In this lecture I trace the role of a number of different structural techniques developed by the Romans to control loads and create stability in large complex concrete vaulted structures, such as the Colosseum, the Pantheon, and the imperial thermae. These techniques include the use of lightweight volcanic materials, metal tie bars, and external buttressing arches. The development of such techniques is then related to social, environmental, and economic changes within the Roman Empire, such as the development of the marble trade, the catastrophic results of the explosion of Mt. Vesuvius in 79 AD, and changing methods of taxation in late antiquity.