



# Association of Applied Geochemists

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## OBITUARY FOR PETER WINTERBURN (1962–2019)

Exploration geochemistry lost one of its most innovative and energetic champions with the tragic death of Dr. Peter Winterburn in an attempted street robbery in late June 2019 while in Valparaiso (Chile) with his family. Peter and his wife, Michelle, had only recently returned to Chile to live, working out of Santiago with the multinational mining company Vale S.A. Over the course of a 30-year career in both the mineral exploration industry and in academia, Peter was a well-known and highly regarded geochemist with Anglo American, Vale, and the Mineral Deposit Research Unit (MDRU) at the University of British Columbia (UBC) (Canada), where for five years he carried out research and supervised students as a Professor of Exploration Geochemistry.

Peter was born in northern England in 1962 and graduated with his BSc (Honours) from the University of Aston (UK) in 1983. He completed his PhD at the University of Edinburgh (UK) in 1988, studying peridotite xenoliths in southern African kimberlites. After a stint with the Council for Scientific and Industrial Research, he joined the Anglo American Research Laboratories in Johannesburg (South Africa) in 1990 as a geochemist, where he went to work managing the geochemical database. This was the beginning of a long 18-year (1990–2018) association with Anglo American, where he developed his geochemical skills in roles of increasing responsibility across Africa, including senior geochemist (1992–1993), manager of the geochemical laboratory (1993–1995) and, in 1995, manager of geochemistry for Africa. In 2002, Peter moved to Santiago to become Anglo's South American Regional Geochemist, a position that he was to hold for the next five years. He returned to South Africa in 2007 for a year as chief chemist at the Anglo American Research Laboratories, and then, in early 2008, he embarked on a new path, joining Vale as chief geochemist – global exploration. Based at first in Johannesburg and then, in 2009, in Toronto (Canada), Peter spent the next four years travelling the globe while directing Vale's worldwide geochemical exploration program.

In 2013, Peter joined MDRU–UBC in Vancouver (Canada). His appointment as the NSERC/Acme Labs/Bureau Veritas Minerals Executive Industrial Research Chair in Exploration Geochemistry was a new position in which he would excel for the next five years. Here, Peter reinvigorated UBC's historic strength in exploration geochemistry with active research projects in British Columbia (Canada), the Northwest Territories (Canada), Colombia, Chile, and Argentina. His research was not confined to traditional inorganic methods but included work in exciting new fields, including soil hydrocarbons, microbial genomics, and the geochemistry of hyper-arid terrains, among others. During this time he was also active with the Association of Applied Geochemists (AAG), serving on AAG Council (2015–2016) and chairing the Local Organizing Committee of the recent 28<sup>th</sup> International Applied Geochemistry



Symposium (IAGS), which was held in June 2018 in Vancouver as part of the broader Resources for Future Generations (RFG) conference. It was a testament to Peter's character that he readily volunteered for the time-consuming role of chairing the AAG's flagship scientific event, all the while attending to his usual busy work schedule of supervising graduate students and conducting research. He guided the 28<sup>th</sup> IAGS to a successful conclusion and the outsized contribution of the AAG to the conference's overall success was largely due to Peter's energetic leadership. In early 2019, Peter left UBC and Vancouver and returned to Vale as chief geochemist, this time based in Santiago. He had

been there for only a few months before his untimely death. Not surprisingly, he had already volunteered to join the Local Organizing Committee of the upcoming 29<sup>th</sup> IAGS, to be held in nearby Viña del Mar (Chile) later in 2020.

Peter was an exceptional scientist and was among those few individuals who were able to successfully bridge the gap between the mineral industry, academic research, and teaching communities. He worked in over sixty countries during his career, in environments from tropical to arctic to arid desert. With his broad practical industry experience—not just in all aspects of exploration geochemistry but also in mineral deposits, regolith development, metallurgy, and laboratory analysis—his career embodied an almost old-school mix of field, analytical, interpretative, and research geochemical skills. This background served him well as teacher and mentor to the new generation of enthusiastic young geochemists he supervised and inspired at UBC, where he initiated original research in nontraditional fields of geochemical exploration. His intellect was recognized early on by his colleagues in industry, and he displayed the same sharp mind, quick wit, and tireless work ethic that would later become apparent to a wider group at UBC. At MDRU, his friends and colleagues remember him for his scientific curiosity and enthusiasm, dedication to research, and dry sense of humor. On a personal level, Peter was a devoted husband and father. He was married to Michelle, whom he met in South Africa, for 29 years, and they raised two daughters, Cassandre and Keryn.

Peter's ashes were scattered over the mountains in Cajon Del Maipo (Chile). Celebration of his life events were held over the past few months in Santiago and at UBC. The MDRU–UBC has established the Peter Winterburn Memorial Fund in his memory, with the objective of supporting and advancing the research of future students of exploration geochemistry and carrying on Peter's legacy and passion in this field. More information is available online at: <https://memorial.support.ubc.ca/peter-winterburn/>.

**Stephen Cook, Jeanne Liu**



## RECENT ARTICLES PUBLISHED IN EXPLORE

The following abstract is for an article that appeared in issue 183 (June 2019) of the *Explore* newsletter.

**“Gold Dispersion in Transported Cover Sequences especially in Chemical (Palaeoredox Front) and Physical (Unconformity) Interfaces Linked to the Landscape History of Western Australia”**

**Ravi Anand<sup>1</sup>, Walid Salama<sup>1</sup>**

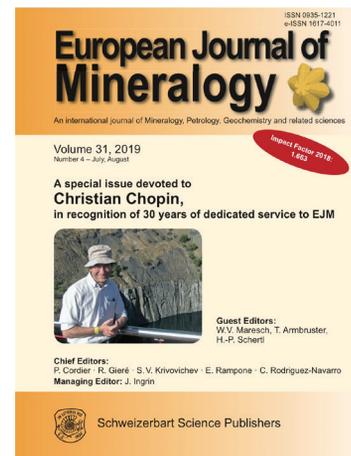
This paper examines how geochemical dispersion may be used in areas of deep transported cover to locate buried mineralisation in the Yilgarn Craton and the Albany Fraser and Paterson orogens of Western Australia. Transported cover is exotic or redistributed material of continental origin that blankets weathered and fresh bedrock, effectively obscuring bedrock-hosted mineralisation in many prospective areas. There are broadly three principal transported sequences: Sequence A, transported cover pre-dating deep weathering (Permo-Carboniferous); Sequence B, transported cover deposited contemporaneously with weathering (Mid Eocene–Miocene); Sequence C, transported cover deposited during an arid period (Quaternary). These sequences can be further sub-divided according to the nature of the transported material. The nature and evolution of transported cover strongly influence the effectiveness of metal transfer. There have been several stages of Au mobilisation in transported cover sequences. In older transported cover (Sequences A and B), in addition to mechanical dispersion, groundwater-related solubilisation and subsequent deposition of Au and pathfinder elements have formed anomalies, especially in Fe oxides (palaeoredox fronts) within the weathered cover at or below the surface. These palaeoredox fronts occur as goethite–hematite-rich ferruginous nodules, pisoliths and mottles that were initially formed during the Palaeocene but more commonly during the Mid to Late Miocene under seasonal climatic conditions. The association of Au with pedogenic calcrete and siliceous hardpan in Quaternary transported cover (Sequence C) indicates that movement of Au is still active. Mechanical dispersion, with some chemical dispersion, mainly occurs in the basal part of the cover. In older transported cover, ferruginous nodules and pisoliths and/or an unconformity between the transported cover and the underlying rock are the preferred sample media. In recent transported cover, sampling of basal gravelly sediments or sampling along an unconformity is optimal. Where it occurs, the calcrete horizon is the preferred near-surface sample medium for Au exploration, except where residual ferruginous materials are present.

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## EUROPEAN JOURNAL OF MINERALOGY

### Special Issue in Honour of Christian Chopin

We are pleased to announce that issue 4 of volume 31 of the *European Journal of Mineralogy (EMJ)* is a special issue in honour of Christian Chopin (Directeur de recherche 1<sup>st</sup> Class au CNRS, Laboratoire de Géologie de l'École Normale Supérieure, Paris, France) who tirelessly served the *EMJ* for 30 years, only stepping down in 2018. This special issue contains a fair proportion of open access articles (see examples below). Read these papers and more at <https://pubs.geoscienceworld.org/eurjmin/issue/31/4>.



- “What’s in the Sandwich? New *P-T* Constraints for the (U)HP Nappe Stack of Southern Dora-Maira Massif (Western Alps)”. By C. Groppo, S. Ferrando, M. Gilio, S. Botta, F. Nosenzo, G. Balestro, A. Festa, F. Rolfo
- “Measurement of Strains in Zircon Inclusions by Raman Spectroscopy”. By C. Stangarone, R.J. Angel, M. Prencipe, N. Campomenosi, B. Mihailova, M. Alvaro
- “From Extension to Compression: High Geothermal Gradient during the Earliest Variscan Phase of the Moroccan Meseta; A First Structural and RSCM Thermometric Study”. By A. Lafid, L. Baidder, H. Ouanaïmi, A. Soulaïmani, C. Hoepffner, A. Farah, O. Saddiqi, A. Michard
- “Low Water Contents in Garnet of Orogenic Peridotite: Clues for an Abyssal or Mantle-Wedge Origin?”. By E. Schmädicke, J. Gose
- “Lithium Mineral Evolution and Ecology: Comparison with Boron and Beryllium”. By E.S. Grew, G. Hystad, M. Toapanta, A. Ostroverkhova, J. Golden, R. Hazen
- “Sr-bearing High-Pressure Tourmaline from the Kreuzeck Mountains, Eastern Alps, Austria”. By A. Ertl, D. Topa, G. Giester, G.R. Rossman, E. Tillmanns, J. Konzett

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In January 2020, the *European Journal of Mineralogy* became a “full open access” journal published by Copernicus Publications with a very attractive article processing charge strategy while maintaining its high editorial standards. A reduced article processing charge of €50 per printed page (or €40 for society members) is offered during a large part of 2020. Submit your papers at: <https://www.european-journal-of-mineralogy.net/>.