1   Art through history

Introduction

Humans are highly visual creatures. Evolution has honed the human brain into a supremely efficient tool for extracting information from visual images, which far exceeds the capabilities of the most powerful computer vision systems available today. The areas of the brain devoted to our visual sense are much larger than the areas devoted to all of our other faculties. Vision begins with an image cast onto the inside surface of the eyes. Large populations of brain cells analyse this image in terms of several essential visual characteristics, including shape, size, texture, colour and motion. These highly complex brain processes underlie all visual experience but they are largely hidden from conscious awareness. The detailed characteristics of brain function must have a profound role to play in our experience of visual art. The aim of this book is to put forward an approach to understanding visual art that is founded on our knowledge of how the eyes and brain function together to create visual experience.

Before we can embark on this task, it is important to define some fundamental terms of reference. Everyone agrees on what we mean by the brain, namely the 1.4 kg jelly-like mass of nerve cells and fibres cradled inside the human skull. The visual system of the brain includes the eyes, the neural pathways connecting the eyes to the brain and all the neurones in the brain that respond primarily to visual stimulation. On the other hand, it is much more difficult to agree on a definition of art. Philosophers continue to debate the virtues of alternative ways to define art; however, one point is clear: any attempt to define artworks in terms of a single characteristic such as their representational properties or their expressive qualities is bound to fail. Counter-examples to single characteristics

such as these can always be found. Maps, for example, are representational because they represent the layout of the land but they are not usually considered to be art; human postures have expressive properties but are not usually considered as art unless adopted during an artistic performance such as ballet. On the other hand, it is difficult to consider the collection of Italian Renaissance paintings in London's National Gallery as anything other than works of art. What about Marcel Duchamp's 'Fountain' (actually a manufactured urinal), or Carl Andre's 'Equivalent VIII' (actually a rectangular arrangement of 120 fire-bricks)? Are these objects works of art?

Some philosophers favour a definition of art in terms of a cluster of features or properties (Dutton, 2009). According to this scheme, no single property is essential for classification as a work of art but some subset of properties may be sufficient. This approach seems to capture the essential characteristics of visual art, at least for the present purposes. An acceptable list might include the following properties.

A work of art should:

1. Have aesthetic merit
2. Express an emotion
3. Present an intellectual challenge
4. Be structurally complex and coherent
5. Offer a novel, individual viewpoint
6. Be original
7. Display skill in its execution
8. Be part of an established historical and cultural art form
9. Be created by an intentional act

We can see that Renaissance paintings tick all the boxes. But what of Duchamp's 'Fountain'? It certainly ticks some boxes in being intellectually challenging, novel and original in conception and intentional. In addition, it played a central role in establishing the conceptual art movement. But it is a manufactured object, normally found in a toilet. It was not created by an act of artistic skill, nor can it be called beautiful. Duchamp also made use of other manufactured objects in his work, which he called 'ready-mades'. His work was a satirical protest at the state of the art world and at conventional judgements of artistic excellence. In a way, Duchamp was deliberately trying to create anti-art, to violate as many of the criteria for art as possible, including a feature that was, to many people, a fundamental property of art – it should be beautiful. In its own way, Duchamp's ready-made art conforms to the defining features of art just as much as do more

Table 1 A timeline of the major art eras over the last thousand years
(see list of illustrations)

1000 1100 1200	Romanesque			
1300 1400	Gothic	Cimabue (Figure 1.2)		
1500	Renaissance	van der Weyden (Plate 16) Bellini (Plate 1) Da Messina (Plate 14) Gossaert (Plate 11)	Bermejo (Figure 5.6) Raphael (Plate 1)	Titian (Plate 18)
1600	Mannerism	Beccafumi (Plate 15) Holbein (Figure 5.7) Brueghel (Plate 5)	Pontormo (Plate 17) Beuckelaer (Plate 16)	
1700	Baroque/ Rococo	Rembrandt (Figure 1.3) Claude (Plate 2) Vermeer (Plate 13) Wootton (Figure 6.1)	Velasquez (Plate 5)	
1800 1900	European Academic	Degas (Figure 2.5) Van Gogh (Plate 20)	Canaletto (Figure 4.4) Monet (Plate 3; Plate 9; Plate 10)	
	Modern	Derain (Plate 4) Rothko (Plate 4)		
2000	Postmodern		Riley (Figure 6.7)	

conventional artworks. The 'Fountain' is seen now as a turning point in the history of art. The modern art movement attempted to displace aesthetic beauty from its position at the pinnacle of artistic excellence, a position it had occupied since the Renaissance, and replace it with other elements in the cluster of features defining art, in particular novelty and intentionality. However, aesthetic beauty was pre-eminent for centuries prior to modern art, and it remains, for many non-specialists at least, an essential quality of great art.

This chapter outlines some major milestones in the history of visual art, so as to offer a little contextual background for later discussions about the relationship between visual art and the brain. It sets the broader theoretical and historical scene for the scientific perspective developed in subsequent chapters. As an aid, Table 1 sketches a timeline of the major art eras over the last thousand years, annotated with the artworks used as illustrations in this book. One

chapter and table cannot, of course, do justice to such a large and complex subject with such a rich history, so it is necessarily rather selective and sketchy and, no doubt, takes some major liberties with the details and subtleties of the subject, which I hope the reader will forgive.

Prehistory

The archaeological record shows that during the Stone Age when modern humans (Homo sapiens) began to dominate over the preceding Neanderthals, there was a rapid expansion in the creation of apparently artistic artefacts. The oldest known artefacts have been found in Africa. A cave discovered in 1991 on the Southern Cape coast of South Africa has yielded remarkable pieces of engraved ochre, thought to be 77,000 years old (Henshilwood et al., 2002). The slabs are inscribed with lines arranged in regular geometric diamond patterns. The engravings could be an attempt to represent the pattern on snake skin, or perhaps were intended to be purely abstract or symbolic. They may have been decorative, or may have conveyed a message about identity or cultural status. We cannot be sure what the markings meant to the people who created them but, whatever their origin, these patterns represent the earliest known mark-making by humans.

Other finds in Europe reveal early attempts at figurative art. A cave in southern Germany has yielded a 35,000-year-old female figurine with exaggerated sexual characteristics (Conard, 2009). Cave paintings elsewhere in Germany as well as in south-west France and northern Spain include many beautifully rendered images of animals dated at over 30,000 years old (Clottes, 2001; see Figure 1.1). These and many other examples of prehistoric art demonstrate that the impulse to create art clearly emerged very early in the expansion of Homo sapiens, a sign of the visual abilities furnished by their large brain.

Art has occupied a prominent place in all human societies since the dawn of recorded civilisation. It became established as a subject for academic study after the sixteenth century, when the Italian artist and scholar Giorgio Vasari documented the lives of Italian Renaissance painters and their patrons in a book entitled *Lives of the Most Excellent Painters, Sculptors and Architects*. The modern empirically based approach to the study of art history dates from the publication, two hundred years after Vasari's *Lives*, of a monumental work by Johann Joachim Winckelmann in 1764, entitled *History of the Art of Antiquity* (Winckelmann, 1764). Winckelmann surveyed the art of ancient Mediterranean

Figure 1.1 36,000-year-old cave paintings of animals. (Redrawn from Clottes, 2001.)

civilisations in modern-day Egypt, Lebanon, Iran, Greece and Italy. He valued ancient Greek art as superior to all other forms of art and, as such, most worthy of study and imitation. Ancient Greek art is therefore a natural starting point for this brief survey of art through history.

Ancient Greek art

Ancient Greek sculpture is traditionally regarded as the zenith of classical beauty and perfect proportion in figurative art. It defined an artistic 'canon' that had a profound influence on Western art for centuries ('canon' comes from the Greek word *kanon*, meaning a straight rod or ruler, a prototype model). Many ancient Greek statues conform to a precise set of rules governing body

proportion, which were described by the Roman architect Vitruvius and illustrated in Leonardo da Vinci's famous drawing of Vitruvian Man (Panofsky, 1955). For example, in a perfectly proportioned human figure, the vertical extent of the head (height from chin to crown) should occupy precisely 1/8 of the total body height. Many ancient Greek statues such as the Riace Warriors (found near the Italian coast in 1972; see Stewart, 1990) conform exactly to the Vitruvian ideal and display a supreme mastery of the art form. These proportions do not necessarily reflect the actual proportions of real human figures (Mather, 2010) but rather idealised proportions. They have guided artistic depictions of the human form for centuries. A possible neuroscientific basis for our preference for certain body proportions will be outlined in Chapter 10.

Ancient Greek philosophers viewed art as a mirror held up to the world, an idealised imitation of nature or of human life. This view represents the earliest theory of art, known as 'mimesis', from the Greek for imitation. Art did not aim simply to imitate nature but to distil the essence of ideal aesthetic beauty in nature and re-present it for the pleasure of the viewer. Accordingly art was judged on its aesthetic merit ('aesthetics' comes from the ancient Greek word *aesthesis*, meaning sensation or perception). Gazing at surviving examples of ancient Greek statues, one can only be impressed by the degree to which the ancient sculptors achieved their aim. Their beauty and fidelity is undeniable. Chapters 8 and 9 will discuss how aesthetic pleasure relates to brain function.

Renaissance art

The Romanesque and Gothic Western art traditions that flourished in the Middle Ages retreated from ancient ideals of mimetic beauty into functionality and a superficial, simplified form of 'naturalness'. There was little attempt, for example, to depict realistic human proportions and facial expressions (Figure 1.2). However, the social, political and intellectual developments that gathered pace in Europe in the fifteenth century were reflected in dramatic changes in visual art. Discoveries about the natural world and the place of humans within it led artists to question the subjugation of individuality that was dominant in the art of the Middle Ages. Newly discovered laws of perspective gave artists tools to emphasise the unique viewpoint of an individual protagonist, who was increasingly rendered in paintings with an unmistakeable personality and emotion. Artists turned to classical antiquity for inspiration. Florentine sculptors such as Ghiberti and Donatello created organic, anatomically realistic human forms, often clad in

Figure 1.2 'The Virgin and Child Enthroned with Two Angels', Cimabue, 1280–1285.

a classical Roman toga. They revived the ancient Greek practice of the *contrapposto* ('placed opposite') stance, in which the upper and lower halves of the body twist in opposite directions to avoid the appearance of unnatural stiffness. Typically, the figure is posed with most of the weight on one leg, while the other leg is relaxed (as in Michelangelo's 'David', or Botticelli's 'Venus').

Vasari coined the term 'Rinascita' or 'Renaissance' (rebirth) in Lives to describe the movement. Renaissance art pursued the ancient tradition of mimesis, striving to capture an idealised depiction of nature in ever greater degrees of faithfulness and aesthetic purity. This pursuit of perfection culminated during the High Renaissance (c.1495–1520) in the work of Raphael, Michelangelo and Leonardo da Vinci. Leonardo believed that:

Painting preserves that harmony of corresponding parts which nature, with all its powers, is unable to maintain. It keeps alive the image of a divine beauty whose natural model is soon destroyed by time and death.

Renaissance artists became masters of the technique of chiaroscuro, in which form is modelled by almost imperceptible gradations of light and dark. Look closely, for example, at Raphael's supremely subtle rendering of the skin tones in 'Saint Catherine of Alexandria' (Plate 1; see colour plate section). The art of the High Renaissance was regarded for a long time as the absolute pinnacle of Western art (although that view has been questioned in the modern era). In the three centuries that followed the High Renaissance, art became established in Europe as an institutionalised cultural industry. Academies, galleries, museums and collectors enshrined the artistic values that were developed during the Renaissance, especially in terms of the pre-eminence of the mimetic and aesthetic values encapsulated in the quote by Leonardo. Art academies acquired casts of sculptures from Greek and Roman antiquity and the Renaissance masters. Their students were trained in draughtsmanship, particularly of the human form, and used the casts as reference points for ideal human proportion. Prior to the Renaissance, there had been little attempt to depict individual human features, and landscapes were schematic backdrops lacking in depth and realism. During the period after the Renaissance, the portrait emerged as a legitimate artistic genre in its own right, as did landscape painting (Plate 2). A ranking system developed at art academies, in which paintings were graded according to subject matter (genre). The highest form of art was said to be based on historical, religious or mythical subjects. Portraiture was in the second rank, above landscape and daily life. The lowest rank was assigned to still life. Rankings affected scholarships, prizes and perceived value. Although the pursuit of aesthetic beauty remained pre-eminent, artists moved on from strict adherence to Renaissance ideals. In the Mannerist movement that succeeded the Renaissance, depictions of the human form departed from classical proportion, often as a way of heightening expressiveness. El Greco, for example, frequently rendered human figures with elongated bodies and relatively small heads.

The brain's capacity to interpret visual images has a crucial bearing on the artist's ability to create mimetic art and on the viewer's ability to interpret the mimetic content of art. These aspects of brain function are considered in Chapters 4 and 5. The aesthetic power of mimetic art such as landscapes is analysed in Chapters 8 and 9.

Modernism and abstraction

Towards the end of the nineteenth century there was an increasing desire among artists to move away from the traditional mimetic and aesthetic approach to art as defined by the academies. Artists became increasingly preoccupied with the medium itself, the canvas and paint, rather than with transparent, faithful depictions of nature. A group of French artists advocated painting out-of-doors to catch fleeting impressions of light and colour, rather than in the artificial confines of the studio. They adopted a technique in which paint was applied in distinct, sometimes heavily loaded touches of pure colour, rather than in smoother, blended strokes characteristic of earlier movements (Plate 3). Artists such as Monet, Pissarro, Cezanne, Boudin and Degas became the vanguard of the modern Impressionist movement, which heralded a shift in emphasis in Western art towards significant form in paintings (line, tone, shape, texture and colour) rather than mimetic content. The Fauvist movement that followed on from Impressionism continued the preoccupation with significant form in their use of bold, nonrealistic colours (Plate 4). The leader of Fauvism, Matisse, commented:

I started painting in planes, seeking the quality of the picture by an accord of all the flat colours . . . subject matter being unimportant.

The first exhibition by the Fauvist movement took place in Paris, in 1905, and this date is generally regarded as the inception of the Modernist movement in art.

According to the Modernist movement, the quality of art is derived not from its mimetic fidelity but from the involuntary response evoked by its form. In 1890, the Post-Impressionist painter Maurice Denis stated:

Remember that a picture, before it is a picture of a battle horse, a nude woman, or some story, is essentially a flat surface covered in colours arranged in a certain order.

For Denis, aesthetic pleasure was to be found in the painting itself, not in the subject matter. Great art was said to share certain universal formal qualities.

This view led to a critical stance in art known as Formalism, which focused entirely on composition and medium rather than subject matter. Formalism provides a vocabulary for describing and evaluating the aesthetic qualities of artworks: design, composition, texture. Thus, modern art moved away from illusionist painting, mimesis and narrative and, instead, emphasised medium and composition. It advocated certain aesthetic practices such as linearity and geometry. Elements of modernism can be seen in the work of earlier periods and may have inspired modernist painters. Titian, for example, used brushstrokes that manipulated surface texture as a form of expression and explored the purely expressive effects that could be created with colour.

According to the critical techniques of Formalism first described by Wolfflin (1915) in his influential book *Principles of Art History*, any artwork could be evaluated in terms of opposing pairs of descriptors. Wolfflin introduced the descriptors as a way of understanding the contrast between Renaissance art and art from later periods, but they have since been applied more generally to art from all periods.

Wolfflin's 'linear' versus 'painterly' dimension contrasts compositions emphasising outline and contour with those dominated by the tonal effects of light, shade and colour, which blend the borders of objects. He regarded Durer, for example, as primarily a linear artist, while Rembrandt was described as painterly (Figure 1.3). Closely related is the 'clearness' versus 'unclearness' dimension, distinguishing between compositions with a clean, clear expression of form and those clouded with paradox, ambiguity, or shadow. Renaissance paintings tended to display a high degree of clarity in line and form, in which no questions are left unanswered, whereas later works exploit a lack of clarity to convey mood. Tintoretto, for example, used shadows across the face to convey suffering. Wolfflin's 'plane' versus 'recession' distinction refers to the depth relationships in the depicted scene. In some compositions such as Velasquez's 'Venus' (Plate 5), the elements of the scene predominantly lie in a plane parallel to the plane of the picture, while others such as Brueghel the Elder's 'Hunters in the Snow' (also Plate 5) convey a strong sense of receding depth planes. Chapter 5 will discuss some of the techniques artists use to convey depth in paintings.

Cubism followed on soon after Fauvism and represented a further departure from the traditional mimetic approach to art. Cubist art, initiated by Pablo Picasso, attempted to represent different aspects or viewpoints of the same object simultaneously. In the early twentieth century, a growing number of artists began creating work that was not connected in any obvious way with the