The Condition and Treatment of a Stone Madonna from the Hunt Collection

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A late fourteenth century Burgundian stone statue of the Madonna and Child (Plate XVI; Fig 1) in the Hunt Collection was sent for examination and conservation to the Ulster Museum/Queen's University Joint Conservation Laboratory in Belfast as a result of a fortuitous meeting between the writer and Mrs. Hunt. Her attention had been drawn, by the curator of the collection at N.I.H.E. in Limerick, Dr. P.F. Doran, to the appearance of a white disfigurement occurring as discrete patches at various locations on the surface. Advice was sought from thw writer as to the possible cause of, and means of arresting this 'stone disease' which was causing the deterioration of the stone. This term is a catch-all to describe the gradual breakdown, from whatever cause, of the fabric of monumental or architectural stone. However, the term, like "bronze disease", is a misnomer as no biological agency acts directly to attack and eventually cause the collapse of either stone or metal. The processes to which this imprecise terminology is applied are the results of physico-chemical interactions between the material and its environment. The modification of such an environment will result in the intensification or amelioration of the rate of response. When these alterations are deliberate, and controlled, the object will be conserved; if ignored, or left to chance, the object may well not survive.

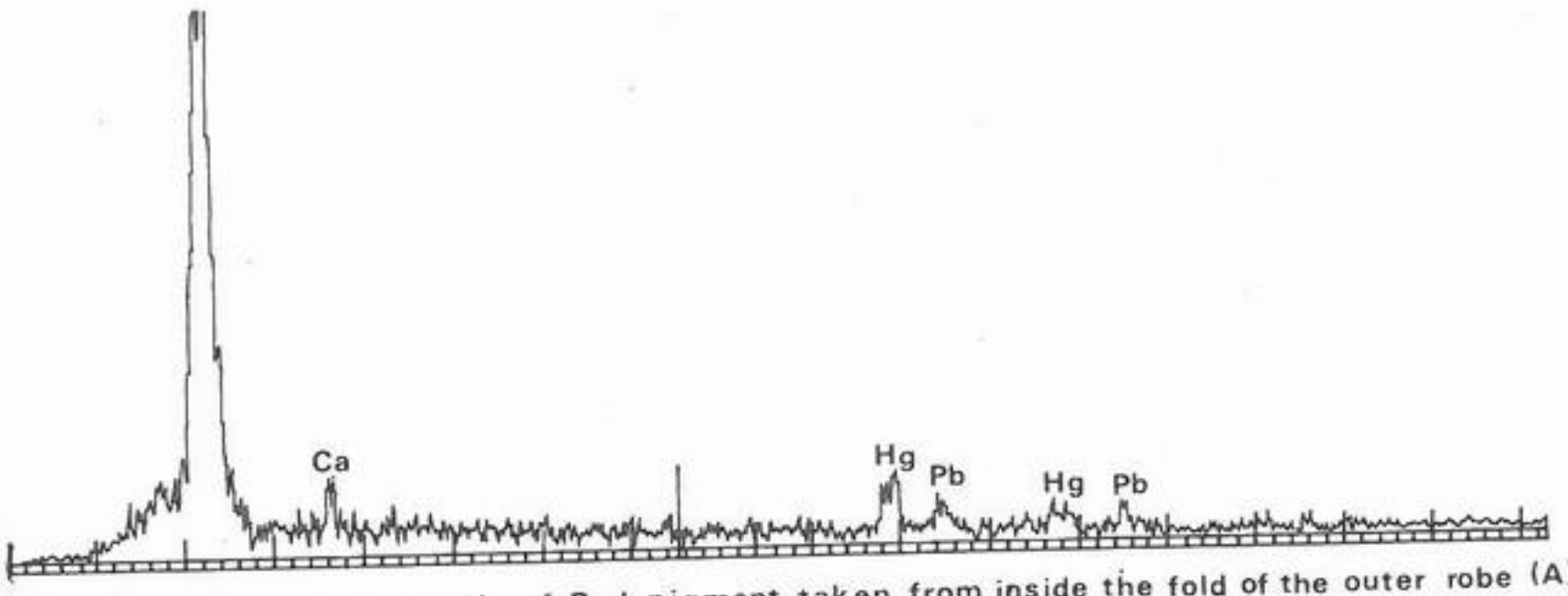
With this statue decay had commenced, and continued, until the manifestation of its products had finally given cause for alarm. The progress of stone decay, and indeed its nature, will essentially be dictated by the chemistry and structure of a particular stone. However, the degree and manner of the deterioration of a stone can be profoundly altered by the presence of pollutants either derived from contaminated air or material in contact with the stone, and the presence of free water. It is not enough to place an object under shelter, as it should be realised that frequent water ing of a free-draining stone, will, in all probability, be more protective than destructive. It is when water becomes available in relatively small amounts at intervals allowing evaporation and hence concentrations of solutes that potentially damaging processes are initiated. The diurnal fluctuations of temperature and humidity which can occur for a variety of reasons, even within museums, can produce just such free water. With the Hunt Madonna a common type of destructive process was in operation. Basically this was a cyclic solution and deposition of water-soluble salts at a paint/stone interface in response to the type of fluctuations mentioned previously. This had proceeded to the extent that the amount of salts leaving solution, together with rehydration of those already deposited, had caused the physical removal of the relatively insoluble and weaker material of the paint layer. The continuation of the process would have formed further interfaces between the stone and accumolated salts resulting in the gradual disappearance of the stone by a mechanism akin to exfoliation.

That this occurred at some areas of an apparently homogeneous rock in preference to others became obvious on closer examination in the laboratory. These areas are not

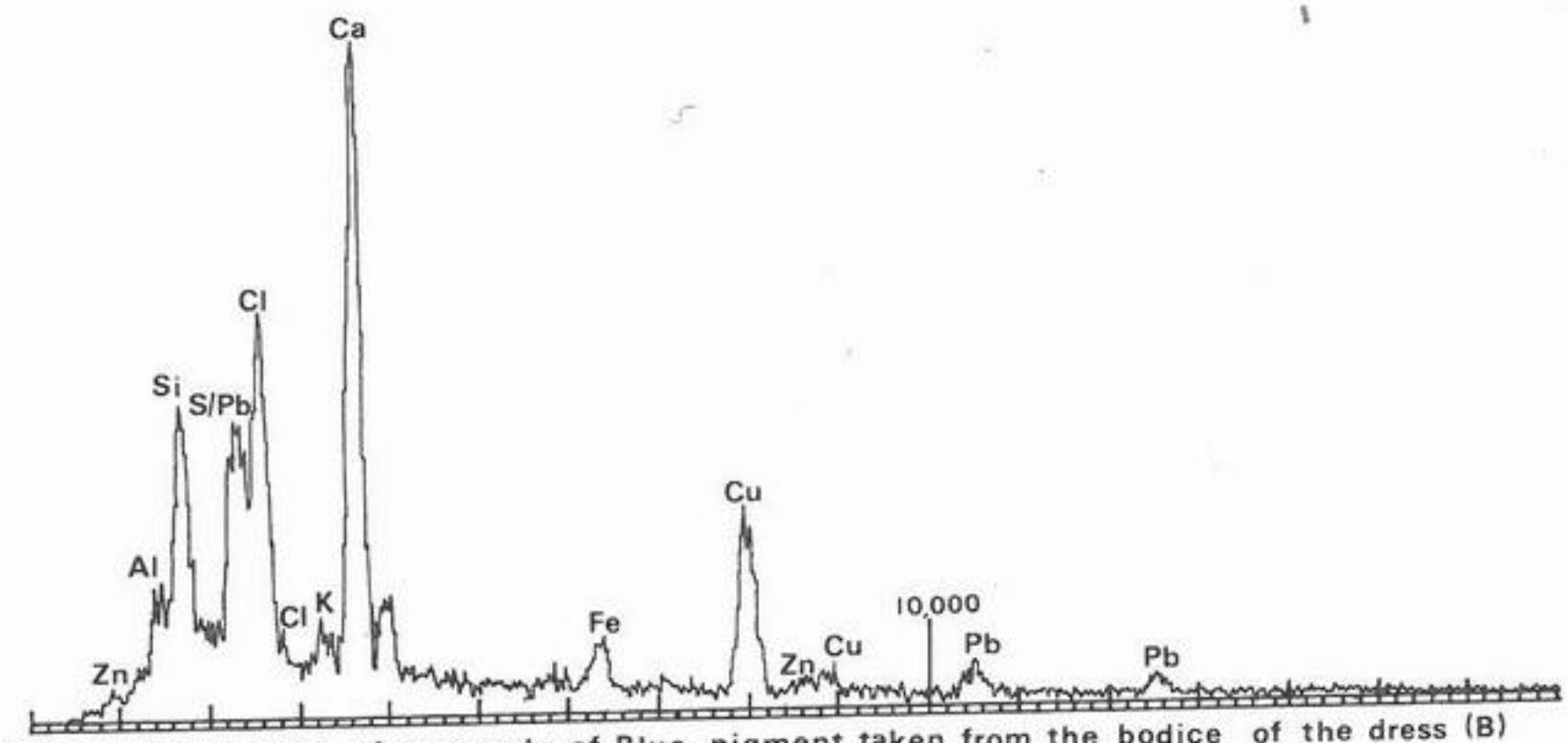
Fig 1: Front and back of 14th century Burgundian stone Madonna and Child.

in fact composed of natural stone but are a synthetic stone, moulded or carved to replace missing pieces. This material is demonstrably more soluble than the natural. The stone of the statue proper was identified by chemical test and petrological thin section as a fossiliferous limestone, dolomitic in character, while that of the restored portions is a fine calcareous cement to which coarser sand grains had been added to simulate the testured surface of the natural stone. A third type of structural material resembling "Polyfiller" (*sic*) had also been applied enthusiastically, but fortnuately not extensively, and was removed. This examination gave no indication of any observable adverse interaction between the natural and synthetic stones. A report of these findings, together with preliminary observations regarding the relationship and extent of the remaining areas of paint was sent to the curator. As a result the laboratory was asked to do only what was required to maintain the then appearance of the statue.

Although it is quite obvious from the various breaks and missing pieces (Plate XVI, 1; Fig. 1) that the statue has suffered physically since its manufacture, the extent of the attacks on its aesthetic integrity, as coats of whitewash, is not readily appreciated from a monochrome photograph. The original painting of this statue would have had prominence equal to, or greater than, its carving — depending upon the reputations of the artists involved; a point either lost, or ignored, subsequently. After the sixteenth century the colouring of statuary was not generally approved of, due, perhaps, to an ignorance of the original appearance of classical statuary. Whatever the reasoning, by the nineteenth century there was generally little respect for original colouring in preference to an overall white or grey tone. This piece has apparently been subjected to such treatment on more than one occasion. While the laboratory had been asked to attend specifically to the problem of the restored areas it was impossible to ignore the paint layers for purely practical considerations. The areas of overpainting are out of harmony with the more colourful original tones but, with one exception, it was decided that they did not present a problem to the execution of the intended programme of conservation and could be left. The paint layer overlying the restored pieces must, of course, be later than the original and, as it overlies both coloured and grey tones, is most likely to be the last layer to be applied. Its abrupt cessation in contrast to the gradual changes of other grey tones also suggested that it had not been extensively used but had been restricted to the restored areas. As it was required to retain these restorations it was decided to remove this layer and its remanents. This was essential if the efflorescence of salts from the synthetic stone was to be stopped, the destruction prevented and to allow consolidation to be effective. The difference in character and appearance of this layer relative to even other layers of overpainting was such that the statue has gained rather than lost by its removal. Firstly, it is clear that the colour was not chosen to harmonise with any original colour but with that of the over-painting. Secondly, removal revealed further areas of colours over-painted to conceal repaired breaks to the right forearm of the Madonna and right foot of the child. Lastly, analysis of the layer indicates an aluminium pigmented paint of a type not available before the twentieth century. This also provides an indication of dating for the restorations but not the other repairs as, for example, the infilling of the forearm break was initially overpainted with coloured tones presumably in keeping with the originals. With this sample of later paint, as with the others taken, no definitive analysis was undertaken as the intention was to support observations rather than to produce detailed



Microanalyser scan of a sample of Red pigment taken from inside the fold of the outer robe (A)



Microanalyser scan of a sample of Blue pigment taken from the bodice of the dress (B)

Fig. 2.

documentation of methods or materials. The analyses were done in the laboratories of the Forensic Science Department and the Industrial Science Division of the Department of Commerce, Belfast, using an Electron Probe microanalyser.

Two examples of the results are shown (Fig. 2), and were interpreted, with the others, as being consistent with the palette available to an artist of the fourteenth century overpainted by a variety of white washes of later dates, a lead carbonate seemingly predominant.

With the one exception detailed, no distinction was made between the paint layers and all were temporarily protected by a porous membrane of soluble nylon applied in an alcoholic solution, prior to desalination of the stones. The latter was completed in the first instance using a magnesium silicate pack which had the added advantage of removing or loosening surface dirt adhering to those areas not covered by paint. Additional packs of absorbant material were applied, particularly to the synthetic

stone. Following the desalination, the protective layer on the paint was removed and the paint surfaces cleaned, using solutions appropriate to the media of the original and later paints. Removal of this grime brought to light a painted decoration on the head band, facial details, a gold decoration on face, hair, headband and hem of the veil, together with indications of even greater extent of the latter as shown by remains of its ground. There is even a possibility that the hair was painted black at some stage. It can therefore be appreciated that the arrangements and relationships of the remaining paints are complex and will not allow of a simple explanation. Further work is being done to provide as full an exposition as possible and will be reported upon in due course.

The material of the restored portions was consolidated using a methoxy silane based stone consolidant, the irreversibility of which was not considered a problem as no original meterial was involved. These same areas were coloured to match that of the weathered surface of the natural stone rather than any supposed original colours. The conservation was completed by the application of a matt varnish utilizing Ketone resin, in place of the usual natural resins, to all areas of paint and to the restored areas. These treatments will allow the statue to be displayed once more correctly in its setting as part of the Hunt Collection.

Acknowledgements

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1. Front view.

2. Back view.

14th century Burgundian stone Madonna and Child.

(*Photos:* UM/QUB Joint Conservation Laboratory, Belfast)