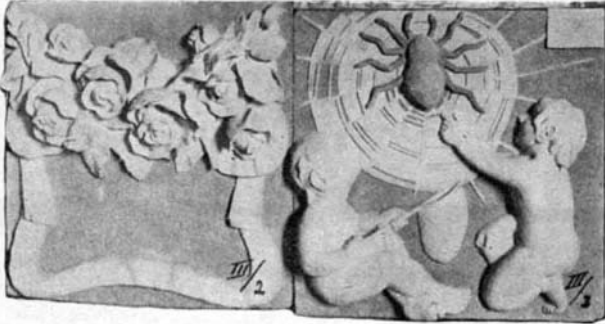


A series of experiments made by Chief Engineer Harper would indicate no danger of the water, resulting from seepage, freezing behind the wall, as it was found that the water never attained a lower temperature than 39 deg. F. at the outside of the bank in the most severe conditions of wind and weather. The removal of the water is abundantly provided for by means of weepers.

In one of the accompanying pictures of this notable work an arch shows. This was built for the purpose of protecting a natural grotto, in which a spring is located. This has been most successfully accomplished without in any manner detracting from the strength



Bas-Relief Made With One Part White Cement and Three Parts of Sand.



Bas-Relief Stamped in a Mold of Plaster and Made With One Part White Cement and Four Volumes of Sand.

and usefulness of the facing wall, by arching the grotto.

It is worthy of note that all the sand and stone used in this construction was dumped on the east side of the terminal railway tracks about 300 feet back from the edge of the bank, from which point it was carried by means of an aerial cableway to a concrete mixer that stood near the edge of the bank. The mixture was dumped into chutes that carried it to the point of use, without causing a separation of the concrete mixture, the mass sliding as a unit in the chutes which were steep, smooth, and small. The scale on which the work was done called for the placing of from 80 to 90 square yards of concrete every day.

#### THE ARTISTIC POSSIBILITIES OF CEMENT.

The use of cement is becoming more and more important, not only to the architect, engineer and builder, but also to the artist, for plastic and sculptural purposes, and few realize that, unlike Italian terracotta, it can be made to withstand the rigor of our northern winters, and is equally impervious to heat

and dampness. With certain treatment, a color, texture and durability is obtained, reproducing to a remarkable extent the old stone figures of another age.

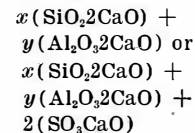
In a recent visit to Mr. W. R. Mercer's studio, the writer was able to convince himself of this. Hitherto, cement for plastic purposes has been of a cold, gray, flat tone, which did not lend itself to the ancient forms and ideas, but after some years of experiment, Mr. Mercer seems to have found a method by which he overcomes this defect. The lover of art is thus able to have within his reach some of the famous examples of ancient sculpture at a naturally much reduced price.

In the studio one may see fonts, urns, busts, bas-reliefs, etc., all destined for the decoration of a garden, which is Mr. Mercer's specialty. One of the great troubles encountered at the beginning of his experiments was the making of a mold that would incase the cement and not take it in so close an embrace as to render its release impossible without breaking the cast. This problem was solved by the use of flexible molds, prepared in such a way as to avoid the repeated failure caused by the casts sticking and the cement not properly hardening before the disintegration of the composition used in the mold.

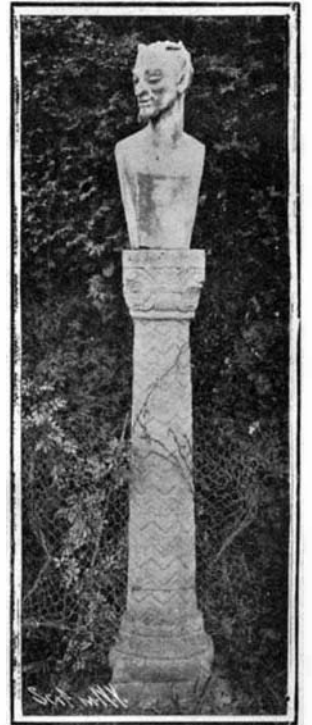
It is hard to enumerate the difficulties that beset the artist at this juncture. Cement is a non-combustible, hard, very durable and cheap material, which can be cast in a cold state by simply mixing with water—hence its great adaptability to the fine arts. It is, however, less ductile than plaster of Paris, and though this difficulty has been overcome by stirring, pressure and other methods of application, its gray color and unsympathetic texture have chiefly repelled the artist. In combating the color certain pigments vitiate the strength of the cement, others do not. Some act chemically upon it so as to transform the tint of the mixture. Certain cements neutralize or weaken when colored more quickly than others, while the rapidity with which the cement dries, whether in the sun or dark, or whether more or less subjected to dampness, will be found to influence the color, or even vary the natural gray tone itself. Further, the method of application of the color, whether injected entirely through the cement before setting, applied during setting from the mold, or incrusting upon the latter in a comparatively thin envelope during setting, modified the result.

As to the texture, certain masses of cement, falling upon the earth outside of molds, or hardening inadvertently in bags and boxes, have assumed this texture of stone, while other masses present a very unpleasing nondescript surface. When molds are used this non-ductility of the material requiring stirring may blotch the surface with areas where the finer particles seem to have collected in a sort of paste. On the other hand, when cast too dry, the cavities are not properly filled. Owing to these difficulties the cement will not always take the texture of the mold, therefore one must resort to other means. The mold itself may be incrusting with ingredients which will communicate their texture to the cement, or materials, coarse and fine, may be introduced into the original mixture so as to modify the result. In a word, the cement is merely a glue causing the gravel and sand to adhere to each other, and is used as a medium and not as a base. The process, which any one can work out for himself if he wishes, lies almost entirely in the adding of certain ingredients to the raw cement. The texture and color are matters of workmanship and taste. When the process is learned it will be possible to reproduce almost any work of art with the accuracy of the copies seen in the illustrations. Once the mold is made there is practically no limit to the number of reproductions.

The production of a white cement has been the endeavor of many investigators, and even at the present time, the problem cannot be considered completely solved. It is the powerful coloring action of the iron which has proven to be an insurmountable difficulty in the practical utilization of many a good idea. It has been an undoubted step forward that Julius Gresley, of Liesberg, Switzerland, contents himself with the production of white Roman cement and does not attempt to produce white Portland cement in which the high burning temperature and the hardness of the clinker substantially increased the chief difficulty mentioned. White cement will probably be always used for the attaining of artistic effects, and for this purpose the strength of Roman cement is quite sufficient. Gresley mixes clay free from iron, particularly kaolin and pipe clay, with lime in such proportions that the clinker is constituted according to the chemical formula



and thereby attains a white cement, answering all proper tests in regard to tensile and compressive strength and which either with or without added coloring matter, lends itself excellently for decorative purposes. We publish herewith two illustrations from photographs of decorative work made of "Marbrit," the name under which the raw material for the production of the Gresley white cement is known, and these show the excellent results obtainable with this substance.

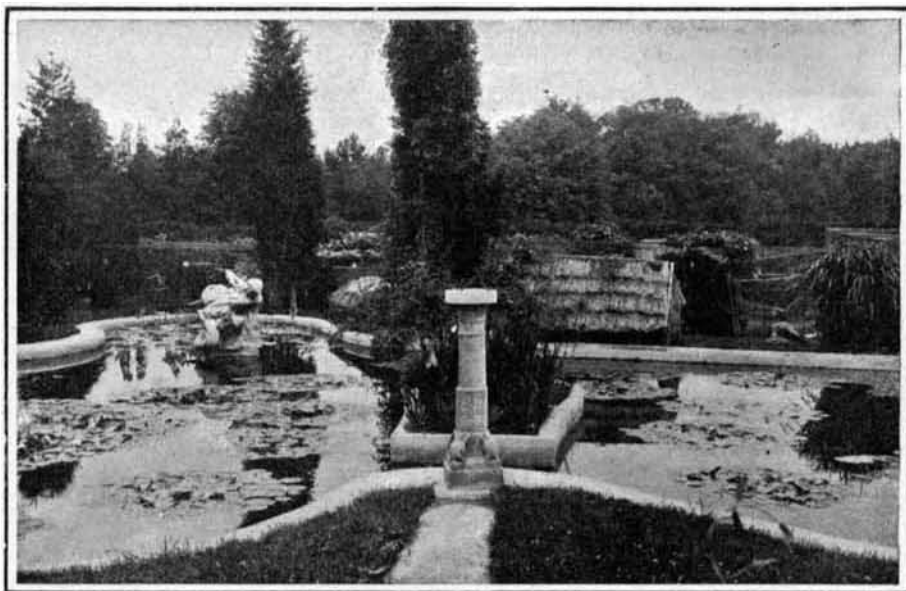


The Figure and the Pedestal are of Cement.

#### The Genesis of the Chauffeur.

Chauffeurs existed, says Figaro, long before there were automobiles. History tells us that along about the year 1795, there sprang up in France, principally in the eastern and central regions, fantastically dressed men with their faces blackened with soot and their eyes carefully concealed, who gained admittance to farm houses and other isolated dwellings at night and committed all kinds of depredations and outrages. They had an atrocious habit especially, from which they obtained the name that posterity has preserved for them. They first garrotted their victims, and dragged them in front of a great fire, where they burned the soles of their feet. Then they demanded of them where their money and jewels were concealed. Such interrogatories could scarcely be resisted. It is from this that is derived the appellation of "chauffeur," which once so terrified old ladies, but which at present evokes in us only cheerful and pleasing thoughts of automobilism, and of voyages and excursions at twenty-five and thirty miles an hour, in which there is nothing but the roads and paved streets that are scorched.

Aluminium and lead will not alloy. They mix when melted, but separate when cooling.



A Sun Dial Cast in Cement in Imitation of the Font of Turtles.



A Cement Flower-Box. The Original Has Been so Closely Imitated That Even the Wear of Time Has Been Reproduced.