



## SCIENCE AND ART: A Future for Stone

The 13th International Congress on the  
Deterioration and Conservation of Stone

### PROGRAMME

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**Welcome to the 13<sup>th</sup> International Congress on the Deterioration and Conservation of Stone. We hope that your visit to Paisley, and Scotland, is a pleasant one, and that you gain something useful from the Congress. This booklet contains useful information and the programme of presentations and events.**

## **The Venue**

The venue for the Congress is the George A. Clark Town Hall in Paisley. The building was inaugurated in 1872, and was built through a bequest of £20,000 from the will of Mr. Clark (1823-1873), one of the town's thread manufacturers. His statue sits at the north east corner of the building; exiting from the front door turn left. We would like to thank Renfrewshire Council, the owners of the Town Hall, for their assistance during the Congress.

Paisley is the largest town in Scotland (i.e. the largest without city status), with a population of approximately 80,000. The Abbey, adjacent to the Town Hall testifies to a long history of settlement, at least since the early medieval period. During the industrial revolution, from the late 18th Century, Paisley was a centre of textile production, especially thread manufacture, evidenced by two remaining thread mill buildings that stand to the south and east of the Town Centre. Reaching a peak during the late Victorian period, the industrial wealth generated is witnessed by many stone-built structures, notably the Town Hall, the Library and Museum and the Coats Memorial Church, also the bequest of a thread manufacturing industrialist, Thomas Coats.

## **Registration**

The registration desk is located in the entrance foyer of the Town Hall. It opens on Monday 5th September at 15:00, and will remain open until lunchtime on Friday 9th September. The registration desk is the place to pick up your delegate pack, your badge and certificate of attendance and to sign up for bus transport to the Congress Dinner and for the excursions on Saturday 10th September. Members of UWS staff will be at the Congress continually, so do ask for assistance when required.

## **Catering**

Coffee, tea and water will be served during breaks simultaneously in the North Minor Hall, and in the Alexander Wilson Suite. The North Minor Hall is on the ground floor, to the right (north) of the main auditorium when facing the stage, and the Alexander Wilson Suite is on the first floor, accessed by the stairs to the south side of the foyer, to the left as you enter the building.

Each delegate has one of two colours printed on their name badge. This is to indicate which area you should go to during the breaks and lunch. Please listen for specific instructions during the housekeeping address. Once you have your coffee/tea, you are free to take it back into the main hall.

## Oral Presentations

The Plenary sessions will take place in the main Auditorium. Oral presentations are to be 15 minutes in length, followed question time for 3 minutes and then 2 minutes to facilitate changeover to the next speaker. PowerPoint is our preferred method of delivery of presentations. If you would like to use another programme (e.g. Prezzi) then please make sure you organise to run the presentation without support from us.

Please ensure your presentation is loaded on the presentation laptop at least during the break period before the session you are speaking in. It will be obvious where and who to give the presentation to, near the main stage area.

## Posters

Posters will also be displayed in the main Auditorium. You will have an opportunity to display your poster for the whole length of the Congress, and can make your poster public from the afternoon of Monday 5th September. We will provide some adhesive Velcro™ for attaching your posters to the poster boards.

Please note the reference that your paper has (in the right-hand column of the poster programme list below). This relates to the location of the display board that your poster should be attached to. The poster boards will be towards the rear portion of the main plenary hall, behind the seating area, and in front of the exhibition area. There will be two rows of double-sided boards.

Posters should be a maximum size of A0 and in portrait format (i.e. the longest dimension is vertical).

## Excursions – Saturday 10<sup>th</sup> September

There are three optional excursions planned for the morning of Saturday the 10<sup>th</sup> September. To register for these please add your name to the list, in person, available at the registration desk. Details are given at the end of this document.

## Outline Timetable

	<b>Tuesday</b>	<b>Wednesday</b>	<b>Thursday</b>	<b>Friday</b>	<b>Saturday</b>
<b>Morning</b>	Welcome Ceremony 1st Plenary Session	Plenary and Poster Sessions	Plenary and Poster Sessions	Plenary Sessions continue	Optional free walking tours
<b>Afternoon</b>	Plenary Sessions			*Closing ceremony	
<b>Evening</b>	Welcome Reception in Paisley Abbey	Whisky Tasting in Paisley Town Hall	Conference Dinner in Kelvingrove Art Gallery and Museum		

# PROGRAMME OF ORAL PRESENTATIONS AND SOCIAL EVENTS

## Monday 5th September

15-17.00 Registration open. Opportunity for set-up of posters.

## Tuesday 6th September

08.15 Registration open.  
Time for poster set-up.  
Coffee and tea available in the Alexander Wilson Suite and the North Minor Hall.

09.15 ***Welcome addresses***

Provost Ann Hall of Renfrewshire Council.

E. Mesbahi, VP Research and Enterprise, University of the West of Scotland

H. De Clercq, President of the Permanent Scientific Committee of the International Stone Congresses.

J. Hughes, Congress Chair

***Session 1 Chairs:*** *Véronique Vergès Belmin and Hilde De Clercq*

10.00 **Weathering Patterns of the Carved Stone and Conservation Challenges - World Heritage Site of Qutb Complex, New Delhi**  
S.S. Bais and S.C. Pandey

10.20 **Georgia Marble at the Minnesota State Capitol: Examining the Correlations between Marble Composition, Local Climate, and Durability**  
P.G. Whitenack and M.J. Scheffle

10.40 **Weathering and Deterioration of Building Stones in Templo Mayor, Mexico City**  
G. Mora Navarro, R.A. López Doncel, M. Espinosa Pesqueira and W. Wedekind

11.00 Break

*Session 2 Chairs: Bernhard Middendorf and Ewan Hyslop*

- 11.20 **Influence of Water Evaporation on the Degradation of Wall Paintings in Hagia Sophia, Istanbul**  
E. Mizutani, D. Ogura, T. Ishizaki, M. Abuku and J. Sasaki
- 11.40 **Analysis and Treatment of the Fire-Damaged Marble Plaque from Thomas Jefferson's Grave Marker**  
C. Grissom, E. Vicenzi, J. Giaccai, N. Little, C. France, A.E. Charola and R.A. Livingston
- 12.00 **Freezing-thawing Phenomena in Limestones and Consequences for their Physical and Mechanical Properties**  
C. Walbert, J. Eslami, A.L. Beaucour, A. Bourgès and A. Noumowe
- 12.20 **Decay Phenomena of Marbles in the Archaeological Site of Hierapolis of Phrygiae (Denizli, Turkey)**  
S. Vettori, S. Bracci, P. Caggia, E. Cantisani, O. Cuzman, T. Ismaelli, C. Riminesi, B. Sacchi, G. Scardozzi, and F. D'Andria
- 12.40 Lunch

*Session 3 Chairs: Christine Bläuer and Stefan Simon*

- 14.00 **The rock reliefs "Steinerne Album" of Großjena, Germany – Problems of Deterioration and Approaches for a Lasting Preservation**  
J. Meinhardt, T. Arnold and K. Böhm
- 14.20 **Role of Hydro-mechanical Coupling in Damage Process of Limestones Used in Historical Buildings**  
F. Cherblanc, J. Berthonneau and P. Bromblet
- 14.40 **Porosimetric Changes and Consequences for Damage Phenomena Induced by Organic and Inorganic Consolidation Treatments on Highly Porous Limestone**  
P. Croveri, L. Dei, J. Cassar and O. Chiantore
- 15.00 **Decay Products of the Kersantite Building Stone in the Monument of Small Staircase at the Kalemegdan Park (Belgrade, Serbia)**  
N. Novaković, M. Franković, V. Matović, K. Šarić and S. Erić

- 15.20 **Influence of the Villarlod Molasse Anisotropy on Cracking Advances in the Comprehension of the Desquamation Mechanisms**  
M. Tiennot, A. Bourgès and J. D. Mertz
- 15.40 **Swelling Clay and Swelling Clay Inhibition in Villarlod Molasse**  
T. Wangler
- 16.00 Break
- Session 4 Chairs: Christoph Franzen and Ann Bourgès*
- 16.20 **Computational Imaging Techniques for Documentation and Conservation of Gravestones at Jewish Cemeteries in Germany**  
C.A. Graham and S. Simon
- 16.40 **Time Tested Repairs: A Review of 11 Years of Cemetery Stone Repair**  
M. Jablonski
- 17.00 **A Metadata-supported Database Schema for Stone Conservation Projects**  
E. Kardara and T. Pomonis
- 17.20 **Recording, Monitoring and Managing the Conservation of Historic Sites: A New Application for BGS SIGMA**  
E.A. Tracey, N. Smith and K. Lawrie
- 17.40 **The Potential of Laser Scanning to Describe Stone degradation**  
R. Janvier, X. Brunetaud, K. Beck, S. Janvier-Badosa and M. Al-Mukhtar
- 18.00 **Digitalisation and Documentation of Stone Deterioration, Using Close-Range Digital Photogrammetry**  
M.Á. Soto-Zamora, R.A. López-Doncel, G. Araiza-Garaygordobil and I.E. Vizcaino-Hernández
- 
- 18.30 Welcome reception in Paisley Abbey.

## Wednesday 7<sup>th</sup> September

### *Session 5 Chairs: Miloš Drdácý and Michael Steiger*

- 09.00 **Direct Measurement of Salt Crystallisation Pressure at the Pore Scale**  
N. Shahidzadeh, J. Desarnaud and D. Bonn
- 09.20 **Quantifying Salt Crystallisation Dynamics in Sandstone Using 4D Laboratory X-ray Micro-CT**  
H. Derluyn, M.A. Boone, J. Desarnaud, L. Gremientieri, L. Molari, S. de Miranda, N. Shahidzadeh and V. Cnudde
- 09.40 **Salt Extraction by Poulticing Unravelling?**  
S. Godts, H. De Clercq and L. Debailleux
- 10.00 **Electrophoresis as a Tool to Remove Salts from Stone Building Materials – Results from Lab Experiments and an On-site Application**  
H. De Clercq, S. Godts, L. Debailleux, Y. Vanhellemont, N. Vanwynsberghe, L. Derammelaere and V. De Swaef
- 10.20 **Electro-desalination of Sulphate Contaminated Carbonaceous Sandstone – Risk for Salt Induced Decay During the Process**  
L.M. Ottosen
- 10.40 **Field Trials of Desalination by Captive-Head Washing**  
D. Young
- 11.00 Break

### *Session 6 Chairs: Torsten Howind and Jadwiga Łukaszewicz*

- 11.20 **Computational Simulation: Important Structural Elements to Protect Ancient Buildings in Persia**  
A. Amir Shahkarami, M. Mehdiabadi and H. Ashooriha
- 11.40 **Field Exposure Tests to Evaluate the Efficiency of Nano-Structured Consolidants on Carrara Marble**  
A. Bonazza, G. Vidorni, I. Natali, C. Giosuè, F. Tittarelli and C. Sabbioni
- 12.00 **In-situ Assessment of the Stone Conservation State by its Water Absorbing Behaviour: A Hands-On Methodology**  
D. Vandevorode, T. De Kock and V. Cnudde



- 12.20 **Artificial Aging Techniques on Various Lithotypes for Testing of Stone Consolidants**  
M. Ban, A.J. Baragona, E. Ghaffari, J. Weber and A. Rohatsch
- 12.40 **Smart Hydrophobic TiO<sub>2</sub>-nanocomposites for the Protection of Stone Cultural Heritage**  
F. Gherardi, A. Colombo, S. Goidanich and L. Toniolo

13.00 Lunch & Posters

*Session 7 Chairs: Ekaterini Delegou and Ákos Török*

- 14.20 **Assessment of a Non-Destructive and Portable Mini Permeameter Based on a Pulse Decay Flow Applied to Historical Surfaces of Porous Materials**  
J. D. Mertz, E. Colas, A. Ben Yahmed and R. Lenormand
- 14.40 **Surface hardness Testing for the Evaluation of Consolidation of Porous Stones**  
W. Wedekind, C. Poetzl, R.A. López-Doncel, T.V. Platz and S. Siegesmund
- 15.00 **Comparability of Non-Destructive Moisture Measurement Techniques on Masonry During Simulated Wetting**  
S.A. Orr, H.A. Viles, A.B. Leslie and D. Stelfox
- 15.20 **Handheld X-Ray Fluorescence Analysis (HH-XRF): A Non-Destructive Tool for Distinguishing Sandstones in Historic Structures**  
P.A. Everett and M.R. Gillespie

15.40 Break & Posters

*Session 8 Chairs: Susanna Bracci and Ingal Maxwell*

- 16.40 **Dating the Pre-Romanesque Church of San Miguel de Lillo, Spain: New Methods for Historic Buildings**  
A. Rojo, L.L.Cabo, C.M. Grossi and F.J. Alonso

- 17.00      **Experimental Study of the Ageing of Building Stones Exposed to Sulphurous and Nitric Acid Atmospheres**  
S. Gibeaux, C. Thomachot-Schneider , A. Schneider , V. Cnudde , T. De Kock , V. Barbin and P. Vazquez
- 17.20      **Biodeterioration of Limestone Built Heritage: A Multidisciplinary Challenge**  
P.J.A. Skipper, H. Schulze, D.R. Williams and R.A. Dixon
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- 17.45      **Fraser Carlin**, Head of Planning and Conservation Renfrewshire Council, Vice Chair of the Royal Town Planning Institute Scotland  
Paisley's Architectural Heritage and the Challenges of Conservation
- 18.00-20.00      **Whisky tasting.**  
(Soft drinks also provided).

## Thursday 8th September

### *Session 9 Chairs: Philippe Bromblet and John Hughes*

- 09.00     **Composition of Stone Plasters and Pigmented Plasters Applied in the 1920s and 1930s in Berlin, Germany**  
S. Laue
- 09.20     **Long-term Monitoring of Decay Evolution in Bricks and Lime Mortar Affected by Salt Crystallisation**  
C. Colla, E. Gabrielli and F. Grüner
- 09.40     **Acrylic-based Mortar for Stone Repair: A Viscoelastic Analysis of the Thermal Stresses**  
T. Demoulin, G.W. Scherer, F. Girardet and R.J. Flatt
- 10.00     **Proprietary Mortars for Masonry Repair: Developing a Predictive Framework for Assessing Compatibility**  
C. Torney
- 10.20     **Restoration of Weathered Load Bearing Masonry with Optimized Gypsum Based Mortars**  
B. Middendorf and U. Huster
- 10.40     Break & Posters

### *Session 10 Chairs: Johannes Weber and Norman Tennent*

- 11.20     **Roslyn Chapel - A Review of the Conservation & Access Project**  
N. Boyes
- 11.40     **The Durbar Square and the Royal Palace of Patan, Nepal – Stone Conservation Before and After the Great Earthquake of April 2015**  
G. Krist, M. Milchin and M. Haselberger
- 12.00     **Conservation of Machu Picchu Archaeological Site: Investigation and Experimental Restoration Works of “Temple of the Sun”**  
T. Nishiura, I. Ono, A. Ito, H. Fujita, M. Morii, F. Astete and C. Cano

- 12.20 **Evaluation of the Preservation State of the Holy Aedicule in the Holy Sepulchre Complex in Jerusalem**  
A. Moropoulou, K. Labropoulos, E. Alexakis, E.T. Delegou, P. Moundoulas, M. Apostolopoulou and A. Bakolas
- 12.40 **Restoring the Past Experience of Stone Masonry in Burkina Faso for Fostering the use of Local Materials**  
A. Lawane, A. Pantet, R. Vinai and J.H. Thomassin
- 13.00 Lunch & Posters
- Session 11 Chairs: Julie Desarnaud and Siegfried Siegismund*
- 14.20 **Intrinsic Parameters Conditioning the Formation of Mn-rich Patinas on Luneville Sandstones**  
L. Gatuingt, S. Rossano, J. D. Mertz, B. Lanson and O. Rozenbaum
- 14.40 **Characterisation of a Pink Discoloration on Stone in the Pnom Krom Temple (Angkor, Cambodia)**  
M. Tescari, F. Bartoli, A. Casanova Municchia, T. Boun Suy and G. Caneva
- 15.00 **The Black Surfaces of the Porta Nigra in Trier (Germany) and the Question of Cleaning**  
M. Auras, H. Ettl, W. Hartleitner and T. Meier
- 15.20 **Investigation of Urban Rock Varnish on the Sandstone of the Smithsonian Castle**  
R.A. Livingston, C.A. Grissom, E.P. Vicenzi, Z.A. Weldon-Yochim, N.C. Little, J.G. Douglas, A.J. Fowler, C.M. Santelli, D.S. Macholdt, D.L. Ortiz-Montalvo and S.S. Watson
- 15.40 Break
- Session 12 Chairs: Robert Flatt and Norman Weiss*
- 16.00 **Consolidation Effects on Sandstone Toughness**  
M. Drdácý and M. Šperl
- 16.20 **Case Study of the Episcopal Group of Frejus (France): Diagnosis and Treatment of Clay Containing Sandstones in Marine Environment**  
M. Trubert, B. Brunet-Imbault, P. Bromblet and C. Guinamard

16.40      **Protection of Medieval Tombstones (Stećci) with Ammonium Oxalate Treatment**  
V. Marinković and D. Mudronja

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19.00      **Congress Dinner** at Kelvingrove Art Gallery and Museum Glasgow, in association with Historic Environment Scotland.

Buses leave Paisley Town Hall at 18.30. If you require transport to the dinner by bus, please add your name to the list at reception.

## Friday 9th September

### *Session 13 Chairs: Elisa Franzoni and George Scherer*

- 09.00 **Analysis Testing and Development of Safe Cleaning Methods of Rusted Stone Material**  
J. Aguiar, S. Bracci, B. Sacchi and B. Salvadori
- 09.20 **Laser Yellowing of Hematite-Gypsum Mixtures: A Multi Scale Characterization**  
M. Godet, V. Vergès-Belmin, C. Andraud, M. Saheb, J. Monnier, E. Leroy and J. Bougon
- 09.40 **Application of Ethyl Silicate Based Consolidants on Sandstone with Partial Vacuum: A Laboratory Study**  
H. Siedel, J. Wichert, and T. Frühwirt
- 10.00 **Marble Protection by Hydroxyapatite Coatings**  
G. Graziani, E. Sassoni, E. Franzoni and G.W. Scherer
- 10.20 **Performance and Permanence of TiO<sub>2</sub>-based Surface Treatments for Architectural Heritage: Some Experimental Finding from On-site and Laboratory Testing**  
E. Franzoni, R. Gabrielli, E. Sassoni, A. Fregni, G. Graziani, N. Roveri and E. D'Amen
- 10.40 **Injection Grouts based on Lithium Silicate Binder: A Review of Injectability and Cohesive Integrity**  
A. Thorn
- 11.00 Break

### *Session 14 Chairs: David Young and Takeshi Ishizaki*

- 11.20 **The Use of Hydroxyapatite for Consolidation of Calcareous Stones: Light Limestone Pińczów and Goland Sandstone (Part I)**  
A. Górniak, J.W. Łukaszewicz and B. Wiśniewska
- 11.40 **Freeze Thaw and Salt Crystallisation Testing of Nanolime Treated Weathered Bath Stone**  
R.J. Ball, G.L. Pesce, M. Nuño, D. Odgers and A. Henry

- 12.00      **IR Thermography Imaging of Water Capillary imbibition into Porous Stones of a Gallo-Roman Site**  
J. Liu, J. Wassermann, Cong-Doan Nguyen, J. D. Mertz, D. Giovannacci, R. Hébert, B. Ledesert, V. Barriere, D. Vermeersch and Y. Mélinge
- 12.20      **The Impact of Science on Conservation Practice: Sandstone Consolidation in Scottish Built Heritage**  
C. Gerdwilker, A. Forster, C. Torney and E. Hyslop
- 12.40      **Study of Protective Measures of Stone Monuments in Cold Regions**  
T. Ishizaki
- 13.00      Lunch
- Session 15 Chairs: Torsten Howind and John Hughes*
- 14.20      **Seasonal Stone Sheltering: Winter Covers**  
C. Franzen and K. Kraus
- 14.40      **Assessing the Impact of Natural Stone Burial upon Performance for Potential Conservation Purposes**  
B.J. Hunt and C.M. Grossi
- 15.00      **Study of Consolidation of Porous and Dense Limestones by Bacillus Cereus Biomineralization**  
J.M. Jakutajć, J.W. Łukaszewicz and J. Karbowska-Berent
- 15.20      **Trials of Biocide Cleaning Agents on Argillaceous Sandstone in a Temperate Region**  
E. S. Long and D.A. Young
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15.40      Closing Ceremony

## Saturday 10th September

Excursions: Optional and free walking tours of Glasgow and the Skelmorlie Aisle in Largs. See below for more details.

## POSTERS

Thematically grouped and alphabetically arranged by first author surname.

### *Damage*

*Ref.*

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- Traffic-Induced Emissions on Stone Buildings** 1-1  
M. Auras, P. Bundschuh, J. Eichhorn, D. Kirchner, M. Mach, B. Seewald,  
D. Scheuvens and R. Snethlage
- Granite and Marine Salt Weathering Anomalies from Submerged,  
Inter-Tidal and Coastal Archaeological Monuments in Ireland** 1-2  
J. Bolton
- Effect of Microorganism Activities in a Polluted Area on the  
Alteration of Limestone used in Historical Buildings** 1-3  
C. Balland-Bolou-Bi, M. Saheb, N. Bousserhine, S. Abbad-Andalousi, V.  
Alphonse, S. Nowak, A. Chabas, K. Desboeufs and A. Verney-Carron
- Role of Hydro-Mechanical Coupling in Damage Process of  
Limestones Used in Historical Buildings** 1-4  
F. Cherblanc, J. Berthonneau and P. Bromblet
- The Contribution of Traditional Techniques to New Technology to  
Evaluate the Potential of Microorganisms for Stone Deterioration** 1-5  
E. S. Ciplak, A. Cetin-Gozen and E.N. Caner-Saltik
- Alteration of Marble Stones by Red Discoloration Phenomena** 1-6  
O.A. Cuzman, S. Vettori, F. Fratini, E. Cantisani, S. Ciattini, L. Chelazzi,  
M. Ricci and C.A. Garzonio
- Investigation of Salt Solution Behaviour in Building Stones Using  
Paper Pulp Poultices Under Laboratory Conditions** 1-7  
I. Egartner and O. Sass
- A Petrographic Investigation Into the Durability of Common  
Replacement Sandstones to the Crystallisation of De-Icing Salts** 1-8  
C. Graham, M. Lee, M. Young and A. Leslie
- Impact of Heat Exposure (Fire Damage) on the Properties of Sandstone** 1-9  
T. Howind, W. Zhu and J.J. Hughes
- Geological Studies on Volcanic Tuffs Used as Natural Building  
Stones in the Historical Center of San Luis Potosi, Mexico** 1-10  
R.A. López Doncel, W. Wedekind, N. Cardona-Velázquez, P.S. González-  
Sámamo, R. Dohrmann, S. Siegesmund and C. Pötzl



<b>Relationship Between the Durability and Fabric of Pasargadae Carbonate Stones (Archaeological Site from Achaemenid Period, South of Iran)</b>	1-11
A. Shekofteh, H. Ahmadi and M. Yazdi	
<b>Rapid Degradation of Stylolitic Limestones Used in Building Cladding Panels</b>	1-12
T. Wangler, A. Aguilar Sanchez and T. Peri	
<b>First Investigations on the Weathering and Deterioration of Rock Cut Monuments in Myra, Lycia (Turkey)</b>	1-13
W. Wedekind, R.A. López Doncel, B. Marié and O. Salvadori	
<b>Contour Scaling at the Angkor Temples: Causes, Consequences and Conservation</b>	1-14
W. Wedekind, C. Gross, A. van den Kerkhof and S. Siegesmund	

*Methods for investigation*

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<b>The Effect of Salt Crystallisation on the Mechanical Properties of Limestone: Statistical Correlation between Non-Destructive and Destructive Techniques</b>	2-1
N. Aly, A. Hamed, M. Gomez-Heras, D. Benavente and M. Alvarez de Buergo	
<b>Computational Intruding: Four Important Structural Elements to Protect the Buildings in Ancient Persian Engineering</b>	2-2
A. AmirShahkarami, M. Mehdiabadi and H. Ashooriha	
<b>Material Analysis of Tarsus' (Mersin, Turkey) Traditional Buildings for the Development of Conservation Strategies</b>	2-3
M.C. Atikoğlu, A. Tavukçuoğlu, B.A. Güney, E. Caner-Saltık, O. Doğan, M.K. Ardoğa and M. Mayhar	
<b>Applications of Image Analysis to Marble Samples</b>	2-4
R. Bellopede, E. Castelletto, N. Marcone and P. Marini	
<b>The Effects of Commercial Ethyl Silicate Based Consolidation Products on Limestone</b>	2-5
T. Berto, S. Godts and H. De Clercq	
<b>Sandstone Weathering: New Approaches to Assess Building Stone Decay</b>	2-6
Jessica Dassow, Martin Lee, Patrick Harkness, Stefan Hild and Alick Leslie	

<b>Pore-scale Freeze-thaw Experiments with Environmental Micro-CT</b> T. De Kock, H. Derluyn, T. De Schryver, M.A. Boone and V. Cnudde	2-7
<b>Salt Weathering of Sandstone During Drying: Effect of Primary and Secondary Crystallisation</b> J. Desarnaud, H. Derluyn, L. Grementieri, L. Molari, S. de Miranda, V. Cnudde and N. Shahidzadeh	2-8
<b>Conservation Study of Stone Masonries Using IRT: Discovering Hidden Information by Thermal Properties</b> Franzen C. and Vallet J. M.	2-9
<b>Digital Field Documentation: the Central Park Obelisk</b> C. Gembinski	2-10
<b>Quantifying the Damage and Decay for Conservation Projects: Identification, Classification and Analysis of the Decay and Deterioration in Stone</b> P.T. Janbade N. Thakur and B.N. Tandon	2-11
<b>The Potential of Laser Scanning to Describe Stone degradation</b> R. Janvier, X. Brunetaud, K. Beck, S. Janvier-Badosa and M. Al-Mukhtar	2-12
<b>Developing Application Technologies of Infrared Thermography for Documentation of Blistering Zone</b> Y.H. Jo and C.H. Lee	2-13
<b>Stability Evaluation and Behaviour Monitoring of Songsanri Royal Tomb Complex in Gongju, Korea</b> Sung Han Kim, Chan Hee Lee, Young Hoon Jo and Sung Hee Yun	2-14
<b>Simulated Weathering and Other Testing of Dimension Stone</b> D. Kneezel	2-15
<b>Active IRT and Theoretical Simulation Inputs for the Voids Determination in Building Material</b> Mouhoubi K., Franzen C., Vallet J.-M., Detalle V., Guillon O. and Bodnar J.L.	2-16
<b>Monitoring of Salts Content in Monuments of Toruń Old Town Complex</b> W. Oberta and J.W. Łukaszewicz	2-17
<b>Water Absorption and Pore-Size Distribution of Silica Acid Ester Consolidated Porous Limestone</b> Z. Pápay and Á. Török	2-18

<b>Conservation Status and Behaviour Monitoring System of Gongsanseong Fortress Wall in Gongju, Korea</b>	2-19
Jun Hyoung Park, KyungKook Yang, Chang Uk Park, Young Hoon Jo and Chan Hee Lee	
<b>Ground Penetrating Radar and the Detection of Structural Anomalies of High Historical Value: A Case Study of a Burgher House in Toruń, Poland</b>	2-20
M. Pilarska, J. Rogóż, A. Cupa, K. Krynicka-Szroeder and P. Szroeder	
<b>Evaluation of Harmfulness of Traditional Cleaning Techniques of Stones with 3D Optical Microscopy Profilometry</b>	2-21
Tedeschi C., Riccardi M. P., Perego S. and Taccia M	
<b>Drilling Resistance Measurement in Masonry Buildings: A Statistical Approach to Characterise Non-homogeneous Materials</b>	2-22
E. Valentini and A. Benincasa	

*Materials other than stone*

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<b>Assessment of the Physical Behaviour of Historic Bricks and their Mechanical Characteristics via Absorption and Ultrasound Tests</b>	3-1
C. Colla and E. Gabrielli	
<b>Multifunctional Polymers for the Restoration of the Deteriorated Mineral Gypsum (selenite) of the Minoan Palatial Monuments of Knossos</b>	3-2
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## **Excursion 1:**

### **Building stone in Glasgow: challenges for conservation and repair**

The excursion is led by Dr Ewan Hyslop, Head of Technical Research & Science, Historic Environment Scotland. Ewan is a mineralogist/petrologist with expertise in building stone analysis, particularly sandstone with experience of many conservation and repair projects.

Glasgow is one of the great sandstone cities. It underwent rapid expansion during the 18th and 19th centuries, built on the wealth of trade and industry. Many of its buildings reflect this prosperity, constructed mostly from local stone obtained from numerous quarries in and around the city. Following economic decline in the late 20th century many buildings fell into disrepair. Over the last few decades the city has seen a renaissance including significant investment in built heritage and public infrastructure. Significant challenges include the sourcing of appropriate stone types for repair (all the original quarries are gone), dealing with a legacy of mistreatment including the use of inappropriate materials and damage from stone cleaning, and the shortage of a skilled masonry workforce. Furthermore, lack of building maintenance and increasing rainfall levels due to climate change are presenting new challenges. The excursion will involve walking in the city centre looking at a number of building exteriors and completed projects. The visit will involve walking on city centre pavements, so wear appropriate footwear noting the potential for wet weather; and awareness of the risk from road traffic.

**Maximum participants:** 15

**When and for how long:** 10 am, for 2 hours.

**Where to meet:** Outside Costa Coffee near the entrance to the Gallery of Modern Art in Royal Exchange Square (Glasgow G1 3AH)

**How to get there:** Glasgow city centre. Short walk from Central or Queen Street stations, Buchanan Street Subway station, city centre car parks etc.

A member of the UWS conference team will meet delegates at Glasgow Central Station, under the central clock, at 9.45 am.

## **Excursion 2:**

### **Stone Metropolis: The Historic Architecture of Glasgow (Glasvegas?)**

The excursion is led by Alex Collins, who is an art historian and doctoral candidate in History of Art at Edinburgh University, where he teaches history of art and architectural history. Before his doctorate he worked in the Scottish heritage sector, and completed his undergraduate degree at St Andrews, where he specialised in medieval Scottish architecture and culture. He gives architectural and historic tours of Edinburgh, Glasgow and St Andrews.

This tour will explore Glasgow's historic architecture and built environment across two hours. Glaswegian architecture ranges from the medieval to the modern, with especially strong concentrations of nineteenth- and twentieth-century architecture. During the city's Victorian and Edwardian heyday, Glasgow was amongst one of the most important industrial centres in the world, and informally called the British Empire's second city. In this guided walk, we will start with one of the oldest and most impressive of Glasgow's stone buildings, its cathedral, begun originally in the late twelfth century. It forms part of the medieval and early modern city, with the old high street forming an axis for urban development from this. From the cathedral we will move through the city's old town, its early modern expansions and then move to the heart of the modern metropolis. This tour will feature several key elements of the city's architectural history, including commercial and industrial settings, residences, churches and banks. We will learn about the history of the city, the role played by different kinds of architecture within this, and see many of the changes to the city's fabric as older sites have been adapted to later uses.

**Maximum Participants:** 20

**When and for how long:** 10.30am – 12.30 pm

**Where to meet:** In front of Glasgow Cathedral.

**How to get there:** Walking from Glasgow Central and Queen Street stations, up and along Cathedral Street. Close by to Buchanan Street bus station, and numerous car parks.

A member of the UWS conference team will meet delegates at Glasgow Central Station, under the central clock, at 10am. The walk from the station to the Cathedral takes about 20 minutes.

## **Excursion 3:**

### **The Skelmorlie Aisle, Largs**

The excursion is led by Maureen Young and Christa Gerdwiker, who are members of the technical conservation team at Historic Environment Scotland. Maureen is a Geologist who has experience of research into stone decay and conservation both in academia and in the conservation sector and Christa is a stone conservator with over 20 years experience, mostly in Scotland.

This Skelmorlie Aisle is a singular historic monument in Scotland, an ornately carved renaissance stone tomb, that sits beneath a vaulted wooden painted ceiling. It suffers from decay, that proves hard to assess, and the causes remain uncertain. Look out for the detailed excursion flyer in your delegate pack and at the registration desk.

**Maximum participants:** 20

**When and for how long:** 11 am, for 2 hours

**Where to meet:** At the door of Largs local history museum. Largs is a coastal town approximately 30 kilometers west from Paisley. It can be reached easily by train in under an hour and the excursion location is a few minutes walk from the train station in Largs.

**How to get there:** By Train from Glasgow Central and Paisley Gilmour Street.

We suggest strongly that for this excursion participants take the train from Glasgow Central to Largs leaving Glasgow at 9.48 am, which stops at Paisley Gilmour Street Station at 9.58 am.

Otherwise, trains leave Glasgow Central Station at 12 minutes before the hour and go via Paisley Gilmour Street Station. Duration approx. 55 minutes and cost £8. Trains leave Paisley Gilmour Street Station at 2 minutes before the hour, every hour and return from Largs at 10-15 minutes before the hour. Journey time is approx. 45 minutes and return travel costs are £7.20.

On arrival at Largs, leave the station onto Main Road (A78) and turn left (towards sea front). Take third turn right into unnamed lane (at the corner of TSB bank). The Largs local history museum is towards the end of this lane, and the Aisle in the graveyard just beyond.



## **Permanent Scientific Committee**

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Conservation Science Consulting Sàrl, Fribourg, Switzerland

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Civil and Environmental Engineering Department, Princeton University, United States of America

*David A. Young*

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*Irene Edmiston*

*Gaia Frola*

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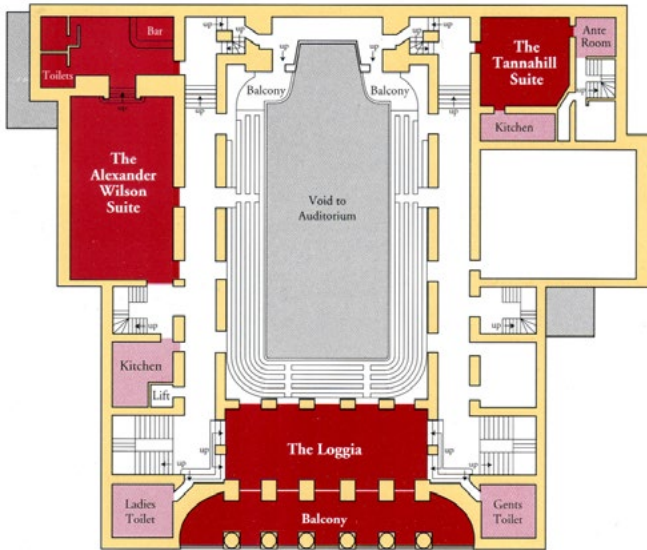
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*John Hughes (Chair)*

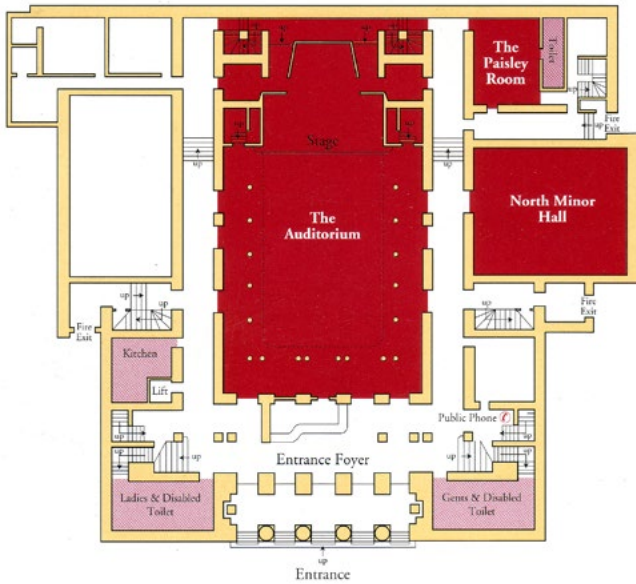
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# Paisley Town Hall

## Ground Floor



## Upper Floor



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