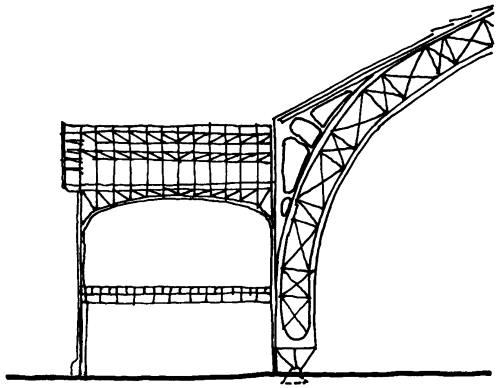

Figure 4.12 *Contamin et Dutert, Galerie des Machines, Paris Exposition, 1889. From Durant, S.,* Architecture in Detail*, Phaidon.*

programme lends itself to such direct or 'one-liner' solutions, such as in the case of exhibition buildings, then this inseparability of form, space and structure is more likely to be realised.

This has consistently been the case with the tent-like structures of Frei Otto (**Figure 4.14**), or with the geodesic domes of Buckminster Fuller (**Figure 4.15**) where decisions about structure determine the nature of external form but also as a direct outcome, the type of space enclosed. Furthermore, the nature of the external membranes of both examples allows a close correspondence with the structure whilst at the same time providing transparency or translucency for daylighting purposes.

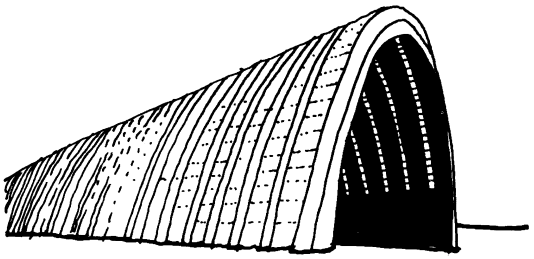

Figure 4.13 *Freyssinet, Airship Hangar, Orly, Paris, 1916. From* Bannister Fletcher*, Architectural Press, p. 1106.*

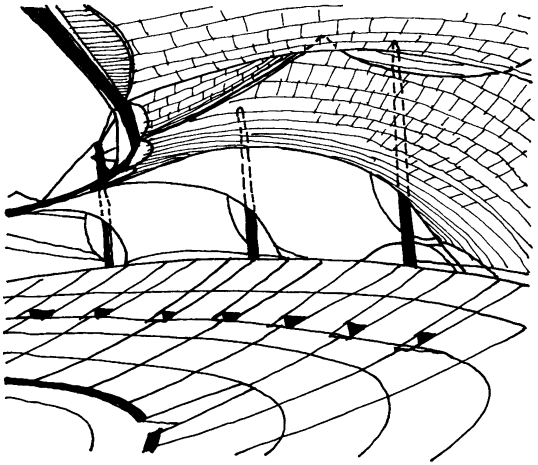

Figure 4.14 *Frei Otto, Olympic Games Complex, Munich, 1972. From* Dictionary of Architecture*, St James Press, p. 243.*

But such structural virtuosity, whilst a demonstration of skill admirably suited to an exhibition building where the primary need is for one large uncluttered and flexible space, is hardly appropriate for more complex architectural programmes; in such situations, the designer re-engages with the notion of 'type'. Although modern structural engineering techniques may

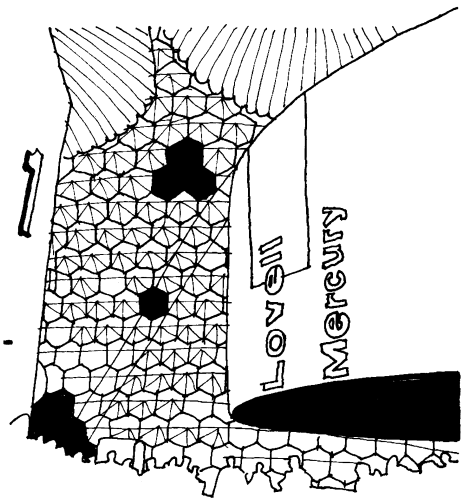

Figure 4.15 *Fuller and Sadao Inc., US Pavilion Expo '67, Montreal. From* Visual History of Twentieth Century Architecture*, Sharp, D., Heinemann, p. 280.*

seem to offer bewildering choices for the architect, the range of tectonic types (like plan types) is limited. For example, will the programme best be served by an 'ad-hoc' application of a traditional load-bearing masonry and timber type, or should advanced building technology be explored with its very different formal consequences? Which tectonic type will best 'fit' the plan type and parti (or diagram) for the building currently being explored?

Plan and structure

At this stage in the exploration it is worth considering how plan and structure interact. The modernists were quick to recognise the potential freedom that framed structures offered architects in generating new plan types. Indeed, Le Corbusier's 'Five Points of the New Architecture' and most particularly his concept of the 'open' plan were dependent upon the minimal structural intrusion on plan that a framed structural type offered (**Figure 4.16**); rather than the intrusive and therefore restrictive 'footprint' of loadbearing walls (**Figure 4.17**), the minimal repetitive footprint of a column within a structural grid seemed to offer a new vocabulary of space enclosure. Moreover, by wilfully avoiding the columns, non-loadbearing partitions could weave on plan between them without challenging the primacy of the structural system (**Figure 4.18**).

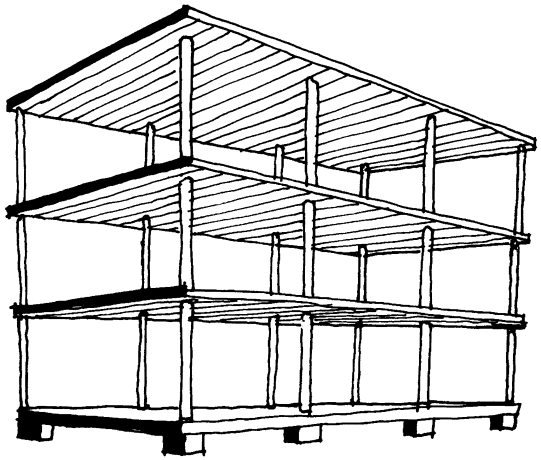

Figure 4.16 *Column and slab structure facilitating 'open plan'.*