

The Three-century Climatic Upheaval Of 2000 BC

Douglas J. Keenan (The Limehouse Cut, London E14 6N, United Kingdom; phone/fax +1-630-604-3528; doug.keenan@informath.org)

Several researchers have previously identified a severe climatic upheaval in tropical North Africa that began just over 4000 years ago and lasted for about three centuries. The upheaval is known to have occurred shortly after a volcanic eruption, and companion work proposes that this eruption was colossal. Here, we suggest how the eruption acted as a trigger for the upheaval: by forcing changes in ocean circulation; although the initial (atmospheric) forcing lasted only a few years, the ocean required three centuries to regain equilibrium. The suggested triggering mechanism is supported by palaeoceanographic, palaeoecological, and archaeo-historical data and by related experiments with a (coupled general-circulation) climate model. We argue that the changes in ocean circulation forced changes in sea-surface temperatures that led to a weakening of the south-west North African monsoon. The upheaval has been proposed to have also encompassed south-western Asia. We argue that it encompassed most of the world: we present a variety of palaeoecological and palaeoceanographic evidence and describe the principal underlying climatology. In some areas the upheaval was the most severe since the ice ages. Its effects on civilisations were great.