is no reason to jibe at the time lapse of after imaging.

But then it may be replied that even though in the case of the distant star, the possibility exists that it no longer emits light, perhaps has even exploded, nevertheless at the moment when we claim to see it, light is just arriving from it, and in the case of after imaging, light has (long) ceased to reach us from the light bulb. However again the same sort of answer is available. When light reached the eye, it takes a finite time to react with the cells of the retina, and for the electric impulses thus created to reach the brain. This time lapse does not affect the use of 'see,' and there is no reason why it should affect the use of 'after imaging.'

Nor need we make our point with reference only to seeing. We are often prepared

to grant the claim that we smell the cheese long after it has been laid to rest, and again it is a scientific discovery in no way affecting the meaning of 'smell,' that small particles of cheese remain in the air after the cheese has been bodily removed. We do not smell these small particles - what we smell is the cheese, just as what we see are trees and houses, though the scientific explanations in terms of light rays and so on. But we do not see photons - we see trees and houses.

But then it may be objected that when I want to stop seeing the light bulb, I close my eyes but that when I after image it, there is nothing I can do to 'switch it off.' However this only shows that after imaging is not quite like seeing, and not that it is not a form of perception. When I put the lemon juice in my mouth, or hold the cheese to my nose, I continue to taste and smell for a time, and can, do nothing to switch it off. So this is no problem for after imaging in particular.

What then of the objection that when I after image a blue spot, in fact when we looked at it, it looked yellow. How can we explain the discrepancy between how something looks, and how we after image it? For we want to say that we after image the same sorts of property - colour and shape - that we see, and not, of course properties like smell and sound, since we are trying to account for people's reports, which are in terms of 'I see a red after image' and so on. However there is no real problem here either. Often when I see hills in the distance they look purple, when in fact they are really green or brown. Similarly the spot which I after image blue, in fact looks yellow to normal sight. This is just a fact about after imaging, that things appear different than they look. Conceivable if we relied on after imaging, we might say that the spot which looked yellow was really blue because that is how

it appears when we after image it. However to allow for the discrepancy between seeing and after imaging, and to acknowledge the greater reliability of seeing, we can say 'I after image the spot as blue' rather than 'I after image a blue spot.'

A more serious objection runs as follows. If after imaging is different from seeing - as it must be, for we can do it with closed eyes, after the object has been removed, and so forth - then how can we use words like 'yellow' 'round' and so on to describe what we after image? The answer, I think, must be that after imaging a yellow spot is like seeing a yellow spot, except for the time lags, lack of clarity, and so on. Certainly we are not suggesting that 'yellow,' 'blue' and so on apply to some private, inner, mental image. They apply to publicly observable objects, and we know how to verify uses of them. 'Yellow' and 'blue' mean just what they always meant, when used in after imaging. So perhaps the question is, 'what does after imaging mean?' To which we must just reply - after imaging is like seeing, except that there are time lags, we are not able to give such precise descriptions, and so on.

If it is thought implausible that after imaging should be like seeing, we can point out that some of the other senses resemble each other - people are constantly mistaking what they taste for what in fact they smell, it requiring the advent of a heavy cold to bring the error to light. Also people can indulge in the same sorts of activities when they after image, as when they are seeing. They can disagree about the colour of the object, they after image, they can even stare for a time at it in order to after image it more clearly or to settle a dispute. Of course it is unlikely that they would do any of these things, but in principle it is possible,

when, if after images are represented as mental images, such actions would not even be intelligible. Also the colour conversion charts produced by psychologists now make sense, when before they did not. They tell us that a spot which looks yellow to eyesight, will look blue to after imaging. But if they are to represent the colours of phenomenological entities, then they are worse than useless.

There is a tendency, on hearing this analysis, to retort - yes, but what is it that is blue when I have an after image, if it is not the after image, and it is not the original spot, which was yellow? The answer of course is that what is blue is the spot - or at any rate there is the spot appearing blue. Of course it is not actually blue. Neither are the hills actually purple, and yet if we ask of them, 'what is it that is purple when the hills are actually green?' we can only reply - 'it is just the hills appearing to be purple.' To ask this question of after imaging is to have missed the point of the analysis. We are resolved to do away with something that is blue when the real spot is yellow, which something was invariably identified as a mental image. All there is, is the real spot, and nothing else.

Scientifically, our claims will be readily granted, for there is plenty of empirical data to suggest that something goes on when we report after images, like what goes on when we see real objects. This cannot be taken as evidence in favour of our analysis rather than perhaps the 'seeming to see' analysis. But at least there is this scientific basis, should we wish to verify at that level, ^{for} the claim that perception is involved. At least the empirical data shows that we may be correct, though it cannot show if indeed we are correct. We may note, that of the original scientific analysis we considered, we may say that what was investigated was not

whether an after image was as bright as a small point of light, but whether the object after imaged, appeared as bright as the small point of light. This is an intelligible enquiry, while as originally conceptualised, it was not.

As we have said, this analysis relies on the original conceptual framework of after image terminology which only permits the use of 'after image' in circumstances where we have previously been looking at an object of a certain sort. This explains why we are not suggesting a similar analysis for such phenomena as hallucination. We will not say of the person with a hallucination, who seems to see pink elephants, that he hallucinates real pink elephants, because there are no grounds for supposing that anything like perceiving goes on. In effect, you can visualise or hallucinate pink elephants, without there being any real pink elephants involved at all.

Of course the presence of suitable objects on which ^{to} base a claim to perceive, is not in itself a reason for saying we perceive. It is only a necessary condition of such an analysis. The reason for our claim that people after image real objects, is that this is the only analysis of all those we have considered, which avoids conceptual errors, and which adequately accounts for what people believe to be true and for the abilities they possess. In effect, we are resolved to resist at all costs an analysis involving mental images or seeming objects, and of the alternatives neither a Malcolm type analysis, nor the pain analogy or 'seeming' to see' analyses, are able to offer an adequate account of after images. In the circumstances then, it is argued that we have no choice but to adopt the only remaining analysis which offers a full account of everything we wish to say of after images, even if it requires a degree of terminological innovation.

CHAPTER THREE.

The form of mental imagery which I want to discuss in this chapter, derives from a prejudice about the nature of seeing. It has been christened 'Iconic Imagery,' and unlike visualising and after imaging, which are activities with which we are all acquainted, this form of imagery has been evoked as part of a technical account of certain phenomena connected with sight. The term 'Iconic Images' is that given by Ulric Neisser, a research psychologist, to the images which he believes take a part in a particular form of short term memory, which I shall discuss presently. This form of imagery is also believed to play a significant part in our perception by sight, of the world, by another research psychologist - George Sperling. We shall consider the accounts offered by both men, in that they offer the opportunity to put into practise, the philosophical principles which we have worked out in the first two chapters. Let us look first at Neisser's account.

Experiments by Sperling, and by two other psychologists, Averbach and Coriell, have shown conclusively, that our ability to recall the contents of a list of letters or numbers, a short time after seeing them briefly, is limited to a recollection of four or five letters or numbers. Specifically, someone presented with a tachistoscope exposure of a table and three rows of four letters per row, is able to recall only the letters in the first row, and perhaps one or two in the second, those in the bottom row being lost to him completely. So far, this is in accordance with the known limitations on short memory.

However if a code is now arranged, whereby if a subject hears a high note, he is to recall the top row, a medium note the middle row, and a low note the bottom row, and provided this note is played within one second of the disappearance of the table,

then he is able to give the letters in any of the three rows. He cannot necessarily recall any more than the four or five of before, but he appears able to choose which four or five to recall, and this after the table has disappeared, because of course the signal note is only played after the table of letter is flashed off the screen. The function of the signal then, is to inform the subject which row to choose to ~~retain~~, but its timing is vital - it occurs after the table has vanished, and consequently, it would appear that the ability of the subject to choose which row to retain cannot be explained by his having any recourse to the table itself.

It was also discovered that whatever accounted for this ability to choose what to remember, was very short lived. If the signal note was delayed for much more than one second after the disappearance of the table, then the subject could no longer respond to it, beyond the normal ability to recall the first four or five letters. Added to these findings were the reports of the subjects themselves, who behaved, when the signal was played within the one second time limit, as if they could still see the table. Sperling reports: 'In fact naive subjects typically believe that the physical stimulus fades out slowly' (Human Factors, Volume 5, Number 1.) Neisser gives the following account of these discoveries and how they are to be interpreted.

'The problem would be resolved however if the visual input were somehow preserved for some time, even after the stimulus itself was over. Happily this turns out to be the case. Our knowledge of this brief but crucial form of visual perception owes much to the recent and seminal experiments of Sperling, and Averbach and Coriell. Their work leaves no doubt that the subject can continue to 'read' information in visual form, even after a tachistoscope exposure is over. This kind of transient memory is in a sense the first visual cognitive process.'

'It seems certain then that the visual input can be briefly stored in some medium which is subject to very rapid decay. Before it has decayed, information can be read from this medium just as if the stimulus were still active. We can be equally certain that this storage is in some sense a visual image.'

'The subjects say they have looked at something and it needs a name ----- . I will call it 'the icon,' or 'iconic memory.' 'Sperling's data suggest about one second's delay before the icon apparently became too unclear to be of any use.' 'The icon remains legible for as long as five seconds if the past exposure field is dark, but less than a second if it is relatively bright.' (Ulric Neisser. 'Cognitive Psychology' Pages 16 - 20.)

So it seems that Neisser wants to account for the experimental evidence, by reference to a rapidly fading image or representation of the stimulus, at which we are permitted but a brief glance, in order to remind ourselves of how the original looked.

This short term memory faculty is thus based more on a form of perception than recall, in which information is derived from a pictorial representation of the stimulus, which representation Neisser calls an 'icon.' Neisser is not too clear on the mechanics of this operation, but it seems that what is envisaged, is that while we are seeing things, there is a constant stream of input from the eyes to the brain, and that when we cease to be confronted with the object seen, this input persists or is preserved for a brief time, in the brain or optic nerve. While the input persists, it gives rise to a series of images which are pictorial in nature, or instead actually consists in a series of such images - Neisser does not say which,

and it is these images which are the icons of 'iconic memory.' It is as if, when the real stimulus which ^{we} were seeing is removed, the visual system is ready with a stand-by in the form of a series of images - exact replicas of the objects seen, which we see instead.

Now what is indisputable in this whole matter, is that people do, under the conditions described, display an increased - perhaps we should call it different - memory ability, in that they can answer questions which normally they could not answer. Neisser goes further, and also takes it as beyond dispute, that this ability cannot be accounted for by the subjects having had access to the real stimulus, because the experiment is designed to prevent this.

Given the assumption, Neisser can go on to ask in effect - 'what is it that the subjects are seeing when they cannot be seeing a real object?', and answer it with 'an image' But now, need we allow this move to be made? Let us look further at its implications.

We have argued that there is a problem to be resolved - the increased memory ability of the subjects, and Neisser's answer is that since the subjects cannot be seeing a real object, then they must be seeing an image. Now what can this mean? Neisser says that this process - the perception of these images, is in a sense 'the first visual cognitive process.' But now this suggests that the perception of images of real objects is in some way basic to all perception. That is to say, not only do images attend a few isolated sets of circumstances, like those in the experiments, but in fact images attend all cases of visual perception.

Now this is not necessarily absurd, but it does constitute a fairly radical

account of perception. To say that what we see, are not real objects, but images of them, which is what Neisser seems to suggest, is to maintain, with Locke, that there is a complete dichotomy between real objects, and ideas or images of them, which latter are all we perceive. In fact, Locke denied that these ideas resembled in any way, the secondary qualities of objects which give rise to these ideas in us, while Neisser neither asserts or denies such a resemblance, but merely assumes it. However the matter is not as simple as that.

If all we ever see or perceive, are images of objects, and never actually the objects themselves, then we can no longer claim to be directly aware of how the world is, by perception. But more than this, we cannot even claim to know indirectly, how the world is, since our entire knowledge of it, to the extent which we perceive the world, is knowledge of how images look, and not real objects. Now we might argue that we could infer from the image of the desk which we see, that there is in the world, just such an object - that in other words our images resemble the objects of which they are images. But how is such a resemblance to be tested, how is it to be found accurate or inaccurate, if we can never directly perceive one of the set of objects with which the resemblance is being asserted? At best, we can only infer that images resemble real objects, and on what grounds could such an inference rest - what would count as evidence for or against it?

Nor is Locke in any stronger a position in denying the resemblance of ideas to the qualities of real objects. For just as there is no conceivable way in which evidence can be found to support the claim that images resemble objects, so none can be found to support the contradictory claim that ideas do not bear a resemblance to the qualities of objects.

However, not only would this interpretation of Neisser involve him in a fairly radical account of perception, but indeed such an account would be of no value to him. The problem he faces, is to account for the increased memory ability of subjects. However if all perception now becomes perception of images, then it is evident that in order to account for this unusual ability, it is of no avail to resort to an explanation in terms of perception of images, since these are now considered to be the usual objects of perception. If anything, we would require to resort to an account in terms of images of images. Where the naive subject imagines that his image fades slowly from sight, we shall explain this belief by saying that in fact he is really seeing an image of an image.

The whole purpose of Neisser's account, which is to explain what we see when we cannot be seeing real objects, by introducing images as objects of perception, is destroyed if we then proceed to install images as the normal objects of perception. If we do this, we leave the way open for an infinite regress from images, to images of images, to images of images of images.

Thus perhaps we should offer Neisser the benefit of the doubt as regards the interpretation of his statement about the perception of images being the first visual cognitive process. The question then becomes one of avoiding a complete dichotomy of internal and external, while still embodying in the resultant account, the crux of Neisser's thesis, which is that short term memory depends on the perception of images. Perhaps a possible alternative to a strict line of demarcation, is a process of alternation which allows that we see both images of objects, and real objects. So let us examine the possibility.

We presume now, that the proper account of the experimental data, is that when a stimulus confronts our eyes, then this is what we see, all right, and not just an image of it. However once the stimulus is removed, then indeed we do see an image of it, which image is called an icon. But now, having established this as Neisser's position, what is to be understood by saying we see an image, having established that this is in some way different from the sort of thing we normally call seeing? Up till now, it has remained open that it might be the case that when Neisser speaks of seeing an image, he is only indulging in a variety of figurative speech, and that he intends precisely what is normally intended by normal perception language. The operation of the eye is to throw an image onto the light-sensitive retina behind the lens, and a few psychologists tend to slip into the error of speaking as if this image is what is seen. It was possible that Neisser was committing such an error. However we have seen that his account is destroyed if we represent seeing images as the normal process of perception. Consequently Neisser is committed to implying, by his reference to seeing images, something quite different than what goes on when we see normally. We must attempt to discover what this could be.

It is certain that either the image is a physical image or a mental one. Let us ask if it could be a physical image. If this is the case, then there seem to be two possibilities. Either we mean by 'physical image,' the sort of thing that a photograph or 'Identikit' picture is, or we mean to refer to the input from the eye to brain, in the form of electric impulses and chemical reactions. If the former is what is intended, then they would be discovered - or could be discovered, by neurologists and eye-surgeons, and none such have been discovered. Also it is not clear how, even if these images did exist, they would in any way be available to be

perceived. The suggestion that television sets must soon be blocked up with dead cowboys and American Marines, would achieve a fair degree of reality in such a situation.

So we shall assume that by 'physical images' is intended some sort of reference to the input from eye to brain, which occurs when, and for a short time after, we see things. But now, how will this resolve Neisser's problem of accounting for short term memory? While it may indeed be true that these inputs persist for a time after the original stimulus is withdrawn, thus explaining how we come to see something, yet they can hardly be offered as substitutes for the stimulus - as the sort of thing we see. We would want to say that activities like electric impulses and chemical reactions occur at a different conceptual level from activities like seeing, which latter are activities which people do - which we do, and not which eyes or brains can be said to do, without, as Churchill put it, some risk of terminological inexactitude.

To suggest that these electro-chemical reactions constitute what we see, and not just how we see, is to suggest that seeing is an activity of the eye or brain, and while it may be acceptable at the level of 'Reader's Digest' articles on the working of the human body, to talk about the eyes seeing things, it will hardly do to elevate this sort of metaphorical language to the level of a philosophical theory. It is as if these chemical reactions were to the eyes or brain, what real objects are to us, we were busily engaged, at some conceptually different level, in watching an action replay of the last few seconds of viewing which took place at the original conceptual level. And even if this were possible, yet it could hardly account for our increased memory ability, since there is no reason to suppose that what goes on at one conceptual level, is relevant or informative in the required manner, to what

goes on at a different level. Even if the flowing of electric impulses through the optic nerve does occasion some sort of inner film show, still there is no reason to suppose that such a discovery offered the solution to the problem in hand of what it is that people see which enables them to give answers which they could not otherwise have given.

So it seems we must abandon this first possibility - that icons are physical images, and try the second alternative - that instead they are really mental images. But let us not leave this first possibility without making it clear that it may well be the case that Neisser has got something right. It is quite possible that an account of how the subjects saw whatever they saw, will be in terms of a visual input which is stored, or persists, for a time after the stimulus vanishes. The mistake is to suppose that this input is what is seen, because this is a category mistake - it suggests that visual input in the form of electric impulses is somehow visual in the way that a display of colourful objects may be said to be a visual display. Neisser is quite possibly correct to say 'It seems certain then that visual input can be briefly stored in some medium which is subject to very rapid decay.' (Op. cit.) But it is a category mistake, when talking about storage at this conceptual level - ie brain processes, to go on to say 'Before it has decayed, information can be read from this medium just as if the stimulus were still active.' The stimulus is the sort of thing we can read information from, but not the medium in which brain processes are stored. With this reservation then, let us proceed.

The suggestion now is that the increased memory ability of the subjects in the experiment, is to be accounted for in terms of their having seen a series of mental images which resemble the original stimulus. Presumably, what is now being

suggested, is that for part of the time when we are perceiving, what we see are real objects. However in a few isolated cases, what we really see are mental images of these objects. When the signal tone is played to the subjects within one second of the stimulus disappearing, they are enabled to give their answers, by a mental image coming into being which sufficiently resembles the original stimulus, to provide them with an alternative source of information.

But now, before we go on to discuss this account, it may be felt that we are taking unreasonable pains to deal with a fairly insignificant phenomenon. Even if the account we are examining is philosophically confused, still, the implications for a theory of perception are not very great - it is, after all, conceded that in the great majority of cases, what we see are not images, mental or physical, but real objects. So it may be apposite at this point, to interrupt our discussion in order to introduce the second of our two thesis - that given by George Sperling, in his article on visual information storage (Human Factors Volume 5 Number 1.)

Sperling, in his account of the experiments which Neisser refers to, is struck by the possibility of extending the iconic imagery explanation of short term memory, to a much more widespread phenomenon. When we look at an object, apart from the many intentional eye movements which we make, there are also many small and rapid movements made independently or automatically, by the eyes, which movements are called 'saccads.' Whether we are watching a moving object or a stationary one, the eyes make constant minute jerky movements between fixation points. While in motion of this sort, the eyes are unable to take in any information. Sperling notes '--- the eye moves in saccads and takes in information only during the fixation pause between the saccads. As there are several fixations per second, the eye codes information from the

environment into a rapid sequence of still pictures.' (Op. cit.)

However despite these jerky and constant movements of the eyes, our vision is smooth and unbroken. Despite the fact that during these saccade no information is taken in by the eyes, we do not experience blank spots in our vision. Thus there appears to be a problem of how we can see things without interruption, when our visual system provides information to the brain only in fits and starts. Sperling gives the following account.

'It is tempting to speculate on the purpose of visual information storage, because its properties seem so well suited to the requirements of a system like the eye, which processes information in temporally discrete chunks. The function of persistence (The storage aspect of visual information storage - V.I.S.) seems to be to maintain a visual image from one fixation of the eye to the next. The function of erasure is to permit the new image following a saccad to overwrite the trace of the previous one without interference to itself, and also to erase the blur resulting during movement of the eye. The minimum duration of storage that has been recorded ($\frac{1}{4}$ second.) is still long enough to preserve the image between eye-movements. Thus V.I.S. acts as a buffer which quickly attains and holds much information, to permit its relatively slow utilisation later. V.I.S. also segregates and isolates from each other, successive bursts of visual information (e.g. images.)' 'The components of V.I.S. can become available to subsequent components of the model as a sequence of items through 'scanning' or 'read out' ' (Op. cit.) In a paper entitled 'Short term shortage of information in vision' ('Information Theory 4th London Symposium, 1960.,) Sperling reports. 'Once it is established that subjects can retain much stimulus information for a brief time, the question naturally arises: how do they do it? The title of this paper suggests that they do it visually, i.e., that they

can utilise a visual image of the stimulus which persists for a brief time ---.

Subjects say, for example, that they can still 'read' the stimulus when the instruction tone comes several hundred milliseconds after termination of the stimulus.

----- A good way to show that stimulus information can be retained as a persisting visual image, is to show how persistence depends on the kind of visual stimulation

----- When the pre- and post- exposure fields are dark, a legible image of the stimulus persists for longer than two seconds ---.'

Thus Sperling is saying that it is the purpose of iconic imagery - V.I.S. as he calls it, to act as a stop-gap during those periods when the eye is temporarily out of action. During these periods, which occur every fraction of a second, what we are seeing is not the real object, but instead a 'legible image.' Images then have been elevated to a position of extreme importance in our theory of perception - without them, our perception of the world would be as jerky as an old fashioned silent film.

Now as before, it seems probable that Sperling may have got part of the way to some truths. He adduces no physiological or neurological evidence in support of his claims, but we may suppose that it may well turn out to be true, that the mechanism which prevents our vision being jerky is some sort of neurological storage mechanism. But this is not what we are told - Sperling argues not that V.I.S. is how we come to see smoothly, but that, it is what we see, when we are not seeing real objects. We are entitled to say this, both because of the nature of Sperling's claims - he talks about 'legible images,' and says elsewhere that these images can be scanned horizontally and vertically, and because of the nature of Sperling's evidence. This latter is almost entirely made up of subjects' reports, from which he deduces that the

subjects, since they cannot be seeing real objects, must be seeing images. He adduces no evidence at all of a neurological or physiological nature, which we would expect to find, if he was arguing the existence of some neurological storage mechanism.

Now the same arguments as before will serve to demonstrate that the images to which Sperling refers cannot be physical images. This would be to commit the category mistake of elevating to the level of what we see, elements of the mechanisms whereby we are enabled to see. Such physical processes may indeed occur - though we have observed the lack of the sort of evidence which we would expect to see adduced in favour of their existence, but if we accept the premise that we only see things which confront our stationary eyes, then the problem still remains of how to account for the smoothness of our vision. Thus we are faced with the only remaining possibility, which confronted us in our discussion of Neisser's account, which is that icons are mental images. And now there is the added incentive to getting the answer right, that our concept of ordinary, everyday perception is at stake.

The first point we can make, is that icons cannot be seen with the eyes. The whole point in invoking them, is to explain what it is which we see, when our eyes are taking in no information. It follows then, that if icons are to fulfil their purpose in life, they cannot be the sort of thing we see with our eyes. Clearly, if our eyes focus on icons, just as they do on tables and chairs, then we should have to say what it is which we see, when a saccad prevents us from seeing an icon - we should require images of icons. Perhaps it is implicit in icons being mental images, that they cannot be seen with the eyes, but it is as well to point out that if they could be seen thus, they would not be the right sort of thing for our analysis.

So we can establish that we do not see icons with our eyes. But then, how do

we see them? Perhaps with some set of inner eyes, but this can hardly be called seeing, and the question was, how to account for our continuing to see when conditions appeared unfavourable, and not, how to account for our doing something else, when we could not be seeing. Also, since mental images are, by necessity private and in principle publicly unobservable, in that we will allow nothing to count as seeing someone else's mental image, does this not mean that much of what we had thought were perceptions of external physical objects, are really perceptions - in a different sense of the word - of internal mental images? And, since these images are such good likenesses of real objects that we cannot tell the difference - we do not, after all, notice any alteration between seeing one sort of thing and another, it will also follow that we can never be sure whether we are seeing a real object or a mental image. This would seem to have serious repercussions for the status of physical object referring language, since we can never be sure that we are not describing some internal and private occurrence. It is difficult to see how the basic standard, on which physical object referring language rests - appeal to some external and publicly observable objects, can survive a situation where we have no way of knowing, on any given occasion, when we are appealing to some such object, and when to some mental image of an object.

And anyway, what shred of evidence is there, to support the claim that mental images are a suitable stand in for physical objects, when it seems we cannot be seeing the latter? Sperling can argue that mental images just must be a good substitute, because our vision is in fact smooth, but this can hardly be considered to be independent proof of the suitability of images for the role they have been assigned. To argue that seeing mental images must be like seeing real objects, because otherwise

our vision would be jerky as it alternated between the two, is just to say that mental images must be the sort of thing we want, because otherwise they would not be the sort of thing we want! And how does it come about that these images are so perfectly synchronised with events which occur in the physical world - surely it is stretching credibility to suggest that just the right image pops up at just the right fraction of a second, to take over from its physical counterpart, as the eyes move to re-focus. We have heard of images trained to spend their nights in dancing, but they were rank amateurs compared with the choreography exhibited by icons.

I think then that we must reject this last possibility - it is extremely doubtful if it offers any sort of account of the problem in question, and it is certainly at least as problematic as any alternative it may be designed to replace. Thus we are forced to reach the conclusion that neither Neisser nor Sperling has successfully accounted for the respective phenomena which they are concerned with - in both of these cases, a resort to imagery solves no problems and offers no solutions. What then are we to say of the phenomena under consideration?

Perhaps the first thing to say, is that both Neisser and Sperling too readily classify what they have been concerned with as phenomena, or as requiring an explanation in terms of the unusual or abnormal. Both assure that the subjects cannot be seeing real objects, and that it is therefore apposite to ask what it is instead, which they can be seeing. But now, need we grant this initial premise, that the subjects cannot be seeing a real object when, in Neisser's case, they appear to choose what to retain after the stimulus is removed, and in Sperling's case, the eyes are in motion and hence are processing no information?

I think the answer is that we need not assent to this premise. Let us take the two cases individually, and see whether there are not analogous situations where we would be prepared to grant that we perceived real objects, and not just images. If we take Neisser's case first, we are faced with a situation where people appear to see a stimulus for a short time after it is withdrawn, and it is assumed that some out of the ordinary explanation is required, because we cannot grant that people see things after they have been removed. But now, why not?

It needs only a little reflection, to think of many instances when we are prepared to grant that we perceive things, after they no longer exist. We have already noted the case of stars and other far off objects, which we continue to see, after they may well have ceased to exist. But the same is in principle true of our perception of nearer objects, which, though they may not cease to exist in the time it takes for light to reach us from them, are still different, if only in minute degrees, from their state at the moment at which the light set off. What is important is that, while these scientific factors like light rays and neurological components may be necessary conditions, without which we could not see, nevertheless they are not what is meant by 'see.' It makes no difference to the meaning of 'see,' whether the light rays involved in the mechanics of seeing took longer than usual to arrive, and it will make no difference, whether the neurological processes which account for how we see, take more or less time to operate. It is a purely empirical fact - an accident of nature, that what we call seeing an object, usually coincides with its presence before our eyes, and there is no reason why it should not be otherwise. 'Seeing' does not denote some sort of relationship between eyes, light rays and physical object - seeing is quite different from these - it occurs at a

different conceptual level - at the level of something in which we participate, and not our eyes and brain. Consequently the decision on whether the people in the experiment are to be said, to see the object for a brief time after it has vanished, is a philosophical one, and not an empirical one.

So if we consider this decision at the level of a philosophical one, it becomes clear that we should be discussing how useful it is to talk of seeing an object after it has vanished, what precedents if any there are for this sort of description, what the alternatives are, and so on. If we do this, it seems to me that it becomes pure prejudice to insist on speaking of seeing only when there is a physical object before our eyes. What, we may ask, of taste or smell - do we not permit the use of these concepts in situations analogous to that faced by Neisser? Why then, not permit a similar degree of latitude for seeing? Of course the degree of latitude is a matter for much discussion, but in the given case, where subjects continue to report seeing an object for a brief time after it has been removed, and can give answers and perform tasks which suggests that they do indeed still see the object, I can see no good reason for denying that the subjects continue to see the object for a short time after it has vanished.

If we go on to consider Sperling's case, it seems to me that this offers a reductio ad absurdum of the strict view that we should only grant claims to see in those cases where the physical processes are operating at what is considered to be the optimum 'transmission' level. Because of this unnecessarily restricted concept of seeing to which we are objecting, we are forced to say that much of what we had considered to be genuine perception of physical objects, fails to meet the standards required, and instead, much of our perception is really not perception of physical

objects at all.

I take this to be a reductio ad absurdum of the position which favours imposing stringent empirical conditions on our use of 'sees a physical object.' But we could go further, and point out that all seeing may fail to meet the required conditions, due to time lags between light rays leaving the object and reaching the eye and between electric impulses being set up in the eye, and travelling to the brain, and so on. Also we might point out, that when light rays pass through a convex lens, such as the lens in our eye, the image which they project onto a surface behind the lens, is inverted. Thus the information passed via the eye to the brain, suggests a world in which everything is upside down. Part of the mechanism whereby we are enabled to see, involves interpreting the information by reversing it. Does this not mean then, if we are to be stringent about the relation of what is seen, to the physical processes involved in how we see, that in fact we do not see the world at all, but rather an inverted image of it?

Of course we could propose a compromise, and deny both that we see images, or that, in the cases considered by Neisser and Sperling, we see real objects. Instead we might perhaps talk of seeming to see. But now, 'seeming to see' has a use already - to indicate that we are uncertain, or that something like seeing is going on. But when I perceive an object normally, I am neither uncertain as to its presence, nor aware that I am not actually seeing it, when my eyes are in motion, and hence out of action. So how could I ever learn this usage, and what practical value could it have?

There just seems to be no good reason for us to restrict the use of 'sees an

object,' to those circumstances in which someone is at that instant confronted by the object. We have argued that we do not seek to adopt this strict interpretation in the context of other forms of perception; that there are many instances where we do not even make this distinction, in the context of seeing - for instance stars, and other distant objects; and that if we did adopt such a strict interpretation, then it is not clear how we could draw the line short of the absurd conclusion that we can never see anything at all, because time lags are involved in all cases of seeing.

Thus our conclusion is that the experimental conditions described by Neisser and Sperling, do not conform to one of the basic assumptions of the researchers, that the abilities of the subjects could not be explained by their seeing an object at the time when the signal tone was played. There is just no good reason to suppose that we cannot see something for a brief period after it has been removed - (how brief a period is a matter for further discussion) -, or to suppose that we do not see things for those brief periods when our eyes are in motion, and there are a number of good reasons to suppose that we do see objects under these conditions. Neisser and Sperling are led astray by a prejudice in favour of identifying seeing an object, with the empirical mechanisms whereby we are enabled to see, and by supposing that 'seeing' somehow refers to the series of interactions which constitute the working of the visual system. In doing this latter, they are involved in the category mistake of predicating qualities of elements of one conceptual level, which are properly attributed to elements of a different conceptual level. Consequently I would suggest that the supposedly naive view of some subjects, that the physical stimulus faded out slowly, is not quite as silly as it was thought to be, and while it may be neither possible nor desirable to completely divorce seeing from its physiological surroundings, yet

I doubt if it will help our understanding of the concept of seeing to place much importance on these surroundings either.

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