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AN ATTEMPT TO TREAT TWO PIECES OF SUGARY MARBLE FROM WITLEY COURT, WORCESTERSHIRE

SUMMARY

This report provides brief details of a partially unsuccessful attempt to strengthen a fire damaged marble, using a solution of calcium hydroxide (lime water). Although surface consolidation was considered to be adequate, no real improvement in the strength of the interior sections was achieved.

INTRODUCTION

In 1937 a fire destroyed Witley Court leaving its main buildings a shell and badly damaging a great many marble fittings in the house. The marble fragments to be treated were probably from one of these internal fixtures. They showed no obvious fire damage, although the outside surfaces bore signs of smoke and soot, and they had sugared so badly that a touch produced cascades of white crystals.

TREATMENT

In an attempt to find a way of treating the marble (A M Lab No 781 208) as a whole two fragments broken off from the rest, and measuring 2 x 2.4cm and 2.8 x 3cm were immersed in lime water as described below. Both pieces had a small portion of the surface still intact, smooth and moderately solid. In contrast the rest of each fragment was exceptionally sugary, crumbling at a touch.

Following the treatment suggested by Plenderleith and Werner (ref 1) lime water was dropped onto each piece. As the whole surface immediately became wet, i.e. the lime water was merely running from top to bottom and then off, it was judged more thorough to immerse the pieces thereafter. In between each immersion the samples were allowed to dry completely.

On becoming wet the marble ceased to crumble and felt more solid to touch. When dry it regained some of the sugary quality, so immersion and drying was continued for six weeks.

RESULTS

The overall result was not good. On the larger fragment the outside surface was solid and unsugary, due to calcium carbonate forming a crystal lattice of about 2mm thickness with the marble. Under this crust, which broke easily, the marble remained crumbly. The smaller piece had diminished in size to about 1 x 2cm, probably due to the fact that its original shape had been uneven and therefore more difficult to hold together within a thin crust.

CONCLUSIONS

Obviously this treatment would not be suitable for marble being displayed outdoors and subject to weathering. Nor yet would it give any structural strength to a large and heavy marble object. For specimens needing only surface consolidation this method has proved effective but in cases like the above, when the marble has completely sugared, a stronger means of support must be found.

Ref 1
H S Plenderleith and A E A Werner
The Conservation of Antiquities and Works of Art OUP 1971 p 318-9

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KATY HUNTER

DR

ADDENDUM

In addition to the lime water treatment it was decided to try a 10% solution of soluble casein both on pieces treated with lime water and on untreated pieces. /Casein in the presence of calcium ions forms an insoluble precipitate of calcium paracaseinate/.

Applications of one and two coats of solution, traced with blue Quink Ink to measure penetration, were made to fragments of the treated pieces. When dry a hard outer crust had formed, about 2mm in thickness. Much more solid that the calcium carbonate layer, it proved very difficult to break into and also insoluble. The Centre seemed less crumbly than previously.

The solution, treated with blue Quink Ink was then applied to an untreated piece of sugary marble. In this case obvious penetration was 3mm although a faint blue colour was visible throughout. It was also solid in the centre.

CONCLUSION

Soluble casein is a stronger consolidant for sugary marble than lime water. Its major drawback is the smell. Even when dry the specimens still smell strongly of casein. (It is advised that it should be used in a fume cupboard).

However, the calcium paracaseinate is insoluble and therefore more likely to stand up to weathering.

KATY HUNTER