ON PROFESSOR GOMBRICH'S MODEL OF SCHEMA AND CORRECTION

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I

In *Art and Illusion* E. H. Gombrich tries to answer a question which arises from the following: (i) at any given historical period there is generally a predominant style of representational art; (ii) styles of representational art vary from one period to another; (iii) neither of these two facts have in his opinion been adequately explained.

In outline Gombrich's explanation is: (i) some artists have as a goal (or as one of their goals) the accurate portrayal of nature; (ii) this goal can only be realized progressively;[1] (iii) the structure of this progressive realization is that of schema and correction, which he describes as being analogous to 'the way science works',[2] *i.e.* the posing, testing, correction and revision of hypotheses. He writes:

> This description of the way science works is eminently applicable to the story of visual discoveries in art. Our formula of schema and correction, in fact, illustrates this very procedure. You must have a starting point, a standard of comparison, in order to begin that process of making and matching and remaking which finally becomes embodied in the finished image. The artist cannot start from scratch but he can criticise his forerunners.[3]

Some of the questions that arise from this account are: What is a schema? Why are schemata required? What does 'correction' mean? In what follows I will touch upon each of these, but will address myself primarily to the last.

II

Gombrich tries to explain what he means by 'correction' in terms of 'more information'. He writes:

> To say of a drawing that it is a correct view of Tivoli does not mean, of course, that Tivoli is bounded by wiry lines, it means that those who understand it will derive *no false information* from the drawing. . . .[4]

Later he compares Constable's painting of Wivenhoe Park with a child's copy of it claiming that the Constable 'is a closer rendering of the motif than is that of the child'.[5] He then attempts to 'define a little more explicitly what may be meant by such a statement':[6]

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> It means, I suspect, that we can, and almost must, interpret Constable's painting in terms of a possible visible world; if we accept the truth of the label that the painting represents Wivenhoe Park, we will also be confident that this interpretation will tell us a good many facts about that countrv seat in 1816 which we would have gathered if we stood by Constable's side.[7]

Taken together these two statements provide. I think, the explicit explanation which Gombrich has to give for the notion of one picture being a more correct rendering of a motif than another. This is the case if: (i) It is more difficult to *not* read in terms of a possible visible world; (ii) It will provide more information regarding its motif from some place at some time; (iii) Those who understand it will derive less false information from it.

I take the first of these to mean that it is more difficult to see as patches of coloured paint on canvas than as the motif it is meant to represent. This is not elucidating for two reasons: (i) It is not clear how such a test can be applied; (ii) In those cases in which its application is relatively clear it will run counter to what Gombrich obviously wishes to maintain, *i.e.* that such paintings as those of Turner and Monet, since they are relatively easy to read as patches of paint on canvas, are less correct as renderings of their motifs than is the child's copy of the Constable. The role which this condition is playing in Gombrich's explanation (though it is not, I believe, intended) is to exclude as 'close renderings of a motif' those mappings which would provide a great deal of information about a motif 'to those who undersotod the notation' but which did not look like pictures of anything

Gombrich is right in holding that a more correct representation will provide more information and less false information than would a less correct one. The trouble is that he draws back from talking about how this information is seen to be correct. He draws back from this because he wants to avoid the philosophical difficulties which would be created by mentioning such things as 'the 'image on Constable's retina' and, indeed, the whole idea of appearances that has proved such a will-o'-the-wisp to aesthetics.'[8] He cannot avoid completely, though, discussing the notion of 'correction' in terms of how things, *i.e.* the motifs and the picture, look. This can be seen if we ask ourselves what can be meant by his saying that *Wivenhoe Park* 'will tell us a good many facts about that country seat in 1816 which we would have gathered if we stood by Constable's side'.[9] The most reasonable interpretation of this, it seems to me, is: If we look at the painting of Wivenhoe Park we will see pictured a good many of the things which we would have seen had we looked at (the motif) Wivenhoe Park from Constable's side when he painted his picture.

Gombrich is trying through circumlocution to avoid the difficult philosophical problems which such an interpretation raises. When he is not so concerned with avoiding such problems he allows himself to say such things as:

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> His (*i.e.* the painter's) is a psychological problem of conjuring up a convincing image. . . .[10]
>
> . . . the art of perspective aims at a correct equation: it wants the image to appear like the object and the object like the image.[11]
>
> [Impressionism] can be seen as the summit of the process that leads the pictorial symbol to be matched ever more closely with appearances. . . .[12]
>
> The complete portrayal might be the one which gives as much correct information about the spot as we would obtain if we looked at it from the very spot where the artist stood.[13]

In addition to this the notion of 'more information' itself stands in need of clarification, particularly in view of the fact that paintings such as those of Duccio, which according to Gombrich[14] are less close renderings of their motifs than are those of Constable or Turner, in important respects provide us with more information. As Gombrich puts it:

> From Duccio's painting we could infer some essential structures of wooden boats even if other information were lost. From Constable's hardly. And when we come to the paintings of Constable's great rival Turner, the structure of objects is often quite swallowed up by the modifications of the moment—mist, light, and dazzle.[15]

Clearly the 'more information' referred to as a criterion for a closer rendering of the motif is more information concerning the way the motif looked rather than information concerning the structure of objects in the motif. To understand Gombrich's model of schema and correction, then, we must clarify what it means to say that one picture looks more like its motif than does another. For this we must turn to his theory of perception.

III

Gombrich does not present a fully developed theory of perception in *Art and Illusion*. Whatever theory he does rest his model on must be pieced together from a few scattered statements. I will try to put together the view he explicitly states, cite some objections to its most superficial reading, and try to interpret it in a way which is, I believe, Gombrich's intended meaning (though I cannot be certain of this) and which will provide some clarification of the notion of 'correction' in his model.

Gombrich claims that psychology has brought 'news of a radical reorientation of all traditional ideas about the human mind, which cannot leave the historian of art unaffected'.[16] The news of which he writes is the rejection of the sense-data theory of perception, which he calls 'the bucket theory of the mind', 'the picture, that is, of a mind in which "sense-data" are deposited and processed'.[17]

The theory of perception that he accepts and upon which he rests his model of schema and correction is that which he calls 'the searchlight theory', which emphasizes 'the activity of the living organism that never ceases probing and testing its environment'.[18] This theory holds that our

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perceptions will be 'vague and general at first'[19] but as we come to require greater clarity in order to resolve a particular sort of problem they will become progressively 'more articulated and differentiated'.[20] In order to resolve such problems we will pose a provisional hypothesis, test it against our needs, improve upon it, test it again, and so on. He writes:

> It might be said, therefore, that the very process of perception is based on the same rhythm that we found governing the process of representation: the rhythm of schema and correction. It is a rhythm which presupposes constant activity on our part in making guesses and modifying them in the light of our experience.[21]

This claim that perception itself follows the model of schema and correction raises the following objections: (i) The method of modification of perception cannot be called 'correction' since there is nothing to 'correct' against; (ii) The method of modification of representational art cannot be called 'correction' unless all that is meant by this is bringing it into closer agreement with the shifting sands of perception.

Gombrich does seem to leave himself open to these objections, which make the notion of correction unintelligible. The way out, which I will develop shortly, is to revise or reinterpret the claim that perception itself proceeds according to schema and correction in such a way as to provide a more stable backdrop for those activities which depend upon perception such as representational art.

Before I try to do this there is the following related difficulty: Gombrich discusses an engraving of Chartres cathedral in which the windows, which are known to be rounded, are depicted as pointed arches. He writes:

> Clearly, if we pointed out to the artist his mistake he could have modified his scheme and rounded the windows.[22]

This suggests that the schema which the artist is using to depict the motif leads him to an incorrect perception of it *i.e.* that the schema not only articulates and differentiates the elements in our field of perception but actually dictates their content and at times does this incorrectly. This suggestion seems to be supported further when Gombrich writes:

> Painting is an activity, and the artist will therefore tend to see what he paints rather than paint what he sees.[23]

This can have two interpretations: (i) that the artist actually sees what he paints even if what he paints is a demonstrably false representation of the motif; (ii) that the artist can distinguish in his field of perception no more than that which is articulated and differentiated by the schema he is employing, though what is thus distinguished will be correct or can be corrected within the scope of that schema. It is the latter interpretation that must stand if the notion of schema and *correction* is to make sense; for if we see what our schemata impose upon us, then where there are no means other

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than visual for correction (and in most cases there are none) there can be no sense to the claim that the schema can be corrected.

In what follows I will sketch in what I believe to be, after putting the pieces together and tailoring them according to a 'he must mean this' standard of interpretation, Gombrich's theory of perception. Since, however, such a game is presumptuous and untenable and since, besides, I do not wish to saddle someone else with what may be my own view, I offer it as my reading of the 'searchlight theory' and one which avoids the raised objections and makes sense of the model of schema and correction.

The kinds of elements we perceive are determined by the kinds of tasks we have had to perform which depend upon the making of visual discriminations. Conversely, we seldom perceive elements if we have or have had no reason to distinguish them. For example, if tracking animals in a forest requires making certain kinds of visual discriminations and if I have never had a need to learn how to track animals in a forest, then I probably would not make those visual discriminations. This does not mean that I can't learn how to do this, nor does it mean that there are gaps in my perceptual field. It means that I do not know what to look for but, presumably, could learn. Learning to do this would involve learning what to look for, which in turn would involve learning to attend to things of which I am not at present aware. I would acquire some new categories for visual discriminations, enabling me to attend to details of my visual field related to, and enabling me successfully to perform, this new activity. Learning new categories for visual discrimination in order to achieve a particular purpose requiring visual discrimination, and applying these in order to pick out elements I was previously unaware of, I call 'articulating the visual field for a particular purpose'. These categories constitute a schema.

Suppose that my purpose is accurately to draw a relatively complicated object, for example a marigold. This means to produce an object, made with some artistic medium, *e.g.* pencil on paper, such that when it is looked at what is seen is a picture of a marigold. In order to do this I must be able to perceive upon looking at the marigold I wish to make a drawing of those details which: (i) can be rendered by me using the medium I have chosen; (ii) contribute to giving this object its particular appearance.

If I am not practised in drawing, or if I do not have a clear recollection of the attempts of others, then I am faced with the task of trying to locate anew those elements in my perceptual field which will help me to perform this task. Suppose that I either acquire from somewhere a crude approach to the problem or through some flash of inspiration simply invent one: what is it that I have gained? It is a way of looking at the marigold in order to see elements which are relevant to my task of drawing it: that is, a schema for articulating what I see for the purpose of rendering on paper with my chosen medium a drawing of it. With this and my skill with a pencil, and

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what I learn upon looking at the marigold, I can make a drawing of it, *i.e.* an object which will be a picture of this marigold.

I included in this 'what I learn upon looking at the marigold' because the schema provides only the form, the categories for visual discrimination, but it is the flower itself, the motif, that provides the content. I emphasize this in order to locate where, if anywhere, the schema can lead us into an incorrect portrayal of a motif, and what 'correction of a schema' means as opposed to 'correction (of a drawing) within the scope of a schema'.

That one has a schema to work within does not mean that one will in all cases accurately apply it. In the example Gombrich gives us, in which rounded windows are drawn as pointed, it is not that the schema needs correcting, but that the artist needs to pay more careful attention to its application. One reasonable interpretation of the example is that the artist failed to look carefully at his motif because he had already made up his mind about the shape of the window on other grounds; the schema itself did not decide the issue. 'Correcting a drawing within the scope of a schema' means bringing the drawing into closer conformity with the elements of the motif articulated, but not fully determined, by the schema.

The schema provides the categories for articulation, the motif provides the empirical content. This is one limitation on the schema. To return to my example of drawing the marigold: the schema with which we began may have been relatively limited, it may be possible to expand it so that the elements originally articulated *and* additional ones might be included. For example my initial schema might have enabled me to locate those visual characteristics that give the petals their particular texture, but it may not have provided me with a means for distinguishing those details which contribute to its spherical form. Put another way: the schema I began with may have provided a means for drawing a flat picture of the marigold, but not one for giving the drawing depth.

It is possible to expand the schema to include a means for articulating what is seen in order to meet the objective of making a drawing which depicts the spherical aspect of things. This is one sense in which one might say 'the schema has been corrected'. However, it does not seem that 'corrected' is the best term to use here since it might lead to confusion with another possible case. There may be a sense of 'correcting the schema' which is not that of enlarging it to include elements heretofore missed which will add a new dimension to the representation, but rather that of rectifying an error which is induced through the use of the schema. For example, consider a schema which makes use of diverging lines in order to depict objects as they recede into space. A correction of such a schema might be one which makes use of converging lines, such as that of linear perspective. This describes the kind of situation for which the expression 'correcting the schema' seems most appropriate. Unfortunately, it is the least intelligible

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use of the expression and the one for which it is most difficult to find concrete, relatively acceptable examples. For instance, the possible example I have given amounts to trying to decide the question of whether or not the method of linear perspective developed during the Renaissance is a better means for accurately depicting aspects of nature than is the Chinese method of a combination of isometric projection, aerial perspective and overlapping planes. Questions such as this are hotly debated and are part of the general dispute concerning whether or not representational techniques are relative or absolute.

'Correcting a drawing within the scope of a schema' is, then, clear and 'correcting a schema', meaning 'expanding the schema to include more aspects of the motif', is also clear. However, 'correcting the schema' meaning 'improving the schema in order that through its use we will be able to produce closer renderings of the motif' is not very clear—it seems to mean 'refining the schema so that its careful use enables the production of pictures which are increasingly like what we see when we look at the motif'—a formula which may include any of the three interpretations discussed.

Given these interpretations of the model of schema and correction with respect to *depicting the motif*, what can be said about the *perception of the motif*? An objection was cited earlier against Gombrich's claim that the perceptual field itself follows the 'rhythm of schema and correction', providing no stable datum for the notion of correction with respect to our depictions of it. One way of interpreting this, in the light of what I have been saying, is that the discriminations which we make within our perceptual field will progress in accordance with the model of schema and correction as the schema is applied to the perceptual field in order to resolve a particular problem. We do not correct our perceptual field according to how closely it corresponds to something else—for there is nothing else against which to correct—but correct the schema in relation to how well it enables us to perform a particular task. For example, when an art student learns how to locate and define the masses of shadow on a figure in order to provide the sense of volume to his drawing, he acquires the perceptual skill of being able to pick out those elements of his perceptual field relevant to this task, but he has not in any sense 'corrected' his perceptual field.

There may be reasons for rejecting the view I have just proposed. One arises from an experiment performed by R. M. Thouless:

> If a subject is shown an inclined circle and is asked to select from a number of figures the one which represents the shape seen by him, he chooses without hesitation an ellipse. This ellipse, however, is widely different from the one which represents the shape of the inclined circle indicated by the laws of perspective, being much nearer to the circular form. The subject sees an inclined figure neither in its real shape nor the shape which is its perspective projection but as a compromise between these. . . .[24]

Furthermore the ellipses selected vary from individual to individual and

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there are wide cross-cultural and cross-racial variations. All of this *suggests* that individuals see different shapes when they look at inclined circles.

It need not be concluded from this, though, that the subjects '*see* the figure neither in its real shape nor the shape which is its perspective projection but as a compromise between these . . .' nor that the subjects *saw* different things when they made different selections or ellipses. What must be admitted and accounted for given these results is not what people *see*, for what they *see* is not part of the result but a possible interpretation of it, but what people *say they see* under certain conditions.

Making a judgement about what is seen is a difficult thing to do accurately and it requires skill and concentration. It is true, and it is compatible with the view of perception I have proposed, that people are influenced by what they think is the case when they come to make such judgements, whether these judgements are given in the form of assertions, drawings, or selections from a given series of such objects as ellipses. This is to say that we need not infer that people see what they say they see since it takes skill and concentration to say with accuracy what we do see. The making of such judgements requires the same kind of skill as such tasks as tracking, drawing, botanical classification, etc., and like these, it also requires ridding oneself of prior conceptions which will adversely affect the judgements made.

The general explanation of the phenomenon reported by Thouless, then, is analogous to the explanation proposed by Gombrich to explain the progression of representational art—*i.e.* schema and correction, and, according to this Thouless's subjects would become progressively more in accord with one another as they acquired the skills needed to make more accurate judgements.[25]

IV

I have tried to make sense of Professor Gombrich's model of schema and correction by describing change and development in the art of depiction based upon schematic invention, testing, and modification taking place against increasing refinement of discrimination of relevant elements within our perceptual field taken as a whole. I have tried by this account to avoid the problems which arise with respect to the notion of correction when this model is thought of as one process of change evolving against another.

REFERENCES

[1] Gombrich approvingly cites Wolfflin's remark that 'not everything is possible in every period'. 'Art and Illusion' (*A & I*), 1965, p. 4.
[2] *A & I*, p. 321.
[3] *Loc. cit.*
[4] *A & I*, p. 90.
[5] *A & I*, p. 299.
[6] *Loc. cit.*
[7] *Loc. cit.*
[8] *Loc. cit.*
[9] *Loc. cit.*

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[10] *A & I*, p. 49.
[11] *A & I*, p. 257.
[12] E. H. Gombrich, 'Psychoanalysis and the History of Art', reprinted in *Meditations on a Hobby Horse* (1963), p. 41.
[13] *A & I*, p. 90.
[14] Cf. *A & I*, p. 295.
[15] *Loc. cit.*
[16] *A & I*, p. 27.
[17] *A & I*, p. 28.
[18] *Loc. cit.*
[19] *Loc. cit.*
[20] *Loc. cit.*
[21] *A & I*, p. 272.
[22] *A & I*, p. 73.
[23] *A & I*, p. 86.
[24] R. M. Thouless, 'Phenomenal Regression to the Real Object', reprinted in *Experiments in Visual Perception*, ed. M. D. Vernon, (1966), p. 158.
[25] Subjects in this experiment who have been trained in the use of perspective chose ellipses closer to that indicated by the rules of perspective.

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