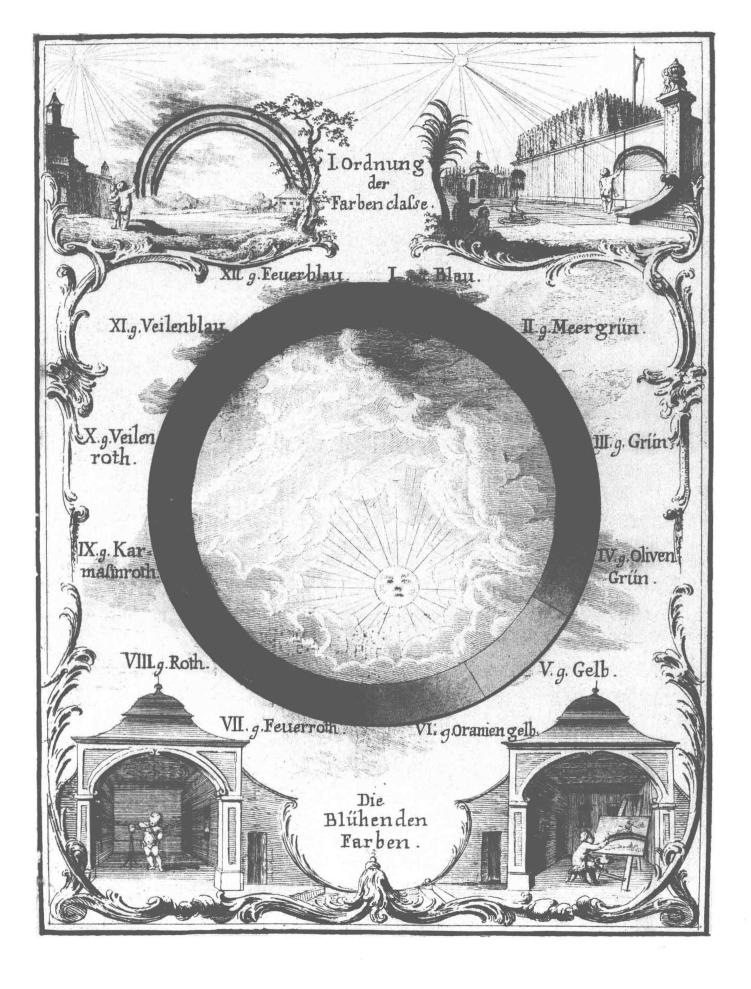


COLOR AND CULTURE



COLOR AND CULTURE

Practice and Meaning from Antiquity to Abstraction

UNIVERSITY OF CALIFORNIA PRESS
Berkeley and Los Angeles

For Nick and Eva, recalling those Florentine days

FRONTISPIECE

Ignaz Schiffermüller, *The Bright Colors*, from *Versuch eines Farbensystems*, Vienna, 1772. A decorative twelve-part color-circle by an entomologist who specialized in butterflies, this suggests a "natural" order of colors which may be experienced both indoors and out. It is one of the first of such circles to place complementary eolors opposite each other: blue (I) opposite orange (VII/VI), yellow (V) opposite violet (XI), and red (VIII) opposite sea-green (II).

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INTRODUCTION

FOR ALL ITS BAGGAGE of scholarly apparatus, this is not an academic book. Nor could it be, for its theme - the way in which the societies of Europe and the United States have shaped and developed their experience of colour - falls between too many academic stools. Colour is almost everybody's business but it has rarely been treated in a unified way: thus my book opens and closes with instances of how a failure to look at colour comprehensively has led to absurdities of theory, if not of practice. I begin with the attempt of some nineteenth-century Classical philologists (led by the Liberal statesman Mr Gladstone) to define the nature of the Ancient Greek experience of colour - without consulting Classical archaeologists, so they were led to believe that Greek colour-vision in the fifth century BC was anomalous, even defective, and that our modern visual system had evolved in only a few thousand years. I conclude with an even more astonishing episode in 1960s American art, where a number of fine colourists were able to persuade themselves, their critics and perhaps even some of their public that they had finally released colour from form. This opinion is the more surprising that it was promoted by an artist, Josef Albers, who had had direct experience of the study of the interrelationships between form and colour in the psychologically oriented German art-world of his youth. In other areas of colour-study, there are still some psychologists who believe, for example, that brown is simply a darkened yellow and black no more than an absence of light, beliefs which would have to be modified after a few conversations with practising artists or even after a careful examination of paintings. So, although there are a number of academic areas in which colour is an important topic of investigation and debate, notably the psycho-physics of colour-vision and colorimetry, and linguistics, it is not a subject that has hitherto played much part in the study of Western cultures as a whole - not least perhaps because it has not lent itself easily to academic treatment.

Nor is this book an interdisciplinary study, using one or other of the ways which modern scholars in the humanities have developed to revive their own subjects, in my case the history of art. This is an historical study in the sense that it deals with one thing after another, looks for the origins of the methods and concepts of visual art and treats art as the most vivid surviving manifestation of general attitudes towards colour expressed in visual form. As an historian I am wary of assuming that today's theoretical positions (I am thinking particularly of the notions of experimental psychologists which have filtered into general culture) are likely to survive any longer than those of the past. I see my task as to provide more material for readers to chew on as they think about colour in the context of history and perhaps their own experience of it too. More than other formal

characteristics, colour has seemed to most of us to speak directly and unambiguously (a good deal of capital has been made from this assumption, not least in the marketing of goods). I hope my book will make this assumption seem more problematic, but even if it does not, I want my reader to be left not simply with some beautiful images, but also with some stimulating ideas about the visual character of a wide range of societies in the West.

Yet I have not written this study to suggest that if we pool ideas from the various areas of enquiry into colour we shall be able to present a more adequate picture of the role it has played, and can play, in Western societies. I am even less concerned to propose a new academic subject which might draw together the strands of what has hitherto been so dispersed. What interests me is precisely how this fragmentation has come about; what has prevented intelligent and sensitive investigators from coming to a clear understanding of their subject; why so much of what has been written and is still being written about colour cannot be believed. The subject may best be approached from the perspective of history, although the very notion of a history of colour may at first sight seem paradoxical. Why I have ventured into this confusing area, perhaps some autobiography will explain.

As a schoolboy painter I was very much attracted to colour – John Piper was my idol – and when I came to look at the history of art I was puzzled by the neglect of colour in describing and accounting for the styles of historical periods. When I began to read aesthetics, first Berenson and then Ruskin, I was even more astonished by the apparent renunciation of colour in writers to whom it clearly meant so much. Berenson's wonderful account, in Sketch for a Self-Portrait (1949), of his first encounter with the 'atmosphere of disembodied colour' in the Upper Church of San Francesco at Assisi showed me that his feeling for colour was not confined to the natural landscape, where he enjoyed it so abundantly, but that he also felt it in art. Yet he did not allow these instincts to override his aesthetic belief that the proper material of visual art was 'tactile values' and 'ideated sensations': hence his preference for Florentine art, especially Florentine drawing.1 I did not discover until much later how deeply rooted these perceptual prejudices were in the classicizing tradition where representation has been seen as the artist's primary function. Berenson's idealism, his crucial distinction between 'ideated sensations' and 'sensations like those experienced in the workaday world' could only make him hostile to colour. For he saw colour as belonging essentially to this humdrum world, as identifying the artefact as an object among other objects, focusing the attention on its materiality; and he had a very condescending attitude to materials and

techniques.² It seems to me that it is precisely the continuity between the experience of colour in nature and that experience in art which makes it so important to us, and not only to those who concern themselves with painting.

A more sophisticated thinker than Berenson, Ruskin turned out to have a far more complex relationship with colour. His early reading of Locke had made him regard hue as accidental: he felt that tonal values in colour, which defined form and spatial relationships, were the primary concern of the artist, including even Turner, whose works he had come to know chiefly through black-and-white engravings. Ruskin's growing devotion to Early Italian art in the late 1840s brought about a rapid revision of this position: with the example of Fra Angelico before him he came to believe that 'the purest and most thoughtful minds are those which love colour the most'; and he had fewer inhibitions than Berenson about positing a continuum between art and nature.3 But even in the 1850s, after a close engagement with ancient and modern Pre-Raphaelites, Ruskin continued to adjudicate in favour of the primacy of form, and he annoyed his co-teacher at the Working Men's College, Dante Gabriel Rossetti, by insisting that a study of colour must come only after a thorough grounding in chiaroscuro. His great practical handbook of 1857 was entitled The Elements of Drawing.4 At the time I did not fully understand the importance of giving as much attention to value (light and dark content) as to hue (spectral location), but I have come to see it more and more, and now agree with Ruskin's assessment of its central interest to Turner.

Berenson and Ruskin set me thinking about hierarchies in colour, but chance encounters in my college library with two other books made me realize that there was far more to colour than meets the eye. One was Paget Toynbee's Dante Studies (1902), which included an essay on the obsolete medieval colour-term perse whose meaning it seemed almost impossible to reconstruct on the basis of written evidence alone. The other was R. D. Gray's Goethe the Alchemist (1952), which persuaded me that colour-theory was not simply a few rules of thumb but a rich amalgam of physical and metaphysical ideas. When at the Council of Europe 'Romantic Movement' exhibition of 1959 I was able to examine Turner's two late paintings Shade and Darkness - the Evening of the Deluge and Light and Colour (Goethe's Theory) - the Morning after the Deluge - Moses writing the Book of Genesis, I knew that I had found a great painter who thought so too.

Neither Berenson nor Ruskin were historians, although they both knew a good deal of history and both, especially Berenson, devoted more attention to the art of the past than to that of their contemporaries. But they attended to this historical art primarily as critics. My spell as an undergraduate showed me that I was neither a good artist nor a good historian yet that history was to be my absorbing interest: I wanted to identify, isolate and understand sets of circumstances which are inseparable from the past, not to take the critical position of making of the past a sort of honorary present. Yet how art, which is so vividly present to us, can be set in its own (past) 'present' is an issue of the greatest difficulty, one which the most recent approaches to arthistorical writing have only been able to accommodate by ignoring. Colour compounds the problem, for in what sense is

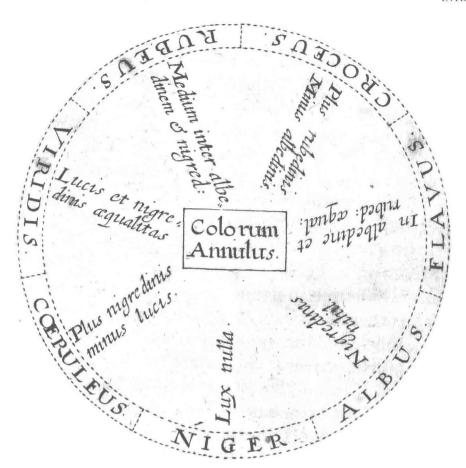
the colour which I perceive in an artefact not 'present'? I may recognize from the style of the work that it belongs to a particular time which is not ours but how can I say the same for its colours? Is not red the same whenever and wherever it is seen? To find the historical dimension of colour I had to look at artefacts and at the colour-language of the periods in question; as Paget Toynbee had warned me, this was an exceedingly problematic issue. The study of colour-vocabularies has been one of the most expansive areas of research since the 1960s: we know a good deal about the structure of colour-thinking, as expressed in language, in many hundreds of cultures and yet we know very little about how these structures came to be formed, how they relate to experience. Wittgenstein, for example, assumed that six colour-terms were adequate for most purposes, a figure almost certainly reached because he was thinking of the colour-circle of three 'primaries' and three 'secondaries', as published for instance by Goethe - a recent and rather specialized way of arranging colour-space. 5 Those who cook on gas know that it is the high-energy (short-wave) blue flames which do most of the heating and even those who do not are likely to be aware that it is the even shorter, higher-energy waves, the ultra-violet, which burn our skin. Yet in common usage it is the long-wave red end of the spectrum which is felt as warm and the blue as cool. We may think of a 'universal' experience of hot red (?) sun and cool blue (?) sea but in the written record this folklore seems to go back no further than the eighteenth century; the first colour-system to incorporate coordinates of cold and hot was probably the one published by George Field as late as 1835. So what is our 'experience' of colour in this case? Why are our linguistic habits so at odds with our knowledge?6

I said earlier that colour is within the experience of almost everyone and that the colours of nature are continuous with the colours of art. But, of course, artists have a special way of seeing colour and a special way of presenting what they see in the form of artefacts. As a schoolboy I went on a summer sketching holiday to Oxfordshire; one dull afternoon at Dorchester I encountered an extraordinary colour-composition of an old red telephone-box isolated on the edge of a wood in which the normally strident contrast of red paint against green foliage was softened and mediated by the 'warm' depths of the dark, treefilled space behind the box itself. It was a stunning image of unity in contrast and I risked the traffic to make a hasty and unsatisfactory painting of it from the best viewpoint in the middle of the road. Some years later I read Adrian Stokes's Colour and Form and was surprised to see a vivid recollection of just such an experience, this time with a red post-box on a telegraph pole. Stokes concluded his long account of it in these terms:

My experience was unique at that time. How long I had waited to see our glaring pillar boxes given by the light and season a structural relationship in the English countryside! For years they had stood out in my eyes, glaring irrelevantly. On this overcast May day, however, the young leaf-greens of intense luminosity and of the right area and disposition, had come to the rescue, had entered into companionship with the red, and with each other, like soldiers who make a solid pile of their (red) hats to prove their amity, the

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One of the most radical early attempts to reduce colour perceptions to a simple diagram was the physician Robert Fludd's colour circle, published in 1626 (see p. 171). Fludd arranges seven colours in a tonal sequence between white and black, but it will be seen he describes both red (rubeus) and green (viridis) as the median colour, with equal proportions of light and dark, white and black. (1)



distinctiveness of each as brother. And in my opinion every picture that really 'works', possesses in infinite reduplication this kind of relationship, this kind of movement.⁷

This experience of colour was available to many, it was perhaps even commonplace, but it was an aesthetic intent which gave it value. It is in pictures, or when we see in terms of pictures, that these colour-relationships take on a coherence. Hence the central importance of art for the study of colour in the larger social context.

As a student I had the good fortune to spend long periods in Florence and came to love those large painted embellishments to Italian fourteenth- and fifteenth-century choir-books, displayed so spaciously and luminously in the Convent of S. Marco and other Florentine libraries and sacristies. I was astonished that such beautiful objects had been so little regarded in the histories of Italian painting. I imagined that because of their perfect state of preservation they could show us what the pristine colouring of the much damaged and repainted altarpieces and frescoes of the period might have been. As it happened, I never did have the opportunity of pursuing my interest in Renaissance manuscript illumination very far; paradoxically, my only discussions here are of two miniaturists mentioned by Dante (none of whose works are known; see Chapter 4) and the disparaging remarks of sixteenth-century critics about this branch of painting (see Chapter 7). I was, in any case, quite mistaken about the import of the colour of these works, since the materials and technical conventions of manuscript paintings were quite different from those in work on panel or wall, which also differ markedly from each other. Berenson's belief that materials have almost no role to play in style should hardly have survived his first visit to S. Croce in Florence, where many chapels still furnished with stained glass, wall-painting and altarpieces from the Trecento show quite clearly that the colour-ranges in each of these media have very little in common. Perhaps, after all, his eye was too conditioned by his use of black-and-white photographs. The study of materials (developed for the most part out of the exigences of conservation) has brought a new concreteness to the historical understanding of art. It is important for us to know how an object was made and what it was made of because of the hierarchy of values inherent in materials and techniques themselves, even now when synthetic pigments and media have taken over. A precious ultramarine in the fourteenth century had no more of an aesthetic value for its user than a synthetic or industrial paint for an American Colour-Field painter of the 1960s. This sort of analysis seems to be even more important for the historian than for the activity of conservation which provoked it, since the rhetoric of conservation-theory often seems to confuse conservation (preventing further preventable deterioration to the work) with restoration (bringing it back to a notional pristine condition). Only very limited sorts of small portable objects - enamels, illuminated manuscripts, cabinet pictures - are ever likely to be seen in their original condition and in something like their original circumstances, which brings us back to the earlier question of how much of the past can ever be seen at all.

A book which has been more than thirty years in the making can hardly expect to engage closely with the most recent phase in a rapidly evolving subject such as the history of art and I have to admit that some recent developments are hostile to the sort of project I have undertaken here. When I began looking at the history of art, its most controversial branch was iconography, as associated especially with the Warburg Institute in London. This seemed to reduce the 'subject' of painting essentially to written texts. I was fortunate to be taught by Edgar Wind who, although he had been a pupil of Warburg's, continued to approach the question from a far broader base than I had come to expect from that school and who believed that subject must also imply style.

Since that time the influence of E. H. Gombrich and especially Michael Baxandall at the Warburg has brought the formal characteristics of artefacts back into the centre of the discussion of their meaning; it is to their work that I owe much of my own approach. Iconography in its less expansive sense has been revived by the most vital of the newer tendencies in arthistorical writing, which has given it a political edge. The New Art History has done a great service in bringing a new seriousness to a subject which might have lost itself in the routine pursuit of influential postures in the figure. However, because it has adopted theoretical tools from writers with no important visual interests, and because the ambiguity of visual images has made them seem poorly adapted to re-cycling as propaganda, there has been a turning away from the visual characteristics of artefacts towards a concern with the sort of representation which may readily be conveyed in verbal terms. It is another version of 'find the text' but this time the text is less likely to be found in historical literature than in social theory or psychoanalysis. But if the visibility of the visual arts is not seen as the proper concern of historians of these arts, the task of treating it will be left in the equally reductive hands of the commodityfetishists of the media and the market.

Although I have had to deal with a number of controversial points, I do not intend this to be a polemical study, for there is no active debate about colour in Western culture to which my arguments might be usefully related. The neo-formalist German school of 'colouring-history' (*Koloritgeschichte*) is too non-contextual in its emphasis and too exclusively concerned with painting to bear more than tangentially on my own subject. 8 I

want simply to demonstrate that there is a set of issues which needs to be grasped. My list of references, though long, is very lean and intended simply to send the reader to my sources. I do not think a large-scale bibliography of colour is practicable at the moment but I have given an outline of what I would expect it to look like in a bibliographical article.⁹

So this book cannot be an historical survey of colour even from A to A. Such a history does not seem to be possible, although a number of bolder historians have attempted it since the 1960s.10 What we still need is an overview of the chief landmarks in changing attitudes to colour and we do not vet know even which historical texts bear on the question, since the several useful historical studies of theories of colour, for example, have been concerned rather with the development of new knowledge than with its diffusion and acceptance by the community at large. 11 What I have tried to do is to find surviving types of monument which were the subject of contemporary commentary; for the earlier periods especially, these are very few and far between. I have tried to isolate techniques, such as mosaic and stained glass, drawing or oilpainting, which were clearly responses to particular aesthetic needs and to discuss their transformation as these needs themselves changed. Some chapters focus on these techniques; others look at more theoretical questions, such as the continual re-interpretation of an ancient text on four-colour painting, or the problem of how to see the rainbow, or the function of the palette, or the paradigm of music, all of which recur in many historical periods. Several themes return repeatedly, such as the feeling that verbal language is incapable of defining the experience of colour, or the notion from Antiquity to Matisse of an 'Orient' which was an exciting and dangerous repository of coloured materials and attitudes. These two themes were constantly interrelated in the belief that the rational traditions of Western culture were under threat from insidious non-Western sensuality. Thus as late as the 1940s Berenson was characterizing his experience of medieval stained glass outside its architectural framework as 'not so different from the Rajah's gloating over handfuls of emeralds, rubies and other precious stones'. 12 How artists and thinkers in the West negotiated these dangers is a theme of great interest and one which I hope will make my readers look at the traditions of Western art and psychology in a rather different way.

1. The Classical Inheritance

Archaeology and philology · Greek theories of colour · Splendour and motion

TOWARDS THE END of the 1860s the Anglo-Dutch painter Lawrence Alma-Tadema exhibited a small picture, Pheidias and the Frieze of the Parthenon. Athens, in which the artist is shown, not as the greatest sculptor of Antiquity, but as a painter, putting the finishing touches to the rich polychromy of the relief, the fiery flesh-tones of the horsemen set off against a background of the deepest blue. 1 Alma-Tadema became famous for his careful reconstructions of the Classical past; this early intrusion of a strident colouring precisely where the dazzling purity of white marble had been thought, at least since the Renaissance, to be one of the noblest characteristics of ancient art was not an arbitrary one.2 For during the first half of the nineteenth century archaeologists throughout Europe and Scandinavia had come to realize more and more that Greek architecture and sculpture had indeed been painted and in the most vigorous way. As early as 1817 the English scholar Sir William Gell had been able to assert of the Greeks that 'no nation ever exhibited a greater passion for gaudy colours'. Even though the discussion of the colouring of the Parthenon Frieze itself had arrived at no very firm conclusions,4 Alma-Tadema may well have been impressed by the 1862 report of the excavations of the Mausoleum at Halicarnassus in Asia Minor, where the sculpted frieze, attributed to Scopas (fourth century BC), was shown to have been brightly painted just as in his picture, the background ultramarine and the flesh 'dun red'.5 To demonstrate the practice of colouring sculpture in the greatest period of Greek Classical art was a bold stroke, which would have been unthinkable in the period of high Neo-Classicism fifty years earlier

Alma-Tadema was perhaps the most daring but he was not the first painter to exploit the archaeological discovery of Greek polychromy. Ingres's 1840 version of Antiochus and Stratonice introduced an interior of extraordinary richness, far beyond anything in his original conception of the subject in 1807. It is very likely that he drew on the impressive researches of J. I. Hittorff, whose magnificent study, De l'Architecture polychrome chez les grecs, had first appeared in 1830.6 Many Neo-Classical architects were themselves turning to polychromy in these years; Karl Friedrich Schinkel's design for a new Royal Palace on the Acropolis at Athens, its interiors laden with inlaid and painted decoration, dates from the same year (1834) as Gottfried Semper's proposals for the use of polychromy in modern classical buildings.7 By the 1840s the last of the English Neo-Classicists, John Gibson, perhaps following Hittorff's suggestions, made a timid attempt to re-introduce polychromy into sculpture itself, first with his portrait of Queen Victoria in 1846 and then, most importantly, with his Tinted Venus of 1851-6, shown in London at the 'International Exhibition' of 1862 in a

brightly coloured niche devised by the designer Owen Jones. It 9 bore the inscription Formas Rerum Obscuras Illustrat Confusus Distinguit Omnes Ornat Colorum Diversitas Sauvis and Nec Vita nec Sanitas Nec Pulchritudo Nec Sine Colore Iuventus ('The gentle variety of colours clarifies the doubtful form of things, distinguishes the confused and decorates everything' and 'Without colour there is neither life nor health, neither beauty nor youth').8 Nothing could demonstrate more decisively the death of the Renaissance and Neo-Classical aesthetic. The discovery of the pre-Classical remains of Mycenae and Knossos in the latter half of the nineteenth century reinforced the view that the Greek world had always been a highly coloured one.

Yet it is an irony of scholarship that in these very years the Classical philologists who approached the Greek experience of colour from the direction of language were reaching entirely opposite conclusions about its nature. The British statesman W. E. Gladstone, in his essay 'Homer's perceptions and use of colour', concluded that the poet's colour-system was 'founded upon light and upon darkness', that the organ of colour 'was but partially developed among the Greeks of his age' and that it had not developed much further by the time of Aristotle.9 More detailed research into Greek colour-terminology tended to confirm Gladstone's views; the then only recently investigated phenomenon of colour-blindness was invoked to explain why the Greeks seemed to be so insensitive to the difference between blue and yellow. 10 But blue and yellow were precisely among those colours most frequently used in early Greek painting, and Gladstone's conclusions were soon contested by at least one scholar who had taken the trouble to compare language and artefacts. 11 We know now that language cannot be interpreted as a direct index of perception and that the phenomenon of colour is multivalent: beside the characteristics of hue and saturation, which modern spectators tend to regard as most important, is the characteristic of value, the degree of lightness in a given hue. It was this last characteristic which was of special interest to the ancient Greeks, an interest rooted in the Greek theory of colour.12

Greek theories of colour

As we should expect, the earliest written Greek records of colour, in the poetry of Alcmaeon of Croton (early fifth century BC), dwell on the antithesis between black and white, or darkness and light. 13 In the fifth century this antithesis provided the armature of the more developed theories of Empedocles and Democritus. Empedocles used the analogy of the painter's mixing colours (harmonin mixante) to illustrate the harmony of



Neo-Classical sculptors were reluctant to follow the discoveries of archaeologists very far. Although it was shown at the London International Exhibition of 1862 under a canopy which stressed the importance of colour (pl. 9), John Gibson's Tinted Venus (1851/6) had the colour restricted to hair, lips, eyes and gold ornaments, with only the palest tingeing of the flesh. (2)

the four elements, earth, air, fire and water, among themselves;14 in an early formulation of the notion that 'like perceives like', he stated that the fiery element in the eye is what perceives white and the watery, black.15 The late antique commentators on Empedocles, Aëtius and Stobaeus, had it that he followed a Pythagorean scheme of 'primary' colours, adding to black and white red and ochron, a vague term which has been thought to designate a whole range of hues from red through yellow to green and must probably be understood to imply a faded quality in any of them. 16 Stobaeus noted that Empedocles linked his four colours with the four elements, although he did not specify which elements were appropriate to red and ochron.

Democritus also spoke of four 'simple' (hapla) colours: white which was a function of smoothness, black which was a function of roughness, red which related to heat and chloron which 'is composed of both the solid and the void'. 'The other colours are derived from these by mixture.'17 When Democritus came to describe the nature of these mixtures, his formulations are difficult to follow. Gold and copper were mixed from white and red (of some interest when we come to consider the affinities of red and gold); purple (porphuron) was mixed from white, black and red - its large proportion of white made it pleasant to look at and could be deduced precisely from its brilliance (lampron). But indigo (isatin), according to Democritus, was mixed from deep black and a little chloron (pale green); leek-green (prasinon) from crimson and indigo, or pale green and a purplish pigment. He added that sulphur is a more brilliant variety of this mixed prasinon, which refers aptly to the greenish cast of sulphur-yellow. 18 This must be the earliest recorded proposal that yellow and green are two species of the

same genus of hue. Clearly we are dealing with a writer who either had little experience of practical colour-mixing or, as is more likely, used his terms to designate a far wider range of hues than we are accustomed to grouping together. Democritus also stated that chloron might be produced from a mixture of red and white, which has led one commentator to suppose that he was thinking of the complementary after-image of a red patch on a white ground. 19 What is more important is the observation of Aristotle's follower Theophrastus (to whom we owe this account of Democritus's theory), that he need not have expanded his 'simple' colours beyond black and white, and that red and green are not true antitheses, since they do not have opposite 'shapes'20 (colour being related to different geometric arrangements of atoms).

These theories of Empedocles and Democritus were taken up and developed by Plato and Aristotle in the fourth century and, through them, became the starting-point of all subsequent colour-systems until Newton. Plato's most extensive account occurs in his poem on the creation, in Timaeus 67d-68d, where he offered what he called 'a rational theory of colours'. White, said Plato, is the effect of the dilation of the ray which the eye sends out in the process of vision and black the effect of its contraction. A more violent 'fire' and dilation of the ray produces what we call 'dazzle' and an intermediate fire, bloodred. But Plato and his contemporaries had no means of assessing the quantities of light reflected from any coloured surface, nor was any means devised until the nineteenth century, and he concluded this passage with a cry of despair: 'The law of proportion ... according to which the several colours are formed, even if a man knew he would be foolish in telling, for he could not give any necessary reason, nor indeed any tolerable or probable explanation of them.' He none the less listed a number of mixtures, including an ochron composed of white and flame-yellow (xanthon), itself a mixture of red, white and lampron. Plato's leek-green was a mixture of flame-colour (purron) and a darkener (melan).21 He concluded:

There will be no difficulty in seeing how and by what mixtures the colours derived from these are made according to the rules of probability. He, however, who should attempt to verify all this by experiment would forget the difference of the human and divine nature. For God only has the knowledge and also the power which are able to combine many things into one, and again to resolve the one into many. But no man either is or ever will be able to accomplish either the one or the other operation. [trans. Jowett]

Plato thus passed on the most meagre of colour-systems. Aristotle, with his more developed interest in experiment, produced a far more extensive and ramified body of doctrine, all of it, however, scattered among writings on many other subjects. It was, however, his school of philosophy which left the only comprehensive treatment of colour to have come down to us from Antiquity.

In his treatise On Sense and Sensible Objects (442a), Aristotle stated that 'the intermediate colours arise from the mixture of light and dark.'22 He also identified five unmixed intermediate colours: crimson, violet, leek-green, deep blue and either grey (which he conjectured might be a variety of black) or yellow (which might be classed with white, 'as rich with sweet').

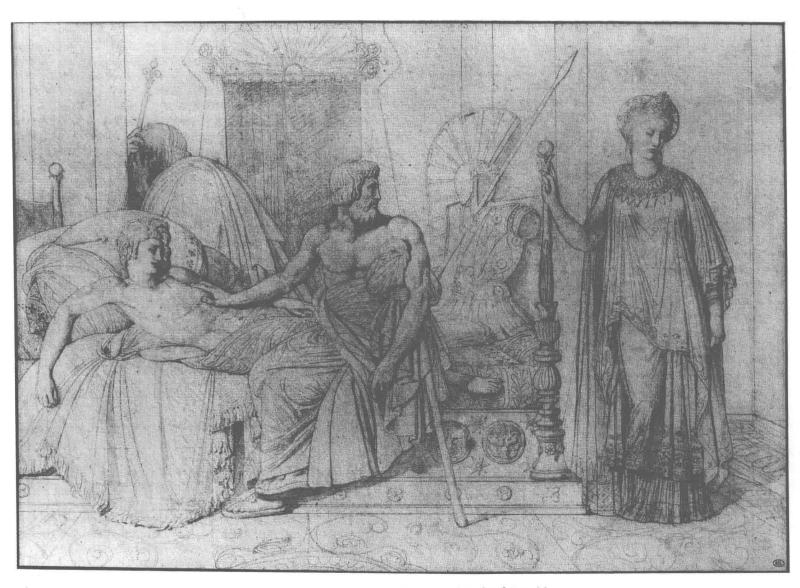
Aristotle seems to be inclined towards a seven-colour scale from black to white here because of its closeness to the musical octave, which had just provided him (439b-440a) with an analogy for the method of generating intermediate colours by numerical ratios. In his account of the rainbow, however (Meteorology 372a), he seemed to regard red, green and purple as the only unmixed intermediate colours. Green appears elsewhere to be the central intermediate colour between (black) earth and (white) water (On Plants 827b; compare Problems XXXI, 959a). Red was closest to light and violet to dark (Metereology 374b-375a).

The Peripatetic On Colours presents few variations on the same theme, although the 'primary' colours here seem to be white (the colour of air, water and earth) and golden (the colour of fire), black becoming simply the colour of the elements in transformation (791a). Here too, in effect, the modification of light by darkness was the cause of the intermediate colours: red was the primary product of such a modification (791b). In

general the picture of the nature of the colours beyond light and dark was as uncertain as Plato's:

We do not see any of the colours pure as they really are, but all are mixed with others; or if not mixed with any other colour they are mixed with rays of light or with shadows, and so they appear different and not as they are. Consequently things appear different according to whether they are seen in shadow or in sunlight, in a hard or soft light, and according to the angle at which they are seen and in accordance with other differences as well. Those which are seen in the light of the fire or the moon, and by the rays of the lamp differ by reason of the light in each case; and also by the mixture of the colours with each other; for in passing through each other they are coloured; for when light falls on another colour, being again mixed by it, it takes on still another mixture of colour. [793b, trans. Hett]

The admission that these problems in identifying colours was



J.A.D. Ingres, Antiochus and Stratonice, a sculptural and monochromic pencil and brown wash study of 1807. (3)

further evidence of the eye's incapacity to judge the true nature of things became enshrined in a tradition of sceptical thought from about the first century AD, when Philo of Alexandria cited an example which was to have a particular resonance in the Middle Ages: 'Have you ever seen a dove's neck changing in the rays of the sun into a thousand different shades of colour? Is it not magenta and deep blue, then fiery and glowing like embers, and again yellow and reddish, and all other kinds of colours, whose very names it is not easy to keep in mind?'²³

Of course, what to one observer was a subject for despair to another was a cause of great sensual delight. In a brilliant setpiece description of a magnificent hall, the second-century Greek writer Lucian paused to consider the plumage of the peacock, which was also to be much in the mind of medieval commentators:

Now and again he is a sight still more wonderful, when his colours change under the light, altering a little and turning to a different kind of loveliness. This happens to him chiefly in the circles that he has at the tips of his feathers, each of which is ringed with a rainbow. What was previously bronze has the look of gold when he shifts a little, and what was bright blue [kuanauges] in the sun is bright green [chlōrauges] in shadow, so much does the beauty of the plumage alter with the light. [The Hall 11, trans. Harmon]

The Peripatetic On Colours had insisted that the study of colour should be investigated 'not by blending pigments as painters do' but rather by 'comparing the rays reflected from . . . known colours' (792b). In discussing the rainbow Aristotle had stressed that the basic unmixed colours there were those 'which painters cannot manufacture' (Meteorology 372a). Yet from Empedocles onwards theorists of colour repeatedly drew on the experience of handling colour in art. Democritus is reported to have left treatises both on colour and on painting, neither of which have survived,24 and Plato, who made frequent references to painting methods, especially in theatrical scenepainting, was thought in Antiquity to have been a painter in his youth. 25 An anonymous, probably Alexandrian Platonist of the sixth-century AD even claimed that the notions of colourmixing expressed in the Timaeus arose from discussions in Plato's studio. 26 One of the most vivid of Aristotle's accounts of colour-contrast derives from his observation of textilemanufacture; it posed a question which was not addressed systematically until Chevreul took it up in the nineteenth century:

Bright dyes too show the effect of contrast. In woven and embroidered stuffs the appearance of colours is profoundly affected by their juxtaposition with one another (purple, for instance, appears different on white and on black wool), and also by differences of illumination. Thus embroiderers say they often make mistakes in their colours when they work by lamplight, and use the wrong ones. [Meteorology 375a, trans. Webster]

This is a remarkably clear formulation of the problem now known as metamerism, by which colours that appear to match under one sort of light, seem different under another.

Records of a number of technical treatises by Classical artists have also come down to us but nothing of their contents.²⁷ The

most intriguing are perhaps On Symmetry and On Colours (volumina . . . de symmetria et coloribus) attributed by the Elder Pliny to the mid-fourth-century BC painter and sculptor Euphranor (Natural History XXXV, xl, 128). Pliny's reference to volumes in the plural suggests that they were distinct treatises, but he may well have been dividing what had been a single concept in the earlier Greek discussion of colour. In the Meno (76d) Plato had defined colour itself, in terms which he had borrowed from Empedocles, as effluences from the surfaces of objects 'fitted' into the channels of sight in the eye by the process of perception: colour was itself a form of 'measuring together' (summetros) or symmetry.28 Pliny may have been inclined to separate these concepts because, as a sculptor, Euphranor had a high reputation for his expertise in symmetry (usurpasse symmetriam). It was as a sculptural concept, the canon of proportions in the human figure, that the term came to have most resonance in the later Classical period. By Pliny's own day the Stoics had treated symmetry and colour as the two essential, but quite distinct, ingredients of beauty. This formulation, transmitted especially by Cicero, had the greatest impact on medieval aesthetics.29

Symmetry was a concept based on number: proportion could only function as a numerical relationship between a number of parts. With the exception of Aristotle's rather vague and random attempt to relate colours to the musical octave, there was in Antiquity no attempt to interpret colours in terms of number. Plotinus, a Greek philosopher living in Rome in the third century AD, excluded colour from the category of Beauty precisely on these grounds: 'All the loveliness of colour, and even the light of the sun, being devoid of parts and so not beautiful by symmetry, must be ruled out of the realm of beauty. And how comes gold to be a beautiful thing? And lightning by night, and the stars, why are these so fair?'30 He was echoing the attitudes of his master, Plato, and, I suggest, of Euphranor. No painting attributable to Euphranor has survived but a Roman reference of the first century AD to his Poseidon at Athens talks of its 'most extraordinary splendour'. 31 It was this splendour, or brilliance in colour, understood as the effect of reflected light, which constituted its chief charm for the ancient observer.

Other Classical writers refer to the beauty of colour: Democritus talks rather obscurely of a 'most beautiful colour' (kalliston chrōma) composed of green, white and red, 'but the green component must be small, for any admixture would not comport with the union of white with red'. ³² In a well-known passage of the *Philebus* (53b) Plato referred to the intrinsic beauty of simple colours on the analogy of simple geometrical shapes; but he did not say which he understood these simple colours to be. Elsewhere, for example in the *Republic* (421c-d), he supported the conventional Classical preference for purple as the most beautiful colour, also endorsed by Aristotle in his discussion of colours and music.

The relationship of these theoretical ideas to the practice of Classical painters is very difficult to assess since almost no specimens of painting of the Classical period, with the exception of vase-painting, have come down to us. There are, however, some indications that the techniques of monumental painters were well understood by the theorists. One of Aristotle's

hypotheses about the origin of the intermediate colours was that:

the black and white appear the one through the medium of the other, giving an effect like that sometimes produced by painters overlaying a less vivid upon a more vivid colour, as when they desire to represent an object appearing under water or enveloped in a haze, and like that produced by the sun, which in itself appears white, but takes a crimson hue when seen through a fog or a cloud of smoke [On Sense and Sensible Objects 440a, trans. Beare]

The use of a semi-transparent white scumble in mural painting is known at least as early as 1400 BC at Knossos and a black under-layer has been noticed in the fifth-century BC Etruscan wall-paintings at Tarquinia, which may be by a Greek artist. 33 Much later, at Pompeii, the use of a black, pink, brown or grey underpainting for red had become standard in the most important schemes. Pliny, who died at Pompeii in the volcanic eruption of AD 79, described a number of red and blue undercoats used to achieve the most brilliant effects with the cheapest purple pigment (Natural History XXXV, xxvi. 45).34 He also left the most important record of what may be a reflection of theory in painterly practice: the four-colour palette confined to black, white, red and yellow, which was attributed to the fourth-century painter Apelles and his contemporaries (see Chapter 2). Pliny's account, which was essentially a complaint about the florid painting of his own day, falls into a familiar Roman rhetorical pattern: painting is now thought worthless, he says, if it is not executed in a multitude of costly and exotic pigments. In another passage (Natural History XXXV, xil, 30), he indicated that these floridi colours were supplied by the patron and not by the artist, which suggests not simply their cost but also that they represented the taste of the consumer rather than that of the producer. The Roman architect Vitruvius also remarked on this practice in the late first-century BC (Ten Books on Architecture VII, 7-8). The theme of the decadence of modern extravagance was a common one in these years: Seneca, for example, contrasted the simplicity of the baths at Scipio's villa with the modern taste:

But who in these days could bear to bathe in such a fashion? We think ourselves poor and mean if our walls are not resplendent with large and costly mirrors, if our marbles from Alexandria are not set off by mosaics of Numidian stone [Crustis Numidicis], if their borders are not faced over on all sides with complicated patterns, arranged in many colours like paintings, if our vaulted ceilings are not buried in glass [mosaic] [nisi vitro absconditur camera] [Epistles LXXXVI, 6f, trans. Gummere]

The reference to Egypt and Numidia is a crucial one, as is the reference to Indian colours in Pliny's complaint (see p. 39), for it was essential that the decadence should have an exotic, an oriental origin. Pliny's contemporary the Latin poet Petronius was already stigmatizing China and Arabia as the source of that luxury which was undermining Roman taste (Satyricon II, 88 and 119). It was an extension into art of the old controversy between the Attic and the Asian in rhetoric, where Attic stood for simplicity and directness and Asian for a soft and over-ornamented style.³⁵ In rhetoric itself the term colores came as early as Seneca in the first century to mean the embellishment

and amplification of the essential structure or material of an argument.³⁶ In the history of visual colour it is important that the materials which provided the basis of sensual delight should have been seen to come into Europe from the East, for this is a *topos* which recurs throughout this book.

For critics throughout Antiquity colour in painting had a profoundly ambiguous status: on the one hand it stood for the adventitious, the merely decorative, the false, 37 but on the other it was what gave painting life and truth. The antithesis was already clear in Aristotle who wrote in the Poetics (1450a-b) that 'the chalk outline of a portrait will give more pleasure than the most beautiful colours laid on confusedly'. Plato, on the other hand, spoke of 'a portrait which is as yet an outline sketch and does not represent the original clearly because it has still to be painted in colours properly balanced with one another' (Statesman 277b-c). For both philosophers the aim of art was the imitation of nature; colour might either further or hinder this aim. Even Philostratus, the novelist of the second to third century AD, who moved beyond imitation to a notion of the intuitive imagination in art, 38 contrasted the colours of cosmetics with the colours of painting, whose function was to imitate: 'if that was not its business, it would not be considered absurd, a pointless mixing of colours'. But, he continued, colours were not even essential to imitation, since verisimilitude could be achieved in monochrome if the drawing was good: 'If we draw one of these Indians even with a white chalk, he will obviously seem black; the snub nose, fuzzy hair, large jaws and (so to speak) bulging eyes have a black effect on the thing seen.'39 Plutarch, in the first century AD, summed up the Classical attitude in a brilliant paradox:

Just as in pictures, colour is more stimulating than line-drawing, because it is life-like, and creates an illusion, so in poetry falsehood combined with plausibility is more striking, and gives more satisfaction, than the work which is elaborate in metre and diction, but deviod of myth and fiction . [Moralia 16c, trans. Babitt]

The emphasis on the imitative function, which at the same time confers a decorative attractiveness, can be seen at work in late Hellenistic polychromy, such as a painted sarcophagus from Sidon, which has both naturalistic colouring and a decorative use of gilding.⁴⁰

For the ancient critics colour, if not positively damaging, was at least not essential to representational painting: it has been argued that the ethos of Hellenistic art was seen to reside less in the use of colour than in a command of line. 41 In a period when execution was already considered to be inferior to conception, it was even suggested that 'a precise mixture of colours and appropriateness in the application of them' were matters best left by the master to his apprentices. 42 Such a view will not have been welcomed in the workshop itself but we are still very illinformed about the details of ancient practice. One of the rare representations of an ancient painter at work, on a painted sarcophagus of the first century AD from Kertsch in South Russia, shows a paintbox with sixteen divisions. Even the painters of the small funeral-stelai at Volos are known to have used a palette of thirteen pigments, including two whites and three blacks as well as blue and green. 43 At Pompeii some twenty-nine different pigments have been identified, including ten reds, although the contemporary Roman murals from nearby Boscotrecase used a very limited palette of five pigments (including an earth green), whose range was somewhat increased by mixing. 44 An account of painting procedures given in the second century AD by Julius Pollux lists twelve colours, including flesh-tints (andreikelon) in an arrangement which seems quite arbitrary (Onomasticon VII, 129). As he was writing essentially for connoisseurs of rhetoric, we can learn rather little about practical attitudes to colour from this sort of lexical compilation.

Splendour and motion

For all their conventionality, the complaints of Pliny and Vitruvius about the extravagant polychromy of later Roman painting do reflect a development in taste which is attested by both monuments and Roman literature at large. We have seen that polychromy was by no means foreign to Classical Greece: one of the rare surviving documents of the economics of Greek taste concerns the interior decoration of the Asclepeion at Epidauros (4th century BC), where the expenditure for labour on wood inlay and the gilded ivory statue of the god was excluding the precious materials themselves - two and a half times that on the colonnade of the temple and more than ten times the annual salary of the architect. 45 The fashion for encrusting walls with thin panels of coloured marble can certainly be traced to sixth-century Greece - the earliest example may be the Siphnian Treasury at Delphi, where now all traces of the marble itself have vanished - but it was used more widely in Rome after the first century BC.46 Clearly, the Romans made far more use of the coloured marbles of Greece than the Greeks themselves had ever done. 47 A development of this sort may be seen most readily perhaps in the sequence of Roman mosaic pavements, from the simpler four-colour mosaics made from black, white, red and yellow pebbles or stone from the third century BC (Morgantina, Serra Orlando in Sicily), through the gradual introduction of coloured glasses especially for bright reds, blues and greens in the second century BC (Pergamon) – to the chromatic splendour of the glass mosaics at Pompeii and Herculaneum or the first-century AD mosaic now in the museum at Corinth, where the most vivid blues, greens, yellows and red are woven into the geometric border. 48 In the Latin language, too, a decisive expansion of colourterminology has been noted in the late first century AD, when the meagre list of five words for hues in Homer's poems had now expanded to over seventy terms, including some sixteen terms for reds, eight for blues and ten for greens. 49 Artistic practice and public perceptions of colour may indeed have gone hand in hand.

Yet we should not leap to the conclusion that a tonal outlook had been replaced by a chromatic one. If we look at Roman descriptions of their sumptuous buildings, we find that they are still seen primarily in terms of light, of brilliance, of splendour. The Roman poet Lucretius, for example, writing in the first century BC, praised the simple life: 'But what matter if there are no golden images of youths about the house, holding flaming torches in their right hands to illumine banquets prolonged into the night? What matter if the hall does not

sparkle with silver and gleam with gold, and no carved and gilded rafters ring to the music of the lute?' [On the Nature of the Universe II, 59–63, trans. Latham], He may have been drawing his images from that locus classicus of architectural description. Homer's account of the Palace of Alcinous (Odyssey VI, 82–130), but he was using it in a didactic poem and in a section where, following Democritus and Epicurus, he was anxious to demonstrate the physical unreality of colour.⁵⁰

If we look at the techniques of painting and mosaic developed by the Romans, the emphasis can be seen to have been no less on lustre than these descriptions suggest. The painted walls of Pompeii and Boscotrecase were burnished until they shone like mirrors;51 the pavements of Pergamon and Morgantina were ground smooth, waxed and polished not only to bring out the colour (as is now done by dousing them with water) but also to produce a highly reflective surface. 52 The effect to be achieved was surely akin to that which Pliny attributed to the thin coat of dark varnish used by Apelles to finish his paintings that 'caused a radiance in the brightness [repercussum claritatis] of all the colours and protected the painting from dust and dirt', and, 'by using a calculated system of lighting', acted so that 'the brightness of the colours would not be offensive to those who looked on them (it would be as if they were looking through transparent mica) and this same device, from a distance, might give an austere quality to colours which were too bright'.53 An effect of at once enhancing and subduing the colours on a surface according to the changing angle of vision of a moving spectator is exactly what polishing will achieve. Apelles was indeed accustomed to working in the context of architecture: his celebrated paintings of the Venus Anadyomene were originally destined for the sumptuously polychromed temple at Kos.54

As Pliny's account of Apelles suggests, the Romans were highly sensitive to the effects of lighting on pictures: Vitruvius, for example, prescribed a north light for museums so that the lighting should be more constant.⁵⁵ A concern for sheen or lustre in coloured objects and in painting was also exemplified in late-antique colour-preferences, at least in those preferences which can be attributed with some confidence to that period.⁵⁶ The most obviously prized hue was purple, the most valuable dyestuff in Antiquity. Purple dye made from a number of species of shellfish had been developed among the civilizations of Asia Minor and in Mycenaean Greece since the fifteenth century BC; already in the seventh century it was noticed by the lyric poet Alcman as being especially admired.⁵⁷

That Greek sculpture was coloured came as a shock to the early Victorians, but by the 1860s the archaeological evidence was too strong to be resisted. Alma-Tadema, in a painting showing the fifth-century Athenians viewing the Parthenon frieze before the scaffolding was taken down, imagined the reliefs painted in strong, schematic colours that would make the bodies stand out in the distance.

4 SIR LAWRENCE ALMA-TADEMA, Pheidias and the Frieze of the Parthenon, Athens, 1868/9 (detail)

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