either as a complete idea or in parts, such as moving a particular piece, occupying a particular square or threatening a particular piece, and so on. This idea then needs evaluating against the objectives before finally deciding whether or not to make the particular move.

To return to the Markus/Maver map, we have already seen how maps of the design process may need to allow for return loops from an activity to that preceding it. The first move thought of by our chess player may on examination prove unwise, or even dangerous, and so it is with design. This accounts for the return loop in the Markus/Maver decision sequence from appraisal to synthesis, which in simple terms calls for the designer to have another idea since the previous one turned out to be inadequate.

The presence of this return loop in the diagram, however, raises another question. Why is it the only return loop? Might not the development of a solution suggest more analysis is needed? Even in the game of chess a proposed move may reveal a new problem and suggest that the original perception of the state of the game was incomplete and that further analysis is necessary. This is even more frequently the case in design where the problem is not totally described, as on a chess board. This was long ago recognised by John Page (1963) who warned the 1962 Conference on Design Methods at Manchester:

> In the majority of practical design situations, by the time you have produced this and found out that and made a synthesis, you realise you have forgotten to analyse something else here, and you have to go round the cycle and produce a modified synthesis, and so on.

So we are inevitably led to the conclusion that our map should actually show a return loop from each function to all preceding functions. However, there is yet another problem with this map (Fig. 3.3). It suggests, again apparently logically, that the designer proceeds from the general to the specific, from 'outline proposals' to 'detail design'. Actual study of the way designers work reveals this to be rather less clear than it may seem. Conventionally the Markus/Maver map of the design process for architects suggests that the early

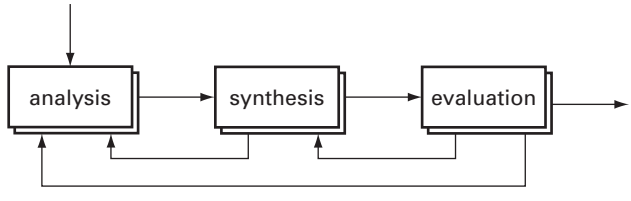

Figure 3.3
A generalised map of the design process

stages will be concerned with the overall organisation and disposition of spaces, and the later stages concerned with the selection of materials used in construction and detailing the junctions between them. In fact this turns out to be yet another example of what may seem logical from a superficial study but where reality is more messy. This is nicely put by the famous American architect Robert Venturi:

> We have a rule that says sometimes the detail wags the dog. You don't necessarily go from the general to the particular, but rather often you do detailing at the beginning very much to inform.
>
> (Lawson 1994b)

It is for this reason that Venturi is so unhappy about the increasing tendency in the United States to separate conceptual design from design development, even appointing different architects at the two stages. The use of the 'design and build' system in the United Kingdom has brought similar problems. At least one very successful and much admired architect, Eva Jiricna, has indicated that her design process is very much a matter beginning with what others would conventionally regard as detail. She likes to begin by choosing materials and drawing full size details of their junctions:

> In our office we usually start with full-size detail . . . if we have, for example, some ideas of what we are going to create with different junctions, then we can create a layout which would be good because certain materials only join in a certain way comfortably.
>
> (Lawson 1994b)

Clearly if this process works well for such a highly acclaimed architect we must take it seriously. The problem for the Markus/ Maver map, then, is just what constitutes 'outline' and what is meant by 'detail'. Experience suggests that this not only varies between designers but may well vary from project to project. What might seem a fundamental early decision on one project may seem a matter of detail which could be left to the end on another. Even if the design strategy itself is not driven by detail as in Eva Jiricna's case, it seems unrealistic to assume that the design process is inevitably one of considering increasing levels of detail.

The map, such as it is, no longer suggests any firm route through the whole process (Fig. 3.4). It rather resembles one of those chaotic party games where the players dash from one room of the house to another simply in order to discover where they must go next. It is about as much help in navigating a designer through the process as a diagram showing how to walk would be to a one-year-old child. Knowing that design consists of analysis, synthesis and