

research that is more directly related to actual conservation treatments as well?

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### To the Editors

Mr Wolbers criticizes our methods and materials, stating that we used formulations and methods which were different to those that he would have used to treat a painting. The experiments we carried out were designed to gain a better understanding of the roles and effects of the various components of resin soaps. It would not be very instructive if experiments were limited to testing the one optimal mixture per paint film (otherwise, how could one be sure what is optimal?). One of the ways to determine how something works, or the best formulation or treatment, is to vary the conditions, compare the results, and examine the data to see if any trends or fundamental principles can be discerned. We are sure that Mr Wolbers understands this approach, since it is one he himself has used [1].

In his study of the factors which influence the amounts of residue left by soaps, Mr Wolbers used a variety of formulations and conditions. Many of these formulations and conditions would never be used in treatments, but were tested in an effort to discern effects and trends which would help him to improve his materials and methods. He criticizes us because one of our formulations had a pH of 10.3, but he used a number of formulations up to a hundred times more alkaline (pH 12.5). Mr Wolbers also asks why in the world one would soak a paint sample in solvent, when he has done exactly that. The amounts of residual soaps he reports in his paper are not the amounts left after clearance by swabbing and rinsing, but the amounts which could not be removed by a combination of swabbing and rinsing followed by soaking in an aromatic solvent (the scintillation solvent in which he soaked his paint samples in trying to remove all of the soaps is based on 1,2,4-

trimethylbenzene). He did not report the amounts removed by swabbing and rinsing alone. Mr Wolbers says that 'nothing practical will emerge' if we don't 'test the materials or methods we actually use', but we have yet to hear him recommend soaking paintings in solvent to try to remove the residues of his soaps (and even then not very successfully).

The point is not whether experiments reproduce exactly the methods of treatment, but whether anything can be learned from them. No research will ever be adequate to predict the optimum treatment for a specific painting, or to replace the judgment, skill or experience of the conservator. The role of this type of research is to provide information to be used in making decisions. Many of the formulations and methods Mr Wolbers used in his experiments would never be used in treatments, but nevertheless his work provided useful data about the factors which influence the amount of residues. We feel that our research also provides information which conservators can use in their treatment decisions.

But all of this distracts from the main point. One can either believe our work, dismiss it, or take it with a grain of salt. The real issue, however, is that it is the responsibility of the person who proposes a treatment to demonstrate that it is appropriate. A new treatment or material must be shown to be safe before it can be used, not presumed safe unless proven otherwise. A number of questions have been raised about the safety of resin soaps, and we believe it is Mr Wolbers's responsibility to answer them if he is to continue to advocate their use. Specifically, these questions include:

- 1 What is the nature of residues left behind by resin soap treatments: not just the resin, but triethanolamine, chelating agents, gelling agents, etc.? How much is left behind by standard clearance procedures (not after soaking in solvent)?
- 2 What are the chemical, physical and optical effects of these residues, in both the short and the long term?
- 3 Since residues have the effect of darkening

(saturating) paint films, is the saturation of a paint film cleaned with resin soaps (or any other non-volatile material) a suitable criterion for saying that the paint film is unaffected? If not, then what criteria should be used to evaluate such treatments?

If Mr Wolbers has data or information relating to these and other questions regarding the use of resin soaps, we strongly encourage him to publish them. An open discussion in the refereed literature would help greatly in clarifying the issues surrounding these materials.

There obviously is still a lot we need to learn about resin soaps.

DAVID ERHARDT and  
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- 1 WOLBERS, R. C., 'A radio-isotopic assay for the direct measurement of residual cleaning materials on a paint film' in *Cleaning, Retouching and Coatings*, IIC, London (1990) 119-125.

## CORRIGENDA

R. ROSSI-MANARESI and A. TUCCI, 'Pore structure and the disruptive or cementing effect of salt crystallization in various types of stone', *Studies in Conservation* **36** (1991) 53-58.

On page 55 *Table 1 Porosity and pore volume*  
line 7 should read:

Tuff	47.6	2	0.95	40	19.0	25	11.9	30	14.3	1	0.5
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and line 8:

Marble	2.5	0	0	7	0.2	46	1.1	44	1.1	0	0
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On page 56 *Table 2 Crystallization pressure*  
line 7 should read:

Tuff	0.07	224	1.33	426	0.83	26.6		677
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and line 8:

Marble		0.18	57.6	1.00	32.0		90
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In the text on page 56, first column, line 15:  $\sigma = 8\text{Pa}$  should read  $\sigma = 80\text{ dynes/cm}$ .