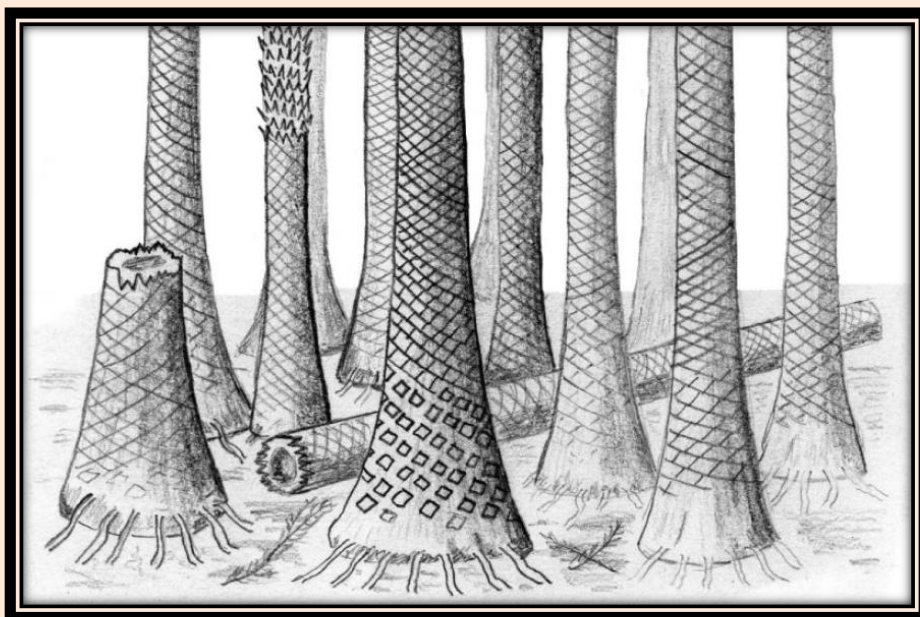


Earliest fossil forests unearthed in Svalbard of Arctic Ocean

Recently two researchers, Chris Berry from Cardiff University and Marshall from Southampton University of UK have unearthed ancient fossil forest in Svalbard, a Norwegian archipelago in the Arctic Ocean. These fossil forests with tree stumps preserved in place were thought to be partly responsible for one of the most dramatic shifts in Earth's climate in the past 400 million years. While Dr Berry from School of Earth and Ocean Science of Cardiff University had identified and described these fossils, John Marshall from National Oceanography Centre at Southampton University had predicted that the forests are dated to 380 million years ago. Their findings have been published in the journal *Geology*.

The forests grew near the equator during the late Devonian period, and could provide an insight into the cause of a 15-fold reduction in levels of carbon dioxide (CO₂) in the atmosphere around that time. Current theories suggest that during the Devonian period (420-360 million years ago) there was a huge drop in the level of CO₂ in the atmosphere, thought to be largely caused by a change in vegetation from diminutive plants to the first large forest trees. As the regions near equator experienced both high temperatures and large amount of rainfall, it is likely that equatorial forests contributed to most of the CO₂ decline. It should be noted that Svalbard was located on the equator around this time, before the tectonic plate drifted north by around 80° to its current position in the Arctic Ocean.



Reconstructed drawing of fossil forest in Svalbard.

Credit: Image courtesy of Cardiff University

Another interesting feature about these fossil forests is that they were formed mainly of lycopod trees, better known for growing millions of years later in coal swamps that eventually turned into coal deposits, such as those in South Wales. These fossil forests thus help in predicting the vegetation and landscape type that would have existed on the

equator before 380 million years, as the first trees were beginning to appear on Earth. The researchers further observed that the forests were extremely dense, with very small gaps i.e., around 20 cm between each of the trees, which probably reached about 4 m high.

Using the results his previous similar kind of study in America, Dr Berry stated that, “there was already geographical diversity of forest plant types and ecology just as soon as they had evolved”. Further he added that, “the evolution of tree-sized vegetation is the most likely cause of this dramatic drop in carbon dioxide because the plants were absorbing carbon dioxide through photosynthesis to build their tissues, and also through the process of forming soils”.

Svalbard is currently one of the most northernmost inhabited areas in the world with a population of around 2,500. Svalbard now plays host to the 'Global Seed Vault' -- a secure, underground frozen seed bank in which a large variety of plant seeds are preserved. The vault functions to provide a safety net against a loss of diversity in a global crisis.

Dr Berry concluded that, "It's amazing that we've uncovered one of the very first forests in the very place that is now being used to preserve the Earth's plant diversity" continued.

Source:

<http://www.sciencedaily.com/releases/2015/11/151119103544.htm>