Design decisions were therefore made on the basis of, first, a criticism of existing answers – known solutions did not solve the problems as *now* perceived – and, secondly, a model which was recognised as relevant to P_1. This is not a question of copying but of being stimulated by an existing structure/building to pursue a particular direction for which there was an already established sympathy. In this case, as Peter Rice records, a 'fixation'; he was 'an engineer obsessed' (Rice, 1994, p.30).

The structural problem was compounded by the fact that on both sides of the clear span area there were zones of use: on the piazza side for vertical circulation, on the street side for service ducts and equipment. The structure had somehow to account for this a:b:a spacing in the cross-section. Various solutions were proposed but eliminated on either architectural or engineering grounds.

The eventual breakthrough came when: 'One of the team, I am no longer sure who, probably Lennart Grut – I know it was not me – suggested a suspended beam on a short-propped cantilever, the so-called gerberette solution named after Heinrich Gerber, a nineteenth century German engineer who invented this structural system for bridges. This solution simply and elegantly resolved all the conflicts. Naturally it was quickly adopted' (Rice, 1994, p.32).

It was then possible to proceed with the design of the other parts of the structure and to involve other members of the engineering design team who could work within the general ideas which had been established. What this part of the design sequence also makes clear is the extent to which decisions are dependent on the knowledge available at any particular time.

The state of current knowledge became even more significant when it came to calculation and specification. Cast steel was not a material which had been greatly studied and was only just coming into use in nuclear power plants and oil rigs.

Right
Renzo Piano & Richard Rogers, Ove Arup & Partners, engineers, Centre Pompidou, Paris 1971–77; gerberettes on the building revealing their sculptural quality

The gerberette was calculated, drawn, modelled and the process was iterated until a satisfactory solution emerged. This process of error elimination, always gauged against the original hypothesis, namely that the 'essence of the design given by the use of cast steel was that each piece was separate, an articulated assembly where the members only touched at discreet points. As in music, where the space between the notes defines the quality, here it was the space between the pieces which defined the scale' (Rice, 1994, p.34).

The great difficulties of manufacture and the problems with contractors and the timetable, however worrying at the