Dome Encyclopedia Article

Dome

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Dome

A dome—essentially a three-dimensional arch—is a special class of vaulted roof. As opposed to other forms of vaulting, the dome is round, like an inverted bowl.

The earliest known domes are found in Cretan tombs dating to about 2500 B.C. The pantheons, or temples, of the Roman Empire were round structures capped by domes. The Romans made extensive use of concrete, bracing arches with cross-vaults when the load demanded it. The dome of St. Sophia church in Istanbul was the first to be placed atop a rectangular building.

Early domes were constructed of masonry. Just as an arch is held together by its keystone and interlocking pieces, a dome's stability relies upon the center piece at the top. The weight of the structure is then dispersed outward and downward through the walls of the dome.

The value of a dome is that it can span large spaces with no internal support. Domes are used as the focal point for public structures such as capitol buildings, churches, and mosques, and are often as ornamental as they are functional.

During the 1800s, domes began to be built with iron and steel frameworks. In the mid-1900s, R. Buckminster Fuller invented the geodesicdome, which made maximum use of minimum materials and consisted of many small interlocking tetrahedrons (pyramid-like forms with a base and three sides). Made of aluminum and glass or plastic, the geodesic dome is lightweight, resistant to wind, and capable of covering acres of ground with no internal support.

While the dome is seldom used in modern architectural designs, it has enjoyed renewed popularity with the construction of enclosed stadiums. Relying more on the sheer strength of new building materials, stadium roofs must be high enough and must cover a large enough playing area so as not to interfere with the game being played The Houston, Texas *Astrodome*, built in 1966, was the first domed stadium. Its roof is 208 ft (63.4 m) high and 642 ft (l95 m) across. Some stadium roofs are retractable. The roof at the *Metrodome* in Minneapolis, Minnesota is composed of lightweight materials supported by compressed air.