

A Green Sahara.

Changes in the Earth's orbit (one of the [Milankovitch Cycles](#)) lead to different patterns in the Sun's energy reaching the Earth. On timescales of 40,000-100,000 years, the most visible impact of these is near the poles where the total amount of ice changes in response, causing "glacial-interglacial cycles". In the Tropics - where the temperature doesn't change so much through the year, rainfall determines the seasons. The Tropics are more influenced by changes in the orbital precession, another Milankovitch cycle, which has a ~21,000 year cycle. This cycle shifts the main band of rain (the Intertropical Convergence Zone or ITCZ) either further into the Northern Hemisphere or into the Southern Hemisphere.

Around 12,000 years ago, rain penetrated its furthest north. One consequence of this was more moisture making it up to where the Sahara desert is. With the greater moisture, plants were able to grow. This greening of the region led to climate feedbacks – as the land cover changed colour there was more moisture recycling. This changed the Sahara from desert to shrub-land. A burgeoning population of Hunter-Gatherer-Fisher folk lived in the Southern Sahara until around 7,000 years ago, at which they were replaced by early pastoralists – probably combining animals imported from the Fertile Crescent (present-day Iraq) with locally domesticated cattle. Some rock art remains as a legacy of the period.

Unfortunately, the Milankovitch cycles were working against them, and as the orbital precession changed the monsoon rain band retreated back towards the Equator. Around 5,500 years ago (3,500 B.C.), the climate-vegetation feedbacks were not strong enough to maintain the moisture needed to support shrub-land, and the region abruptly changed back to desert. The resultant immigration into the Nile Delta out of the newly reformed Saharan desert is thought to have been a catalyst of ancient Egyptian civilization.

