

trade-offs and compromises are made remains a matter of skilled judgement. There are thus no optimal solutions to design problems but rather a whole range of acceptable solutions (if only the designers can think of them) each likely to prove more or less satisfactory in different ways and to different clients or users. Just as the making of design decisions remains a matter of judgement so does the appraisal and evaluation of solutions. There are no established methods for deciding just how good or bad solutions are, and still the best test of most design is to wait and see how well it works in practice. Design solutions can never be perfect and are often more easily criticised than created, and designers must accept that they will almost invariably appear wrong in some ways to some people.

3 Design solutions are often holistic responses

The bits of design solutions rarely map exactly on to the identified parts of the problem. Rather one idea in the solution is more often an integrated and holistic response to a number of problems. The dished cartwheel studied in Chapter 2 was a very good example of this and puzzled George Sturt for exactly this reason. The single idea of dishing the wheel simultaneously solved a whole series of problems. The Georgian window studied in Chapter 4 can similarly be seen as an integrated response to a great many problems. Thus it is rarely possible to dissect a design solution and map it on to the problem saying which piece of solution solves which piece of problem.

4 Design solutions are a contribution to knowledge

Once an idea has been formed and a design completed the world has in some way changed. Each design, whether built or made, or even if just left on the drawing-board, represents progress in some way. Design solutions are themselves extensively studied by other designers and commented upon by critics. They are to design what hypotheses and theories are to science. They are the basis upon which design knowledge advances. The Severins Bridge in Cologne, which we studied in the previous chapter, does not just carry people across the Rhine it contributes to the pool of ideas available to future designers of bridges. Thus the completion of a design solution does not just serve the client, but enables the designer to develop his or her own ideas in a public and examinable way.

5 Design solutions are parts of other design problems

Design solutions are not panaceas and most usually have some undesirable effects as well as the intended good effects. The modern

motor car is a wonderfully sophisticated design solution to the problem of personal transportation in a world which requires people to be very mobile over short and medium distances on an unpredictable basis. However, when that solution is applied to the whole population and is used by them even for the predictable journeys we find ourselves designing roads which tear apart our cities and rural areas. The pollution which results has become a problem in its own right, but even the car is now beginning not to work well as it sits in traffic jams! This is a very dramatic illustration of the basic principle that everything we design has the potential not only to solve problems but also to create new ones!

The design process

1 The process is endless

Since design problems defy comprehensive description and offer an inexhaustible number of solutions the design process cannot have a finite and identifiable end. The designer's job is never really done and it is probably always possible to do better. In this sense designing is quite unlike puzzling. The solver of puzzles such as crosswords or mathematical problems can often recognise a correct answer and knows when the task is complete, but not so the designer. Identifying the end of design process requires experience and judgement. It no longer seems worth the effort of going further because the chances of significantly improving on the solution seem small. This does not mean that the designer is necessarily pleased with the solution, but perhaps unsatisfactory as it might be it represents the best that can be done. Time, money and information are often major limiting factors in design and a shortage of any of these essential resources can result in what the designer may feel to be a frustratingly early end to the design process. Some designers of large and complex systems involving long time-scales are now beginning to view design as continuous and continuing, rather than a once and for all process. Perhaps one day we may get truly community-based architects for example, who live in an area constantly servicing the built environment as doctors tend their patients.

2 There is no infallibly correct process

Much though some early writers on design methodology may have wished it, there is no infallibly good way of designing. In design