Chapter 2

The Renaissance and the Academic method

The purpose of *PART TWO* is to review approaches to drawing teaching that have proved their worth over time. It is divided into two parts. Each of these relates to a different phase in the history of European art. The first lasted from the *Italian Renaissance* until the arrival of the *Impressionists* in the 1860s and, second, from that time until the present day. In the earlier period, a great deal of ingenuity went into solving the problem of creating *realistic looking images*. In the later one, the priority was finding *personal ways* of *seeing* and *feeling*.

Italian Renaissance artists faced two problems. One was that of making accurate drawings *from observation.* The other was producing realistic looking images *from the imagination*. *Figures* 1 - 7 describe ways of solving the first problem. They depend on mechanical image-transfer procedures that minimize the need for knowledge of the properties of the objects being reproduced. For example, several of them use *tracing,* a task that requires neither special skills nor familiarity with the traced object. *Figures 8 - 17* show ways of solving the second problem. These depend on knowledge of the *invariant properties* of appearances, known by artists as "*the laws of nature*". The best known examples of these are "*linear perspective*" and "*anatomy*". However, because they describe characteristics of objects and spatial layouts that never change, they cannot be used for depicting the uniqueness of appearances. Does this mean that rules of *linear perspective* and *anatomy* cannot help with drawing from observation? Not at all. On the contrary. They can help a great deal, but only if they are thought of in a completely different way: Instead of being used in the conventional way as "*guides to doing",* they must be conceived as *guides to looking"*. The companion volume, "*Drawing with Knowledge*" shows how this can be done. But, *knowledge to guided looking* strategies are also required when analysing unique and therefore unfamiliar aspects of appearances. *PART 3* of this book provides a deep and practical understanding of these.

IMAGE TRANSFER PROCEDURES

Figure 1 : Baptistry of San Giovanni, Florence. According to Antonio Manetti (1423-1497) an Italian mathematician and architect from Florence, the Florentine architect Brunelleschi (1377-1446) made a painting of this building by tracing its reflection on the surface of a small mirror (half a braccio square - 35 X 35 cm). To resolve the problem of the mirror-image inversion Brunelleschi drilled a conical hole in the centre of the image, which was as "small as a lentil" on the painted side of the panel and the size of a "ducat" (that is to say rather larger) on the other. While looking through this peephole, Brunelleschi held up another mirror so that the image of his painted panel appeared in it. In this way, he created a right-way-round mirror-image of the Baptistry. The concept of eye beams fanning out from the viewing aperture and transformations due to the distance of the mirror from the Baptistry provide the basis for the mathematical descriptions which enabled the first step in the discovery of the laws of linear perspective.

Figure 2a : Shows a woodcut of a perspective frame by Albrecht Dürer. Notice the aligning device for keeping the eye still. More usual is a chinrest. Notice also the squared up paper upon which the artist is making his copy of the model.

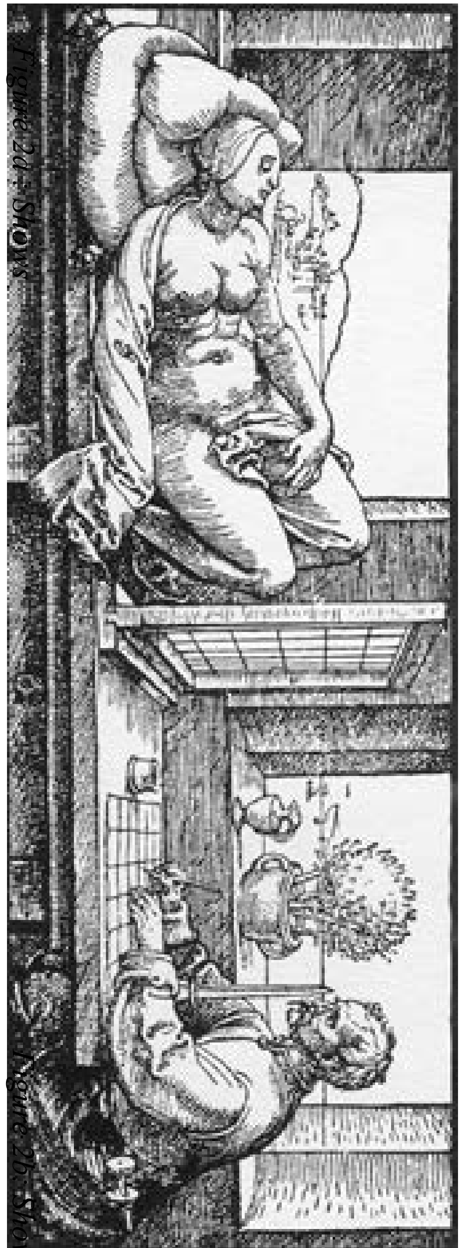

Figure 2b : Shows a second woodcut by Albrecht Dürer, this time illustrating a device that enables two people to make a perspective image by a direct transfer procedure. It demonstrates the lengths to which people would go to achieve accuracy.

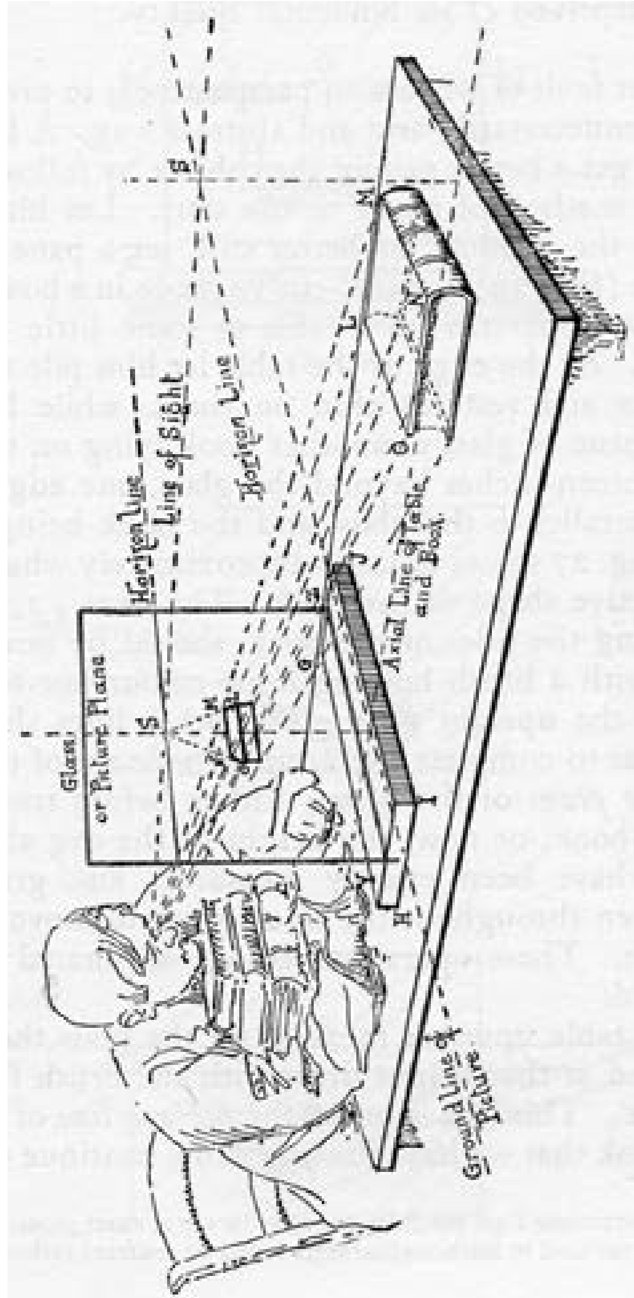

Figure 3 : An artist drawing on glass (from Vernon Blake "The Art and Craft of Drawing"). The artist is tracing the image of a book lying on a table on a sheet of glass. As with the perspective frame it is necessary for him to keep his head still, this time he does so with a chin rest made of a number of books. The idea of tracing on glass is at least as old as Leonardo da Vinci as the following quotation from him shows: "In order to put into practice this perspective of the variation and loss or diminution of the essential character of colours, observe some objects standing in the landscape, such as trees, houses, men and particular places. Then in front of the first tree have a very steady plate of glass and keep your eye very steady, and then, on this plate of glass, draw a tree, tracing it over the form of that tree. Then move it on one side so far as that the real tree is close by the side of the tree you have drawn; then colour your drawing in such a way as that in colour and form the two may be alike, and that both, if you close one eye, seem to be painted on the glass and at the same distance."

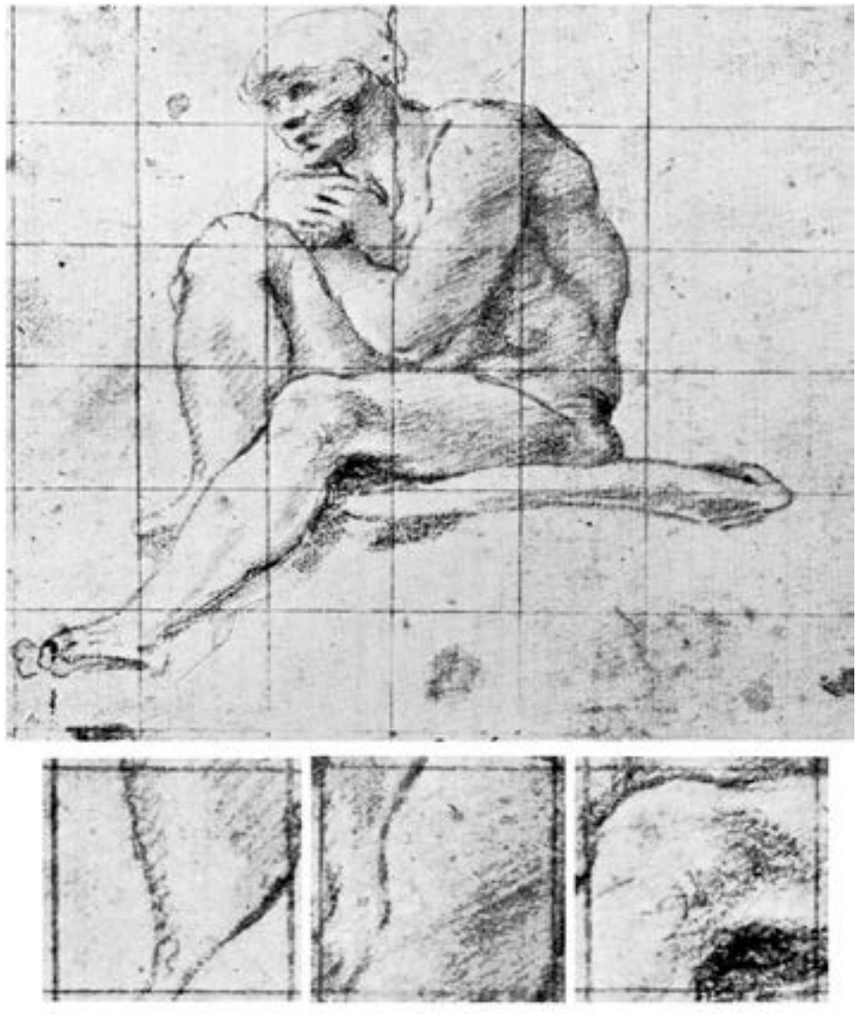

Figure 4 : Shows (top) a squared up drawing by Antonio da Correggio, along with (bottom) three of separated out squares containing seemingly abstract lines contained within easy to refer to horizontal and vertical grid lines. Using these as references, an accurate enlarged version of the drawing can be drawn on a picture surface or wall. This particular drawing was used for a fresco in the church of S. Giovanni in Parma, Italy.

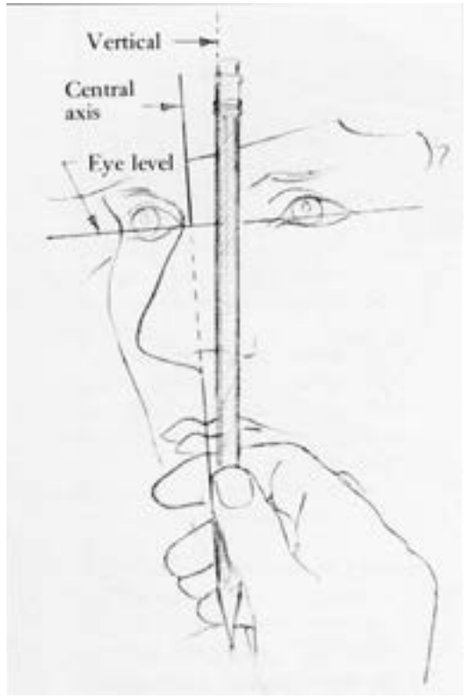

Figure 5 : An illustration from Betty Edwards's book, "Drawing with the Right Side of the Brain". It shows a pencil being used to measure the angle of the tilt of a head. The same device can be used to measure the relative lengths of lines. In effect a pencil used in this way operates on the same principle as the perspective frame. However, it only works reliably: (1) if the eye is kept absolutely still and (2) if the distances between the object and the pencil and between the pencil and the eye are kept as constant as they are in the case of the perspective frame by means of the chin rest. Anyone who has used a perspective frame, will know that it is actually very hard to draw the extremities of the image while keeping the head and the eye absolutely still. Since using the pencil as a measuring device should be equally difficult, it can be concluded that if ever doing so seems easy, the reliability of the result must be questionable. This conclusion is supported by the regularity with which student drawings made by this method prove to be significantly inaccurate. Using it properly, requires a level of concentration that few of those who practice it suppose to be necessary.

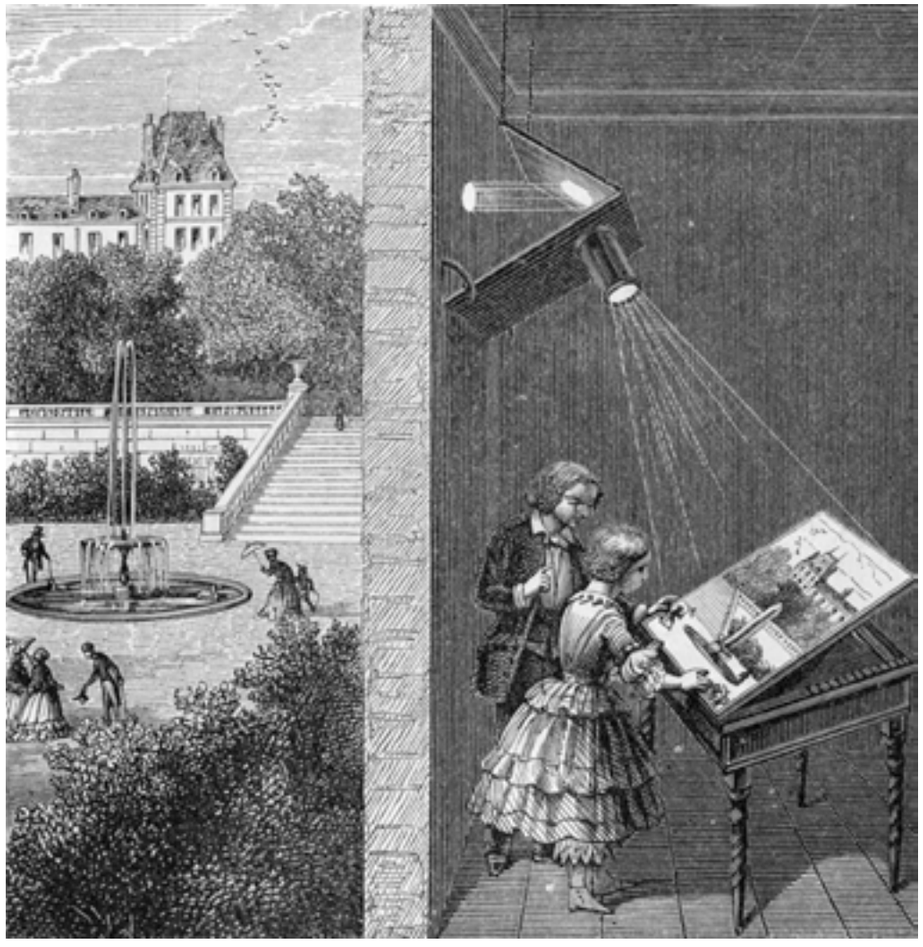

Figure 6 : Shows a 19th century version of a camera obscura being used to create an image of an outside scene indoors on a flat surface. The lens system corrects for the mirror-image inversion. Devices working on the same principles were used in the 17th century by artists such a Johannes Vermeer. The camera obscura had the advantage over the perspective frame that the image produced stays still when the artist moves about: No need to keep the eye stable while tracing it. A much used modern equivalent has been the slide projector used to project images onto a flat surfaces where they can then be traced.

Figure 7 : Shows a painting of a nude woman by Edgar Degas next to a photograph that he is said to have used as a model for it. While the finished work is not an exact copy, the two images certainly have a great deal in common. Often photographs used as models were squared up like the Correggio study in Figure 4. Accordingly the vertical and horizontal reference lines broke up the image into quasi abstract parts which provided a means of avoiding the perceptual minefield everyone faces when drawing actual models from observation.

LINEAR PERSPECTIVE

As explained in the introduction to this chapter, linear perspective and anatomy concern common properties of different objects and spatial layouts. The story of linear perspective has it origins long before the *Renaissance*, but had to be rediscovered. The first breakthrough came with the mirror experiment of Brunelleschi described in the text under *Figure 1*. This established the key ideas of the *vanishing point* and *horizon line* and initiated the process by which the community of architects and artists very rapidly mastered all the intricacies of the subject. Key figures beside Brunelleschi were his colleague, the architect Leon Battista Alberti, and the painters Piero della Francesca, Paulo Uccello and Leonardo da Vinci. In "*Della pittura*" (1436), Alberti codified for painters, much of the practical work on the subject that had been carried out at that time.

While the work on linear perspective was pioneered by Brunelleschi and possibly first put into practice by Masaccio (circa 1401 – autumn 1428), it was left to Piero della Francesca (1415 – 1492) to delve into some of the more arcane intricacies of the subject. He wrote three treatises that are recognised by modern mathematicians. They are: "*Trattato d'Abaco*" (Abacus Treatise), "*Libellus de Quinque Corporibus Regularibus*" (a short Book on the Five Regular Solids) and "*De Prospectiva Pingendi*" (On Perspective for Painting). The subjects covered in these writings include arithmetic, algebra, geometry and innovative work in both solid geometry and perspective. Piero was evidently familiar with Euclid's "*Optics*", as well as his "*Elements*", whose principles he refers to often. *Figure 9* shows how he used his knowledge in a painting.

Much of Piero's work was later to be absorbed into the writing of others. His work on solid geometry appears in the "*De Divina Proportione*" of Luca Pacioli (c 1446-1517), a work illustrated by Leonardo da Vinci (1452 – 1519). *Figure 8* gives an example of a page opening.

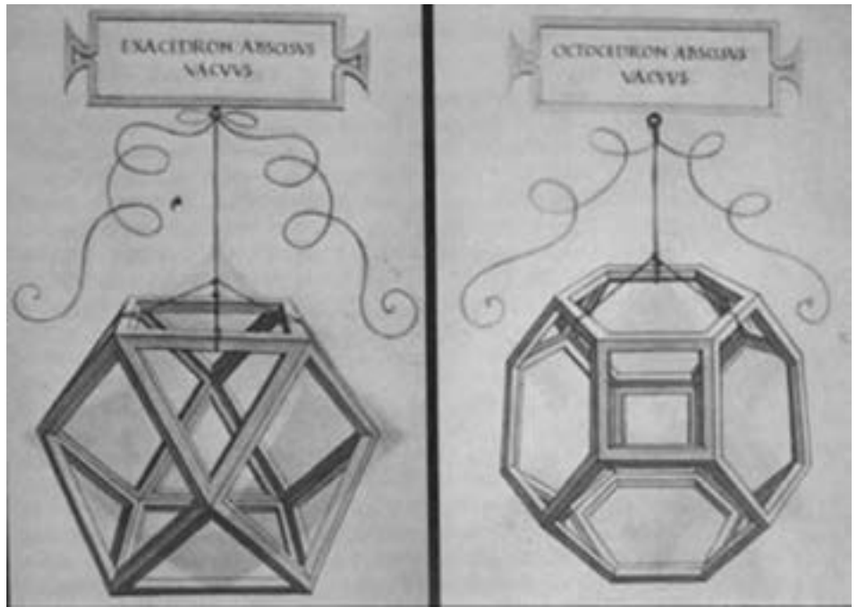

Figure 8: Illustration by Leonardo da Vinci in "De Divina Proportione", Piero della Francesca's book on advanced problems in linear perspective.

Figure 9 : Piero della Francesca- The flagellation.

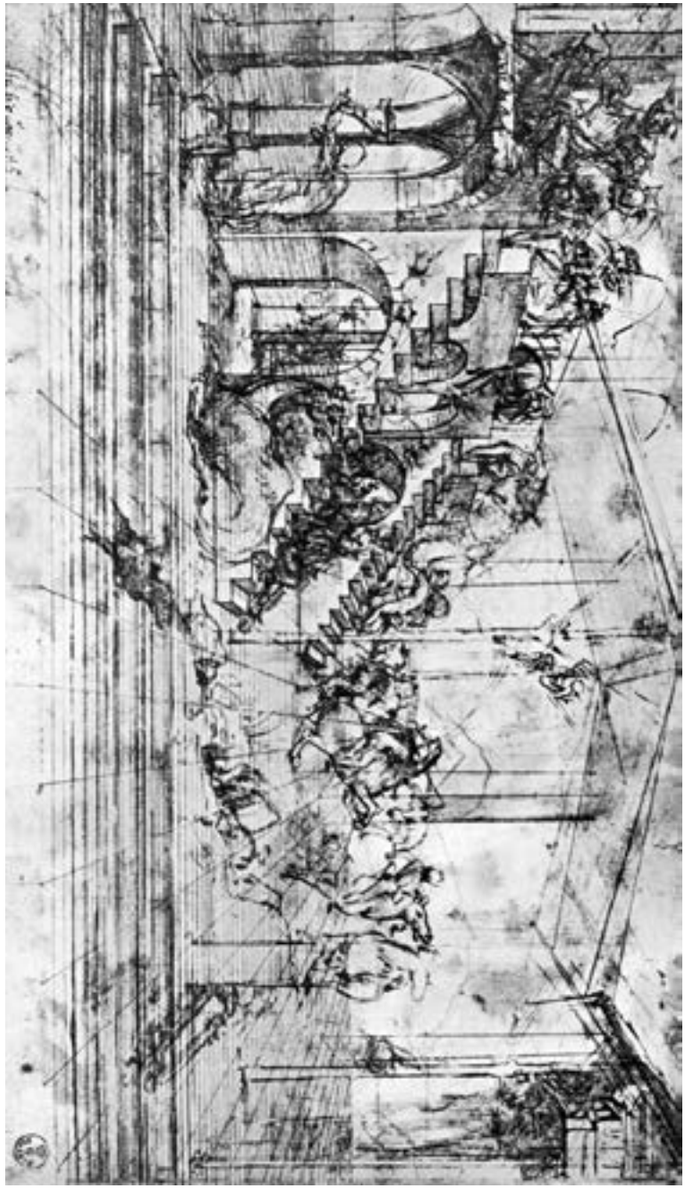

Figure 10 : An elaborate study by Leonardo da Vinci for a large painting in which it is easy to see the perspective construction lines all going towards the same vanishing point. It illustrates both some of the advantages and some of the disadvantages of using linear perspective constructions. Amongst the latter is the fact that the buildings have to be unnaturally parallel to one another. A further shortcoming is that whenever (as in this case) the perspective construction implies a near viewpoint, such that it is necessary to turn the head when looking from side to side of the picture, the more sharply angled lines towards the top and bottom should be curved towards the edges of the picture surface.

ANATOMY

The story of how the Renaissance artists re-learnt anatomy involved much illegal dissection of the bodies of criminals that had been taken down from the gallows (a punishable crime). As a result of their researches, they became extremely knowledgeable about the muscle structure of the human body. As with linear perspective, the main problem with anatomy is that it can never correspond to unique features of appearance. For this reason, and because it almost always ignores the influence of fatty layers, drawings based on it cannot produce good likenesses of real-world people

Figure 11 : One of many plates from "De humani corporis fabrica" the influential book of the Belgian architect Vesalius (1516-1564). The early plates show surface musculature. The ones that follow show the same view but with a number of muscles detached to reveal what lies below. In subsequent plates (like the one illustrated) more muscles are detached revealing more of what is beneath. The process progresses until the skeleton is laid bare.

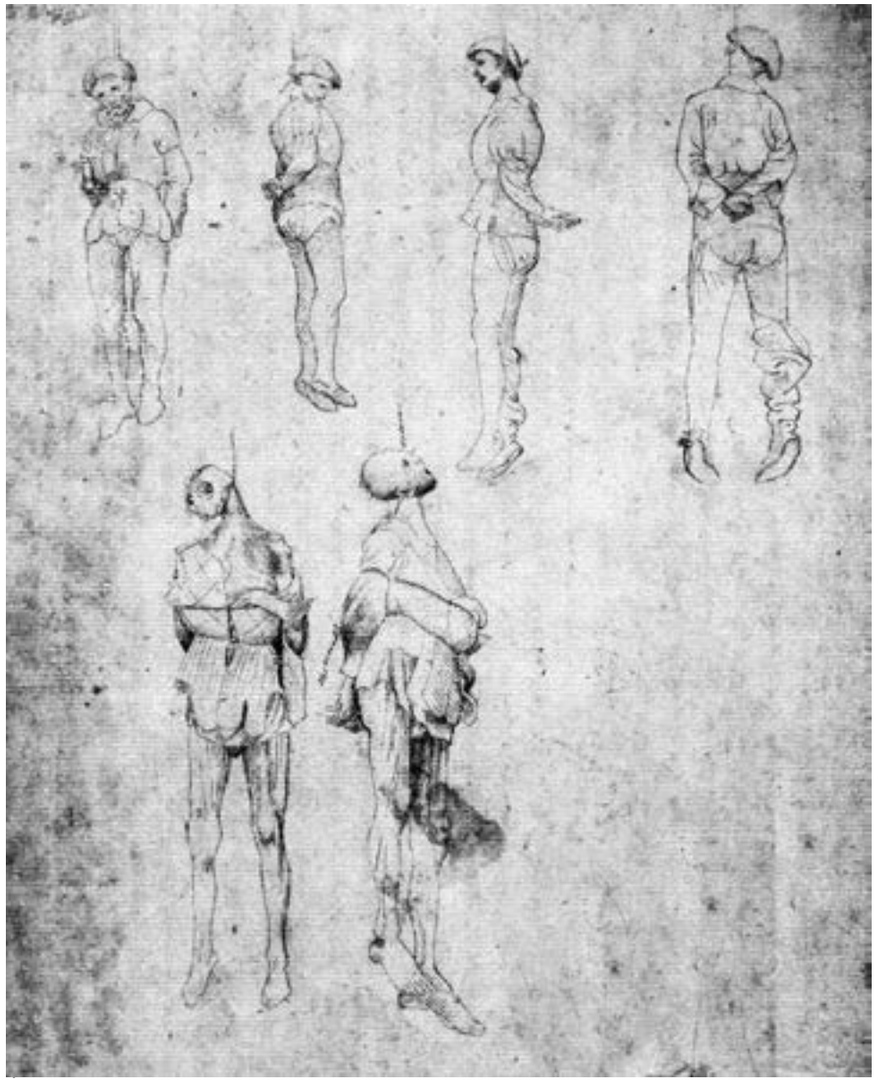

Figure 12 : Studies of hanged men by Pisanello (c. 1395 – 1455). The gallows provided an important source of models for Renaissance artists, some of whom were prepared to risk the law and steal the dead bodies so that they could dissect them and learn more about human anatomy.

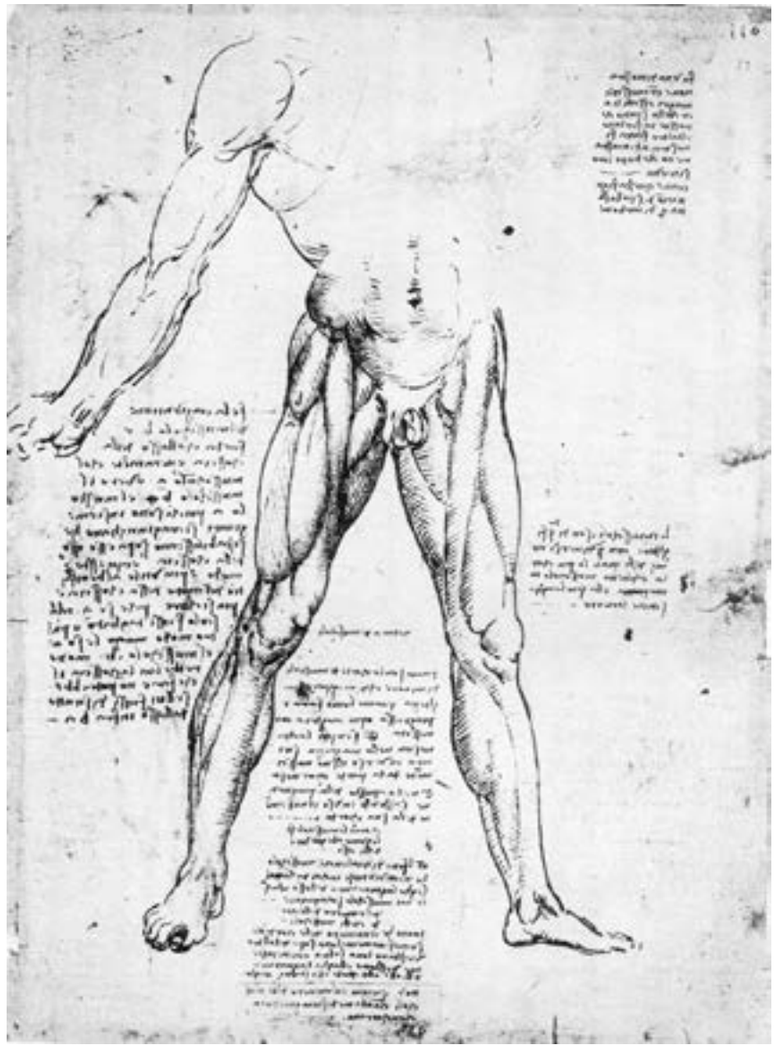

Figure 13 : Anatomical study of legs by Leonardo da Vinci: One amongst many which between them represented the surface and deep anatomy of all parts of the human body. Together these gave Leonardo's unrivalled knowledge of the subject enabling him to understand the anatomical significance of every visible feature of the naked body.

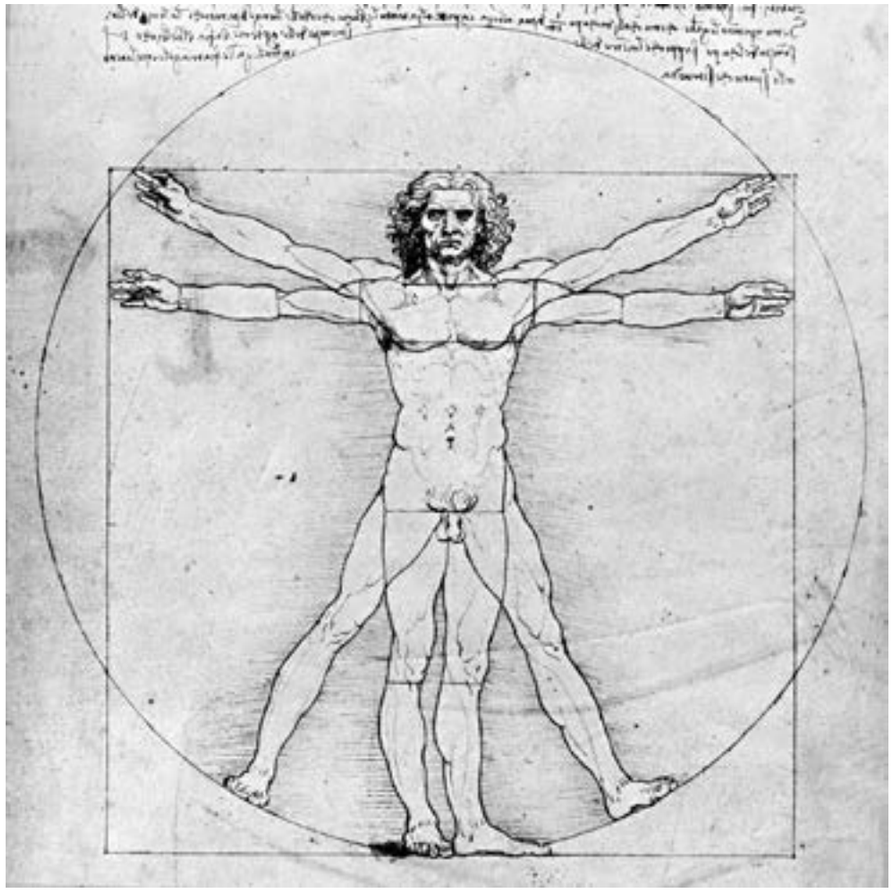

Figure 14 : Composite of two figures by Leonardo da Vinci, showing how the human body can be made to fit both into a square and into a circle. This search for ways of fitting figures or parts of them into geometric forms such as circles squares and triangles was of interest for two reasons: firstly because having a framework helped to avoid gross inaccuracy and, secondly, because such forms were thought to have symbolic significance.

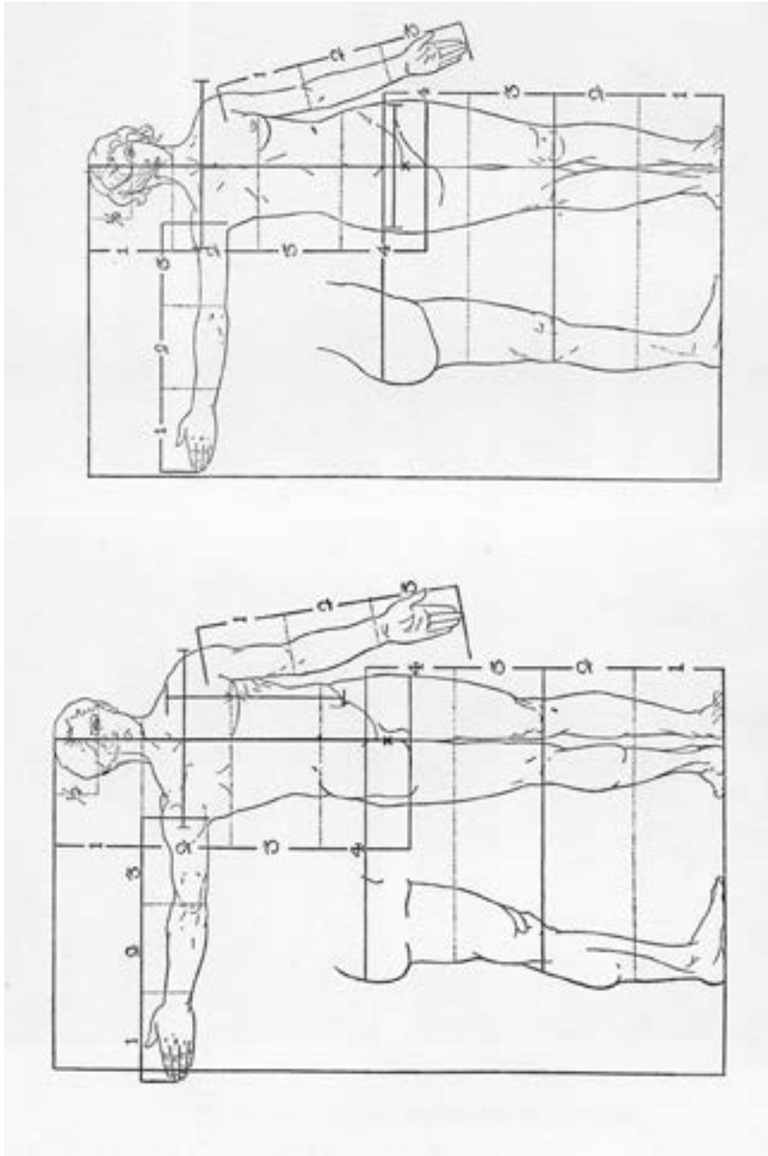

Figure 15 : Proportions of the human body according to Richer (1870). There are two problems with such codifications. The first is that different authorities come up with different solutions suggesting variation (for example, Michelangelo calculated 8 heads to the body). More important, no matter what proportions are chosen, they only work for head-on views of distant figures, since only then can distortions caused by perspective be discounted.

FITTING FIGURES TO SHAPES

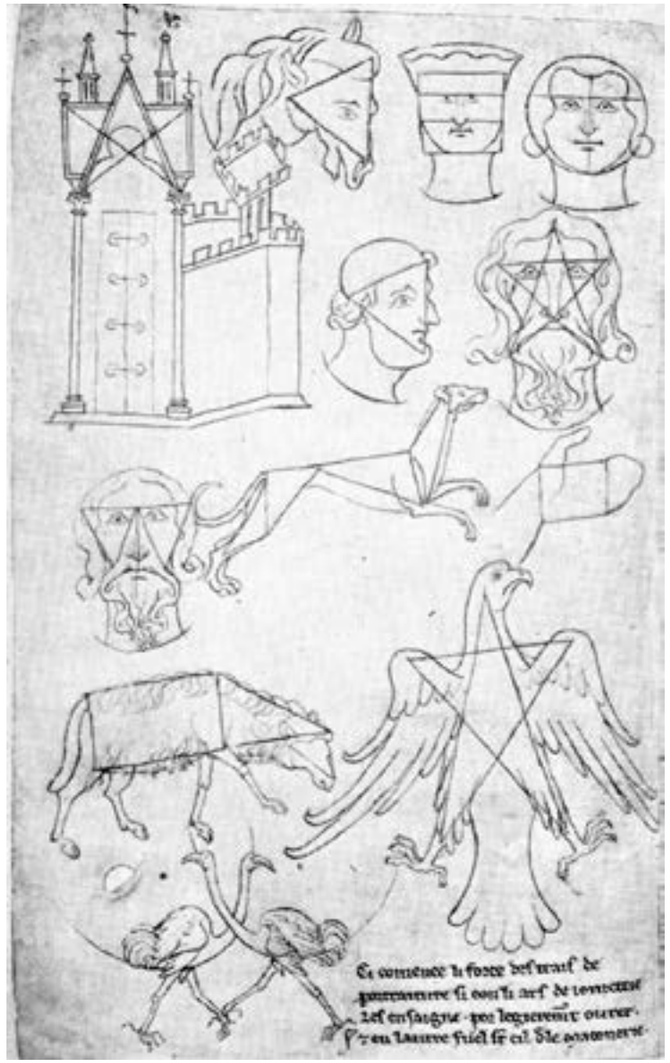

Figure 16: A page of studies by Villard de Honnecourt, made around 1235, showing that the idea of fitting animal and human forms to geometric figures was in use well before the Renaissance.

MORE IMAGE-TRANSFER METHODS

For the sake of completeness, it is worth mentioning four additional, well tried methods of transferring already-produced images from one place to another (for example, the picture support onto which the final product will be painted). Thus, in addition to the *squaring up* illustrated in *Figure 4* there are *carbon-copy-type transfer, pouncing, tracing using a light box* and *pantograph* (a device for producing enlarged versions of images):

- **The carbon-copy-type transfer** involves, first, covering the back of a drawing with a loosely adhering medium (for example, chalk or graphite), then, laying it, front up, on the target surface (that is to say, where the transferred image is required) and tracing around its edges. As with a carbon copy, an image appears on the target surface.
- **Pouncing** involves pricking holes at intervals around the outlines of a drawing, laying the drawing on the target surface and then rubbing a powdery medium over the holes so that it penetrates to the surface below, creating a dotted trace of the outlines, which can be filled in subsequently.
- **A light box** can be used to make it possible to trace images through relatively thick paper. This can be very useful for testing alternative modifications of the drawings.
- **A pantograph** (illustrated in *Figure 17*) produces an enlarged version of an image by means of a simple system of connected levers.

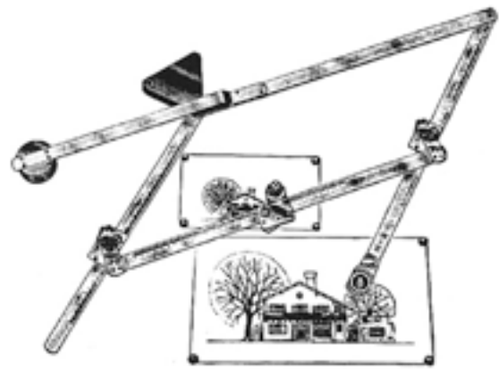

Figure 17 : A pantograph.

It is important to realise that none of these devices, nor any of those detailed on the preceding pages, would have been necessary if the artists using them had been confident in their ability to achieve accuracy in drawings from observation without them. Amongst the artists who felt it necessary to use one or other of the above listed methods were all the acknowledged "*Masters*" of the period between the *Renaissance* and the rise of *Modernism in painting* in the late 19th century. As will become clear later, the most likely reason for their implied lack of confidence in their unaided visual skills was that these paragons of drawing-from-observation felt that they could not trust them either with respect to making the required judgements of relative length, relative position, relative orientation.

THE ACADEMIC METHOD OF PREPARATION

The so called "*academic method*" was a distillation of working methods pioneered by the *Renaissance artists,* developed by their successors and incorporated into the curriculum of the Academies. Although the *Impressionists* and their successors are well known for deriding academicism, their working practice shows that there was much to be found in its teachings that they wanted to preserve. What they questioned was the rigidity, not only of the procedures but also of the compositional rules and the aesthetics. What a surprising number of them still liked was not the detail but the general idea of structured stages of preparation which they felt free to select and adapt to their own special needs.[1] So what were the procedures developed by the academies? Let us take them in turn:

- **The idea**. This was always the starting point and was usually provided by a patron. It would largely determine the subject matter, including the characters that needed to be included.
- **The sketch**. Once furnished with the idea, the artists were ready to explore compositional possibilities which they would do by means of a series of "*sketches".* These were products of the *imagination* and were used to explore alternative ways of fitting together the elements required by the idea. They were likely to be rough-and-ready in appearance and produced with accredited rules of composition in mind.
- **The study**. When the artists (and their patrons) were happy with the layout as indicated in the sketches, they set about making careful "*studies"* of the main elements proposed in the sketch. It was this stage that

1 Nobody more so than Matisse, but also Picasso, Kandinsky and many others.

has been responsible for the vast bulk of the "*Old Master*" drawings that have come down to us, whether they be of man-made objects, animals, people, drapery, perspective constructions, or natural objects.

One reason why the human figures in these studies tended to be relatively small was that, over the years, the community of artists had discovered by experience that it is much more difficult to obtain accuracy if the copy being made is larger or smaller than "*sight-sized*". One way of describing what this means is that it corresponds to the size of the object being drawn as it would appear on a piece of glass situated in the same place as the drawing board, from the viewing position of the artist [2] This size will vary with respect to:

1. The actual size of the object that is being drawn
2. The distance of the tracing glass from it.
3. The distance between the artist's eye and the tracing glass.

If the image of the object is meant both to fit onto the tracing glass and to be a reasonable size, the three-way relation between it, the object being drawn and the artist's eye has to be adjusted accordingly. In theory this can be done by artists moving their head nearer and/or further from the tracing glass until the desired image size is obtained. However, since all artists are likely to have a preferred drawing distance[3] what has to be varied in practice is the space between the object and the tracing glass.

- **The teaching**. Using *sight-size* was also important for the success of the academic teaching method. In this the students were placed in front of a model, told to copy it and left to do their best on their own until eventually the *drawing master* came along. When he did so, his job was to point out errors. In order to rectify these, students have to make *comparisons* between the indicated parts of the model and the *mistakes* in the rendering of them. It is at this *comparative looking* stage that a main advantage of having a sight-sized image becomes apparent. Any other size, whether larger or smaller, would mean that *like is not being compared to like*, with the result that the copying task would be that much more difficult.

  On many occasions, when pointing out an error, the drawing master

2 *Figure 3* pictures these relationships

3 Which might differ with *drawing style, length of arm*, or either *short* or *long sightedness*

would place it in the context of anatomical plausibility. Since the students would have been thoroughly schooled in this subject, doing so would provide an additional way of drawing attention to a feature of appearances that they had previously overlooked. At the same time, relating the error to knowledge of anatomy would provide the students with a tool that could help them to look more effectively for themselves.

- **The cartoon**. When all the required studies had been completed, the images produced by them were redrawn on a larger piece of paper such that the relationships between them accorded with the composition worked out in the sketch. Once in position, the composite image was shaded in according to the lighting conditions decided upon. The outcome, which was known as the "*cartoon*", was a highly detailed, achromatic rendering of the image to be used in the final composition. Most importantly, all the relativities of lightness[4] within the picture surface (otherwise describes as the "*whole-field lightness relations*") were fully worked out.
- **The ébauche.** The preparatory stages were now almost complete, but there still remained the important task of deciding the colours to be used in the final painting. This was achieved by means of the "*ébauche*", a rapidly made, roughed in colour-scheme whose sole purpose was to test out possible colour schemes.
- **The transfer**. All that remained to be done was to *square-up* the *cartoon* and transfer the outlines of the objects in the cartoon one square at a time onto a larger, squared-up picture support (be it canvas, wooden panel or wall). These were then filled in according to the scheme of lightnesses and colours already worked out.

It was only when all this research and preparation had been completed that the artists deemed themselves ready to start work on the final painting. By this time they had given themselves a good chance of acquiring what Matisse termed "*a full conception*" of what it would look like. Certainly they were in a position to proceed with confidence.

Implications

All the artistic practices described in this chapter have demonstrated their worth not only with respect to the role they have played in the production of

4 Commonly referred to as "*tone*" or "*value*".

recognised masterworks but also by making life much easier for countless numbers of less skilled artists. Their success is due to the fact that each of them transforms the copying task in such a way that excellent results in terms of accuracy can be accomplished by means of a relatively low level of skill. For example, in the case of tracing the contours of an image produced by a camera obscura, a slide projector or a light box, all that is required is the ability to track a line with the point of a pencil. Anybody, even relatively young children can do it. Indeed, all the other practices and devices mentioned in this chapter also work because they offer a way of doing things that most people can manage without going beyond the scope of their existing skills. Seldom is the learning of new ones required.

It is also noticeable that neither feeling nor intellect has a useful role in any of the procedures listed. If either is brought to bear, the result could only be neutral or negative. As we shall see a unique feature of the ideas presented in this book is that they suggest a way of integrating these essentially sterile, no-brainer methods into a learning strategy of great potential richness. But before explaining how this can be the case, we need to look at the teaching methods associated with the Modernist revolution.