HUMAN EVOLUTION AND THE ATMOSPHERE: A RETURN TO THE PLIOCENE?

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D.N.F Dunbar Physics Lecture Theatre, Building 39, Daley Rd, ANU

This lecture is free and open to the public.
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The evolution of Australopithecines and subsequently the Genus Homo from about 4.5 million years ago was intimately related to an overall cooling trend associated with orbital forcing of the Milankovic cycles, natural long-term rhythms of global climate change caused by changes in the position of Earth relative to the sun. These included extreme conditions which forced humans to migrate and adapt through development of sophisticated communications (language) and technological innovation, culminating in the mastering of fire and thereby gaining control over the environment. Since the 18th century there has been a release into the atmosphere of over 300 billion tons of fossil carbon buried over hundreds of millions of years. The consequent increase in atmospheric CO2 levels by nearly 40 percent since 1750 threatens the delicate carbon cycle balance of the atmosphere, which allowed the development of the large ice sheets some 34 million years ago and the development of Neolithic agriculture and civilization from about 9,500 years ago. Current climate trajectories are leading toward atmosphere/ocean conditions similar to those of 3 million years ago (mid-Pliocene).

Dr Andrew Glikson is an Earth and early climates scientist, currently researching connections between climate and human evolution, with reference to modern climate change. Since 1964 he conducted geological surveys of large parts of central and western Australia and studied the early evolution of the Earth system, including the role of volcanic eruptions and asteroid impacts in triggering mass extinction of species. He has an asteroid and an impact crater named in his honour by Eugene Shoemaker, the late chief of the US Geological Survey Astrobiology Branch.