

designer plenty of scope for architectural expression, for just as architects of the functionalist school decreed that the nature of the 'carcass' should receive attention as an expressive element, so did they tend towards the view that the nature of materials making up the building's envelope, and more particularly, the manner of their assembly, should also contribute to 'reading' the building.

To the modernist there was something inherently satisfying about a building which was so explicit about its structure, its materials and its assembly and construction that it is not surprising that the pioneers of modernism looked to the work of contemporaneous structural, mechanical or nautical engineers and its naked expression of materials and assembly, for an acceptable *modus operandi* (Figures 4.34–4.36). But the pluralist world of so-called post-modernism in which we now find ourselves allows for alternative forms of architectural expression where other pressures, be they cultural or contextual, may well override

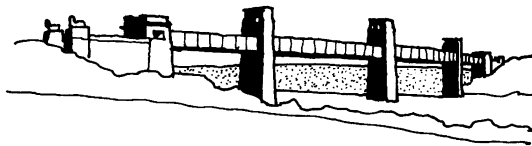


Figure 4.34 Robert Stephenson, *Britannia Bridge, Menai Strait, 1850*. From *Architecture of the Nineteenth and Twentieth Century*, Hitchcock, Penguin.

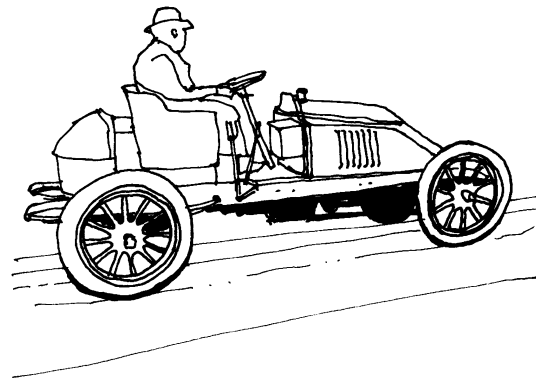


Figure 4.35 1903 Renault.

any perceived need to make an explicit display of structure, or constructional method.

The envelope

The majority of our constructional concerns relate to the design of the building's external envelope; the walls and roof membranes and how these are pierced for lighting or access. Decisions about the nature of this external

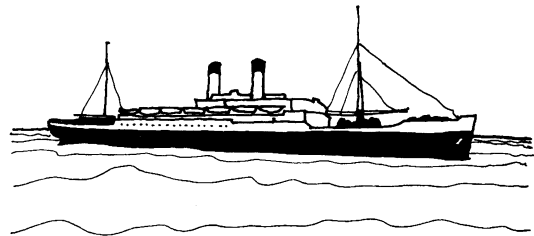


Figure 4.36 *The Flandre*. From *Towards a New Architecture*, Architectural Press, p. 81.

'skin' to the building will not only interact with other major decisions as the design develops, but will also determine to a large extent how the building will look.

The roof

Take the roof for example; will it be flat or pitched, and in either case will it project beyond the wall plane to afford some protection from the weather or will it be arrested behind a parapet wall? Should the roof be considered as a lightweight 'umbrella' structurally and visually separate from the principal structural idea (**Figure 4.37**), or does that idea also produce the roof envelope merely by the application of a waterproof membrane (**Figure**

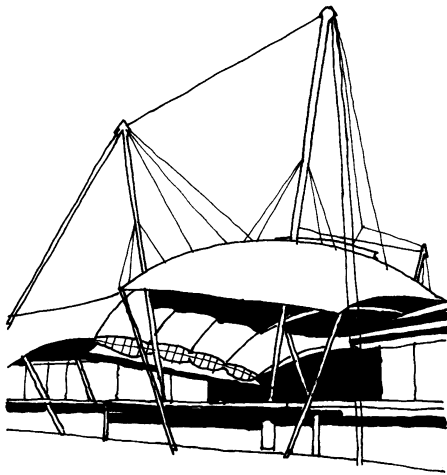


Figure 4.37 Michael Hopkins, *Inland Revenue Amenity Building, Nottingham, 1995*. Section. From *Architectural Review* 5/95, p. 46.

4.38)? These fundamental questions of whether the roof is a lightweight or a heavyweight envelope (with a considerable thermal mass) have real consequences regarding the building's appearance but also its performance.

Flat roof technology has developed so that insulation is positioned at the 'cold' side of any heavyweight roof, allowing the structural thermal mass to work in favour of the building's thermal performance. Not surprisingly, the flat roof (or a roof with minimum falls to points of rainwater collection) will be considered as a continuous impervious skin whether that skin is applied to a heavyweight structure or to a lightweight roof 'deck'. But as to pitched roofs, decisions regarding a lightweight impermeable and continuous membrane as opposed to a heavy roof of traditional provenance formed from individual tiles or slates which are by their nature permeable, will again

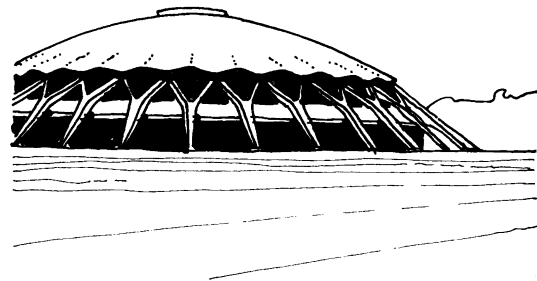


Figure 4.38 P. L. Nervi, *Palace of Sport, Rome, 1957*. From *Visual History of the Twentieth Century Architecture*, Sharp, D., p. 213.