

**36TH FORUM ON THE GEOLOGY OF INDUSTRIAL
MINERALS
AND
11TH EXTRACTIVE INDUSTRY GEOLOGY
CONFERENCE
6TH-12TH MAY 2000
PROGRAMME**

SATURDAY 6TH MAY

5.00-7.00 pm Registration at Hilton National Hotel, Bath

SUNDAY 7TH MAY

9.00 am – 5.00 pm **Pre-Conference Field Excursion E** to underground Bath Stone Mines at Westwood (Jurassic limestone) and cement works at Westbury (Cretaceous Chalk and Kimmeridge Clay). Coach departs from Hilton National Hotel.

5.00–7.00 pm Registration at Hilton National Hotel, Bath

7.00-8.00 pm **Welcome Reception and Introduction to the Conference and the historic City of Bath in the 18th Century Guildhall.** The Right Worshipful The Mayor of Bath, Councillor John Bailey and the Mayoress will be in attendance. Drinks and nibbles provided.

MONDAY 8TH MAY – WEDNESDAY 10TH MAY

08.30 onwards on Monday, Tuesday and Wednesday: Registration in the Assembly Rooms

The opening morning (Monday) of the Conference will be a single Plenary Session in the Tea Room of the Assembly Rooms.

For the rest of the Conference (Monday pm, Tuesday am & pm, and Wednesday am) there will be two parallel sessions in the Octagon Room and the Tea Room. On Tuesday, the sessions in the Octagon Room will generally (but not exclusively) have a North American/International orientation, whilst those in the Tea Room will be mainly concerned with UK subjects.

The excursions for the accompanying persons will depart from the Hilton National Hotel on all three days at 9.00 am.

MONDAY 8TH MAY

MORNING PLENARY SESSION IN THE TEA ROOM

Chair: Colin Bristow, Visiting Professor, Camborne School of Mines

9.00-9.20am **Introduction and welcome.** Mrs Angela Yeoman,
Chairman of Foster Yeoman Ltd and High Sheriff of Somerset.

Theme - The Present and Future Extractive Industry.

9.20 - 9.45 **Industrial Minerals outlook for the 21st Century: some observations on global supply and demand beyond Y2K.** Henry N. McCarl, The University of Alabama in Birmingham, USA.

9.45-10.10 **Sustainable management of mineral resources by the integration of land use and related information.** Bill Hatton, David Highley, Tim Colman and Jo Mankelow, British Geological Survey.

10.10-10.50 Coffee, Posters and Trade Exhibition.

Chair: Peter W. Scott, Camborne School of Mines

10.50-11.40 **THE ANSEL DUNHAM LECTURE. Ethics and Geoscience in the Extractive Industry.** Richard A. Fox, RMC Aggregates (UK) Ltd.

11.40-12.05 **Aggregate resources of the United States - an overview.** William H. Langer, United States Geological Survey.

12.05-12.30 **Marine aggregates - meeting the challenge of quality for Europe.** Ian Selby, Hanson Aggregates Marine Ltd., UK.

12.30-2.00pm **Lunch sponsored by Lafarge Redland Aggregates, together with Posters and Trade Exhibition.**

AFTERNOON SESSION IN THE OCTAGON ROOM

Chair: Bob Ganis, Harrisburg, USA

Theme - The Geology of Industrial Minerals.

2.00-2.25 **Salt resources and production in the United States.** Kenneth S. Johnson, Oklahoma Geological Survey, USA.

2.25-2.50 **Sediment-hosted sparry magnesite deposits, British Columbia, Canada.** George J. Simandl. British Columbia Ministry of Energy and Mines, Canada.

2.50-3.15 **Sapphire deposits of Montana.** Richard B. Berg, Montana Bureau of Mines and Geology and James P. Dahy, Stillwater Mining Company, USA.

MONDAY 8TH MAY CONTINUED

3.15-3.40 **Commercial perlite deposits and selected prospects in North America.** J.M. Barker and G.S. Austin, New Mexico Bureau of Mines and Mineral Resources, K. Santini, Santini and Associates, USA and A. Alatorre, Fideicomiso de Formento Minero, Mexico.

3.40-4.15 Tea, Posters and Trade Exhibition.

4.15-4.40 **Industrial Minerals in the Western Canada Sedimentary Basin.** Wylie N. Hamilton and W.A.D. Edwards, Alberta Geological Survey, Canada.

4.40-5.05 **A century of fire and brimstone: the rise and fall of the Frasch Sulfur industry of the Gulf of Mexico basin.** J. Richard Kyle, The University of Texas at Austin, USA.

5.05-5.30 **Economic geology of manganese, Part II.** Jerome F. Machamer, Consultant, USA.

AFTERNOON SESSION IN THE TEA ROOM

Chair: Clive Nicholas, Exeter, UK

Theme - Quarry design and extraction.

2.00-2.25 **Rock slope management and the new quarry regulations.** Tony Butler, Transport Research Laboratory, Scotland.

2.25-2.50 **Applications of hazard and risk assessment techniques to quarry slopes.** Doug Stead, John S. Coggan and Denise M. Pascoe. Camborne School of Mines, University of Exeter, UK.

2.50-3.15 **Living with the quarries 2000 legislation - a practical approach.** Adrian C. Charters and Brian Duthie, Tarmac Quarry Products Ltd., UK.

3.15-3.40 **The identification and appraisal of hazards on quarry rock faces.** George D. Matheson, Matrock Consulting Ltd and George M. Reeves, University of Newcastle upon Tyne, UK.

3.40-4.15 Tea, Posters and Trade Exhibition.

4.15-4.40 **Investigation of unstable steep ground above a quarry face.** W.L. Barrett, Tarmac Quarry Products Ltd. and Geoffrey Walton, University of Leeds and Geoffrey Walton Practice, UK.

4.40-5.05 **Resource modelling at Talc de Luzenac, France.** Mark Howson, Rio Tinto Technical Services Ltd., UK.

EVENING

7.00-8.00 **Civic Reception** in the Roman Baths, hosted by the Chair of Bath & North East Somerset Council, **Councillor Betty Perry**; followed by **Conference Dinner** (8.00-11.00), sponsored by **Tarmac Quarry Products Ltd.**, in the adjacent 18th Century Pump Room.

TUESDAY 9TH MAY

7.30-8.30am Forum Committee Breakfast meeting, Hilton Hotel, Bath.

OCTAGON ROOM

Chair: David Morgan, British Geological Survey and President, Mineralogical Society.

Theme - The Geology of Industrial Minerals

9.00-9.25am **Flexure zone controlled pegmatitic kaolin deposit sub-province in ENE Brazil.** A. Bhaskara Rao, University of Brasilia, Claudio de Castro, Department of Mining Engineering, UFPE and Maria S. Adusumilla, University of Brasilia, Brazil.

9.25-9.50 **Developing models for speciality clay deposits: applications of trace element geochemistry to characterise kaolinite deposits formed in felsic volcanic rocks.** Nora K. Foley. Eastern Minerals Resource Team, United States Geological Survey.

9.50-10.15 **Perchlorate in natural fertilizer materials - what do we really know?** Greta Orris, United States Geological Survey, G.J. Harvey, D.T. Tsui and J.E. Eldridge, US Air Force.

10.15-10.45 Coffee, Posters and Trade Exhibition.

10.45-11.10 **Ochre - a natural iron oxide in the coloured pigment market.** Stan Bearden. New Riverside Ochre Company Inc., Georgia, USA.

11.10-11.35 **Borate deposits in California - past, present and future.** David J. Beeby. California Division of Mines and Geology, USA.

11.35-12.00 **Value added refractory dolomite - a case study.** David Hopkins, Baker Refractories, USA.

12.00-12.25 **Industrial Minerals of Saudi Arabia - prospects and opportunities.** C.J. (Kip) Jeffrey, University of Leicester, UK.

12.25-2.00pm **Lunch sponsored by Hanson Quarry Products Europe, Posters and Trade Exhibition.**

Chair: Brian Sturt, Norwegian Geological Survey.

2.00-2.25 **A guide to exploration and uses of pyrophyllite ore in East Asia - pyrophyllite deposits related to acidic igneous activities of Mesozoic age.** Tadataka Hida, Shokozan Mining Co Ltd., Hiroshima, Japan.

2.25-2.50 **A review of Industrial Minerals in Sweden - deposits and production 1998.** Nils-Gunner Wik, Geological Survey of Sweden.

2.50-3.15 **Perspectives of the Finnish industrial minerals industry.** Yrjo Pekkala, J. Reinikainen, O. Sarapaa and H. Seppanen. Geological Survey of Finland.

TUESDAY 9TH MAY, OCTAGON ROOM, CONTINUED

3.15-3.45 Tea, Posters and Trade Exhibition.

3.45-4.10 **Industrial Minerals of Milos Island, Greece.** D. Alfieris, U. Lutat, and J. Simos, Silver and Barytes Ores Mining Co SA, Greece.

4.10-4.35 **Industrial Minerals in South America: European future grain-stock?** Anibal Gajardo, Servicio Nacional de Geologia y Minería de Chile, Pedro Martinez, Grupo SAMCA, Spain, and Manuel Reguero, Instituto Tecnológico Geominero de España, Spain.

4.35-4.50 **37th Forum on the Geology of Industrial Minerals, Victoria, British Columbia.** George Simandl. British Columbia Ministry of Energy and Mines, Canada.

4.50-5.00 **Forum on the Geology of Industrial Minerals, Business Meeting.**

TEA ROOM

Chair: Geoffrey Walton, Geoffrey Walton Practice, Charlbury, UK

Theme - Coal.

9.00-9.25am **Aspects of coal geology in the Western Interior Coal Region, USA.** LeRoy Hemish, Oklahoma Geological Survey, USA.

9.25-9.50 **Opencast restoration for the 21st Century: An evaluation of all the stakeholders' expectations.** Justin Hancock, H.J.Banks and Co. Ltd., UK.

Theme - Geology of construction raw materials

9.50-10.15 **Practical Petrography - the modern assessment of aggregates for AAR potential.** Ian Sims, Sarah A.S. Smart and Barry J. Hunt. Stats Consultancy, UK.

10.15-10.45 Coffee, Posters and Trade Exhibition.

10.45-11.10 **Patterns of clay resource utilisation in the UK brick industry.** Andrew J. Bloodworth, British Geological Survey.

11.10-11.35 **Sourcing of armourstone and rockfill for a Hebridean causeway, Scotland.** Chris Ravey, formerly Babbie Group and Stuart Mollard, Babbie Group, UK.

11.35-12.00 **A study of the properties of blended cements produced with biogenic microsilica rich rocks.** Michael G. Stamatakis, National University of Athens, Greece, D. Fragoulis, TITAN SA Cement Company, Greece, G. Csirik, Geological Institute of Hungary, I. Bedelean, University of Babes-Bolyai, Cluj, Romania and S. Pedersen, Geological Survey of Denmark.

TUESDAY 9TH MAY, TEA ROOM, CONTINUED

Theme - Managing the environment (a further paper on this topic Wednesday am).

12.00-12.25 **An overview of reclamation law dealing with mineral resource development in the United States of America.** Belinda Arbogast. United States Geological Survey.

12.25-2.00pm **Lunch sponsored by Hanson Quarry Products Europe, Posters and Trade Exhibition.**

Chair: C.J. (Kip) Jeffrey, University of Leicester, UK

2.00-2.25 **Mineral resource protection and sustainability.** John F. Cowley, Mineral and Resource Planning Associates, UK.

2.25-2.50 **Mining to build new landscapes.** Anthony M. Bauer. Bauer-Ford Reclamation Design, Michigan, USA.

2.50-3.15 **Strictly for the birds? The EC Bird Protection Directive (79/409/EEC) and the cement industry in southeastern Northrhine-Westphalia, Germany.** T. Reimer, Dyckerhoff Zement GmbH., Germany.

3.15-3.45 Tea, Posters and Trade Exhibition.

3.45-4.10 **The hydrogeological effect of quarrying kartsified limestones: operational requirements for monitoring and mitigation.** Steven L. Hobbs, Enviros Aspinwall, UK.

4.10-4.35 **The ecological benefits of quarrying: potential for increase in biodiversity resulting from mineral extraction.** Chris C. Leake, Shrewsbury, UK.

4.35-5.0 **Extractive Industry Geology Business Meeting.**

EVENING

6.00pm **sharp** Coach departs from outside Hilton Hotel for Stonehenge and The George, Norton St Philip for traditional inn dinner, returning to Bath about 11.30 pm. *Those going on this excursion may like to equip themselves with a small snack and drink, as dinner will not be taken until after 9 pm.*

6.30pm Minibus departs from outside Hilton Hotel for visit to Bath Stone workings at Combe Down, courtesy of Bath and North East Somerset Council. Return at about 8 pm.

WEDNESDAY 10TH MAY

OCTAGON ROOM – MORNING SESSION ONLY

Chair: David J. Harrison, British Geological Survey.

Theme - Managing the environment.

9.00-9.25 **A case study of the hydrogeological impacts of sand and gravel extraction adjacent to an internationally protected saline marsh: Efford Quarry and Landfill - Lymington to Keyhaven Marshes, Hampshire.** Geoff Bowen, Marcus Hodges Environment Ltd. UK.

Theme - By-product raw materials and recycling.

9.25-9.50 **Fly ash utilisation in the Western United States.** Gretchen Hoffman. New Mexico Bureau of Mines and Mineral Resources, USA.

9.50-10.15 **Synthesis of high added value zeolites from perlite and expanded perlite waste materials.** G. Christidis, K. Galani and Th. Marcolous. Technical University of Crete, Greece.

10.15-10.45 Coffee, Posters and Trade Exhibition.

10.45-11.10 **The utilisation of blastfurnace and steelmaking slags as aggregates for construction.** Howard L. Robinson, Tarmac Quarry Products Ltd., UK.

11.10-11.35 **Development of saleable mineral products from quarry waste.** David J. Harrison, Clive J. Mitchell and Ellie Evans. British Geological Survey.

TEA ROOM – MORNING SESSION ONLY

Chair: Adrian C. Charters, Tarmac Quarry Products Ltd., UK

Theme - Limestones

9.00-9.25 **Ontario limestones and their contribution to economic development.** Dale W. Scott, Ministry of Natural Resources, Ontario, Canada.

9.25-9.50 **Caves in quarries.** Nelson R. Shaffer and Richard L. Powell, Indiana Geological Survey, USA.

9.50-10.15 **Rock slope stability: a case study at Coles Quarry, Backwell, north Somerset.** Richard J. Small, RMC Aggregates (UK) Ltd.

10.15-10.45 Coffee, Posters and Trade Exhibition.

10.45-11.10 **Mendip and near-Mendip Limestones.** Reg Bradshaw, Somerset, UK.

WEDNESDAY 10TH MAY CONTINUED

11.10-11.35 **Quarrying and reclamation at Torr Works, Frome, Somerset.** Hugh Lucas and Steve Nice, Foster Yeoman Ltd., UK.

AFTERNOON

11.45-12.00 noon Coaches depart from outside the Assembly Rooms for Marston House.

12.30-1.45 pm **Lunch, sponsored by Foster Yeoman Ltd.**, in the Ballroom and Orangery of Marston House, near Frome (the headquarters of Foster Yeoman).

2.00 pm Depart for Field Excursions A, B, C & D. Coaches depart from Marston House, returning directly to Bath, not via Marston House.

5.00pm Coaches arrive back at Hilton Hotel, Bath.

EVENING

6.00pm *sharp* Coach departs from outside Hilton Hotel for Stonehenge and The George, Norton St Philip for traditional inn dinner, returning to Bath about 11.30 pm. *Those going on this excursion may like to equip themselves with a small snack and drink, as dinner will not be taken until after 9 pm.*

THURSDAY 11TH MAY AND FRIDAY 12TH MAY

Field Excursion to South-West England. Coach departs at 8.30am from Hilton Hotel, Bath. Travelling to Dorset and Devon to look at ball clays, arriving to stay overnight at Plymouth, New Continental Hotel at 6.00pm approximately, and then visiting china clay localities on Friday, returning to Bath at about 8 pm. An optional third day to visit geological and mining localities in West Cornwall is also planned, but participants will have to bear the additional costs and find their own way from Cornwall to their onward destinations. See separate field guide.

Field Excursion to the Midlands. Coach departs Hilton Hotel, Bath, 9.00am, visiting extractive operations in the West Midlands and Shropshire, arriving to stay overnight in the Lord Hill Hotel in Shrewsbury at 6.00pm approximately. On Friday visit salt extraction operations and industrial sand quarries, returning to Bath at about 8 pm. See separate field guide.

POSTERS

(On display in the Octagon Room and Card Room Bar from Monday 8th May until Midday Wednesday 10th May)

Field evaluation of fine grained industrial minerals. Clive J. Mitchell, British Geological Survey.

The characterisation and specification of natural stone setts. George D. Matheson, Matrock Consulting Ltd. and Jim W. Hare, Glasgow City Council, Scotland UK.

Quality systems in the production of natural stone setts. George D. Matheson and Jim W. Hare. Glasgow City Council, Scotland, UK.

Models and domains: Tools to help realise the industrial mineral potential of the developing world. Steve Mathers, British Geological Survey and Peter W. Scott, Camborne School of Mines, University of Exeter.

Landscape replication in the Welsh Valleys - the extension of Hafod Quarry. Duncan R. Wardrop, LaFarge UK Aggregates Ltd., UK.

The legacy of quarrying - statutory nuisance or scheduled ancient monument? Medieval quarrying underground in Surrey. Paul W. Sowan, Subterranea Britannica, UK.

The Geology of roofing slates. Manuel Lombardero, Instituto Tecnológico Geominero and Javier Garcia-Guinea, Museo Nacional de Ciencias Naturales, Madrid, Spain.

Geologic materials used for brick manufacture by the Glen-Gery Corporation, North-east and Midwest U.S. G. Robert Ganis, BL Companies and Jon R. Moyer, Glen-Gery Corporation, USA.

The application of magnetic susceptibility surveying in exploration for soapstone and talc deposits in eastern Finland. Annukka Lipponen, University of Helsinki, Finland.

Mineral deposits of Norwegian ultramafic rocks: their past and future. Brian A. Sturt, T.A. Karlsen, Tom A. Heldal, L.P. Nilsson and H. Gautneb. Geological Survey of Norway.

Brick Making: the ultimate waste repository. Andrew S. Smith, Hanson Brick, UK.

Pegmatite rejects and others in ENE Brazil: genuine recycling with economic benefit and environmental protection. A. Bhaskara Rao, University of Brasilia, Claudio de Castro, UFPE, Recife and Maria S. Adusumilla, University of Brasilia, Brazil..

A review of Greek Industrial Minerals. Kiki Hatzilazaridou, Institute of Geology and Mineral Exploration, Athens, Greece.

Managing the perception of geological hazards. Andrew Avramenko and Rachel Thomas, Bath and North East Somerset Council, UK.