

Architecture

Architecture is often described as the art of sheltering, and it is the one art form that combines aesthetic considerations with intensely practical ones. Our formal responses to architecture often involve the purpose of the building: a church, an office building, a residence, and so on. The way architects merge interior function with exterior form provides much of our encounter with works of architecture.

Although a variety of fundamental technical elements exist in architecture, we will only discuss one: *structure*.

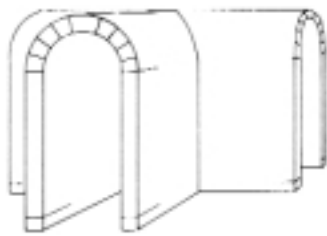
Structure

Architecture contains many systems of structure. As we travel through the centuries in our examination of human creativity, we will see examples of POST-AND-LINTEL, CANTILEVER, ARCH, bearing wall, and skeleton frame structures. Laying horizontal pieces (LINTELS) across vertical supports (posts) gives us one of our oldest structural systems—that is, post-and-lintel (see Fig. 4.26). When unimpeded interior space became an architectural necessity, the arch gave architects an additional means of solving the practical problems involved. Whether it was used in VAULTS (arches joined end to end) or in domes (concentric

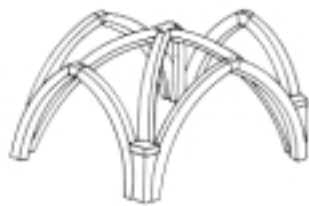
arches), as we shall see in the great Gothic cathedrals of the Middle Ages or the dome of the Pantheon (see Fig. 4.23), the arch opened interior space to usable proportions. When vaults cross at right angles, they create a GROIN VAULT (Fig. 0.11). The protruding masonry that indicates a diagonal juncture of arches in a tunnel vault is a RIBBED VAULT (Fig. 0.12). Cantilever, as exemplified in the Zarzuela (zahr-ZWAY-luh) Race Track (Fig. 0.13), provided architects with dramatic means for expression, for here, unsupported, overhanging precipices define space.

The system of *bearing wall* has had ancient and modern applications. In it, the wall supports itself, the floors, and the roof, and both log cabins and solid masonry buildings are examples in which the wall is the structure. When the wall material is continuous (not joined or pieced together) it is called MONOLITHIC.

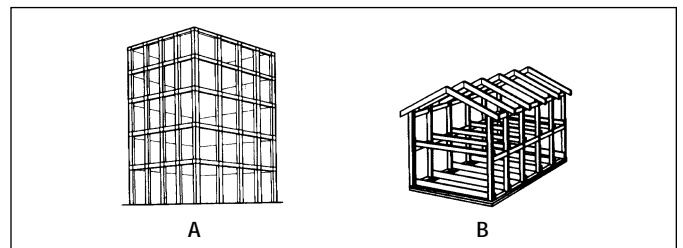
Finally, *skeleton frame* structure uses a framework to support the building. The walls are attached to the frame, thus forming an exterior skin. When skeleton framing makes use of wood, as in house construction, the technique is called *balloon construction*. When metal forms the frame, as in skyscrapers, the technique is known as steel-cage construction (Fig. 0.14).



0.11 Groin vault.



0.12 Ribbed vault.



0.14 Skeleton frame structures: A. Steel-Cage Construction; B. Balloon Construction.