

**THIS IS THE THIRD ISSUE DEDICATED TO THE MEMORY OF
DISTINGUISHED SCIENTIST ALFRED KRONER WHO SADLY PASSED
AWAY ON 22 MAY 2019**

It is now over eleven years' ago, in November 2010, that the *American Journal of Science* published the first of two volumes marking the 70th birthday of Alfred Kroner. We, his friends and colleagues, planned to mark Alfred's 80th birthday with another special issue of the *American Journal of Science*, designed to showcase the scientific advances that had been made over the past decade in those areas of geoscientific endeavor that were closest to Alfred's heart. Sadly, Alfred passed away on 22 May 2019, less than four months before his 80th birthday (8 September). This is the third and final volume compiled to celebrate his tremendous contribution to geoscientific research.

In the *Preface to American Journal of Science*, volume 310, number 9 of November 2010, a comprehensive outline of Alfred's career up until that date was presented (kindly outlined and supplemented by Alfred) and the reader is referred to this for more details of his earlier career. In the *Preface* to the first of these special issues (volume 321, numbers 1,2 of January-February 2021), we focused on the last ten years, outlining Alfred's major contributions, where his work was principally focused, and the key activities he undertook. We include this information below:

Alfred's long association with Prof Liu Dunyi and the Beijing SHRIMP Center continued throughout the last decade of his life and resulted in a fruitful cooperation that was especially beneficial to young Chinese geoscientists. Alfred would spend several months every year based at the SHRIMP Laboratory, although he made many journeys both within China to deliver invited lectures and short courses at numerous institutions and universities, as well as undertaking many fieldtrips both in China and neighboring countries. In particular, his work on the Central Asian Orogenic Belt (CAOB) was ongoing in Mongolia, Kyrgyzstan and Russia. As Chairman of the International Precambrian Research Center of China (IPRCC), Alfred also organized a series of lectures, workshops and fieldtrips every year; many designed principally for students. The first of these was in May 2010, when the field workshop "Early Crustal Evolution of the SE Kaapvaal Craton in South Africa and Swaziland" was organized and attended by a large contingent from China. In October that year, the 5th SHRIMP Workshop and a workshop on "Advances in high-resolution SIMS and LA-ICP-MS Geochronology and Application to Geological Processes" were held in Beijing and Alfred took an active part in their organization. These were followed by a field excursion to Inner Mongolia to investigate Paleoproterozoic ultra-high temperature rocks of the Khondalite Belt. Also organized during this period was a training course in zircon geochronology including SHRIMP analytical techniques, which was run for the benefit of higher degree students from universities and institutions all over China. This course was presented by Ian Williams, Robert Pidgeon, Lutz Nasdala, William Griffin, Fernando Corfu, Klaus Mezger, M Santosh and Yusheng Wan.

In April 2011, there was the "Lithospheric Evolution through Time" workshop in Beijing presented by Alfred Kroner, Walter Mooney and Ron Clowes, and in October 2012 a training course on "Migmatites, Melting and Intracrustal Differentiation", followed by a fieldtrip for the students held at Taishan in Shandong Province, both run by Michael Brown, Edward Sawyer, Richard White and Simon Wilde.



Alfred and Yusheng Wan checking notes at Anshan in October 2013



Alfred, Guochun, Min Sun and students at the University of Hong Kong in March 2014



Alfred deep in discussion with Shaojie and Yusheng Wan on the September 2014 IPRCC fieldtrip in Shandong Province



Alfred with a group of Chinese geologists on the trip he organized to South Africa in July 2018

Color Plate: Photographs kindly provided by Yamirka Rojas Agramonte, Jean Wong and Simon Wilde

In October 2013, there was a training course on “Structural Geology and Applications to Tectonics and Mineral Deposit Studies” run by Shoufa Lin, Cees Paschier and Lauren Godin. There was also an international meeting later that month on “Precambrian Evolution and Deep Exploration of the Continental Lithosphere”, followed by a post-conference fieldtrip to look at the oldest rocks in China at Anshan, led by Yusheng Wan.

Activities in 2014 included a training course in Beijing in September on “Geochemical and Isotopic approaches to understanding Crustal Evolution” run by Kent Condie and Geoff Vervoort, with a subsequent fieldtrip to Yunmengshan and Miyun near Beijing. There was also a field excursion in October to examine the rocks in Western Shandong, where members of the Beijing SHRIMP Center have worked for a number of years.

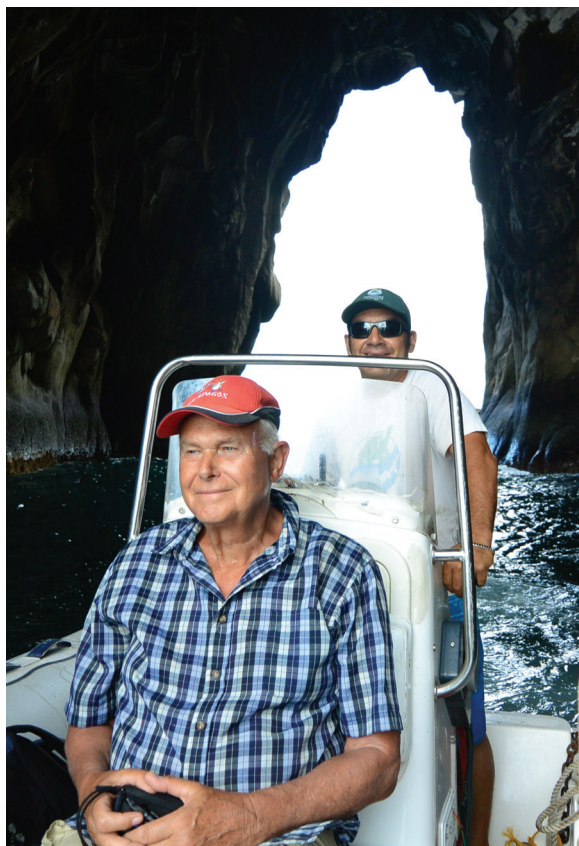
Then in October 2015, Alfred, through the IPRCC, organized a training course on “Precambrian Surface Processes” run by Nick Beukes, Christoph Heubeck and Kurt Konhauser, which was followed by a field workshop in Baotou, Inner Mongolia, to examine Neoarchean to Paleoproterozoic supracrustal and intrusive rocks in the Daqingshan area. In October 2016, a training course on “Global Geodynamic Processes” was held in Beijing, run by Paul Hoffman and Martin Van Kranendonk, and followed by a field excursion to Eastern Hebei.

The following year was particularly busy for Alfred, when in April 2017 he assisted the SHRIMP Laboratory in organizing a major conference in Kunming, Yunnan Province, on “Zircon Geochronology and Crustal Evolution: the smaller the scale the more we learn” which attracted wide participation from China and overseas. This was followed by a field excursion to examine a range of rock-types in Yunnan Province. Then in July and August, the 2nd Taishan meeting and training course was held in Jinan, Shandong Province, to look at the “Applications of Geochronology and Geochemistry in Geoscience”. This was followed by a field training course focused on the greenstone belts and associated TTG-migmatite suite in the Qixingtai area of Western Shandong. In October of that year another training course was organized in Beijing on “Precambrian Lithospheric Tectonics and Modelling” given by Peter Cawood, Craig O'Neill, and Alan Jones, followed by a field excursion to the Three Gorges area in Hubei Province.

In April 2018, a training course was held in Beijing on “Fluids in High-grade Rocks” run by Dan Harlov and Jaques Touret, whereas in July Alfred organized a field workshop in the Limpopo Belt attended by a large number of Chinese geologists. In October, a course on “Global Geodynamics”, given by Richard Ernst and David Evans, was followed by a field excursion to examine the geology of the Qinling Belt in Central China.

In April 2019, Alfred organized a training course in Beijing on “Detrital zircon geochronology and Tectonic Interpretation” that was presented by Pieter Vermeesch and Andrew Cross. Then finally, he organized a training course on “Crustal Melting: Migmatites and Granites” that was presented in October by Michael Brown, Tim Johnson, Chris Yakymchuk, and Simon Wilde. This was to be the last meeting Alfred would organize in China – and he would sadly not be there to see it come to fruition.

Besides all this activity focused in mainland China and Asia, Alfred visited the University of Hong Kong nearly every December since 2010, working extensively with Min Sun and Guochun Zhao and undertaking zircon U-Pb and Hf analyses, using LA-ICP-MS rather than his beloved SHRIMP. Over this period, Alfred remained active in Europe as well, and still sat on a number of committees and attended many conferences. It goes without saying that Alfred still found time to produce numerous research papers over the last decade, especially on the development of the Central Asian Orogenic Belt; currently one of the hottest topics in global geoscience circles.



The final word rests with Alfred: if you are going to undertake fieldwork in remote and exotic places like the Galapagos Islands – then why not enjoy it

Color Plate: Photograph kindly provided by Yamirka Rojas Agramonte

Now for some highlights in the last decade of Alfred's career. In 2010, he received the Friendship Award from the Chinese State Administration of Foreign Experts Affairs in Beijing. He was also made an Honorary Professor of Northwest University in Xian, China, an Honorary Fellow of the Geological Society of America, and an Honorary Professor of the Chinese Academy of Geological Sciences, Beijing. In 2017, he received a special award from the Chinese Academy of Geological Sciences in Beijing for reaching an impressive *h*-index of 100. Currently, Alfred Kroner is still highly cited, with the number of cites increasing annually; attesting to his substantial and lasting contribution to the discipline he loved – geoscience.

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