Understanding the problem

So often design problems are posed in terms of the solutions expected. As we saw at the beginning of this book, the different design professions are divided not by the kinds of problem they tackle, but by the kinds of objects they create. Even within a single design field such as architecture we tend to think of a project by the building type which it is expected will result, such as office, school, house, hospital and so on. The good design tutor is careful to draw the student's attention to the need to think afresh about the problem without preconceptions about the type of solution. When the Open University began a course entitled 'Man-Made Futures' the course team saw the need to provide this kind of help for students who would not necessarily have the normal levels of contact with their tutors. Perhaps for this reason, Reg Talbot and Robin Jacques invented PIG, or the problem identification game. The game itself is probably rather too elaborate to be a useful design tool in practice, but the ideas behind it are extremely valuable.

The idea of PIG is that the designer distils the problem down to a very short and simple statement from which crucially problematic relationships can be identified. These relationships or 'problem pairs' as the game's authors call them, can then be used to try to develop others and thus expand the understanding of the problem. Five mental tricks are used: asking the designer to think of ways of relating people or issues by 'conflict', 'contradiction', 'complication', 'chance' and 'similarity'. Thus the game might proceed by identifying people involved in the design situation as being in conflict or seeing things from different points of view (contradiction), or seeing that things may not be as simple as originally thought (complication). Like many creative thinking techniques these devices can be used self-consciously to change the direction of thinking which can otherwise become channelled in a single direction.

The model of problems

The model of design problems suggested in this book can be used in very much this kind of way. It is possible to explore a design problem by visiting all the boxes combining constraint generators, domains and functions trying to think of some problems relevant to this project. It is also useful to ask, where in the model do the critical constraints lie? In most design situations there are a limited number of constraints

which are absolutely critical and central. In such cases the key to success lies in identifying these factors and paying more attention to them. Again, reference to the model of design problems from time to time during the design process may reveal the rather distorted attention which can otherwise develop. Quite simply, an aspect of the problem can come to interest the designer who becomes determined to find a good solution, however, examination of the whole model may suggest this may not be one of the key factors for success.

Of course, good designers may do this without the need for such tools and such a self-conscious approach. The Malaysian architect Ken Yeang makes this point rather nicely:

> I trust the gut feeling, the intuitive hand, the intuitive feel about the project . . . you can technically solve accommodation problems, you can solve problems of view and so on but which problem to solve first is a gut feeling . . . you can't explain it but you feel that's right and nine times out of ten you are right.
>
> (Lawson 1994b)

Broadbent's method

Perhaps one of the most ambitious programmes of design methods was developed by Geoffrey Broadbent (1973) specifically for use in architecture but which actually has many generic qualities. In reality Broadbent's method probably does not hold together as a total method but relies upon four distinct ways of generating design form which he called, 'pragmatic', 'iconic', 'analogical' and 'canonic' methods. Broadbent arrived at this taxonomy from a study of the history of architecture and shows how each of his four techniques have been used at various times. Broadbent suggests a complete design method could find the designer using all four of his tactics in an ordered and organised way, and then selecting from amongst the solutions produced. There is no evidence of designers actually working like this, but his four tactics are worthy of study and form a very useful addition to the designer's tool kit of tactics for controlling design thought.

Pragmatic design is simply the use of available materials methods of construction, generally without innovation, as if selecting from a catalogue. Provided that the designer has a good grasp of the strengths and weaknesses of traditional and established techniques this method certainly has its uses. It is essentially traditional and conservative and, therefore, a low risk approach unlikely to lead to dramatic failure. This is virtually a pattern-book approach and