PALAEONTOLOGY

A long-lost tundra

Hidden deep beneath vast ice sheets and in foreboding desert valleys lie remnants of Antarctica’s warmer past. Before the dawn of the southern ice sheets, Antarctica was covered by plants, lakes and rivers — a landscape that would be quite unfamiliar to the penguins and seals that call the continent their home today.

Beginning about 50 million years ago, the Earth’s climate started to cool, and by 34 million years ago ice sheets slowly marched across the southernmost continent. Although this cooling marked the end of the reign of many temperature-sensitive plants, little is known about the survival of the more rugged shrub tundra community. Now Adam Lewis of Boston University and colleagues have discovered a wealth of fossils in the McMurdo Dry Valleys that chronicle the final demise of the tundra (Proc. Natl Acad. Sci. USA 105, 10676–1068; 2008).

The team found spectacularly preserved fossils among the sediments of ancient alpine lakes from about 14 million years ago. The deposits revealed a number of diatoms and ostracods that colonized the lake surface and the bottom sediments. The researchers also found a number of semi-aquatic mosses from the lake shore and other mosses blown or carried in from further away. In addition, the sediments were rife with pollen from a number of plants, including beech trees, as well as the occasional beetle.

This fossil assemblage suggests that the lakes in question were permanent, and largely free of ice throughout the year. However, the lakes of that area, and their denizens, were gone 200,000 years later. The team used glacier modelling to conclude that air temperatures rapidly decreased by 8 °C from 14 to 13.8 million years ago. The overlying sediments suggest that the temperatures, and the tundra, never recovered.

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