Applicability and efficacy of an enhanced nanolime consolidation technique for British Museum limestone objects

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Supplementary materials

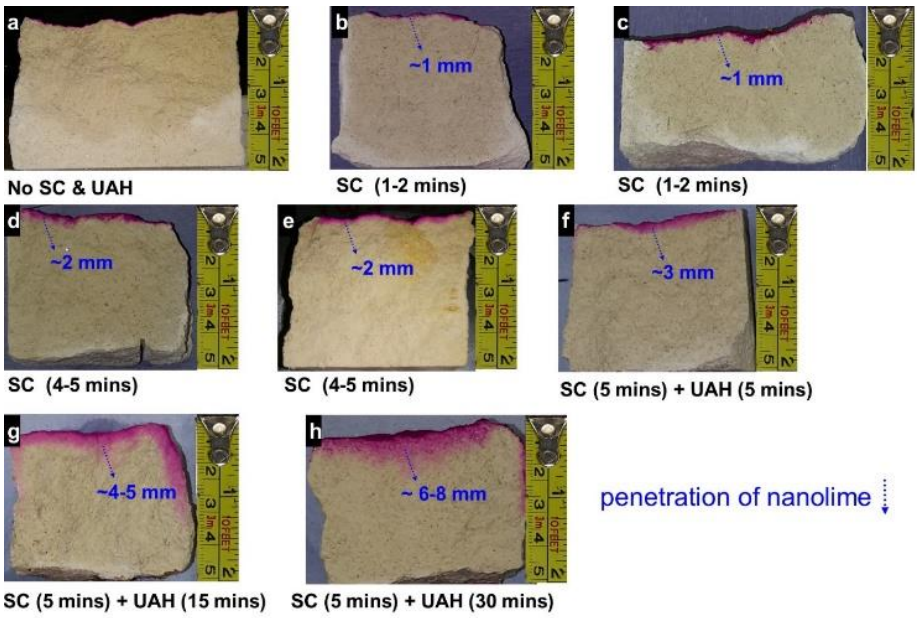
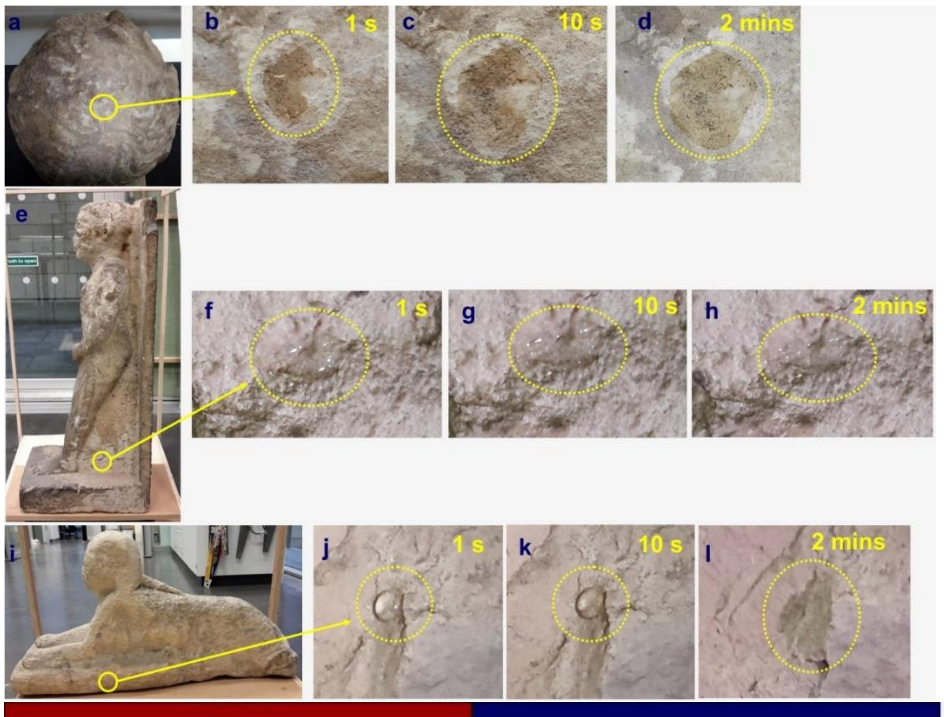
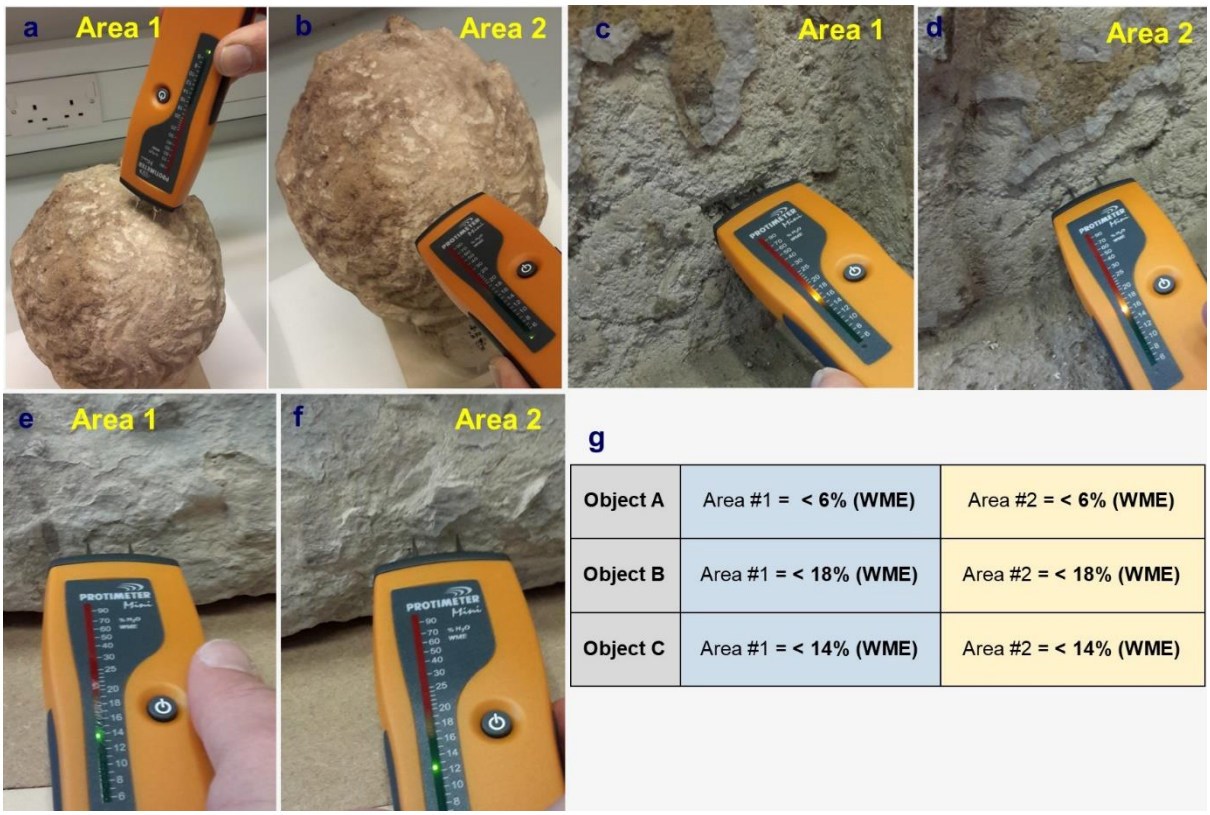


Fig. A Results of phenolphthalein tests carried out on cross-sections of fine-grained *Lavoux* limestone samples upon completion of treatments with steam cleaning (SC) and ultrasonic air humidification (UAH) at different periods, and nanolime (CaLoSiL® 5g/L in ethanol).



Absorption		Migration	
10s	**Slow** *surface glittery & residual water*	2 mins	**Slow** *Obvious circle/ stain*
	Fast *Marked circle / stain*		**Fast** *Faint circle / stain*

Fig B. Wettability tests carried out on the objects A – C for $Tp = 21°C$ and $RH = 40$ %; and proposed kinetic model based on the absorption and migration rates.



Object A	Area #1 = **< 6% (WME)**	Area #2 = **< 6% (WME)**
Object B	Area #1 = **< 18% (WME)**	Area #2 = **< 18% (WME)**
Object C	Area #1 = **< 14% (WME)**	Area #2 = **< 14% (WME)**

Fig C. Measurement of residual water on objects (**a & b**) A, (**c & d**) B, and (**e & f**) C with a Protimeter (BLD 2000 Moisture Meter). The results are expressed in % of Water Moisture Equilibrium (% WEM).

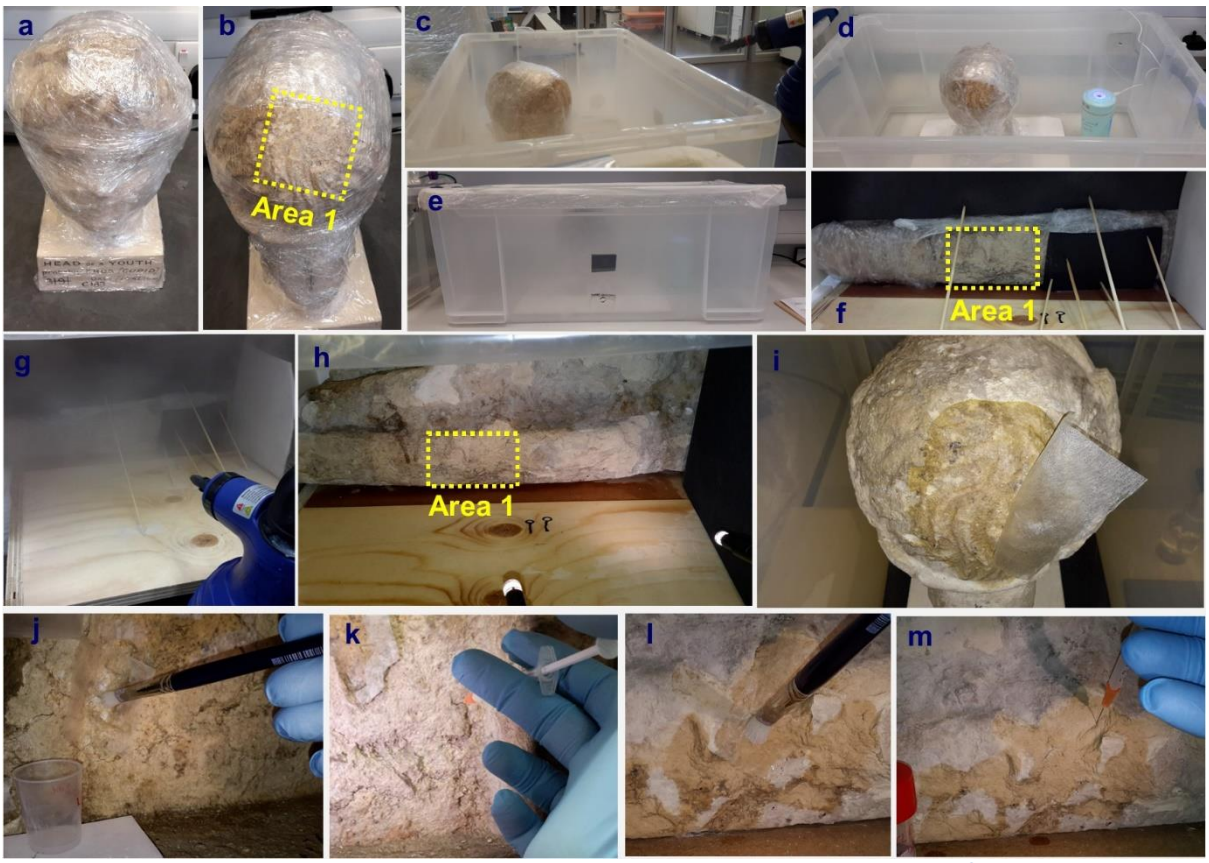


Fig D. Conditioning and consolidation of objects: **(a)** Object A wrapped in Cling Film® with **(b)** Area #1 left unwrapped; **(c)** steam cleaning in process and **(d & e)** object submitted to UAH; **(f)** Area #1 of Object C before conditioning with **(g)** steam cleaning and **(h)** after conditioning; **(i)** Consolidation of Object A with nanolime being brushed over a japanese tissue; **(j & k)** Object B consolidated with nanolime being brushed and injected, respectively; and (**l & m) O**bject C consolidated with nanolime being brushed and injected, respectively.

Fig E. Humidification and curing of treated objects: (a & b) DIW sprayed over the treated Area #1 of the objects B & C; **(c & d)** making process of humidification pad using medical gauze swab and hydrogel; **(e-g)** application of humidification pads over the treated Areas # 2 of the objects A, B, and C, respectively; **(h)** external and **(i)** internal views of the curing chamber of the object A; **(j-n)** and **(o-s)** details of the curing chambers for the object B and C, respectively.

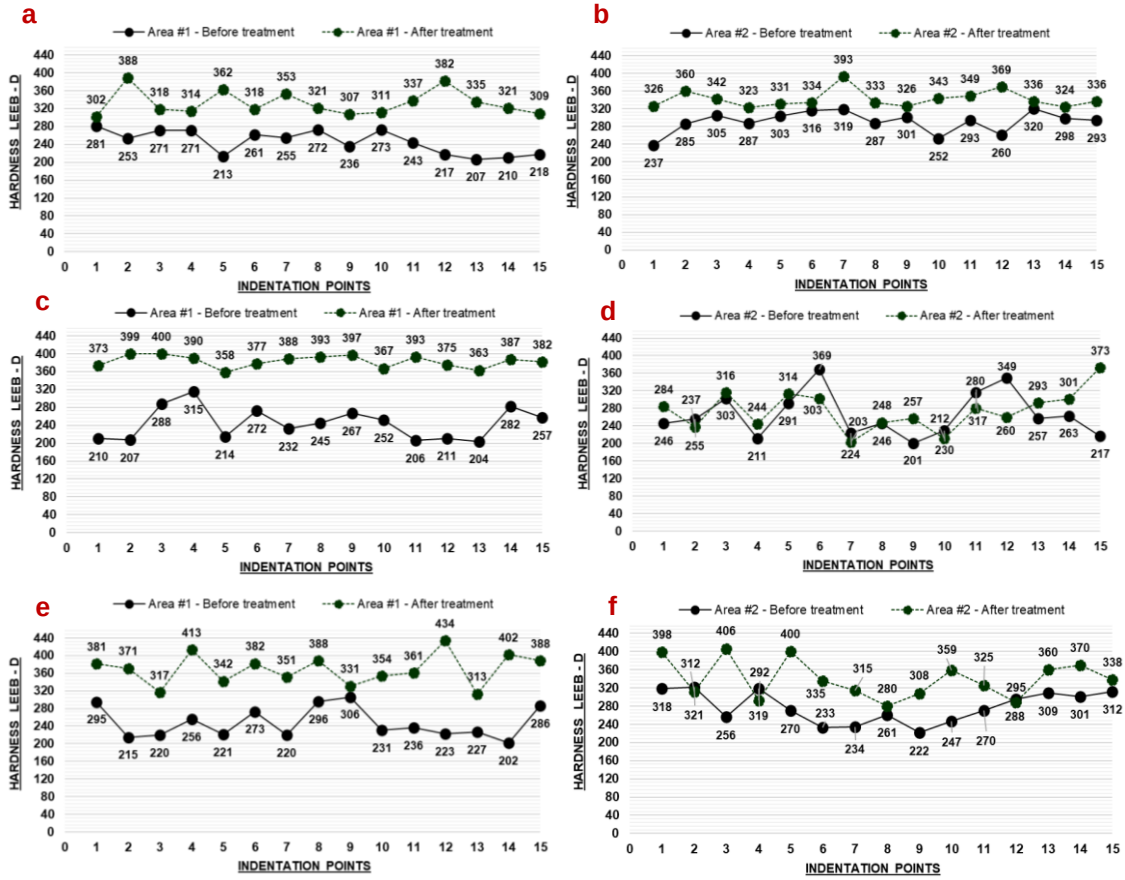


Fig F. Surface hardness data obtained upon completion of tests carried out on **(a & b)** Object A; **(c & d)** Object B; and **(e & f)** Object C