

Hygric Swelling of Stone



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Many sedimentary stones contain clays that cause swelling when they get wet. The expansion can be large enough to cause buckling during wetting and (in some cases) cracking during drying. Portland brownstone contains chlorite, which is not usually a swelling clay, but which becomes capable of swelling as a result of weathering. The deterioration of brownstone buildings appears to result largely from dilatation during wetting/drying cycles. In this talk, we investigate the mechanics of swelling and cracking, and explore the effectiveness of treatment with diaminoalkanes. Wendler and Snethlage showed that these molecules would reduce hygric swelling, which we have confirmed in our lab. The mechanism by which they work, and the durability of their effect, will be discussed.

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Topics in Museum Conservation

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MCI Theater

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