confused with the timidity of the 'permanent student' whose name haunts the lists of application for grants, research funds, and finally, minor teaching appointments. These must again be distinguished from the serious student of scholarly bent who 'reads' the subject and may make a distinctive contribution to theory or criticism. By the word 'student', therefore, I mean those who still question what they are doing, and ask why.

There is no word by the use of which sex-discrimination can be avoided. Readers must accept that when 'him' or 'man' is used, these words embrace both sexes (unless the text does draw a distinction). Women should not be deterred from course-work that includes the use of machinery and unfamiliar work with hand-tools. Invariably such skills are gained rapidly and practised with enthusiasm.

This, then, is the apparent situation of the designer and where this book begins. Returning to the statement that every human is a designer, and using it as a springboard: we do well to remember that designers are ordinary human beings, as prone as others (given half a chance) to every human weakness, including an exaggerated idea of their own consequence. Consider the following questions: Should a designer design for a factory in which he could never imagine working as an operative? Is design social-realist art? Is it handy to be in a state of moral grace when designing a knife and fork? Does design work justify its claims to social usefulness, or is it a privileged form of self-expression? Is a profession a genteel self-protection society with some necessary illusions? Should a designer be a conformist or an agent of change?

Those who feel that such questions are diversionary and a waste of time, should perhaps put this book down; others read on, but not for easy answers.

2   Is a designer an artist?

Before discussing this question, which involves describing a designer's work in some detail, it is necessary to look at the context in which it is usually asked. First, each country or culture has its own history, and this must affect how design functions now in any particular culture. The second difficulty is more widespread. It is the well-known but uneasy juxtaposition of 'fine-art' studies with 'design' subjects within a common faculty, excluding (normally) architecture. It would be out of place here to examine the history of this problematic and to some extent (now) arbitrary grouping of studies. It is enough to point out that the situation could be more realistically appraised if painting and sculpture were studied alongside music, dance, poetry, film and other activities that interpret, primarily, the psychological and sensuous and spiritual understanding of man. It would then be easier to distinguish those activities which must first satisfy his physical and accessory needs under conditions of complex social constraint (as in building design), or which may have a much humbler role in serving and pleasing man. It is true that, in the last analysis, every human artefact – whether painting, poem, chair, or rubbish bin – evokes and invokes the inescapable totality of a culture, and the hidden assumptions which condition cultural priorities. (In a basic sense, and given the conditions for warmth, food and shelter, the rest is a choice and speaks to us of priorities which need constant revaluation.) For the purpose of the remarks which follow, it is certainly necessary to say that if the words 'fine-art' and 'design' simply refer to a duality as experienced in art schools, it is difficult to set up satisfactory distinctions on that basis alone.

For the discussion that follows, the situation is seen from the standpoint of a designer.

Here is a sober but accurate description of professionalism by Misha Black: '... the offering to the public of a specialized skill, depending largely upon judgement, in which both the experience and established knowledge are of equal weight, while the person

possessing the skill is bound both by an ethical code and may be accountable at law for a proper degree of skill in exercising this judgement.'

Not, obviously, a full description, and perhaps a somewhat negative one, but making the fact plain that a designer works through and for other people, and is concerned primarily with their problems rather than his own. In this respect he might be seen as a medical man, with the responsibility a doctor has for accurate diagnosis (problem analysis) and for a relevant prescription (design proposals), though the comparison should not be taken too far. It must be clearly realized that designers work and communicate indirectly, and their creative work finally takes the form of instructions to contractors, manufacturers and other executants. The exception is the designer-craftsman or artisan, whose situation is discussed in part 6. The instructions may include written specifications, reports, and other documents, detailed working drawings, presentation drawings for clients, scale models and sometimes prototypes in full size. Since this is as far as a designer goes in direct production (strictly what he makes are visual analogues), it is necessary that the instructions are very clear, complete, and in other ways acceptable to those who must work from them. Much is said about this requirement in parts 11 to 16 of this book.

The designer usually has the further responsibility of supervising the work, but there is no obvious equivalent for the feedback through eye-and-hand so familiar to the painter or sculptor, whereby the original idea is constantly developed, enriched, or diverted by the actual experience of the materials and the making-process. The artisan is an exception. For most designers the point of no return (commitment to final drawings) is indeed final, unless everything is upset by site contingencies. So-called 'feedback' does of course operate at the design stage, mainly through people, circumstance, and the continuous absorption of new information into the design brief, which will alter its definition. The outcome will still change radically from first ideas thrown up by superficial acquaintance with the design problem, but the changes will not always be of the designer's own choosing: their nature may be objectively determined by factors quite outside his control. Such factors might be something to do with costs, the availability of materials or techniques,

a change in the client's requirements, or simply the discovery of factors that were hidden from sight in the early stages of the job.

Hence, in summary, the designer provides instructions (having exhaustively established and agreed the best course of action), and the work necessarily involves many different people whose interests (often in conflict) he must seek to reconcile. With some such people he may have (legally) contractual relationships.

Thus many specific responsibilities may arise – to clients, contractors, to the public who use the end-product, to numerous specialists or colleagues who may be involved if the undertaking is a large one (which implies team-work and frequently shared decisions). If it is a building, it mustn't fall down; if it is a chair, it mustn't be thirty inches high, have an innate tendency to collapse under load, it mustn't employ joints that can't be made except by special machinery (unless this can be found economical) and it mustn't cost so much as to be unmarketable. The designer cannot exercise personal insights until every apparently conflicting factor in his brief has been reconciled to best advantage: until, in short, he knows exactly what he is up against and which constraints can be made to play in his favour.

For such reasons, the designer is highly 'problem' conscious; a large part of his work may consist in problem analysis, though rarely of the complex order familiar in the sciences. To an ability for sorting, ordering, and relating information he must bring qualities of judgement and discrimination as much as a lively imagination. There is a diffuse sense in which the most seemingly 'objective' procedures in problem analysis are in practice discretionary, embedded as they are in the whole matrix of professional judgement in which relevant decisions are conceived. In some fields (such as textile design) there is far greater latitude than in others. In most design work the ultimate decisions affect, in a vital degree, appearance; but the look of the job, however lovingly considered, will emerge from, and in some sense express, the functional and circumstantial background. There are of course cases in which a communication requirement will be superimposed overridingly upon other factors, like structural logic; that would simply be a special (perhaps sophisticated) view of function.

Drawings can never be an end for a designer (excepting an

illustrator); they are a means to the end of manufacture, and their expressive content is strictly limited to the purposes of relevant communication. This obvious distinction from fine-art drawing can easily be overlooked in a design school where the design projects are theoretical, and drawings become the only outcome, acquiring the false dignity of an end-product in the process. This does not imply that drawings can be loveless, slovenly, or inadequate in any way, but that their nature is strictly purposeful. It may indeed be necessary to the designer to make loving, scrupulous and over-adequate drawings for his own self-satisfaction and to preserve his own standards. Only in this sense are design drawings 'self-expression'.

At every stage of design there will be discussion, questions and argument; the final design will have to be demonstrated and if necessary defended to the client, who will not understand what the final result will look like, but will naturally tend to assume that he knows more about his own problems than does the designer – despite having called him in to solve them. A design proposal intermingles with the world of considerations familiar to the client; communication media must be carefully chosen – verbal reports and other documents may accompany drawings and models. Designers use words constantly and in direct relation to their work; in forming and discussing ideas, assessing situations, annotating drawings, writing specifications and letters, and in report writing. This aspect of design work is frequently underestimated: an ability to use words clearly, pointedly, and persuasively is at all times relevant to design work.

It is now possible to ask, what kind of person might be happy and personally fulfilled in taking up design? It will be seen that a designer must be capable of more detachment than may be necessary to a fine-artist. He must be able to weigh up a problem, or an opportunity, in a dispassionate way, on its terms (as well as his own), and to select, arrange, and dispose his decisions accordingly. He must be able to thrive on constraint and to turn every opportunity to good account. He must like and understand people and be able to treat with them; he must be able to accept fairly complex situations in which he may well be working as a member of a team. He must be reasonably articulate. He must be practical and prepared for extensive responsibilities to other people. Finally he must be

prepared to spend at least half his time working with graphic media, since most design work appears in drawings of one sort or another when decisions have been finalized.

These remarks may suggest an uncomfortably glum idea of human perfectibility. In practice, of course a designer's life is as muddled, informal, and accident-prone, as most people's lives manage to be; not only behind the scenes, but sometimes in front of them. Every profession has roughly defined public responsibilities, which are met as closely as possible by accepted codes of practice. Again, the fact that design work is ten per cent inspiration and ninety per cent fairly hard work – not an unusual prospect – does need some well-organized procedures to keep the brief clearly in view, and the available energies best occupied.

Some of these procedures will be familiar to painters and sculptors, and certainly to film-makers; but for them the work will have a more inward character in its origins. Thus a painter's first responsibility is to the truth of his own vision, even though that vision may (or maybe always does) change as his work proceeds. He may be involved with contractual responsibilities, but not to the same extent as is a designer, whose decisions will be crucially affected by them. The designer works with and for other people: ultimately this may be true of the fine-artist, but in the actual working procedure a designer's formative decisions have a different order of freedom. The fine-artist is less dependent on discussion, agreement, letters, visits: the apparatus of communication that brings definition to a design problem, and relevance to its solution. A fine-artist usually works directly with his materials, or with a very close visual analogue to the final work. As we have seen, the designer has a long way to go before firm proposals can emerge – and even then a model may be the nearest thing to a tangible embodiment of his ideas.

In the case of film, television, and theatre, which might be described as a realm of public art, quite complex design procedures are involved. In the main, however, the real connection between fine-artists and designers springs from the benefit of a shared visual sensibility; not from a relevant or direct transference of skills, language, or formative insight, from one field to the other. Students are warned that this is an opinion: recalling the breadth of the design 'spectrum', they will see that this is a difficult matter to unravel. So

many factors impinge on the visual appearance of a design outcome that a designer's hand would seem to be guided by a wholly different 'requiredness' (a term borrowed from Gestalt psychology) from that which informs a painting or a work of sculpture. Yet there are component experiences with something in common. Equally valid transferences may occur from the 'feel' of related work in other fields (for example, philosophy, music, or mathematics) and should be encouraged to do so. Similarly, a creative sensibility may derive from unlikely sources that cannot be looked for in any one field alone.

It is only necessary to hammer home the obvious because fine-art and design (excepting architecture) are often taught as closely interrelated subjects, and students are asked to choose between them. The isolation of architecture, which has always been the home base of design theory, is hard to explain and justify. Perhaps the theory is affected by it. The term 'fine-art' is unpleasantly genteel, but will be met with in the careers prospectuses and in the art schools, normally to comprise painting, sculpture, printmaking, and photography, and to distinguish these studies from 'applied art', in the various fields of design discussed here. The view that there is a parallel situation in the sciences, as between pure science and applied technology, is a questionable one: equally untrustworthy is the supposition that painting, sculpture, industrial design, architecture, derive in some sense from the common fountain-head of 'art'. To suggest this seriously requires a view of art (and a set of definitions) quite outside the scope of the present discussion: it is partly a semantic problem, pointing to the inadequacy of ordinary descriptive language. Without distorting common usage, it might be said that designers are content to bring a certain artistry to their work, and to recognize that there is much in common between the few masters in any field – fine-art, design, science, medicine, philosophy – more, perhaps, than unites the very disparate standards that coexist in any one profession.

3 Design education: principles

'Well building hath three conditions: commoditie, firmnes, and delight'
    Vitruvius / Sir Henry Wotton

'Love, work and knowledge are the wellsprings of our life. They should also govern it'
    Wilhelm Reich

A design capability proceeds from a fusion of skills, knowledge, understanding, and imagination; consolidated by experience. These are heavy words, and they refer to the foundations. We accept a certain minimal competence as the basis of professional self-respect, and as some guarantee of a designer's usefulness to other people. Within limits such a competence is definable, and will begin to form outlines within a formally structured teaching/learning situation. It is too much to say outright that design ability can be 'taught'. As with any other creative activity, it is a way of doing things that can only be grown into, perhaps – but not necessarily – in the context of a formal design education.

This view is readily conceded for something as immaterial as 'imagination', but it is commonly held that skills and knowledge must not only be taught, but rigorously examined: if only to protect an unsuspecting society against social or technical malpractice. Defensible as this may be, it is not an assumption that should go unquestioned, nor deflect attention from the weaknesses of received professional standards. The damage caused by knowledge used without understanding is merely difficult to measure: it is not less real for that. A skill may be irrelevant to the nature of a problem, or – in dealing with people – may be grossly uninstructed in a necessary tact and discernment. Knowledge may be thinly experienced as a rag-bag of conventional responses helped along by access to someone else's published working details. Plainly, skill and knowledge cannot be weighed out by the pound, and separated from qualitative