

Draft Minutes for the 1583rd meeting of the Geological Society of Washington

November 16, 2022

Video Conference via Zoom

President Meinert called the meeting to order at 20:03 EST.

Attendance

There were 47 attendees.

Minutes

The meeting began with the approval of the minutes from the previous meeting (1582nd). The minutes of the 1582nd meeting had been posted online and a Minute's Minute was read aloud at the 1583rd meeting. No corrections were noted and the minutes were accepted.

New Members and Guests

Five new members were announced: Caroline Kenney (PVCC), Nikita Kepezhinskas (APEX Geoscience), Laura Sammon (MathWorks), Nicholas Powell (USGS) and Magdalen Grismer (NMNH).

No guests were introduced.

Announcements

No announcements were made.

Obituaries

John Repetski gave an appreciation of Martin Buzas, Curator of Benthic Foraminifera at the Smithsonian National Museum of Natural History. John said that Marty, as he was known by all, was a really nice guy who helped a lot of people. He had a quiet way but a sharp wit. His specialty was in the distribution of foraminifera over large areas, and he published 15 books and over 100 articles. Marty also taught at George Washington University and was a great teacher. A moment of silence was observed.

Informal Communication

There was no informal communication.

Formal Program

The formal program commenced at 20:08 EST and consisted of three speakers: Lyle Nelson (Department of Earth Sciences, Carleton University), Sean Gaynor (Department of Geosciences, Princeton University) and Nicholas Tailby (American Museum of Natural History).

Lyle Nelson presented "Utilizing Tandem In Situ and Isotope Dilution U-Pb Detrital Zircon Geochronology to Calibrate Evolution of Life and Climate in the Late Neoproterozoic and Early Cambrian." Lyle opened by pointing out that the Death Valley region of California hosts beautifully exposed late Neoproterozoic-early Paleozoic strata deposited during rifting and passive margin development in western North America. While these units provide globally significant sedimentary records of evolutionary and environmental changes during this dynamic interval of Earth history, a notorious lack of radioisotopic age constraints has hindered calibration of the biostratigraphy, chemostratigraphy, and paleoclimate records. Nelson highlighted recent efforts to improve age models for the Neoproterozoic-Cambrian strata of Death Valley using tandem in situ and isotope dilution U-Pb geochronology of detrital zircons. He concluded by noting that his results contribute to calibration of the Cryogenian snowball Earth glaciations and the Cambrian explosion of animal life. *Talk Length: 22'58"*

Questions were asked by: Steve Shirey (Carnegie Institution), Nick Powell (USGS), Graham Lederer (USGS) and Larry Meinert (Economic Geology & CSM).

Sean Gaynor presented "Local Melt Contamination and Global Climate Impacts: Geochronology of Karoo LIP Sills in Organic-Rich Shales." Sean started with an overview of Large Igneous Provinces (LIPs) and their correlation with global climate change and mass extinctions. To establish this causative link, chemical proxies from marine sedimentary sections must be temporally tied to LIP activity through high-precision geochronology. These temporal relations need to be established through highly precise and accurate U-Pb geochronology; however, many LIP rocks lack U-rich mineral phases, and therefore present challenges for utilizing U-Pb geochronology. The Eccra Group of the Karoo basin hosts Jurassic LIP mafic sills, as well as abundant shale horizons, so the emplacement of sills and subsequent thermogenic degassing of their carbon-rich wall rocks is a potential climate change driver. Unlike the basalts that make up much of the Karoo LIP, pegmatitic pods from mafic Karoo LIP sills yield abundant zircon, which is considered the "gold standard" for U-Pb geochronology. However, analyses from these mafic pods yield unusually variable dates and geochemical compositions, which indicate that localized assimilation of sedimentary rocks enabled localized zircon crystallization. These complications come with a benefit. Because of this assimilation-crystallization relationship, these minerals directly date interaction of LIP magmas with carbon-rich wall rock. Given the temporal overlap of the emplacement of sills and the timing of the global Toarcian Oceanic Anoxic Event (TOAE), Sean noted that his data support a causal link between this discrete period of Karoo sills emplacement and global climate change that took place during the Early Jurassic. *Talk Length: 22'20"*

Questions were asked by: Mike Ackerson (NMNH) and John Jens (USACE ERDC TEC).

Nicholas Tailby presented "Rutilated Quartz: A Useful and Cautionary Tale Involving Thermobarometry and Diffusion." Nick described his approach to quartz thermometry, using rutilated quartz from a granodiorite of the Lachlan fold belt in southeastern Australia. The titanium content of quartz serves as a proxy for the crystallization temperature and Nick noted that this technique has a previously established set of assumptions involving pressure, temperature and activity that need to be met. He shared his results and discussed the potential complications and ultimate benefits of using rutilated quartz for thermobarometry. *Talk Length: 19'14"*

Questions were asked by: Liz Cottrell (NMNH), Megan Holycross (Cornell U), Sean Gaynor (Princeton U), Larry Meinert (Economic Geology & CSM), Jane Hammarstrom (USGS) and Graham Lederer (USGS).

President Meinert said that the 1584th meeting will include his presidential address: "Exploration for Skarn Deposits – if Sherlock Holmes had been a geologist" and that the 130th Annual Business Meeting will follow. He adjourned the 1583rd meeting at 21:42 EST.

Respectfully submitted,

Beth Doyle