

THE HISTORY AND USE OF CEMENT.

Cement has become one of the most important materials used in modern construction, and its use insures an absolute hardness and strength that will not deteriorate, provided the necessary care is taken in its manufacture, care and deposition which long and varied experience has proved to be indispensably requisite.

By its judicious application, many works may now be erected which by reason of the great cost of other material attending their erection could not be constructed. This is especially true of submerged or partially submerged structures.

The monuments of Egypt present one of the oldest examples of the use of lime in construction. The mortar which joins the stone of the Pyramid of Cheops is precisely similar to modern mortars made of sand and lime. In limiting the use of mortar to filling narrow joints, separating immense blocks, thereby reducing almost to insignificance the part which it had to play, the Egyptians seemed to forestall the influences of a dry and burning climate. Time has justified their prudence in this, for the works erected on the banks of the Nile by the Romans, made of small materials and presenting many joints, have left but faint traces, while some Egyptian temples still present themselves as monuments against the onslaughts of time.

The knowledge of the properties of lime descended from Egypt to Greece, where the exigencies of the climate and the ingenuity of the people brought forth many of its uses, unknown to Egypt. Subsequently Greek colonies imported and popularized their processes in Italy.

According to Vitruvius, a Roman architect, the Romans made use of the lime, sand and materials of the countries where they built. He also affirms that they considered the best lime to be produced from hard and pure marble—i. e., the fattest lime known; that in Italy they mixed it with pozzolana when used for hydraulic purposes, and that out of Italy they replaced the pozzolana from Vesuvius by powdered brick or tile.

In the Middle Ages a volcanic conglomerate from the banks of the Rhine, named traass, was substituted for the pozzolana of Italy, and mortar was made of fat lime, mixed with traass, to render it hydraulic. Many castles erected at that time stand well today; the well known castle of the Bastille, erected in 1369-83, which after withstanding a siege, required, in 1789, the use of powder for its destruction, being extremely solid even in the interior walls.

At what period were first used certain limestones, having the property of producing a lime which will harden under water, is not precisely known. The first use of cement stone is also equally obscure. In 1796 Messrs. Parker and Wyatts began to manufacture from egg-shaped limestones found near London a product known as Roman cement, which was soon received with great favor throughout Europe; but neither the producers nor the consumers offered any explanation of its merits.

In 1818 the true explanation of the hydraulic properties of limes and cements was given by Vicat in the publication of his discoveries on this subject. The dis-

coveries of Vicat attained their immediate object, for in the short time artificial hydraulic lime of excellent quality was manufactured on a large scale under his direction, and a few years later he indicated as many as 400 quarries in France where hydraulic limestones were to be found.

From the time of Vicat many new discoveries have been made in cement, both in its composition and in the many practical uses in which it is employed.

From the time when the ancient Egyptians used their crude cement, which nevertheless has proved indestructible in the many ages which have passed, to the present, is a long stretch of time; but nevertheless the world is just beginning to discover the value of cement, and the many uses to which it may be put, and what a factor of economy it assumes in the gigantic construction of the present day. It is no longer used only to cement crevices, or as in later day for foundations; now foundation, superstructure, roof, crevice and plaster form mediums for its use.

With the discovery of the cement block machine for the manufacture of artificial stone, a new impetus has been given to the life of cement, and now buildings rivaling in strength and beauty with purest marble are made from it at a wonderfully small proportion of the cost of the stone it imitates, and which stone in many respects is greatly its inferior. Subways, harbor, improvements, bridges, sea walls, light-houses, municipal sewerage improvements, tunnels, canal locks, large depots and hotels, are made entirely of this valuable product.

The age of stone has indeed found a rival worthy of its steel, and a new age is being born—the age of cement. Cement has every quality to recommend it. The small cost of its manufacture and the convenience with which it can be handled, its wonderful powers of endurance and durability, give it a preference in construction which it is hard to imagine will ever be replaced by any other material.—Kansas City Architect and Builder.

The brickyard of the London Builders' Supply Co., London, Ont., was sold last week to Wm. Tytler for \$9,000.

FIREPROOFING WOOD.

Increased attention is being given to the problem of rendering wood and other easily inflammable substances fireproof. From reports in the German press it would seem that the process of a Mr. Gautsch, of Munich, is very successful. The timber to be treated is placed in a vacuum, produced by pumping out the air. The cells are thereby freed from air and the wood is then impregnated under pressure with a solution of sulphate of ammonia and borax ammonia. The color, texture or density of the wood is not affected thereby.

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