

## **The Role of Volcanic Eruptions in Human History and Civilization**

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Volcanic eruptions have played a schizophrenic role in human history. Life on earth has evolved within an environment which volcanic eruptions have played a vital part in forming, yet the human species may barely have survived the environmental disruptions which followed the ~74 000 BP Toba eruption. In contrast to popular perceptions, throughout history and prehistory cultures and civilizations have developed and thrived, often despite an intimate association with active volcanoes. This paper explores the relationship between cultures and volcanic eruptions and suggests that, contrary to popular myth, it is relatively rare for cultures to have been severely damaged by volcanic activity alone. Archaeologists and ancient historians love volcanic eruptions; they are big, spectacular events and they can use the eruption to account for almost any change in a culture's history and development that they struggle to explain through their main research tools. Often a circular argument is used; 1) significant cultural change is noticed which cannot be explained and must therefore have been caused by a large external forcing mechanism, 2) a volcanic eruption is discovered to have occurred within the limitations of available dating, 3) the eruption MUST have been large enough to have caused the cultural change, 4) the cultural change was caused by a massive volcanic eruption. This phenomenon is demonstrated in wide a variety of literature which associates what must have been the very busy Hekla 3 eruption (VEI4) with narrow tree rings in Ireland, wide tree rings in Turkey, settlement abandonment in the north of Scotland, the fall of Mycenae, the rise of the sea Peoples, plague in Ireland, the collapse of Hittite civilization on the Anatolian plateau, flooding in Hungary, A rise in the level of the Caspian sea etc and most of these phenomenon are not even precisely dated. Wherever we look in the world to see cultures and volcanic eruptions living side by side we can observe a process of adaptation and response. Simple societies in particular appear very resilient. In Japan, time after time villages were destroyed by eruptions and buried by ash fall, and time after time people returned, put paths in the same places, built houses on the foundations of the old and even disposed of household wastes in the same place. Despite the occurrence of ten volcanic eruptions in Costa Rica during a period of 4,000 years, archaeologists have reconstructed a quite remarkable picture of cultural stability. In Papua New Guinea, simple cultures have been exposed to very large eruptions, which would have undoubtedly killed many indigenous peoples, but the cultural toolkit of newcomers, their civilization, was often indistinguishable from that which it succeeded. Settlement on the Palma Campania around Vesuvius is nearly continuous from prehistory to the present day. Cultures and civilisations may therefore be resilient in the face of the impact of a many volcanic

eruptions. But what of Thera and Minoan civilisation? Most current interpretations of the dating framework of the event suggest that the final collapse of the Minoans was over 100 years after the eruption. And one culture's catastrophe may be another's opportunity; with the fall of the Minoans the Mycenaean culture glorified by Homer and Schliemann rose to prominence. Volcanoes must be allowed their influence on human society, but this must be measured by a clear understanding of the dynamics of the eruption and its influence on environment and the vulnerabilities of each society. It is not good enough to simply quote temperature anomalies and shout famine! If one looks at Europe in 1816 following Tambora, the summer was cooler on average, Germany, the Netherlands and France experienced record rainfall and agricultural trauma û but Denmark and points north experienced a famously dry summer and bumper crops; the same atmospheric circulation anomaly was responsible for both conditions!