element of Orleanian localities and hereby its represented by a new species. *Semigenetta elegans* from Sabuncubeli is similar to the holotype from Winterhoft-West (MN3a) but is slightly smaller. Besides *Euboictis*, *Palaeogale* is the second genera that have records in both Aliveri (MN4) and Sabuncubeli. Most interesting part of Sabuncubeli carnivore fauna is the new Viverid genera which closely resemble that of enigmatic viverrids *Kichechia* and *Legetetia* and marks clear affinities with *Euboictis-Sivanasua* group. Although, Creodonts are quite common in Early Miocene faunas of Africa and somehow Europe, they are absent in Sabuncubeli

Although, small mammals clearly show that Anatolia and Europe were different bioprovinces during the Early Miocene, the carnivore fauna of Sabuncubeli marks a unique composition in having European and African (?) (Viverridae, new genus) affinities together. In the light of new taxa, different migration scenarios will be discussed in terms of faunal similarities.

Factors influencing sandstone response to changing environmental conditions in Northern Ireland

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The built environment will respond to climate change. Evidence already suggests that the 'greening' of sandstone masonry reflects recent atmospheric changes in moisture and pollution. This emphasises the importance of changing environments as a key controller on stone decay processes. As such, there is a need to understand decay, not just in a dynamic environment, but in a world where the nature of the dynamics themselves are changing. The current study investigates how changing future meteorological conditions impact upon the underlying drivers of stone decay – specifically, the thermal and moisture cycles experienced at and below the stone surface. To evaluate the nature and scale of future damage to masonry knowledge of the current interplay of water, materials and surroundings is required. Environmental monitoring of both meteorological and internal sandstone conditions will satisfy this need. The construction of test-walls embedded with sensors will record temperature and wetness profiles with depth from the surface. This is relevant for identifying internal moisture cycles which have influence the deliquescence, movement and precipitation of hygroscopic salts, the swelling of clay minerals and on associated stress gradients. Both heat and moisture are monitored in real-time, an approach that will consider the synergies between the two variables. Logging stone moisture contents will allow the 'time-of-wetness', a variable of importance for biological colonisation, to be quantified. The presence of a weather station mounted to the test walls permits measurement of the 'perturbed' situation. The observed microclimate will be linked to conditions recorded within the stone. Matching stone response to changing meteorological parameters will provide an understanding into the scale interaction between, and lag-structures associated with, seasonal, daily and sub-hourly cycles. It will also allow the identification of potential feedbacks (such as stones with high surface wetness will have a lower albedo, therefore altering the thermal regime, and perhaps resulting in less marked temperature ranges between the surface and sub-surface) between atmospheric and stone decay processes. Few studies consider the influence of climatic change on stone decay processes. Where studies exist, they all neglect the uncertainty inherent in climate modelling. This research employs a modelling structure that allows the development of multiple, equally plausible futures and at a finer resolution than previous stone decay-climate change studies. Future projections for; temperature, precipitation, wind speed, relative humidity, potential evapotranspiration, and solar radiation, will be made using the Statistical DownScaling Model 4.2. This involves establishing relationships between observed surface stations and large-scale atmospheric variables. The model is then forced under future emissions scenarios to produce a daily time series for a 30-year time-slice. Uncertainty is catered for by using multiple climate models and emission scenarios and also an ensemble of model runs. It is necessary for model outputs to be made relevant to factors affecting decay processes. Therefore, rather than investigating annual sums of rainfall, the intensity, duration and frequency of fall events are of more importance. Future climate scenarios are yet to be downscaled, however, expected results are the increased contrast between winter and summer rainfall, and also increasing night-time temperatures (due to increased atmospheric moisture, hence greater cloud cover). This research into stone response to environmental condition will feed into the development of a new model of sandstone decay that considers increased winter wetness and the implications this has for deeper-penetrating moisture (and therefore salts) and increased algal colonisation.

Climate change and wet winters: Testing the diffusion of soluble salts in building stone under saturated conditions

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Controls on stone decay processes are rapidly changing as a result of changing climate. As such, there is a need to understand decay, not just in a dynamic world, but also in a world where the nature of the dynamics themselves are changing. Future climate change scenarios for the northwest of the United Kingdom (NW UK) typically project both increased short-term uncertainty in day-to-day weather conditions and an underlying trend towards wetter, warmer and longer winter conditions. The result of this is that natural stone used in buildings and monuments is wet for long periods of time – over a wet winter, it is possible that entire blocks become saturated. Usually the movement of salts is associated with moisture flux, but this paper investigates an alternative mechanism of salt movement – when blocks are saturated and a concentration gradient is set up, ions must move by diffusion. Because of the increasingly likely scenario of block saturation (in NW UK), this paper proposes a way of testing salt diffusion through natural building stones, modified and refined from studies testing chloride diffusion in concrete, to determine how quickly salts may diffuse through natural stone and any associated deleterious chemical effects. A concentration gradient is set up, whereby salts diffuse through a saturated sandstone sample from a 'cell' containing a 0.55 molar solution to another 'cell' containing de-ionized water. The increase in concentration in the cell containing de-ionized water can be measured at intervals using Ion Chromatography. Preliminary tests have shown that both salt and stone types are important controls for the rate of diffusion. Emphasis is placed on the need to adapt laboratory studies to more accurately reflect the environmental conditions under investigation.

Spatial distribution of salt penetration in weathered sandstone

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This research investigates the importance of the spatial distribution of salts in the weathering process of stone decay. The relationship between salt penetration and the intrinsic rock property, permeability, is examined to elucidate the ingress and egress of salt solution in masonry sandstone. The accelerated weathering trial simulates pre-loading a sandstone block with a 10% salt solution (equal parts NaCl and $MgSO_4$) during a wet winter followed by dried out in summer. Permeability data measured from horizontal slices through the block are correlated with salt data from IC analysis. Results indicate relatively high surface permeability values and salt crystallization on exposure to air. The effect of salts blocking pores and reducing permeability is evident in a reduction in permeability in the near surface