begins to talk about the technicalities of the solution rather than the abstractions of the problem.

> The idea that you have got a transparent plane and it's very big, 40 m high or whatever, you then have to develop an idea of how to hold it up. The notion of transparency; if it's not understood by everybody, very clearly, is very easy to miss, and in fact we missed it – three of us together and though we defined transparency, we ended up with a kind of vertical structure, a square grid. But then we were trying for the bracing of the glass, the wind bracing and everything else, we weren't relating it back to transparencies.
>
> Certain problems had emerged, things like maintenance, things like cost, and all these are extra. Then we suddenly realised that part of the idea of transparency was panorama, if this transparency had panorama you've got it. To us this implied horizontality which introduced other problems for us like maintaining something with a horizontal structure. Eventually that was how we arrived at the form you see.

Now we can see how this exploration of the materials that could be used in the solution had led to a form with which Ritchie was unhappy. His unhappiness relates to their failure to produce a solution that achieved the 'transparency' he had identified as a key quality of the desired 'views out'. Suddenly comes this moment of insight in which a new concept is introduced, that of 'panorama'. This carries with it an assumption of horizontality in the glazing pattern which changes the form from its previous vertical emphasis.

What is important here is just how much progress is made through this conversation. It matters not at all whether there are one or many designers, the process seems to be the same. A conversational interaction with the situation is taking place in which drawings and ideas each have their place. The ideas are undoubtedly processed through concepts described in words. These words have enormous significance since they represent a complex set of characteristics some of which may help the designer to see a way of proceeding. The drawings appear to reveal problems and enable the designer to see unsatisfactory situations. Together these two powerful forces combine to make the very essence of design thinking. However it is the very introduction first of 'transparency' and then of 'panorama' that enables Ritchie here to view the problem in such a way that all the conflicts are resolved. It looks much more like a form of negotiation than a form of moving from problem to solution based on some theoretical knowledge.

This introduces us to another common form of conversation that is helpful to our enquiry here. We shall now explore the idea of conversation as negotiation. In negotiation two or more parties

begin with disparate positions about some common purpose. The parties come into the negotiation taking different views and having different objectives but with a willingness to try to reach some form of agreement that all parties can accept. We can see the design process as one of negotiation too. Famous and public negotiations are often very tricky. For example in any industrial relations dispute or international squabble over territory the parties seem completely irreconcilable for most of the conversations they hold.

The problem and solution views

In fact the negotiation between problem and solution in design turns out to be every bit as tricky to resolve. Earlier on in this book the argument was advanced that problems and solutions have a curious relationship in design. In Chapter 3 we arrived at a diagram showing the design process as a negotiation between problem and solution (see Fig. 3.7). In Chapter 4 we saw how design solutions are often integrated responses to design problems. In fact one of the most beautiful examples of this integration can be seen even earlier in the book in the description by George Sturt of the dished cartwheel (see Figs 2.4 and 2.5). Later in Chapter 6 we saw how the architect Denys Lasdun described features of his National Theatre in London as integrated solutions. In both these examples what we see is that a single idea in the solution, the dish shape of the cartwheel or Lasdun's 'strata', simultaneously solves many problems. As we have also shown in Chapter 5, success in solving those problems cannot necessarily be measured using a single metric. For example we cannot measure the goodness of a view and the energy efficiency of a window with the same kind of scale. Even worse, the relative importance of all the problems a designer is solving is also not easy to establish clearly or objectively. It is no wonder then that negotiating a 'good' solution to a complex design brief is so tricky.

In fact it turns out that this tension between a problem view and a solution view of the situation is at the very heart of the way designers have to think. It is what makes design as an activity not only so challenging and frustrating but also so satisfying and compulsive. We have seen repeatedly in this book that designers tend to be 'solution focussed' rather than 'problem focussed' in their approach. I have written in *What Designers Know* about the way in which designers seem to accumulate knowledge about solutions (Lawson 2004). The role of this knowledge in helping to form