



Our Stone Age: From the Neolithic to the New Millennium

Keeping up with appearances in the stone repair business

Encounter some tough but polished Italians, Brazilians and Slovenians

The granites in Spain are anything but plain

Nice Neogene Nubian anorthositic gneiss

Wonderful Whitehorse 2016: Field Trip Preview

**Editor/Rédacteur en chef**

Andrew Kerr  
 Department of Earth Sciences  
 Memorial University  
 St. John's, NL, A1B 3X5  
 E-mail: akerr@mun.ca

**Managing Editor/directrice de rédaction**

Cindy Murphy  
 E-mail: cmurphy@stfx.ca

**Publications Director/Directrice de publications**

Karen Dawe  
 Geological Association of Canada  
 St. John's NL Canada A1B 3X5  
 Tel: (709) 864-2151  
 E-mail: kfm dawe@mun.ca

**Copy Editors/Rédacteurs copie**

Rob Raeside  
 Paul Robinson  
 Reginald Wilson

**Associate Editors/Rédacteurs associés**

Sandy Cruden  
 Fran Haidl  
 Jim Hibbard  
 John Hinchey  
 Stephen Johnston  
 Fraser Keppie

**Assistant Editors/Directeurs adjoints**

Columnist: Paul F. Hoffman  
 - The Tooth of Time  
 Outreach: Pierre Verpaelt (Québec)  
 Beth Halfkenny (Ontario)  
 Godfrey Nowlan (Prairies)  
 Eileen van der Flier-Keller (BC)  
 Sarah Laxton (North)  
 Professional Affairs for Geoscientists:  
 Oliver Bonham  
 Views from Industry: Elisabeth Kusters  
 Series:  
 Andrew Hynes Series: Tectonic Processes:  
 Stephen Johnston, Brendan Murphy and  
 Boswell Wing  
 Canada GEESE (Geospatial Earth and  
 Environmental Science Explorations):  
 Declan G. De Paor  
 Climate and Energy: Andrew Miall  
 Economic Geology Models: David Lentz  
 and Elizabeth Turner  
 Geology and Wine: Roger Macqueen  
 Great Canadian Lagerstätten:  
 David Rudkin and Graham Young  
 Great Mining Camps of Canada:  
 Stephen McCutcheon  
 Heritage Stone:  
 Dolores Pereira and Brian R. Pratt  
 Igneous Rock Associations: Jaroslav Dostal  
 Modern Analytical Facilities: Keith Dewing,  
 Robert Linnen and Chris R.M. McFarlane  
 Remote Predictive Mapping:  
 Jeff Harris and Tim Webster

**Illustrator/Illustrateur**

Peter I. Russell, Waterloo ON

**Translator/Traducteur**

Jean Alfred Renaud, Magog QC

**Typesetter/Typographe**

Bev Strickland, St. John's NL

**Publisher/Éditeur**

Geological Association of Canada  
 c/o Department of Earth Sciences  
 Memorial University of Newfoundland  
 St. John's NL Canada A1B 3X5  
 Tel: (709) 864-7660  
 Fax: (709) 864-2532  
 gacpub@mun.ca  
 gac@mun.ca  
 www.gac.ca

© Copyright 2016

Geological Association of Canada/  
 L'Association géologique du Canada  
 Except Copyright Her Majesty the Queen  
 in right of Canada 2016 where noted.  
 All rights reserved/  
 Tous droits réservés  
 Print Edition: ISSN 0315-0941  
 Online Edition: ISSN 1911-4850

Volume 43

A journal published quarterly by the Geological Association of Canada, incorporating the Proceedings.

Une revue trimestrielle publiée par l'Association géologique du Canada et qui en diffuse les actes.

**Subscriptions:** Receiving four issues of *Geoscience Canada* per year for \$50 is one of the benefits of being a GAC member. To obtain institutional subscriptions, please contact Érudit: [www.erudit.org](http://www.erudit.org)

**Abonnement:** Recevoir quatre numéros par année pour 50,00 \$ du magazine *Geoscience* est l'un des avantages réservés aux membres de l'AGC. Pour les abonnements institutionnels, s'il vous plaît contacter Érudit: [www.erudit.org](http://www.erudit.org)

**Photocopying:** The Geological Association of Canada grants permission to individual scientists to make photocopies of one or more items from this journal for non-commercial purposes advancing science or education, including classroom use. Other individuals wishing to copy items from this journal must obtain a copying licence from Access Copyright (Canadian Copyright Licensing Agency), 1 Yonge Street, Suite 1900, Toronto, Ontario M5E 1E5, phone (416) 868-1620. This permission does not extend to other kinds of copying such as copying for general distribution, for advertising or promotional purposes, for creating new collective works, or for resale. Send permission requests to *Geoscience Canada*, at the Geological Association of Canada (address above).

**La photocopie:** L'Association géologique du Canada permet à tout scientifique, de reprographier une ou des parties du présent périodique, pour ses besoins, à condition que ce soit dans un but non-commercial, pour l'avancement de la science ou pour des buts éducatifs, y compris l'usage en classe. Toute autre personne désirant utiliser des reproductions du présent périodique doit préalablement obtenir une licence à cet effet d'Access Copyright (Canadian Copyright Licensing Agency), 1 Yonge Street, suite 1900, Toronto, Ontario M5E 1E5, Tél.: (416) 868-1620. L'autorisation susmentionnée exclut toute autre reproduction, telle la reproduction pour fins de distribution générale, de publicité ou de promotion, pour la création de nouveaux travaux collectifs ou pour la revente. Faites parvenir vos demandes d'autorisation à *Geoscience Canada*, au soin de l'Association géologique du Canada (voir l'adresse indiquée ci-dessus).

Those wishing to submit material for publication in *Geoscience Canada* should refer to the Instructions to Authors on the journal's website, [www.geosciencecanada.ca](http://www.geosciencecanada.ca)

**AUTHORS PLEASE NOTE:**

Please use the web address <http://journals.hil.unb.ca/index.php/GC/index> for submissions; please do not submit articles directly to the editor.

The Mission of the Geological Association of Canada is to facilitate the scientific well-being and professional development of its members, the learned discussion of geoscience in Canada, and the advancement, dissemination and wise use of geosciences in public, professional and academic life. Articles in *Geoscience Canada* are freely available two years after their publication date, unless authors have arranged for immediate open access. Opinions expressed and interpretations presented are those of the authors and do not necessarily reflect those of the editors, publishers and other contributors. Your comments are welcome.

**Cover Photo:** This life-size statue of King Chephren was fashioned around 2500 BCE, from anorthositic gneiss quarried in the remote desert of southwestern Egypt. This same stone, known as the Chephren gneiss, was also used to create thousands of funerary vessels. The beauty of these artifacts attests to the skills of these ancient artisans, but also to the innate qualities of this heritage stone. The statue now resides in the Egyptian Museum, Cairo; the bowls reside in museums in Brussels (top) and Turin (bottom).

*Photo credits: Jon Bodsworth (left) and Tom Heldal (right).*

# GEOSCIENCE CANADA

JOURNAL OF THE GEOLOGICAL ASSOCIATION OF CANADA  
JOURNAL DE L'ASSOCIATION GÉOLOGIQUE DU CANADA

<b>Editorial</b>	<b>1</b>
GEOSCIENCE CANADA – The Road Ahead <i>A. Kerr</i>	
<b>Special Issue</b>	<b>3</b>
Heritage Stones of the World: Introduction to the New Series <i>D. Pereira and B.R. Pratt</i>	
<b>Series</b>	
Heritage Stone 1.	<b>5</b>
Repair and Maintenance of Natural Stone in Historical Structures: The Potential Role of the IUGS Global Heritage Stone Initiative <i>D. Pereira and B.R. Marker</i>	
Heritage Stone 2.	<b>13</b>
The Dora-Maira Unit (Italian Cottian Alps): A Reservoir of Ornamental Stones Since Roman Times <i>A. Borghi, P. Cadoppi and G.A. Dino</i>	
Heritage Stone 3.	<b>31</b>
Degradation Patterns of Stone used in Historic Buildings in Brazil <i>A.G. Costa</i>	
Heritage Stone 4.	<b>43</b>
The Piedra Berroqueña Region: Candidacy for Global Heritage Stone Province Status <i>D.M. Freire-Lista and R. Fort</i>	
Heritage Stone 5.	<b>53</b>
Silicified Granites (Bleeding Stone and Ochre Granite) as Global Heritage Stone Resources from Ávila, Central Spain <i>J. García-Talegón, A.C. Iñigo, S. Vicente-Tavera and E. Molina-Ballesteros</i>	
Heritage Stone 6.	<b>63</b>
Gneiss for the Pharaoh: Geology of the Third Millennium BCE Chephren's Quarries in Southern Egypt <i>T. Heldal, P. Storemyr, E. Bloxam and I. Shaw</i>	
Heritage Stone 7.	<b>79</b>
Pohorje Granodiorite – One of the Most Significant Slovenian Natural Stones <i>S. Kramar, M. Trajanova, M. Dolenc, M. Gutman, M. Bedjanič and A. Mladenovič</i>	
<b>GAC-MAC Field Guide Summary</b>	<b>89</b>
Whitehorse 2016: GAC-MAC Joint Annual Meeting Field Trips <i>R. Cobbett</i>	
<b>Review</b>	<b>91</b>
Voyage of Discovery – Fifty Years of Marine Research at Canada's Bedford Institute of Oceanography <i>M.A. Tivey</i>	
<b>Commentary</b>	<b>93</b>
Open Access - Panacea or Pandora's Box? <i>A. Kerr</i>	