Lesson 27: Glaciers and Iceages

The Great Lakes of North America, some of the largest freshwater lakes on the planet, did not exist a million years ago. They were not carved by rivers or formed by volcanoes. They were scooped out of the bedrock by ice. Enormous sheets of glacial ice, in some places more than two kilometers thick, ground slowly southward across the continent, scooping up rock and soil as they went. When the ice eventually melted, the basins it had carved filled with meltwater. This is the power of **glaciers**: patient, relentless, reshaping landscapes in ways that last for millions of years.

A glacier forms when snow accumulates in cold regions faster than it melts. Year after year, new snow presses down on old snow, compressing it into dense ice. When enough ice builds up, it begins to flow under its own weight, a slow river of ice moving a few meters a day, grinding over everything beneath it. This is one of the most powerful forces of **erosion** on Earth. Glaciers can flatten mountains, carve deep U-shaped valleys, and carry boulders the size of houses hundreds of kilometers from where they started. The classic mountain valleys of Norway and the Alps were shaped entirely by glaciers that retreated thousands of years ago.

Earth's **climate** has cycled in and out of **Ice Ages** many times throughout its history, driven by subtle, predictable wobbles in Earth's orbit around the Sun. During the **Pleistocene** Epoch, from about 2.6 million to 11,700 years ago, ice sheets advanced and retreated repeatedly across the northern continents. During the coldest periods, **sea level** dropped by more than 100 meters as enormous quantities of water were locked up in ice. That exposed vast areas of the continental shelves, land that is now underwater, and created bridges between continents that allowed animals and people to walk to places they could not otherwise reach.

The last Ice Age ended about 11,700 years ago. As the glaciers melted and retreated, colossal floods of meltwater carved new channels, built new deltas, and filled new lakes. The world's coastlines shifted as the sea returned. The landscape of every continent was reshaped. The world we recognize today, its river systems, its lake districts, its valleys and plains, was largely built by ice.