Discussion introduced by Dr Simon Turner, Senior Research Associate, Dept of Geography, UCL and Secretary of the Anthropocene Working Group. He has been researching the impact of human activity on environmental systems since PhD research in the late 1990s on Anthropocene timescales of environmental change.

The key techniques involve using geochemical, physical and radiometric analyses (mercury, trace metals, nitrogen and carbon isotopes, fly-ash, microplastics, organic pollutants, weapons test and natural radionuclides) to record environmental change and the history of anthropogenic contamination and its impact on freshwater organisms.

The ‘Anthropocene’ was coined in the 1980s, then popularised in 2000 by atmospheric chemist Paul J Crutzen and diatom researcher Eugene F Stoermer. By way of background, the NHM comments that:

*“It is widely accepted that our species,*[*Homo sapiens*](https://www.nhm.ac.uk/discover/the-origin-of-our-species.html)*, has had such a significant impact on Earth and its inhabitants that we will have a lasting - and potentially irreversible - influence on its systems, environment, processes and*[*biodiversity*](https://www.nhm.ac.uk/discover/biodiversity.html)*. To make matters more complicated, the word Anthropocene is used in a variety of cultural and scientific contexts. Researchers, conservationists, poets, philosophers, politicians and activists are all using it, and often they mean quite different things.*

*Although there have been*[*mass extinction events*](https://www.nhm.ac.uk/discover/what-is-mass-extinction-and-are-we-facing-a-sixth-one.html)*in Earth's history where vast swathes of life have been wiped out, until now they have all been triggered by natural causes like asteroids and volcanic eruptions. This is the first time a single species has caused such destructive effects on the natural world and had an awareness of doing so.”*

The proposed start of the Anthropocene is 1952 (when the plutonium from hydrogen bomb tests appeared in sediment in a Canadian lake). This would then mark the official point when the world moved out of the Holocene, a relatively stable period beginning after the end of the last ice age and if ratified by the international Anthropocene Working Group, a Global Boundary Stratotype and Section Point (GSSP, or ‘golden spike’) for the Anthropocene would be created.

However, after 15 years of discussion, by a 12 to 4 vote last month, the international Subcommission on Quaternary Stratigraphy decided against the proposal to make the Anthropocene an official epoch. This triggered reports in the press that the decision “bore the hallmarks of neglect of due scientific process and calls for the decision to be annulled” because most scientists felt that the data collected in the past 20 years or so as simply overwhelming and the sediments deposited wholly different to the Holocene.

<https://www.nature.com/articles/d41586-024-00868-1>

The post WW2 heavily fossil-fueled era with huge increases in both CO2 and human population, radionuclides spread around the globe from atomic weapons testing, vast output of vehicles, plastics and household products in particular, the gigantic landfill dumps around every large conurbation, changes in farming (horses to tractors) and world trade practices, world-changing deforestation (after the invention of the chainsaw), all of which were radically different from the pre-war circumstances. Most historians and culturalists for example, readily identify with these early 1950’s changes.

The IUGS is the parent organization for the International Commission on Stratigraphy (ICS), to which the SQS belongs. “There is no further supreme court one can go to,” says Jan Zalasiewicz, a palaeontologist at the University of Leicester, UK, who is the SQS chair who protested against the subcommission’s vote. “I have no immediate plans for a challenge.”

Under ICS (the International Commission on Stratigraphy) rules, such a proposal would normally be discussed for a 30-day period and then voted on for another 30 days. Zalasiewicz says that he and vice-chair Martin Head, a stratigrapher at Brock University in St. Catharines, Canada, recused themselves from moderating the discussion because of conflicts of interest from their earlier participation in the Anthropocene working group. When the discussion period ended and other SQS members moved to vote on the proposal, Zalasiewicz and Head objected, saying that it had not been given serious consideration and that the vote was rushed.

The Anthropocene has become a hot topic, particularly among the historical community, perhaps more so that from the scientific groups surprisingly, and since the GSL had played a pivotal role in the past in supporting the Anthropocene proposal in 2006, Simon felt that it was highly appropriate in holding this meeting with the GSDG. Another significant factor in public perception must surely be the fact that many people still alive can recall 1950 and therefore recognise easily that they or their parents were actually born in the previous epoch! They can relate to 74 years in their own family whereas none of us can relate so easily to say a million years. This must also offer scientists an opportunity to help publicise the environmental impact that humans have made on the planet in a comparatively short space of time.

Given that the Anthropocene is a popular topic that people generally can relate to the factors which underly it, it seems truly astonishing that a scientifically specialised international group should actually oppose it. Why would that be? Why would anyone oppose the establishment of a fixed a ‘stratotype’ or GSSP (Global Boundary Stratotype Sections and Points - reference points on stratigraphic sections of rock) particularly as if subsequent more refined information becomes available, they can be revised in the future?

Proposed GSSPs for the Anthropocene include in the mud at the bottom of Crawford Lake mud (near Toronto) ice cores from Antarctica, a coral reef from Australia and peat from Poland. A world-famous example is the so-called K-T boundary at the end of the Cretaceous, for which the GSSP marker is in Egypt rather than probably the better-known example is on the Italian coast as it better shows the changes in the sedimentary record.

The reality is that in the past, a great deal of prior evidence had been gathered before the Holocene term was adopted in 1885, but it was not until 2009 when the official marker for the Holocene’s start in 2009 was agreed from a borehole in the central Greenland ice sheet.

It may be therefore, that a vote in favour of the Anthropocene by the International Commission on Stratigraphy is going to take time, despite the evidence. This is a great pity as it means that it will not be taught in schools because it will still be a concept, not a recognised fact, which will change how people regard the planet.

In the Holocene, the age that can be defined in an ice core is +/- 1 year with a 95% probability. The first stages of the industrial revolution can be seen in ice cores - particles from high temperature combustion, dispersed metals, changes in Nitrogen isotopes indicating power generation, so it is very likely that the Anthropocene can be defined to an actual year. The primary marker for the Anthropocene however is Plutonium; the first atomic test occurred in New Mexico on 16 July 1945 and atmosphere testing continued until a peak in 1964 - when the test ban treaty was signed! [The first H bomb was tested in the Marshall Islands on 1st November 1952 and no doubt that can be identified in ice cores as well.]

The fear is that the recent international decision on the Anthropocene may reflect a fear that a positive decision on the Anthropocene would, at the same time, also be defining the end of the Holocene (and hence also the end of the Quaternary as well). Sadly, at present, reasons for the decision had not been published, but it is recognised that in stratigraphy, there is an inherent conservativism and a desire to make decisions as soundly based as possible.

By contrast, in China, the Academy of Sciences recognises the great geopolitical importance of a GSSP (<https://en.wikipedia.org/wiki/Global_Boundary_Stratotype_Section_and_Point>)

and there is active promotion to the public.

In summary, there was unanimous encouragement for Simon to prepare an article or opinion piece for Geoscientist.

John Bennett