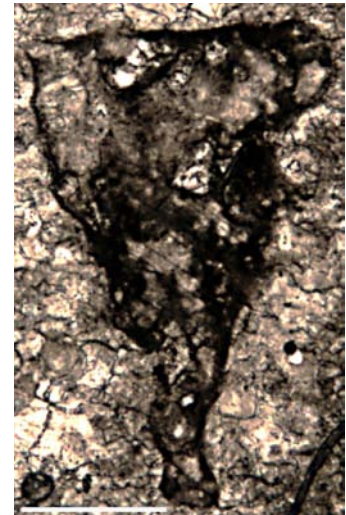


HIGHLIGHTS FROM THE CURRENT ISSUE OF THE SOUTH AFRICAN JOURNAL OF SCIENCE Vol 108, No 1/2 (2012) Jan/Feb

The advent of animal life

In this issue, Bob Brain and colleagues describe what they have interpreted as the oldest animal fossil yet discovered. *Otavia antiqua* is a submillimetre-sized, sponge-like organism preserved in ancient marine rocks (limestones) in Namibia. Some *Otavia* are more than 750 million years old and many range between ca. 700 and 550 million years in age, to a time when the most extreme climatic changes in Earth's history – the 'snowball Earth' glaciations – occurred. *Otavia* is globular in overall form and consists of a carapace of calcium phosphate that is pierced by many openings connected to a network of internal passageways that lead into a large, irregular, interior void, thought to be a primitive gut. It was previously thought that the emergence of animals occurred 600 to 650 million years ago, but this remarkable organism appears to have evolved before, and survived through, the environmental extremes of snowball Earth. Thus *Otavia* may well represent the basal stem group for all animal life.

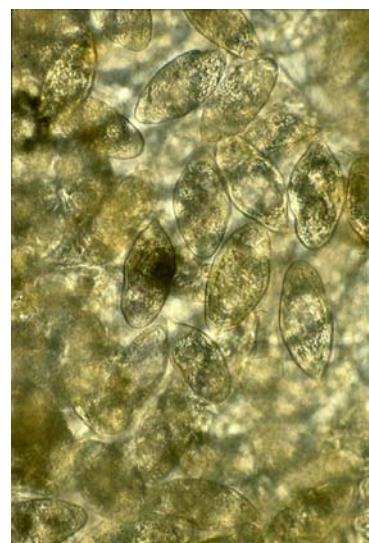


Calcium phosphate carapace of *Otavia* (in black): the oldest animal fossil (Scale bar = 500 μ m)

Read more: Brain CK, Prave AR, Hoffmann KH, et al. The first animals: ca 760-million-year-old sponge-like fossils from Namibia. *S Afr J Sci.* 2012;108(1/2), Art. #658, 8 pages. <http://dx.doi.org/10.4102/sajs.v108i1/2.658>

The reappearance of a disease after 60 years

Twelve years after Dr Theodor Bilharz discovered *Schistosoma haematobium*, the flukeworm that causes urogenital bilharzia, during a post-mortem in Cairo in 1852, Dr John Harley found eggs of the same parasite in the urine of boys from Uitenhage in the Eastern Cape. The disease described by Harley and others in the closing decades of the 19th century was often chronic, but started to decline around 1900. The disease had virtually disappeared by the 1940s, but reappeared in 2002 when an outbreak occurred near Jeffrey's Bay. Why did bilharzia disappear from the Eastern Cape for so long? According to Appleton and Naidoo, it is probably because the Eastern Cape is drought-prone with very cold winters. Waterbodies in the area dry out, causing populations of the parasite's snail host *Bulinus africanus* to die out or show reduced fecundity, preventing transmission of the parasite. Recolonisation would have been slow and the infection of both snails and people would have had to recur annually. The southern



Eggs of *Schistosoma haematobium* lodged in the mucosa of the bladder wall. These eggs typically measure 112-170 x 40-70 μ m. (Photo: CC Appleton)

part of the Eastern Cape is an outbreak area for urogenital bilharzia and the transmission near Jeffreys Bay in 2002 represents the most recent outbreak – which is attributed to reintroduction of the parasite to a local dam by migrant fishermen.

Read more: Appleton CC, Naidoo I. Why did schistosomiasis disappear from the southern part of the Eastern Cape? *S Afr J Sci.* 2012;108(1/2), Art. #411, 11 pages. <http://dx.doi.org/10.4102/sajs.v108i1/2.411>

Are electric vehicles the answer to a cleaner South Africa?

At a time when we are becoming increasingly conscious of our carbon footprints, is it obvious that in order to lower our greenhouse gas emissions in South Africa we should switch to electric vehicles? No, say Liu et al., because the full environmental impact of an electric vehicle depends on the cleanliness of the electricity grid, and South Africa's is not clean. Our electricity comes mainly from low-quality coal, and the latest clean coal technologies have not yet been implemented. Consequently, the use of electric vehicles in South Africa will not result in significant reductions in greenhouse gas emissions, now or in the foreseeable future. In fact, electric vehicles may actually increase some pollutant emissions considerably. These pollutants include the greenhouse gases carbon dioxide and nitrous oxide, as well as sulphur dioxide, which is responsible for acid rain. These emissions could be reduced by a cleaner grid that uses advanced technology and by using renewable energy resources, but this is unlikely to occur in the foreseeable future.



A sign for an electric vehicle charging station - one we may not see in South Africa in the foreseeable future (Photo: MR38, Flickr®, CC)

Read more: Liu X, Hildebrandt D, Glasser D. Environmental impacts of electric vehicles in South Africa. *S Afr J Sci.* 2012;108(1/2), Art. #603, 6 pages.

<http://dx.doi.org/10.4102/sajs.v108i1/2.603>

Climate change negotiations fail the planet

The Durban Platform for Enhanced Action was agreed by national government delegations in the early hours of Sunday 11 December 2011, a day-and-a-half after COP17 was due to end. The platform might represent a diplomatic victory, but it does little to ensure that global warming stays within 2 °C, a target that governments themselves have set, and which is probably too high to avert catastrophe in some regions. In this issue, Wilson discusses global climate change politics and concludes that the COP process is neither ambitious nor fast enough to address what is required. There is, for example, a 6 to 12 *billion* tonne gap between the pledged emission reductions of carbon dioxide equivalents and those that are required to meet the 2 °C target. While it is critical that pressure remains on national governments to negotiate a fair, ambitious and binding agreement, it is also necessary to look outside of the official processes, where there are a myriad of renewable energy alternatives.

Read more: Wilson J. The diplomats fiddle whilst Africa burns. *S Afr J Sci.* 2012;108(1/2), Art. #1065, 3 pages. <http://dx.doi.org/10.4102/sajs.v108i1/2.1065>

Hi-tech spin-offs from MeerKAT and SKA?

Whilst the primary scientific purpose of MeerKAT – one of the world's most sensitive radio telescopes – is radio astronomy, there has always been another very important engineering and public policy goal: to serve as a catalyst for local high-technology development. David Davidson, the SA Research Chair in Electromagnetics for SKA at Stellenbosch University, discusses the potential technological spin-offs from MeerKAT and the South African Square Kilometre Array (SKA) bid. In addition to overcoming the engineering challenges of MeerKAT itself, which include the design of the dishes and minimising electromagnetic interference (both from the instruments and from farming activities in the Karoo), this 'mission-driven innovation' could include spin-offs extending from improvements in data computation to road infrastructure and power provision.

Read more: Davidson DB. Potential technological spin-offs from MeerKAT and the South African Square Kilometre Array bid. *S Afr J Sci.* 2012;108(1/2), Art. #1050, 3 pages.
<http://dx.doi.org/10.4102/sajs.v108i1/2.1050>

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