Chapter 5

Negative shapes

Introductory

The concept of "negative shapes" has for a long time been used as a teaching aid in drawing classes throughout the world. It has endured because it works, at least up to a point. The purpose of this chapter is to prepare the way for a different way of achieving the same result. But one that goes well beyond that point. This will be presented in the course of the "feeling based drawing lesson" described in PART 3. When compared with the negative shapes approach, this different method provides:

- *More help with the analysis of shapes and their component parts, whether or not they are described as negative.*
- *A useful basis for further progress.*

The chapter starts with some history.

Drawing "*what you know*" rather than "*what you see*"

In the 1930s a developmental psychologist named Luquet asserted that young children draw "*what they know*" while adults "*draw what they see*".[1] He described the development of drawing skills as being a transition between these two states. His idea, which came to be known as the "*Theory of Intellectual Realism*", was picked up by later developmental psychologists. The most influential of these was Jean Piaget, who for many years was acknowledged as the leader in the field of child development. When I first heard of this theory, my immediate reaction was one of astonishment. Like every teacher of adult drawing classes I had seen abundant examples of intellectually realistic drawings produced by my students. Similarly, I can only presume that teachers of young children would be similarly surprised, for given the right context, their charges are far more capable

1 Luquet, G. H., 1927, *Le Dessin Enfantin*, Alcan, Paris.

of drawing relatively accurately from observation than Luquet gave them credit for.[2,3] However, despite the weakness of his claims, Luquet and those influenced by him were right to give significance to the role of *knowledge* in drawing.

One inevitable consequence of drawing "*what you know*" is overlooking "*what you do not know*". Either, you realise or suspect that something is missing and look back at the subject matter to find what it is, or you are left with no alternative but to fill in the gaps on the basis of information previously stored in long-term memory. My observations both as a scientist and as a teacher makes clear that this second option is taken by many people, including accomplished artists, even when they believe themselves to be drawing from observation.

There are however significant differences between beginners and advanced drawers. The beginners:

- Pick up less information from the scene being drawn.
- Lack the knowledge of appearances that would be required for filling in the gaps in such a way as to deceive people into believing that their drawings represent "*what they see*".

Such gap-filling on the basis of inadequate knowledge results in drawings that can be described as "*childish*", "*naive*" or "*intellectually realistic*".

In contrast, many professional book illustrators and certain famous artists (for example, Picasso) can make realistic looking drawings of a wide range of objects, including the human figure, whether clothed or unclothed, without ever looking at the subject matter. Of course, it hardly needs saying that they must have spent a great deal of time acquiring the knowledge required for enabling them to do so.

What this means is that both beginners and experienced artists who wish to improve their observational skills, will have to escape the straitjacket of their existing knowledge-base. All the artists' aids and practices described in this book, including the device of using *negative shapes,* can, in one way or another, perform this service. And it was not only unskilled artists who used them. Even many of the "*Old Masters*", including such accomplished draughtsmen as Leonardo da Vinci, Albrecht Dürer and Johannes Vermeer, resorted to such devices as the *trac-*

2 Phillips, W. A., Hobbs, S. B. and Pratt, F. R., 1978, "*Intellectual Realism in Children's' drawings of Cubes*". Cognition, Vol.. 6, pages 15-33.

3 W. A. Phillips, M. Inall and E. Lauder., 1985, "*On the discovery, storage and use of graphic descriptions*", In, "*Visual Order. Studies in the Development of Representational Skills*". Eds: Freeman, N. H. and Cox, M. Cambridge University Press.

ing glass, the *perspective frame* and the *camera obscura*. That they felt the need for them suggests that they too had to overcome the problem of knowledge getting in the way of accurate analysis.

Ambiguous images

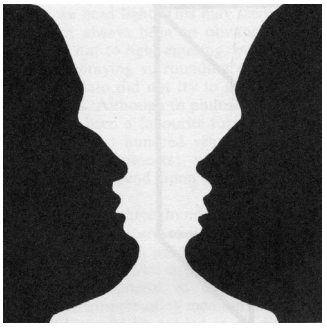

Figure 1 : Vase/face ambiguity.

Illustrations similar to *Figure 1* are to be found in many books on the *Psychology of Perception.* The image is known as the *vase/face illusion* because it can be seen either as two silhouetted faces, in front of a white background, looking towards one another, or as a white vase against a black background. What is perceived as being positive and what being negative have swapped places. The brain must choose which of the two interpretations of this either/or image to give precedence. But notice two things: first, that neither of the alternative interpretations is seen as being "*negative*" and, second, that no matter which interpretation is chosen, the other one is still actively competing for your attention.

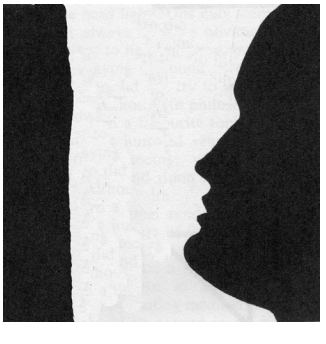

Figure 2 : Silhouetted face against white ground.

In *Figure 2*, the left hand side silhouetted face has been removed. The one that remains is still likely to be seen as being in front of a white background. We might see the remaining regions as abstract shapes or as objects (for example, the white area as a knee-high boot), but, in the present context, the important thing to notice is that each of these interpretations requires a *different way of looking,* and that, as soon as we give a shape an *interpretation* (even if it is as an "*abstract shape*"), it both seems to come *forward* and becomes *positive*.

What is a negative shape?

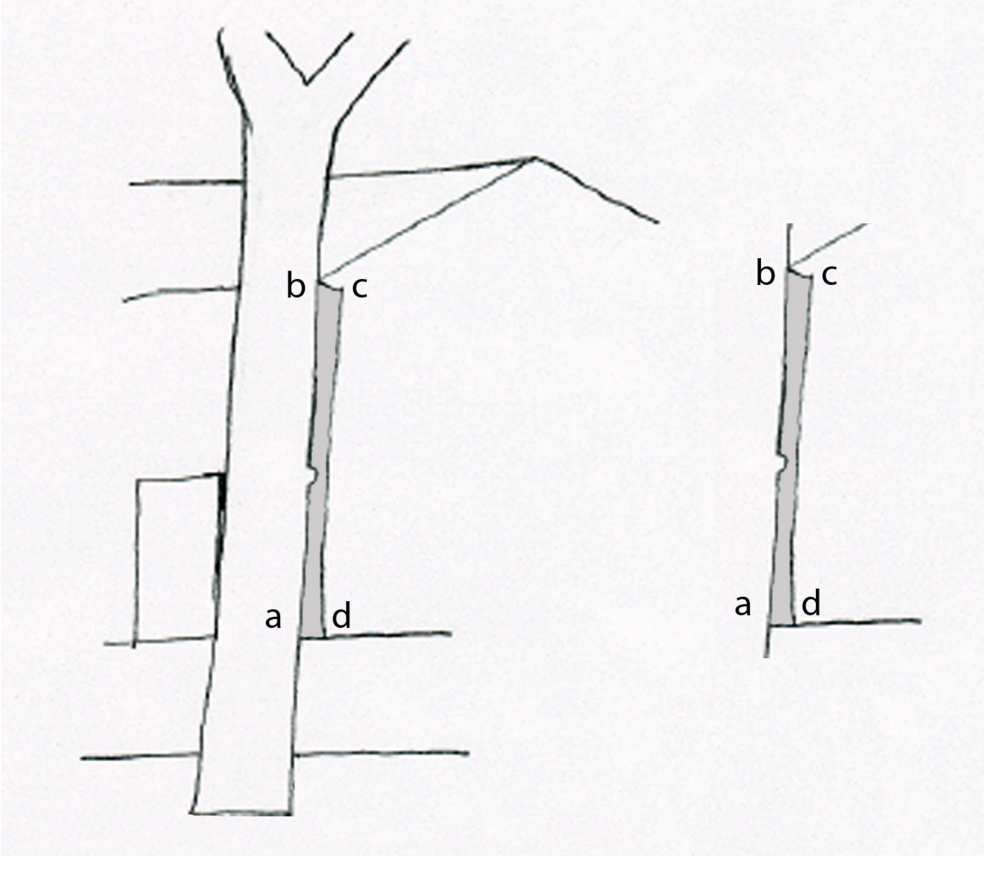

Figure 3 : The grey area a, b, c, d. is a so-called "negative shape"

Figure 3 shows a line drawing representing a tree trunk that is situated in front of a low wall and the end section of a house. To the right of the tree trunk, we can just see a glimpse of the end of the front facade of the house, consisting of a sliver of wall, a wedge of gable end and triangle of roof. The greyed-in region, circumscribed by the lines *ab, bc, cd* and *da*, constitutes what can be described as an "*enclosed shape"*. The borders of this are made from sections of the contours of various recognisable objects (tree trunk, the wall-top and parts of house). The length of each section is determined by where contours of objects that are *in front* intersect with and partially obscure contours of those that are *behind*. When described in the context of these objects, it is not difficult to see how the grey area might come to be described as a "*negative shape"*.

Now look at the inset to the right of *Figure 3*. In this, the same shape is separated out from its context. It is no longer easy to see it as being constructed out of the contours of recognisable objects, nor do we perceive it as a recognisable object. Now, there is no way of perceiving it as negative. On the contrary, it has unambiguously become a *positive, abstract shape*.

Shapes made from *in front/behind relations* in this way, described as n*egative shapes*, have played an important role in the teaching of drawing-from-observation in USA and Europe for well over half a century. Generations of students and artists have gained much benefit from using analytic-looking strategies based on looking for and finding them. They simplify drawing from observation by enabling the eye/brain to see matters in terms of *abstract shapes*. The fact that teachers have come to refer to these shapes as "*negative*" is irrelevant to the explanation for this desirable outcome. It is the abstraction and simplification rather than the name given to it that helps artists, and this can be arrived at in other ways. For example, as just demonstrated, it can be made as the result of analysis in terms of *in front/behind relations* and seeing how the different parts can be linked into an *enclosed positive shape*.

More precisions

Since, in my experience the phrase "*negative shapes*" is fraught with ambiguities and consequent misunderstandings, it is important to be extra clear about what is meant by it in this book. To help throw light on this issue, I asked a colleague whether there are any "*negative shapes"* in the photograph of the seated figure shown in *Figure 4*. After some hesitation, she replied ,*"Perhaps, the triangle made by the underside of the arms, the top of the leg and the glimpse of*

the arm of the chair." When I delved further by asking whether any of the three shapes listed below should be described as "*negative shapes*", her answer was that she didn't think so. If I had been asked the same questions I would have given the same answers for her responses were consistent with the understandings I have gleaned from books, teachers and students who have come to my painting school.

Figure 4 : Seated figure in front of fireplace.

Here, then, is the list of the three shapes:

- The triangle of red between the upper side of the forearm on the left hand side in the photograph (the persons right forearm) and the contour defining the shirted part of the upper arm and the shoulder above it.
- The bright red shape between the left side forearm and its shadow.
- The white shape within the fireplace bordered by a grey area to the left of it and the shoulder, hand and head to the right of it.

The list could have been much longer, but three examples are enough to make the point that there are many shapes in the visual world which, according to the clarifications and definitions above, would not be described by most people as "*negative shapes*", but which, nevertheless, could be at least as useful as them for analysing drawings from observation. Indeed relative to the triangle made by the underside of the arms, the top of the leg and the glimpse of the arm of the chair, they would be much more helpful.

So what should these shapes be called? Anyone including them into a line drawing of their contours has to construct them, a bit at a time, out of a number of sections of contour, often involving *in front/behind relations* (as in *Figure 3*). When a shape is completed, it can be well worthwhile to stop and compare it with the corresponding shape in the scene being depicted. For this reason, in the drawing lesson, I am likely to refer to them as "*completed shapes*", but the phrase "*enclosed shapes"* would do equally well. Whatever the name chosen, they can all be called "*positive shapes*".

The reason why it is worthwhile to look back and compare each *enclosed positive shape* with the shape to which it corresponds in the scene being depicted, is that doing so will immediately show up any distortions that have been caused by errors that have accumulated in the production of the lines that define it. It can also be a good tactic to search for "*enclosed positive shapes"* in advance. Doing so can greatly facilitate the process of copying the sections of edges from which they are constructed. I call doing so "*casing the joint*".

Another alternative would be to look at all these shapes from the perspective of the eye/brain. If we do so, there would be little choice but to call them simply "*positive abstract shapes*". As we shall see in what follows, where eye/brain processing is concerned, there is no room anywhere for the word "*negative*".

Why niggle over the name?

If using the notion of *negative shapes* can help at least in some instances, why should I niggle over the name? I have two basic answers to this question. These come from observing students over long years as a teacher. During these it has become clear to me that the *negative shapes* approach:

- Only gets those adopting it so far.
- Gives no help in preparing for the minefield of traps that lie ahead.

Its ability to get its users "*so far*" might be enough to justify its use, if there were

not much better ways of getting to the same place, which are much more helpful in preparing for the traps that lie ahead.

The remainder of the chapter is divided into two sections: The first, much shorter one, summarises the benefits of looking for n*egative shapes*. The second, much longer one, is devoted to the potential disadvantages of doing so. As already been suggested, these are sufficiently important that a different approach is called for. In *PART 3,* which is dedicated to an in-depth drawing lesson*,* the practical value of abandoning the idea of searching for "*negative shapes"* in favour of using *in front/behind relations* and "*completed shapes*", "*enclosed shapes*" or "*abstract shapes*" will be explained and demonstrated in detail.

BENEFITS OF USING NEGATIVE SHAPES

The reason usually given for looking for *negative shapes* is that doing so provides a way of escaping from the problem of *familiarity*. The argument given is that focusing our attention on them stops us from "*drawing what we know"* in the interests of "*drawing what we see*". In this way, they enable us to bypass habits of looking that are holding us back, thereby enabling us to *look in new ways*.

It all seems so reasonable: if we want to avoid being guided by "*what we know*", we need to bypass the problem of *familiarity.* If so, what better way of doing this than looking for *negative shapes*? Since they do not relate to any object, we cannot have any knowledge relating to them. Accordingly the negative shape strategy will help us to escape from the tyranny of preconceptions and free ourselves to attend to the abstract shapes in their own right. Suddenly, we find ourselves seeing everything both differently and in ways that enables us to improve our accuracy. What more could we want? Is not this exactly the outcome that we were hoping for?

DISADVANTAGES OF USING NEGATIVE SHAPES

The disadvantages of looking in terms of *negative shapes* will take longer to explain. However, they can be summarised under three bullet points. Thus they:

- Are based on a flawed theory.

- Stop short of the main problems with which they give no help.
- Are less effective than alternatives approaches that are designed to avoid the difficulties and confront the problems.

This said, there are six disadvantages that need longer explanations. All of these have revealed themselves to me in the course of my teaching career.

1. Limited availability

A first shortcoming stems from the fact that there are so many scenes where described as "*negative"* are either rare or absent. Also, as we have just seen in *Figure 4,* candidates for being described as a negative shape can be hard to find and/or hard to make use of.

Notice also that if a slight adjustment were to be made in the scene illustrated in *Figure 3,* they could have been absent. This could have been the result if the viewpoint had been moved a short distance further to the right, such that the corner of the house had been obscured by the tree trunk and the window frame had been displaced sufficiently to the left to leave a gap between it and the tree. Moreover, even as it is, with only the two *negative shapes* illustrated anyone copying the scene would have to use a different strategy for coping with the remainder of it.

2: The word "*negative*"

The second disadvantage is that the concept of "*negative shapes*" entails an unnecessary distraction. As far as I know the importance of this in the context of drawing from observation has not been experimentally tested. However, it is related to a demonstrable experiential truth and can only influence matters in an adverse direction. A clue to the nature of the issue can be found in the fact that the concept "*negative*" implies the existence of a "*positive*". For example, in the scene in *Figure 3* an implication of describing the shaded space as "*negative*" is that the tree, the area of grass, the wall and the various parts of the house are being thought of being as "*positive*". As long as this is the case, our analytic-looking systems will be perpetually suspended between an *object-based* interpretation and an *abstract shape-based* one and, potentially, influenced by both. In other words, no section of the shape being analysed will be able to escape a degree of ambiguity.

The outcome can be compared to the difficulty of sustaining either the vase

or the faces interpretation in *Figure 1*. It is an unnecessary juggling act. It is also disruptive for, in so far as we are clinging to our perception of the shape as being created from parts of *familiar objects* (such as trees, houses, walls, etc.), we will be, to some degree at least, less able to see it in terms of the *abstract relations* between the lines, curvatures and relativities of position of which it is constructed. It is a small matter, but it can only be a disadvantage.

3: "*Familiar*" aspects of shapes described as "*unfamiliar*"

The third problem with the concept of looking for *negative shapes* is both theoretical and practical. The shortcomings of the theory can be related to neurophysiological realities and those relating to the practice have been experimentally tested and shown to be highly significant.

The advocates of the negative shapes strategy rightly claim that it regularly helps people to "*see in new ways*". They tell you that this desirable outcome is a consequence of the *unfamiliarity* of *negative shapes*. Their argument is that, as only familiar things can be drawn from memory, unfamiliar things will have to be drawn in some other way. According to them, the only alternative is to "*draw what they see*".

Their logic might seem impeccable, but there is a deep flaw in it. It lies in the fact that the eye/brain can only enable the analytic-looking systems to analyse something if it has instructions for doing so. Since instructions are stored in memory (the store of existing knowledge), the analytic-looking systems are limited to analysing "*the known*". It follows that in as far as negative shapes can be analysed, there must be a sense in which the eye/brain is treating them as being familiar.

It is difficult to understand why the developmental psychologists who gave credence to the theory of *intellectual realism* did not take this basic truth into account from the start. After all, from the dawn of time, every single human being has been confronted with the problem of making sense of objects, features, shapes and concepts that, at first, they perceived as being unfamiliar. Accordingly, the human race would have been in a pretty pickle if the forces of evolution had failed to furnish our eye/brains systems with a capacity for giving instructions to the analytic-looking systems capable of coping with *unfamiliarity*.

So what are these instructions? What does the eye/brain do when it is confronted by novel objects, features or shapes that they at first perceive as being familiar? The answer is that it triggers well-rehearsed, fit-for-purpose looking

instructions. These tell the analytic-looking systems to go down through what brain scientists call the "*levels of description*", and to go on doing so until they come across something that they are able to recognise. As we should expect, the outcomes of this process can vary. Sometimes, the descent might stop when the analytic-looking systems recognise *object-parts* (for example, faces, leaves, branches, trunks, bricks, roofs, walls, windows, etc.). At other times, it might be *aspects of objects*, such as the materials out of which they are made (fabric, skin, plastic, cement, etc.). Failing these and all other object-related characteristics, they will find themselves faced with the properties of appearance known as the "*visual primitives"* (sometimes referred to as, "*the basic building bricks of appearances*"). These include simple shapes, such as ellipses, rectangles, triangles, edges, junctions, curvatures, surface-characteristics, etc.). There is no need to look any further, since every scene is constructed from these basic elements, it is safe to say that their ubiquity ensures that, far from being unfamiliar, they are the most familiar of all the objects in our visual experience.

This realisation brings us to the nub of the matter. We have been taught that the whole point of looking for negative shapes is to bypass the influence of familiarity and, thereby, make it impossible to make intellectually realistic copying errors. But, as just explained, if the eye/brain will always find familiarity, this conclusion must be false. We delude ourselves if we believe that we can "*draw what we see*", no matter how simple or abstract the subject matter.

The next question is how the unavoidable familiarity of the visual primitives helps drawing performance. The answer lies in a difference between the generalisations in memory that represent objects as a whole and those that represent the visual primitives. It is that the visual primitives correspond more closely to measured reality.

To give an example: our knowledge of straight edges consists of a generalisation that will enable us to represent their shape accurately by means of straight lines, whereas our knowledge of chairs will never enable us to do the same with the unique features of perceptions of real world chairs. Our knowledge of ellipses and curvatures is more problematic but, as we shall see later (when we come to the drawing lesson described in *Chapters 9 - 11*) it is nevertheless significantly more useful in the search for accuracy than is our knowledge of complex objects. Generalisations of ellipses and curves may seldom correspond exactly to measured reality, but the fact that we see them as ellipses alerts us to possible *knowledge-driven* ways dealing with these variations. As we shall see in the next

section, there are also *knowledge-driven* ways of avoiding the "*minefield of traps*" due to the operation of the *constancies of visual perception*, to which we now turn.

4: The constancies

The traps laid for us by the constancies of visual perception cannot be sidestepped by any of us when drawing from observation, because analytic-looking is essentially a matter of making *comparisons* using *same/difference judgements*. When dealing with abstract shapes, such as those brought to attention by looking for negative shapes, this means assessing similarities and differences between model and copy and making judgments of relativities between parts with respect to size, orientation, curvature profiles, lightness, etc. Let us take the examples of size and orientation constancy to explain why this causes a problem:

- *Size constancy* occurs whenever the sizes of two similar but different things are compared. When making the comparison, the eye/brain automatically squashes or stretches compared images into the same visual processing space (situated in the parietal area of the visual cortex[4]). As a result, the different images are perceived as being more similar than they are in measured reality. Accordingly, everyone has a tendency to draw the compared elements as being more equal than the should be. Obviously, this is a state of affairs that can play havoc with attempts at literal accuracy.
- *Orientation constancy* has a similar outcome, this time we find ourselves perceiving straight or approximately straight edges as either more vertical or more horizontal than they are in measured reality.

Clearly, such distortions provide a challenge for anyone making drawings from observation. Just how serious the predicament in which they find themselves is indicated by the results of experiments I did at the University of Stirling with the help of a group of children (8 year olds) and two groups of adults (one group unskilled and another of skilled). The objective was to discover how accurate the different groups would be when copying the different types of image under a variety of conditions.[5] There were three types:

- Familiar objects.
- Abstract shapes.

4 See the *Glossary, Figure 1* with its detailed explanations.

5 *"What Scientists can Learn from Artists", Chapter 5.*

- Randomised arrangements of 2, 4 or 8 straight lines.

As might be expected, when copying familiar objects, the skilled adults produced reasonably veridical copies. In contrast, the children and the unskilled adults copies were full of typical "*intellectual realistic*" (eye/brain-system produced) generalisations. More information came from the video-tape record of eye-movements. This showed skilled adults doing a great deal of looking back and forth from model to copy, whereas the unskilled adults and children did hardly any of it.

When it came to the abstract shapes and the arrangements of straight lines the results were significantly different. Everybody, young and old, unskilled and skilled, did roughly the same amount of looking and, achieved the similar levels of accuracy. However, significantly, for those who want to rely on *negative shapes* as a guide to accuracy, rather than meaning that their performance was equally good, it meant that it was equally poor. Thus, when copying the separated straight lines the average error for both relative length and the relative position of lines was 10%, while that for angles was 5°. These figures might seem bad enough but the real situation was worse for the spread within these averages was large. Where lines were close to one another and fairly similar in both length and orientation, errors were relatively small, sometimes very small indeed. However, when they were more widely separated and more different in length and orientation, errors were much larger than the average. It as not rare for them to be as much as 20% and 10°.[6]

Although my experiments predicted that this would be the case, I could not help feeling that there was too much difference between the experimental context and normal drawing conditions to trust their findings. However, the validity of the results has been amply confirmed by over 25 years of observing students of all levels, in the course of teaching at the *Painting School of Montmiral*. Even so, to this day, after thirty years worth of evidence that should prepare me for them, I still find myself being surprised by the size of some of the errors made by students. Even with highly skilled, professional figurative artists, the extent of the error correction required to approach veridicality can be astonishing.

All these errors can be explained as a result of the action-organising part of the brain putting too much reliance on eye/brain-generated generalisations and

6 See section on the "*Deliberate Mistakes*" experiment in *"What Scientists can Learn from Artists", Chapter 5,* where the evidence is presented that these large errors can be explained in terms of a combination the experimental subjects *drawing what they know* about the properties of straight lines and of their judgements being distorted by the operation of the constancies of size and orientation.

relativity-distortions due to the various *constancies*. The fact that a shape is *unfamiliar* (whether or not they are described as "*negative"*) makes no difference. Clearly, *intellectual realism* is just as prevalent when copying abstract shapes as when copying familiar objects.

Before progressing to the next section, we need to clarify what is meant by the phrase "*skilled adult"*. Perhaps I should have done this earlier since a primary objective of this book is to help its readers to make significantly smaller errors when copying unfamiliar material than the so called "*skilled adults*" who took part in my experiments. They were called "skilled" on the basis of being able to produce veridical drawings of familiar objects. Clearly they were not skilled at producing veridical copies of unfamiliar arrangements of straight lines. It was much more difficult to find people with that kind of skill. Accordingly, it is worth mentioning that I did eventually find two artists whose error count, when copying the randomised straight line patterns, was much lower than the averages produced by my skilled artist group. Clearly, these had reached a skill level that gave them a better knowledge of how to look appropriately when analysing the relativities of length and orientation in question.

The aim of this book is to help readers to achieve analogous levels of accuracy whatever the subject matter or what the nature or level of its familiarity, and to use them as a tool for expanding awareness.

5: "*Making use*" and "*line output*"

The fifth reason why the strategy of using the concept of *negative shapes* is fraught with problems stems from a consideration of fundamental importance that is often overlooked, not least by scientists of visual perception. It concerns the seemingly miraculous nature of the processes by which the brain *makes use of* visual information. To appreciate the amazing achievement of the processes of evolution in this respect, it will suffice to reflect on how the information contained in the patterns of light entering the eyes is transformed by the eye/brain into the action-instructions that guide their line output. Or, to be more specific, on how information from one modality can be used to drive actions in another that involve the coordination of the component parts of the many muscle systems involved, not only in finger, hand and arm movements, but also in the eye, ear, head and body ones that control posture and sense of position in space. If you are like me (or like a computer engineer trying to model similar transformations) any attempt to imagine the details of this process will leave you in awe.

However, one thing is clear. The astonishing complexity of the interactions involved provides an explanation as to why the task of learning a new set of instructions is likely to prove difficult. Progress is bound to be particularly slow if the eye/brain/body coordination instructions previously stored in memory are not relevant to the drawing task: A state of affairs which must invariably be the case with anyone with little or no previous experience of drawing.

The universality of the problem of converting patterns of light rays into complex action-instructions provides a contributory explanation for the regular occurrence of accuracy errors in drawings from observation made by artists of all levels. It takes time to learn the required skill. Until it has been mastered, looking at matters in terms of *negative shapes* will not get you very far.

6. Moving the head

A sixth reason why artists have problems with n*egative shapes* prepares us for later chapters. It has nothing to do with "*knowledge*" as such. Instead it follows from the fact that, whenever *negative shapes* are discovered in natural scenes, they are likely to be made up of parts of contours of objects that have an *in front/behind relation* to one another. If this is the case, their shape will change with every movement of the eyes (up or down, from side to side, nearer or further). The only way of stabilising the situation is to make sure that the eyes and, therefore, the head, are always in the same place. In theory this may seem easy, but in practice, unintentional head-movements let a lot of people down.

But, beware of concluding that keeping the head still is always desirable in drawing from observation. As will be explained later, moving the head can greatly help with accurate observation. The reason why is that head-movements can automatically bring attention to useful information that might otherwise be neglected.

There will be more on the significance of this little realised fact in later chapters.

Summary and conclusions

The negative shapes strategy provides a convenient and effective way of introducing beginners to a new way of looking. Its advantage for more advanced artists is more questionable. This is partly because:

- *Of the scarcity of negative shapes in actual scenes.*
- *Identifying negative shapes is only a first step.*

- *What to do next is the real issue.*
- *There are better approaches to dealing with familiarity.*

The value of identifying negative shapes is that it helps artists to isolate sections of contours of objects and of object-parts from the influence of the existing knowledge that is the basis of familiarity. If there is a need to do so, it is a consequence of the fact that representations of objects in memory can never include the unique features of appearances that artists wish to depict. The problem for the advocates of the negative shapes strategy is that, no matter how far down the levels of description they descend, the eye/brain systems will always find themselves confronted by generalisations. This is true even of the visual primitives, which is one reason why artists make errors when depicting abstract shapes, complex contours and relations between them.

Another, even more significant, flaw in the idea of bypassing familiarity is that the analytic-looking systems are unable to function in its absence. This must be the case because they are guided by instructions residing in memory, and these can only relate to preexisting knowledge of the objects, object-parts or visual primitives concerned. In short,"drawing what we see" is not an option. We have no choice but to"draw what we know".

This being the case, what is the nature of the "knowledge" that will best help artists to achieve accuracy? Here are some suggestions (notice that the negative shapes strategy could never be more than a first step for any of these):

- *Knowledge of the best ways of finding visual primitives and assessing relationships between them.*
- *Knowledge of making use of **context**, particularly that provided by **in front/behind relations**.*
- *Knowledge of the best ways of using the **same/difference judgements** that provide the basis of **comparative looking** to assess relativities.*
- *Knowledge of the **constancies of visual perception** and how to compensate for the distortions they engender.*
- *Knowledge of **ways** of breaking complex curves into more manageable sections.*

More about all these in the "feeling based drawing lesson", detailed in PART 3, Chapter 9 - 11.

The next chapter focuses on "contour drawing", another much-used method

of forcing a different and potentially useful way of looking. It can also be used as a means of developing and encouraging expressive line production. As is the case with the negative shapes strategy, we shall find that, despite having indisputable advantages, it suffers from important misconceptions and intrinsic shortcomings.