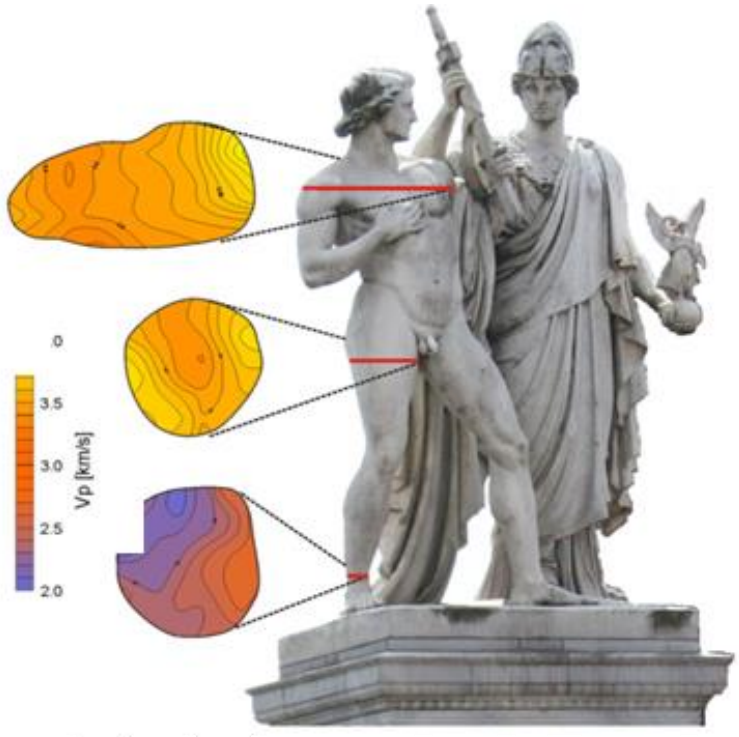
GEORG-AUGUST-UNIVERSITÄT GÖTTINGEN
Geowissenschaftliches Zentrum der Universität Göttingen

"Marble decay and Ultrasonic testing"

Numerous case studies of damage on sculptures. architectural heritage or facade stone made from marble indicate that the deterioration of building stones depends mainly on climate. Chemical mechanisms have recieved much attention in recent years with a special emphasis on the effect of acid rain or biofilms. It has been shown that the initial reaction of calicte surfaces to incident rainfall produces clear morphological alteration even within a short term of exposure. Recently, the physical weathering is discussed to be the initial stage of deterioration of marbles. Durability is an important issue to consider specifying stones as cladding material for exterior exposure.

In the seminar a recent study will also document the results of an interdisciplinary model project that was planned with the aim of developing an innovative winter covering system for marble statuaries. Such a system would need to fulfil the various requirements for structural stability, aesthetics, climate and practical use.

The degree of destruction can be measured by means of ultrasonic velocities that drops from more than 5km/s for fresh material down to less than 1km/s for totally dstructed material. The predominantly strong decay of the marbles can be determined exactly in the laboratory or on-site, in additon via ultrasonic tomography. Since on-site the influence of water leads to an increase of ultrasonic velocities, the water content has to be taken into account when dealing with ultrasonic analysis.



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