sense, it could mean clay, lime or Portland cement. Cement, as we know it today, was invented only in 1824, by Joseph Aspdin, a bricklayer in Leeds, England. And it took at least another 80 years before it began to be used extensively.

Clay, on the other hand, has been around for thousands of years. Lime has been used for nearly as long. And hydraulic lime, which is often called Roman cement, has also been around since the time of the Romans.

The properties of lime are significantly different from those of modern-day cement. All buildings constructed before the 20th century would almost certainly have been built using lime.

Another misleading claim is that you cannot build high-rise structures with Lime mortar. The tallest lime masonry structure in the world is the Philadelphia City Hall standing 167 metres tall.

The Poor Cousin
Traditional building techniques and materials were different from those of today. Old buildings were constructed with brick, cob and stone. Brick and cob are relatively porous. Due to absence of damp-proof course at the plinth level, sub-soil moisture rises through porous walls, which is detrimental to the health of the wall. Lime mortar, being porous, lets moisture evaporate, thereby helping buildings remain cool during summer.

Being relatively softer mortar, Lime mortar withstands certain degree of movement which comes with settlement and seasonal change in ground conditions.

How Long Can Premixed Lime Mortar Be Stored?
Premixed lime mortar in airtight bags, which prevent it from absorbing Carbon-dioxide from the atmosphere, will last indefinitely.

Lime Plaster
Lime plaster is a finishing layer. Sand is ground with mature lime putty and water
to form a mortar. There are three grades of lime plaster; 1:2, 2:3, and 1:1. These are ratios of mature lime putty to sand. The 1:2 grade is suitable as a rough layer on exposed brickwork. The 2:3 ratio is better for 'breathability' and can be used as a finishing coat. The 1:1 ratio produces the smoothest surface and can be used to match the finest traditional finishes.

**Whitewash**

Whitewash is a 'breathable' paint made from lime putty thinned with water. Whitewash is approximately 1 part mature lime putty to 1 part water. It can be coloured with pigments and used on both interior as well as exterior walls. It works best on porous surfaces and hardens as it absorbs carbon dioxide from the atmosphere to form calcite crystals, giving it its unique appearance. Typically, two to three coats are needed on new walls.

**Portland Cement**

Portland cement, in its various specifications, is a magnificent material for modern structures that greatly benefit from its strength and quick setting qualities. It is useful in reinforced concrete, which is used in high-rise modern structures. However, Portland cement is not designed for use as mortar or plaster on old/historic buildings, which do not require its specific good qualities, but suffer from its drawbacks and ill-effects.

Lime has been used as a binder for stones and brick, and as a plaster, for thousands of years. Unfortunately, the knowledge of its properties and how to use it has been lost to us in the last 7 to 8 decades.

**The Sad Truth**

Engineering degree courses do not teach the use of lime and new graduates are unaware of its properties, uses, and benefits. This leads to major problems in repair and maintenance of old structures made from lime as architects/site managers specify the use of cement.

Problems of dampness and durability associated with the use of cement on old structures may not become apparent for as long as 50 years after its first use. Some countries have even banned the use of cement on all historic buildings that have otherwise stood the test of time.

**Earth**

Earth, be it in the form of bricks, clay lump, adobe or rammed earth, is probably one of the oldest and most efficiently used building materials in the world. With local variations in technique, earth has been used to build all types of houses and palaces across Africa, Asia, the Middle East and the Americas.

One of the oldest earth brick settlements are Harappa & Mohenjo Daro, dated around 8000 B.C. In desert conditions in Peru, earth structures are over 3000 years old, and in Egypt, arched earth brick storerooms from 1600 B.C. still stand in Luxor. Earth construction was particularly efficient in military structures, because of its ability to withstand artillery.

There are magnificent centuries-old ruined forts, such as Bam in Iran; The Great Wall of China, with walls that are up to 20 metres wide. Others show advanced structural skill in domes, while houses of ten-storey or more are found in Yemen and Morocco. Most important fact is perhaps the beauty of the domestic architecture of many old cities, built without any overseeing modern-day architects, exhibiting a spontaneous harmony primarily dictated by the use of earth.

**Misleading claims**

Cement companies claim that cement has been around for hundreds of years, implying that Portland cement has been used throughout this period. This is patently false. Cement is a word we use to mean a binder for aggregates and in this...