

University of Reading



**Earth, air, fire and water.
An elemental analysis of the Minoan eruption of
Santorini volcano in the Late Bronze Age.**

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Abstract

Around 3600 years ago one of the largest volcanic eruptions of the last several thousand years occurred on the island of Santorini in the southern Aegean Sea. An important prehistoric town on Santorini was destroyed. Finds from the island linked the eruption to the early Late Bronze Age, and specifically, the Late Minoan I period of Crete a little over 100 km to the south. The scale of the eruption indicates a regional impact. In 1939 a Spyridon Marinatos, advocated in a leading archaeology journal that the eruption directly caused the destruction of the civilisation of Minoan Crete. Since then there have been many claims and counter-claims for the impact of the eruption: on Crete, in the Aegean, and even further afield. Views at present remain sharply divided; and the evidence required to support or deny positions is still often inadequate.

This study seeks to provide and analyse new, rigorous, data relevant to several key aspects of the question of the impact of the Minoan eruption of Santorini. In the context of a critical examination of the pivotal data and discussions of previous authors, a new assessment is made of its nature, seasonal timing, and impact.

The archaeological setting for the eruption is examined, and three zones most at risk are identified. The volcanological data on the eruption are critiqued and a range of physical characteristics of the eruption drawn up. The pyroclastic products which have been attributed in the literature to the eruption are examined to assess their quality. It has been proposed that a large tsunami was a major factor in the destruction of human settlement sites. Possible methods of tsunami generation by the eruption process are formulated and the question of tsunamis within the stratigraphic record is assessed.

Fieldwork was undertaken on Crete and Rhodes. This fieldwork highlights the importance of the coastal zone for preserving evidence of the eruption and provides further quality evidence on the tephra fallout. The fact that coastal areas of these islands are fast vanishing resources for the archaeological and environmental history of the region is highlighted.

Finally, a series of simulations, using a computer model, of the Santorini eruption tephra fall are undertaken. Modern wind data is used to distribute the tephra and the results

suggest that the eruption occurred in the summer months. Thus there may have been a significant impact on crops ready for harvest and in the process of storage.

The thesis demonstrates that simplistic ideas of cause and effect for the Minoan eruption are unrealistic. It highlights that sites are affected on an individual basis and that concepts of civilisation collapse are not valid. The loss of settlements on Santorini itself is shown to be significant. Sites to the east of Santorini, such as Trianda on Rhodes, are demonstrated to have been significantly affected by the tephra fallout. Clear evidence for damage on Crete is both more ambiguous and restricted. Combined with considerations of the exact date of the eruption, versus the dates for the destructions of the Minoan palace sites, it appears difficult now to sustain any significant causal connection. Further multi-disciplinary work is proposed for the coastal zone in an effort to retrieve ephemeral but highly significant data that is currently not available.

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