The History of Colour in Art

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Introduction

It is almost impossible for us to know just how colourful the art of the past was. We can hardly begin to imagine how extraordinarily sumptuous mediaeval and Renaissance churches and palaces appeared – with their wall paintings, tapestries, painted architectural ornament, precious metals, enamels, and every kind of brilliant artifact. Any history of colour in art can only be partial, because so much art and so much colour in art has either perished or has survived only in a much changed form.

We have only to think of sculpture, for example, to see how our imagination fails us. With classical Greek and Hellenistic marble statues, it always comes as something of a shock to realise that they normally had realistically coloured lips, eyes, hair and clothes. We now usually imagine the antique through the practices of Renaissance and neo-classical artists, who saw Greek sculptures already stripped by time or the hand of Man of all their painted decoration. Polychromy of stone sculpture was certainly normal right up to and through the Romanesque and Gothic. It was only in the Renaissance – by a combination of mistaken interpretation of the nature of classical sculpture and a genuine interest in the natural textures and colours of materials that polychromy of stone sculpture died out. Very little intact medieval polychromy of carved stone survives, but where it is found – as in the great west portal of the collegiate church in Toro in north central Spain (The Portada de la Majestad, dating from the late thirteenth century), hidden for centuries under many layers of later polychromy – then the impact is astonishing.

Polychromy of wooden sculpture, of course, continued right through the Baroque and beyond. But a moment can be identified when one artist
decided to strike out in a different direction. In mediaeval and early Renaissance Germany, it was usual for limewood sculpture and altar-pieces to be painted. Then, in 1490–2, Tilman Rimenschneider, the greatest of all the limewood sculptors, made the first known limewood retable in monochrome – the Munnerstadt altarpiece, which now survives only in fragmentary form. It was not entirely uncoloured: the pale wood was stained a little darker than its natural colour. But from then on, two traditions developed side by side and the more expert carvers revelled in the new unpainted freedom to show off the fineness of their carving and the subtle wood textures that they could produce.

There is an ironic sequel to Riemenschneider’s making of the Munnerstadt altarpiece: eleven years later, the parish decided it was too plain, and in 1503 commissioned Veit Stoss to paint it in the old manner. His polychromy stayed on it for three centuries or more; then – we do not know precisely when – it was stripped off, a process that undoubtedly removed the original glaze beneath as well. Colour in art can be as untrustworthy as it is vulnerable.

**Il libro dell’ Arte: colour combinations based on pure pigments**

Our best chance of constructing a coherent history of colour in art is to look at representational painting in all its forms from late mediaeval times to the twentieth century; the best place to start is with the most famous and influential treatise in the history of painting, *Il libro dell’ Arte* written around 1390 by the Tuscan painter Cennino Cennini.

In his book, Cennino gives detailed instructions on the preparation of materials for painting in fresco and on panel. Learning to draw is important, he says, but working up the colours and painting with them is the ‘glory of the profession’.

Cennino clearly describes systems of colour for depicting flesh, draperies, buildings and landscapes. Importantly, they are systems devised for painting in fresco and egg tempera – opaque, quick-drying media that were used in simple, direct techniques.

To paint faces, for example, Cennino describes how the flesh must first be underpainted with the pale green earth, terre verte. The pink flesh
tones were then hatched or painted thinly on top, working in progressively paler shades from shadow to light; the green was allowed to show through in the half-tones and nicely imitated the pearly tones of real flesh. Today, many such faces are worn and damaged and the green has become too prominent. Cennino was very strict about this correct sequence for painting flesh: 'some begin by laying in the face with flesh colour – then they shape it up with a little verdaccio [brown-green shadow colour] and flesh colour, touching it in with some highlights and it is finished. This is a method for those who know little about the profession.' Later, in a famous passage, he recommends the pale yolk of a town hen's egg for painting the faces of young people with cool flesh colours, but the darker yolk of a country hen's egg for aged or swarthy persons.

Cennino’s methods for painting coloured draperies were also highly specific, and formed the basis for painting the clothed figure right through the quattrocento and beyond. Essentially, colours were used in their pure form in the deepest shadows and then lightened progressively with white towards the lit areas, finishing with highlights of pure white. For its time, it was a remarkably successful scheme, but there were problems with it.

First, by placing the purest and most powerfully saturated colour in the deepest shadows and progressively desaturating it towards the lights, the shadows appeared to advance and the lights appeared to recede – the very opposite of the desired effect. Secondly, the relative brightness of the pure colours was very variable: this could lead to the unbalancing of compositions in which the brighter draperies, such as the yellows, stood out much more prominently than the darker ones, such as the blues. For this reason, painters often attempted a balance of symmetry, arranging their bright colours in pairs around a central axis – a scheme now termed isochromatism.

With the Cennino system, we thus have a series of colour combinations based on, and pre-determined by, the pure forms of the available pigments. Cennino describes the preparation of pigments from a variety of sources, both natural and artificial. Such colours could be readily available and inexpensive, or rare and cost a fortune: in the latter category, the best-known is ultramarine blue (literally, from ‘over the sea’, since it was then found only in Afghanistan), extracted from the semi-precious
stone lapis lazuli and invariably (correctly) described as more expensive than gold. In late mediaeval times, when paintings were valued by the worth of their materials as much as the skill of their execution, the purest ultramarine was reserved for painting the Virgin's mantle and often costed separately in painter's contracts.

In such a painting as Lorenzo Monaco's *Coronation of the Virgin* (Figure 1), many of the available pigments are seen at full strength or mixed with white - coloured earths alongside ultramarine blues and the very beautiful lead-tin yellow. There was no green available powerful enough to compete with these strong colours and so areas of green tended to be mixtures of blue and yellow. Reds might be vermillion (an
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artificial form of the mineral cinnabar) or lake pigments – made by adsorbing natural dyestuffs on to a white base.

Lake pigments were sometimes very fugitive when exposed to light and we have in this painting a dramatic example of how a colour can change and alter the appearance of an entire work. The Virgin's robe was originally a deep mauve-pink, not white as it appears today. The evidence is satisfyingly exact. A minute sample of paint from the main area of the robe, seen in cross-section, shows many colourless particles which were once mauve. A sample taken where the robe passes below some mordant-gilding – where it was protected from the light – shows the particles still with their original colour.

Painters sometimes made precise decisions about their pigments which suggest a sophisticated knowledge of material properties. In his Santa Croce altarpiece, the Sienese painter Ugolino di Nerio deliberately chose azurite blue for its greenish tonality, instead of the ultramarine that might have been expected for such a prestigious commission: even the Virgin's robe is azurite. This conscious choice set up a whole series of subtle colour contrasts and harmonies that mark out Ugolino as one of the most innovative colourists of the trecento.

Cennino's treatise mentions one other colour system for draperies that was used widely right through the Italian Renaissance and later became firmly associated with Michelangelo and the Mannerist painters. This was the system of cangiantismo – of showing shot or cangiante fabrics that appear to change between the lights and the shadows. Cennino lists a number of colour combinations appropriate for cangiante effects and one of them can be seen in in Nardo di Cione's Altarpiece: Three Saints, painted around 1365. One saint has a greenish robe, yellow in the highlights and ultramarine blue in the shadows, painted just as Cennino described.

This is quite a subdued example of cangiantismo – much more brilliant hue-shifts can be seen in, for example, Mantegna's Virgin and Child with Saints, painted towards the end of the fifteenth century in tempera on canvas, in essentially Cenninian colouring.
The colour systems described by Cennino set the basic pattern for tempera painting in the quattrocento. Then, in 1435–6 Leon Battista Alberti published his *Della Pittura*, most famous for its revolutionary systematic description of single-point perspective. Suddenly, three-dimensional space could be realistically drawn on a two-dimensional surface – and representational art was changed forever.

Alberti also had a number of things to say about colour. His actual definition of colour primaries – which he listed as blue, red, green and earth colour – was based on the old Aristotelian tradition and was not very helpful. His remarks on modelling and relief are much more useful. His method assumes that light will strike an object from one side only, forming clearly defined areas of light and shade: 'Note the middle of it with a very fine line so that the method of colouring it will be less in doubt.' A clear example of this subdivision into light and dark halves is Fra Angelico’s predella panel of the *Miracle of St Nicholas*, painted in the late 1430s.

Then we come to the manipulation of colour itself: 'the same colour, according to the light and shade it receives will alter its appearance – we must consider how the painter ought to use black and white ... with great restraint you will commence to place the black where you need it and at the same time oppose it with white.'

Alberti’s system is unmistakably different from Cennino’s. Cennino constructs forms simply by modelling up from the pure colour with white: Alberti recommends modelling up with white and down with black by equal amounts, the pure colour now being positioned somewhere in the middle. Alberti was, however, very conscious of the fact that both white and black desaturate and diminish colours and exhorted his readers to be sparing with them: ‘I cannot overemphasise the advantage of the frugality to painters. It would be useful if white and black were made from those large pearls that Cleopatra destroyed in vinegar so that painters would be miserly with them and their works would be truthful, sweet and pleasing.’

The influence of Alberti’s system on tempera painters of that period is debatable. Certainly Cennino’s method remained the standard one, and
without detailed analysis it is difficult to be sure just which painters mixed black in with their shadows. However I would mention just one example in which both systems seem to be present on the same panel. In the Trinity Altarpiece (Figure 2), mainly by Pesellino but finished by Fra Filippo Lippi after Pesellino's death in 1457, the orange-red cloak of the right hand saint (ignoring the bottom half which is a later restoration) appears to be up-modelled with white by the Cennino method, while the red robe of the saint towards the left appears to be up- and down-modelled with white and black according to the Alberti method. Notice,
how much more subdued is the Albertian colouring – reminding us of his strictures about frugality in the use of black and white.

Alberti explored another aspect of colour in Della Pittura and this was what we now call the colour chords, colours that enhance each other when placed together, a phenomenon that in later centuries developed into a theory of complementary colours: 'There is a certain friendship of colours so that one joined with another gives dignity and grace.' Amongst other colour combinations, he says, ‘rose near green and sky blue gives both honour and life’. This is exactly the sort of colour combination that Alberti would have seen and admired in Masaccio’s fresco paintings in the Brancacci Chapel, and exactly this combination of colours is found in Cosimo Tura’s Roverella Altarpiece (of around 1475) with its fantastic architecture mirroring the pink and green robes of the angels and the whole scene improbably constructed against the deep blue sky. Tura was just the sort of academic painter who might have read Alberti.

The development of oil painting

Alberti’s colour system did offer painters more control of their pigments in tempera, but the whole technical basis of painting was about to change. The development of oil painting in northern Europe introduced a use of colour that was eventually to sweep away egg tempera completely.

By the early fifteenth century, oil for painting had been around for two centuries or more. Indeed, there are grounds for thinking that oil was the indigenous painting medium in northern Europe, only temporarily displaced during the fourteenth century by the Italianate egg tempera technique of the International Gothic style. By the 1420s and 30s, Netherlandish painters such as Van Eyck and Robert Campin were using it in an extraordinarily refined way for panel painting. They had not abandoned the use of egg entirely – most of these panel paintings have underpaints of egg and finishing layers of oil – a fact that had been long suspected but only recently proven using microanalytical techniques.

The properties of oils, such as linseed, walnut or poppy, that make them so desirable for painting, are that they are glossy, viscous, slow-drying and highly refractive. Paint layers can be made thick or thin, opaque or transparent and individual brush strokes can be sharp and
dramatic or blended imperceptibly until they disappear. Most importantly for colour, the same pigments that are opaque and high-key in egg can, in oil, become rich, semi-transparent glazes.

The implications for colouring within paintings were immediately apparent. Shadows no longer had to be unrealistic pure pigments or dully down-modelled with black. Now they could have infinite subtlety; they could be dark and full of colour at the same time. Half tones could be modelled with infinite softness. Highlights could be lustrous or dazzling.

The transition from egg tempera to oil as the principal panel-painting medium was a much faster process in northern Europe than in Italy. By the mid fifteenth century, the switch from egg to oil was almost complete in the Netherlands; in Italy it had only just begun. The precise mechanism by which the assimilation of oil painting into Italian practice occurred is still not clear. Vasari’s account of Antonello da Messina travelling to Flanders to learn the technique from Van Eyck is chronologically impossible, but clearly Antonello was an early practitioner.

One recent clue has been provided by the analysis at the National Gallery of the Ferrarese painter Cosimo Tura’s Allegorical Figure (Figure 3), painted for the studiolo at Belfiore in the late 1450s. The lowest layers are of egg tempera and may relate to a different composition; but the layers corresponding to the finished composition are solely of oil, used in an unequivocally Netherlandish technique of opaque underlayers modelled with glazes. The intricate brocade sleeve is strikingly similar to that of one of the kings in Rogier van der Weyden’s Columba Altarpiece of around 1455 – and indeed, other paintings by Rogier were known to be in Ferrara by that date. Some historians have even cited the possibility that Rogier himself may have visited Ferrara and instructed Tura on a pilgrimage to Rome in 1450, but this cannot be verified.

The transition from egg to oil in Italy is difficult to chart, except by microchemical analysis of the paintings themselves, because many painters used oil in much the same way as they had used egg, and there is little visible difference in the appearance of their works.

But, essentially, by 1500 the predominant painting medium was oil, and its versatile properties prompted painters to explore a whole range of colouring systems that led European painting in various directions over the following centuries. Let us look briefly at one or two examples.
Figure 3 Tura, Allegorical Figure. (The National Gallery, London.)
Chiaroscuro and sfumato

The essential truth of Alberti’s observations on the modelling of relief persisted and became the basic chiaroscuro mode of colouring in the sixteenth century. In Sebastiano del Piombo’s Raising of Lazarus (1518), we can see how areas of high-key colour are set against sharp, deep shadows. The whole effect is highly contrasted, precise and crisp, but essentially fragmented.

A century later, Caravaggio was to refine the chiaroscuro mode into something altogether more atmospheric. Meanwhile, Leonardo da Vinci developed his own method of achieving a magical dark harmony at first glance derived, but in reality quite different, from chiaroscuro, this was

Figure 4 Leonardo da Vinci, Adoration of the Kings. (Galleria degli Uffizi, Florence.)
the colouring mode known as *sfumato* (literally, smoke-like) in which finely modulated forms emerge from soft shadows.

In such paintings as the *Virgin of the Rocks* (of about 1508) the subdued tonality is based on an extensive undermodelling in monochrome black, brown and grey. Such an undermodelling had been used by Piero della Francesca in his oil paintings from the 1470s, but Leonardo went much further. His colours were thinly applied and low in key and, muted by the deep monochrome below that, virtually eliminated any luminosity from the white ground. We can see this dark underpaint directly in the unfinished hand of the angel where it touches St John’s back. We can see it completely uncovered in the unfinished *Adoration of the Kings* (Figure 4) of 1482.

**Cangiantsimo: the Sistine Chapel**

Almost exactly contemporaneous with the *Virgin of the Rocks*, but as different as it is possible to be is Michaelangelo’s Sistine Chapel vault, revealed in its astonishing colours by recent cleaning. The scheme of colouring here is *cangiantsismo* on an unprecedented scale. There can be no doubt that these are the brilliant colours that Michelangelo intended – needed, indeed – to make the dark vault of the chapel light up and to render the individual scenes visible from far below. Carried out in true fresco, the colouring is essentially derived from Cennini – up-modelling, with *cangiante* draperies everywhere. The extraordinary turquoise-violet or orange-blue hue-shifts anticipate the complementary contrasts of the Impressionists by three and a half centuries.

**Titian: *disegno* versus *colore***

Any history of colour in art must take as its central point the emergence and flowering of the sixteenth century Venetian school culminating in Titian, generally considered the greatest colourist of all. It is no surprise that Venice, the centre of the pigment trade in Europe, should foster a group of painters who delighted in colour and filled their paintings with an abundance of the finest pigments available. We might take as our first example *The Incredulity of St Thomas* by Cima (painted around 1500),
which has been found to contain virtually every pigment available at that date – including some which were rarely used, such as orpiment, realgar and haematite. Moreover, he used different grades of azurite and ultramarine for different colour effects, and highly unusual organic glazing colours. The general sense is one of great sophistication, both in pigment
use and colour composition. There is only one repeated colour in the entire work—the green worn by St Thomas and the apostle at the far right.

Like Michelangelo’s Sistine Chapel ceiling, Titian’s Bacchus and Ariadne (Figure 5) has been revealed in its true colours by cleaning in recent years. It is one of the most radiant images in art, made so by the extraordinary range and purity of the pigments. Almost every pigment available in Venice is here, all of unparalleled quality and used at full strength. The ultramarine in the sky is the purest found in any painting yet examined at the National Gallery.

What is so striking about the use of strong competing colours here is that the composition could so easily have fallen apart visually, like the Sebastiano Raising of Lazarus. Yet Titian has achieved an overall harmony effortlessly, knitting everything together with a subtle framework of quiet greens and earth colours.

Titian’s paintings of this period are complex in their layer structure, largely because he worked out many of the details of his compositions only at the painting stage. Let us look at the figure of Ariadne, for example, standing against the sea and sky, the vivid red scarf across her shoulder. You or I—or indeed Michelangelo—would probably have drawn it all out and then carefully filled in the colours to each area. But not Titian—he made it up as he went along: a cross-section shows that he painted the sea first, Ariadne’s bare shoulder next and finally the scarf in the purest vermillion on top of that.

Titian’s paintings became, more and more, acts of spontaneous creation on the canvas itself. It was this tendency that led to a famous instance of the perennial disegno versus colore quarrel. Ever since Aristotle, scholars had debated whether drawing or colour was more important in painting. Cennino and Alberti had sensibly allowed them equal importance. But Vasari could not resist joining in the fray—especially if, as a good Tuscan, he could score a few points off a Venetian.

In his Life of Titian he described a conversation with Michelangelo about Titian’s method in some paintings they had just seen: ‘Buonarroti commended it highly, saying that his colour and style pleased him very much, but it was a shame that in Venice they did not learn to draw well.’ Vasari was especially scathing about Giorgione who, he said, ‘failed to see
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that, if he wants to balance his compositions ... he must first do various
sketches on paper to see how everything goes together.

The opposition of *disegno* and *colore* was not simply drawing versus
colour: as we have seen, Michelangelo, the greatest exponent of *disegno,*
was also capable of astonishing colour. It is, rather, the method of cre-
ation: Titian's habit of creating his compositions directly in paint on the
canvas is the essence of *colore.*

We can only imagine how much more aghast Vasari would have been
to read Palma Giovane's celebrated account of the older Titian at work on
such paintings as the late *Death of Actaeon.*

He used to sketch in his pictures with a great mass of colours as a bed or
base for his compositions ... then he used to turn his pictures to the wall
and leave them there without looking at them, sometimes for several
months. When he wanted to apply his brush again, he would examine
them with the utmost rigour, as if they were his mortal enemies to see if
he could find any faults. Then he gradually covered these forms and in the
last stages he painted more with his fingers than his brushes.

Titian paved the way for the great *alla prima* painters of the Baroque:
Rubens, Velázquez and Rembrandt. All three fell under his spell, Rubens
making copies of the great Bacchanals in Madrid, Velázquez seeing his
paintings daily at the Court of Philip IV and Rembrandt basing his 1640
self-portrait on Titian's *Man with a Blue Sleeve,* seen briefly in
Amsterdam.

Each of them developed colour in highly personal ways. Rubens per-
sisted with white grounds in such luminous and brilliant works as the
1609 *Samson and Delilah,* painted immediately after his return from
Italy and influenced strongly by the jewel-like colours of Adam
Elsheimer.

Rembrandt and Velázquez painted with much more limited palettes
but with a sophisticated control over their materials that is only now
being discovered. They used both light coloured and dark tinted grounds
and experimented with unorthodox pigment mixtures to achieve extra-
ordinarily subtle effects. In his wonderful portrait of his wife *Saskia in
Arcadian Costume,* Rembrandt has added the highly unusual azurite to
many parts in order to give a cool greenish tint to the whole picture. And
Saskia's waistband is a notable piece of Rembrandt bravura, testing the
properties of oil paint to their limit, challenging us to see the illusion beyond the reality.

Throughout the seventeenth century, great painters all over Europe developed their individual styles and produced masterpieces of astonishing diversity. The colore versus disegno debate raged on, with the battles between the Poussinistes and the Rubenistes in the French Academy in the 1660s and 1670s – battles that had more to do with spontaneity and formality than with colour and drawing. Technically, the processes of painting varied little from place to place or from painter to painter. It is worth remembering that, despite the extraordinary richness and variety of seventeenth-century paintings, all were produced using essentially similar materials and techniques.

**The introduction of synthetic pigments**

In terms of painting materials, the modern era began in 1704, with the invention of Prussian Blue. This is a date that every student of painting techniques knows as a *terminus post quem* and because it marks the beginning of the synthetic pigment industry that was to lead to a complete rethinking of the artist's palette in the early nineteenth century. Prussian blue became widely used within twenty or thirty years. Canaletto, who in his earliest works used ultramarine for his skies, was certainly using Prussian Blue by the time he painted the *Stonemason's Yard* in the late 1720s.

The precise dating of pigment inventions gives us a formidable weapon in the matter of determining authenticity. A number of apparently old paintings have been betrayed by the presence of Prussian Blue: and *Entrance to the Cannaregio* (Figure 6) once firmly attributed to Francesco Guardi was hurriedly relabelled 'Imitator of Guardi' when it was found to contain Cobalt Blue, invented nine years after Guardi's death.

In the first three decades of the nineteenth century an extraordinary number of new pigments appeared, the direct result of a rapidly expanding chemical industry. The discovery of cobalt, chromium and cadmium, the synthesis of artificial ultramarine in 1826 (following a competition sponsored by the French government) and the first synthesis of alizarin,
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Figure 6 Imitator of Guardi, Venice: Entrance to the Cannaregio. (National Gallery, London.)

the red colouring of the madder plant in 1868, were just some of the notable landmarks in the history of modern pigments.

Nineteenth century painters adopted these new materials as soon as they became commercially available. Moreover, the development of the flat-ferrule brush, and – even more important – collapsible metal paint tubes made of lead or tin (available from about 1840), transformed painting practice. Brilliant, mostly stable colours were plentifully available and it was now easier than it had ever been for painters to work out of doors.
The Impressionists

All painters benefited from these developments, but it is the Impressionists that we think of automatically, and I want to look now at the use of colour by the Impressionist group. So much has been written, so many myths have been constructed about their art that it is difficult to know where to begin. Perhaps the best, the simplest, the truest definition of how they painted is Monet's famous remark to his chronicler Lila Cabot Perry:

when you go out to paint, try to forget what objects you have before you, a tree, a house, and a field or whatever. Merely think here is a little square of blue, here an oblong of pink, here a streak of yellow, and paint it just as it looks to you, the exact colour and shape, until it gives your own naive impression of the scene before you.

There is as succinct a description of Impressionist practice as you will encounter: observe and record. Until we get to Seurat and neo-Impressionism it is inappropriate to speak of any unifying colour theory of Impressionism. It is true that Chevreul's Principles of Harmony and Contrast of Colours (published in 1839) was influential in a general way, but the principles of colour contrast that he proposed were only acknowledged in Impressionist paintings in the simplest terms: indeed, such use of colour had long been implicit in the practice of Delacroix and others.

Impressionist use of colour is quite straightforward. They rejected the prevailing academic notions of chiaroscuro – modelling in light and shade – and constructed their images in terms of pure colour, heightened in many cases with white, the technique known as peinture claire.

The most striking feature of many of these pictures is the bold juxtaposition of complementary colours – blue with orange, red with green, yellow with violet – all seen in Monet's dazzling Regatta at Argenteuil (Figure 7) of 1872. Chevreul had described how such complementary pairs mutually enhance each other by simultaneous contrast. It has to be said that the idea was anything but new; it goes all the way back to Alberti's colour chords and the 'friendship of colours'.

Renoir's Boating on the Seine (of 1879 or 1880) shows a vivid blue–orange pairing – and the pigments here are nearly all nineteenth century inventions: cobalt blue, chrome yellow, chrome orange, lemon yel-
low and viridian, used almost unmixed, as they came from the tube.

The Impressionists were captivated by the purity and brilliance of the new pigments. Their avowed dislike of the old dark colours led to a principled rejection of black and the earth pigments that was more propaganda than fact. ‘There is no black in nature’ they cried, but black lingered on their palettes long after they claimed to have given it up.

Nevertheless, they sometimes went to extraordinary lengths to avoid using dull earth colours. In his Gare Saint Lazare (1877; Figure 8) Monet has mixed no less than seven high-toned pigments together to make the dark station canopy that could easily have been painted with brown and black. Throughout the 1870s he adopted this procedure, clearly intrigued by the almost imperceptible shimmer of powerful colours in the darks of his compositions.

The use of coloured shadows by the Impressionists is a well-known
characteristic of their work, and is something much more general than Monet’s elaborate pigment mixtures. Goethe, Delacroix and others had long before noted violet shadows in yellow drapery and greenish shadows cast by a red sunset and had realised that these phenomena are caused by the physiological reaction of the human eye to powerful colours. ‘Every decided colour’, said Goethe, in his *Theory of Colours*, ‘does a certain vio-
lence to the eye and forces it to opposition'. In other words, after looking at a strong colour for a while, everything becomes tinged with its complementary.

Coloured shadows in Impressionist paintings generally contained blue/violet tones as the complementary to yellow sunlight. Much fun was had at their expense, and the derisive term 'violettomania' was coined to describe their 'collective sickness' of painting 'people in violet woods' and 'purple-tinted corpses in a state of decay'.

Monet in his Rouen Cathedral series pursued the complementary coloured shadow to its ultimate point: almost abstract patterns of blue and orange, shimmering before us.

The use of colour by the Impressionists was essentially empirical and it is only when we reach Seurat and the neo-Impressionists that we have to consider a theoretical or scientific underpinning for their art.

Seurat

Seurat presents an enormous problem to students of art history and science alike. In the century since he painted, numerous scholars have accepted the premise, first disseminated by his friend the critic Félix Fénéon, that Seurat's technique of 'chromo-luminarism' imitated the very behaviour of light itself: that dots of pure spectral colour could re-form into the colours observed in nature with a brilliance and luminosity unobtainable with conventional pigment mixtures. Seurat, we were told, had based his method firmly on the scientific principles of such colour theorists as Chevreul and Ogden Rood.

In recent years a distinct reaction has set in to this mythology. We now know that Seurat misunderstood much of current colour theory and that, in many cases, the optical mixtures he so carefully calculated simply do not work, and they are certainly no more luminous than ordinary pigment mixtures.

This then is our problem. Scientifically speaking, there is a great deal less to Seurat than meets the eye; but his flawed and partial theories have given us some of the most haunting images in European art and all our reservations about his science must not blind us to that fact.

If we peer through the complex web of myth and pseudo-science that
has been endlessly spun around his work, we can see that Seurat was, in fact, applying just two simple principles of contrast derived directly from Chevreul. Enhanced contrast of tone is seen very clearly in the light and dark haloes around the boys in the centre and at the right of the great *Baignade à Asnières* (p. 53) — painted in 1884 before Seurat’s pointillism had begun, but retouched with some pointillist details in 1887. Next to the lit sides of the boys’ bodies the water has been consciously darkened and next to the shadowed sides of their bodies it has been lightened.

The other contrast, that of complementary colours, is used everywhere in Seurat’s optical mixtures, both for coloured shadows and for mutual enhancement of adjacent areas. Around many of his later pictures, he included a painted pointilliste border in which the dominant colour constantly changed and became the complementary of that part of the painting nearest to it — orange next to the blue sky, red next to green grass and so on. In his picture of *La Crotoy* of 1889 (now in Detroit) the original painted frame, with just such a colour scheme, still survives.

But obsessive pointillism killed spontaneity and careless optical mixtures actually killed colour as Signac, Seurat’s fellow neo-Impressionist was later to admit. Writing in 1894, he said:

> Pointillage simply makes the surface of the paintings more lively, but it does not guarantee luminosity, intensity of colour or harmony. The complementary colours which are allies and enhance each other when juxtaposed, are enemies and destroy each other if mixed, even optically. A red and a green if juxtaposed enliven each other; but red dots and green dots make an aggregate which is grey and colourless.

As many have since observed, that greyness is palpably there, hovering over many neo-Impressionist paintings. To some it is part of their magic; to others it just adds a further dimension of unreality.

We have come a long way from the artificial colouring system of Cennino to the equally artificial system of Seurat. But I want to leave you with a simple image which, to me conjures up the whole charmed relationship between painters, their materials and their subjects. It is this small landscape painted in 1878 by Camille Pissarro on his own palette (Figure 9). The six colours he has used for his picture are all there around the edge, high-toned Impressionist colours out of which he has made something
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quiet, harmonious, timeless. No elaborate colour theories here, just a painter at work, observing and recording in pure colour – practising, as Paolo Pino, the sixteenth-century Venetian author called it, the ‘true alchemy of painting’.

Figure 9 Pissaro, Landscape Painted on his Palette. (Sterling and Francine Clark Art Institute, Williamstown, Massachusetts.)

Further reading


