Paul G. McHenry

Adobe Today

Las Tampas Church, an example of adobe architecture.

Adobe is the oldest and most widely available building material used by man. A surprising fact about adobe is that nearly half the people of the world today live in adobe or earthwall houses. The second surprise is that adobe is much more durable than one might think. Popular perception is that adobe is used only in a desert or arid lands climate. Nothing could be further from the truth, as it is found in every climate zone, with the exception of the Arctic and Antarctic zones. Even in the Arctic, igloos are built with the same principles as adobe domes, but with snow blocks instead of dried earth bricks.

There are several types of earthwall buildings. The two major ones are adobe (sun-dried mud brick laid up with earth mortar and dried by the sun), and rammed earth, or *pisé*, (earth compacted in forms to make the wall). Both use the same material, but rammed earth is used in humid climate areas where rain and dampness would slow or prevent sun drying of the bricks. Both systems are widely used, with the type of building system chosen dependent on the local climate and the tradition of the builder. There are also two other common types of earthwall buildings. One is called *jacal*, or *Bajareque*, and it uses a wood/thatch armature to support the mud; the other is a "puddled" (wet-placed mud) form.

Worldwide Tradition

The basics of earthwall construction are similar worldwide, but with some notable exceptions. In the Middle East, where trees for structural members are very scarce or nonexistent, a system of arches and domes was developed perhaps as early as 7000 B.C. The ingenuity and masonry skills are truly incredible. Consider the imagination it took to figure out a way to build a roof structure with a span of 50' or more, using only pieces that are less than 10" in length. This was done, and the technology transferred from the Middle East to the shores of the Mediterranean and on to Italy and Europe.

Adobe in the United States

Building with earth was a common occurrence in early America, from the eastern seaboard to the Rocky Mountain west and to the Pacific Ocean. Better building materials were not unknown, but earth often was used when other (better) materials were unavailable or too expensive. Rammed earth buildings are still found in North and South Carolina, Virginia, and Washington, DC. At a recent international conference on adobe preservation, an architect from New York identified more than 25 adobe homes in the State of New York. (See Pieper article, p. 30.)

There are many materials that are stronger, more long lasting, and better than adobe, but the advantages and utility of adobe are repeatedly rediscovered in our history alone. Countless communities, particularly in the western United States, needed buildings for homes, commercial enterprises, and public works, but they were located far from the supplies of more conventional building materials. Furthermore, economics was an additional driving factor. There are in New Mexico countless churches, homes, and commercial buildings. Sometimes the facade of a merchant's store was made of fired brick while the rest of the walls were made of adobe. A Department of Energy study in the State of Colorado uncovered many adobe buildings of great age. They were built in various styles, and often the residents were not aware that these were earth buildings.

In 1941, a large elementary school was needed in the small town of Anthony, New Mexico. The city did not have money to build it, so public-spirited citizens got together, made

Dervish Mosque, Mahan, Iran, covered with tile.

bricks from the local soil, and employed townspeople in need of jobs to build their school. It is in sound shape today. The Works Progress Administration (WPA) made wide use of adobe and rammed earth during the drought and Great Depression of the 1930s. Farmers were relocated to Bosque Farms, New Mexico, where the government provided plats of irrigated land and arranged for the design and construction of more than 40 small homes. The government supervised the construction of the homes, which were leased to displaced persons who were to become future owners. There are 42 of these homes in use today. Many of the designs have been modernized to meet today's standards and expanded to provide the additional space.

Lost Technology

The skills for building with earth are quite simple and were well known to almost everyone until World War II. However, after the war, the new "modern" materials became the first choice because they were, in some ways, better than adobe, and they were affordable. In addition, the building industry was under tremendous pressure to keep up with explosive growth. The industry's rapid growth and the influx of new materials resulted in a whole generation of architects, engineers, and building professionals who in their entire careers never once experienced working with adobe. In this gap of 40 to 50 years, adobe took on an image of poverty, a perception that persists today. The technology was almost lost, except in primitive economies and among a few dedicated builders who used adobe architecture as an artistic medium. At an international conference on housing held in Brussels in the 1980s, a famous Egyptian adobe architect and proponent of low-cost housing was scorned and vilified to where he was accused of trying to return housing to the Middle Ages.

Public Image

Where this material was used only by "poor" people, it is now a premium material. Look at Santa Fe, New Mexico! Poor people, indeed, live here. And, high-end homes made of adobe are very popular in Santa Fe, often favored by people from other areas where high-priced housing is common.

In 1981, the Bureau of Indian Affairs (BIA) wanted to build adobe housing on several Native American reservations, but rejected the idea as "too expensive." Unfortunately, the attitude of the BIA reflects attitudes by the architectural community as well, which values what is new and ignores many benefits from the past.

The Future

Mankind has an extensive history of repeatedly abusing and exhausting natural resources. Energy, natural resources, and ecology will suffer. It cost surprisingly large amounts of energy to manufacture modern building materials. For example, it takes one gallon of gasoline to make eight common bricks. In the past, when the effects of manufacturing building materials reached catastrophic proportions, earth building has come to the rescue.

In most industrial nations the art of building with earth is a lost one. We must create a corps of skilled professionals who are ready to train others and provide answers to questions with regard to earthen construction. The main villain of this situation is ignorance. It starts with the basic tenets of architecture and architectural education, and it ends with the creation of unrealistic buildings and zoning regulations. These regulations are made, of course, with the best intentions, but frequently fall short of meeting practical needs.

In 1997, the Earth Architecture Center International was created to collect and disseminate accurate technical information on earthen building. In 1998, it was transformed into the Earth Building Foundation. For further information on this organization, please visit our web site <www.earthbuilding.com>.

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Photos courtesy the author.