A METHODOLOGICAL APPORACH FOR INTERPRETING DISASTER RESPONSE IN ANTIQUITY

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A Methodological Approach for Interpreting Disaster Response in Antiquity

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Abstract

Archaeologists have long been interested in identifying earthquakes in the archaeological record, although they have traditionally portrayed seismic disasters as cataclysms over which humans have no control. However, a seismically-induced disaster is not just an event visited upon a human population, but is the result of interactions between human actions and natural processes, meaning that humans have some agency over the occurrence of a disaster and its outcomes. This failure to consider the role of human agency in seismic disasters has limited our ability to understand the material record at sites affected by these events. In order to resolve this issue, I present a new methodological for understanding ancient seismic disasters which investigates the role of human agency in these events by taking people’s responses as its focus. Since people’s responses to modern disasters have been subject to more thorough investigation, this approach draws partly from methods developed for the study of these modern events.

As a case study, I apply this method to evidence from Kourion, a city on the island of Cyprus which was affected by an earthquake in the late fourth century CE. The traditional interpretation of the Kourion earthquake, developed by David Soren, is that it struck the city and the nearby Sanctuary of Apollo Hylates in 365 CE, resulting in the abandonment of both sites, with the city being reoccupied in 383. My analysis of the earthquake differs from Soren’s in several respects, as I suggest that the earthquake occurred between 370 and 380, and that the city was not abandoned following the event. Moreover, I argue that changes to the urban landscape at Kourion after the earthquake are not solely attributable to the earthquake, but are also related to broader cultural and religious changes happening in the Mediterranean region during the Late Antique period. I also suggest that the abandonment of the sanctuary was related to these changes, and was not caused by seismic activity.
Lay Summary

The primary goal of this thesis is to develop a method for investigating how people responded to damage caused by earthquakes in antiquity. Archaeological research has generally focused on identifying these events, ignoring the role that people’s responses play in shaping the development of a site after an earthquake. I use the Late Antique city of Kourion, Cyprus as case study for testing this methodology; archaeologists have known that the city was struck by an earthquake since the early 20th century, but people’s responses to the disaster have never been thoroughly investigated. Using my methodological approach, which treats the outcome of seismic disasters as a result of interactions between people and earthquake events, I argue that changes in the urban layout at post-earthquake Kourion cannot be solely attributed to the earthquake, but are also related to broader cultural and religious changes happening in the Mediterranean region during this period.
Preface

This thesis is the original, unpublished, independent work by the author, A. Marlyn.
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Finally, I would like to thank my parents, who have always supported me in my education.
Chapter 1: Introduction

Earthquakes posed a significant hazard to the ancient inhabitants of the Mediterranean region, just as they do to people in the modern day. Archaeologists have long been interested in identifying these events in the archaeological record, often for the purpose of explaining widespread destruction. The impact of earthquakes on ancient populations has also been a subject of discussion, with the seismic event being portrayed as a cataclysm over which humans have no control. However, a seismically-induced disaster is not just an event visited upon a human population, but is the result of interactions between human actions and natural processes, meaning that humans have some agency over the occurrence of a disaster and its outcomes.

Because archaeologists have rarely considered the role played by human populations in seismic disasters, this has limited our ability to understand the material record at sites affected by these events. The consequences of a natural disaster on a site’s trajectory of development cannot be correctly interpreted without investigating the reactions of its population. Therefore, in order to better understand seismic events in the archaeological record, a new methodological approach is required, one which treats earthquakes as disasters, as opposed to explanatory mechanisms or natural phenomena. In this paper, I present such an approach, which facilitates the investigation of the role of human agency in seismically-induced disasters by taking people’s responses as its focus. Since people’s responses to modern disasters have been subject to more thorough investigation, this approach draws partly from methods developed for the study of these modern events. As a case study, I apply this method to evidence from Kourion, a city on the island of Cyprus which was affected by an earthquake in the late fourth century CE.

1 Blaikie et al. 1994, 3-4.
1.1: Agency and earthquakes

As this project seeks to discuss the role of human agency in ancient disasters, it is necessary to frame my use of the term within broader theoretical discussions on the topic. Since its development in the 1980s as a critique of structuralism, the concept of agency has undergone a number of transformations.² In the 1990s, when the term entered mainstream archaeological discourse, it referred to the ability of an individual to carry out a desired action; desires were assumed to be intrinsic to human nature, and unrelated to cultural context.³ In the 2000s, agency was used to discuss the ways in which social actors reproduce and transform the structures which guide their actions; these structures were conceptualized as culturally specific.⁴ Most recently, theorists have decoupled agency from its association with the individual; groups of people and objects can also exert agency. Social action is conceived of as a product of the relationships between people and these other types of actors.⁵

I would like to draw attention to two aspects of this body of theory which are involved in my use of the term “agency.” The first is the concept of object agency. The material world left behind by the earthquake shaped people’s actions following the event; the word “response” itself implies a dialogue between human and non-human agents which forms the action taken. The second theoretical concept relevant to my discussion is that the structures which guide peoples’ decision-making processes are culturally specific. Peoples’ responses to earthquakes are thus developed in relation to these culturally-specific structures. In addition, since disasters arise from interaction between human actions and natural processes, they themselves are shaped by the socio-cultural context of the actors involved in their creation. Part of the reason the earthquake

² Dobres and Robb 2000, 4-8; Dornan 2002, 303-304; Robb 2010, 495.
³ Robb 2010, 496.
⁴ Robb 2010, 497-498.
which struck Kourion initiated a disaster is because certain types of architecture, which were highly vulnerable to the effects of a seismic event, made up a significant part of the physical and cultural landscape of the city. Therefore, the outcome of any disaster will have been shaped by the socio-cultural context in which it takes place. These particular aspects of agency theory form the framework upon which my arguments regarding disaster responses are built.

1.2: Building a methodology for investigating disaster responses in antiquity

To develop an approach for investigating people’s responses to earthquakes in antiquity, I have in part looked to other archaeological methods for discussing disasters in antiquity. However, since interest in investigating disasters themselves is relatively recent, I have also drawn from methods used by scholars of modern disasters.

One approach for investigating the roles of both human action and natural processes in a disaster comes from archaeologist Satoru Shimoyama. He argues that instead of only reporting the occurrence of a disaster, archaeologists should attempt to reconstruct its “basic characteristics,” which are the factors that shape the disaster and its outcomes. He has organized these factors into six categories: initiation, immediate causes, local conditions, damages, assessment, and actions (Table 1.1).\(^6\) Unfortunately, since some of Shimoyama’s characteristics can only be identified using geological data,\(^7\) his approach cannot be applied in its entirety at sites which lack this data (Kourion being one such site). However, certain aspects of Shimoyama’s method are useful, in particular his inclusion of assessment in the basic characteristic of natural disasters. This concept, which describes the process of examining

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\(^7\) Different types of data may be needed to identify the basic characteristics of different types of disasters. See Shimoyama (2002, 22) for an example.
damages caused by a disaster, restores agency to the people impacted by a natural disaster, as it emphasizes the decision-making processes which resulted in people’s responses. While the assessments themselves are not present in the archaeological record, they can often be reconstructed based on people’s responses.\(^8\)

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Definition</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Initiation</td>
<td>A natural process (often an extreme natural event) which initiates the disaster</td>
<td>An earthquake</td>
</tr>
<tr>
<td>Immediate causes</td>
<td>Aspects of the event which affect its impact on human populations</td>
<td>The magnitude of the earthquake</td>
</tr>
<tr>
<td>Local conditions</td>
<td>Aspects of the local environment either natural or social, which affect the impact of the event on human populations</td>
<td>The type of soil underlying buildings</td>
</tr>
<tr>
<td>Damages</td>
<td>The concrete negative effects of the event</td>
<td>The collapse of a house as a result of earthquake-induced shaking</td>
</tr>
<tr>
<td>Assessment</td>
<td>The process of examining the damages and deciding how to respond to them, undertaken either by the victims or other relevant parties (e.g. landlord)</td>
<td>The owner of the house deciding if it should be rebuilt</td>
</tr>
<tr>
<td>Actions</td>
<td>People’s responses to the damages caused by the event</td>
<td>The reconstruction of the house</td>
</tr>
</tbody>
</table>

*Table 1: Shimoyama’s basic characteristics of natural disasters. Adapted from Shimoyama 2002, Table 2.1.*

To investigate how people’s decision-making processes may differ within a population, I make use of a framework termed “the access model.” This framework by was developed by scholars of modern disasters to explain how an individual’s access to resources affects their vulnerability to a hazard.\(^9\) Vulnerability, in the context of disaster scholarship, means the ability of a person to manage the consequences of a natural hazard.\(^10\) This framework proposes that access to resources is not evenly distributed, and that access is based upon a person’s

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9 Blaikie et al. 1994, 47.
socioeconomic status. Factors such as social standing, gender, or wealth can thus impact access to resources. As a result, when a disaster occurs, not everyone is equally vulnerable to its effects.\footnote{Blaikie et al. 1994, 48-49.} Since disparities in resource access existed in the ancient world, this model can be easily applied to the study of ancient disasters.

The utility of the access model can be demonstrated by examining a modern disaster such as Hurricane Katrina, which struck the city of New Orleans in 2005.\footnote{The ongoing COVID-19 pandemic has also brought to light the importance of socioeconomic status in determining the outcome of a disaster, as certain groups (such as those in care homes) have been more severely impacted than others.} Poor residents and black residents of the city were disproportionately impacted by the flooding caused by the hurricane\footnote{Squires and Hartman 2007, 5-6.} for a number of reasons related to their ability to access certain resources. Housing in New Orleans was highly segregated along both racial and economic lines, with the result that black residents were concentrated in the city centre, where flooding was most severe.\footnote{Squires and Hartman 2007, 4-5.} Middle- and upper-class white residents largely lived in the suburbs, which were higher in elevation, and thus less susceptible to flooding. Wealthier residents were also able to leave the city more easily, as they had easier access to transportation and temporary housing.\footnote{Squires and Hartman 2007, 4-5.} Even in cases where wealthier people did not have the ability to evacuate, they often had social relationships with people in positions of power that could help them escape; one example of such a situation is when Al Gore chartered two planes to remove patients from a hospital because a doctor in the hospital knew him and asked for his help.\footnote{Squires and Hartman 2007; 4-5.} In contrast, racist actions on the part of individuals in power prevented black residents of the city from escaping, such as when police in a neighbouring town blocked a bridge leading out of New Orleans.\footnote{Squires and Hartman 2007, 2.} Therefore, considering people’s differing access...
to resources is essential in understanding why certain populations were disproportionately affected by this disaster.

The access model, along with Shimoyama’s concept of assessment, provide a framework for my discussion of people’s responses to seismically-induced damage at the site of Kourion during the late fourth century CE. Previous investigations into earthquake destruction at the site have largely avoided discussing the responses of the site’s inhabitants to this disaster, making it an excellent test case for this methodological approach.

1.3: The history of Kourion and its excavations

There are a number of aspects of the Kourion’s history and the history of excavations which are relevant to discussions of seismic activity at the site. Understanding the history of the site is important because its trajectory of development prior to the earthquake shaped how its residents responded to the impact of this event. This is made evident in Chapter 3, where I discuss responses to seismic activity at two different parts of the site, Kourion city and the Sanctuary of Apollo Hylates. The history of excavations at Kourion is significant because the processes of excavation at the site, and the presentation of the data gathered during these excavations has impacted what data is available, and in what ways the data can be interpreted.

1.3.1: History of Kourion

The site of ancient Kourion is located on the southwestern coast of Cyprus (Figure 1.1). The city itself occupies a promontory above the Mediterranean coast, while the associated Sanctuary of Apollo Hylates is located 2 km to the northwest (Figure 1.2). \(^{18}\) The region surrounding the

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\(^{18}\) Costello 2014, 8.
ancient city has been continuously occupied since the Neolithic, although there is no evidence of occupation on the promontory itself until the Cypro-Classical period (475-325 BCE); evidence from this period is rather scant (see Table 1.2 for an overview of the chronological periods on Cyprus). By the Hellenistic period, Kourion was prosperous and of a moderate size, as attested by epigraphic and archaeological evidence. Enough of the infrastructure of this period is identifiable to determine that Kourion possessed the typical architectural features of a Hellenistic city, although most of these remain buried beneath Roman or Byzantine construction.

Kourion’s theatre, which was used throughout the Roman period, was initially built during the second century BCE, although it underwent a number of renovations throughout its use-life.

![Figure 1: Map of Cyprus, showing the location of Kourion and other ancient cities. Davis 2010, 6.](image)

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19 Costello 2014, 6-7.
20 Costello 2014, 10.
21 Costello 2014, 10-14.
Much of the visible architecture visible today at Kourion city dates from the Roman period (Figure 1.3). The city experienced relatively frequent alterations to its public infrastructure up until the fourth century, which were largely linked to imperial benefaction. In addition, it is thought that Kourion was struck by an earthquake in 77 CE, which may have necessitated the reconstruction or repair of major structures. Buildings relevant to this study which were constructed during this period include the nymphaeum (built in the first century) and the stoas which surrounded the forum (built in the second century). Two other structures, the Earthquake House and Building 4, were also occupied during the Roman period, although their exact date of construction remains unknown. Almost all of these buildings were renovated over the course of the Roman period.  

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22 Christou 1986, 14.  
23 Costello 2014, 13-14; Grimsley et al. (forthcoming, 5-6, 8-9).
Figure 3: The excavated remains of Kourion city. Costello 2014, 11.
During the late fourth century, the city of Kourion was severely impacted by seismic activity, and it is widely accepted that the city was abandoned until the very end of the fourth or early fifth century. The importance of Christianity at the site during the period following the earthquake is evidenced by the development of Kourion’s Episcopal Precinct starting at the beginning of the fifth century. The city’s main basilica, the central building of the precinct, was built on the footprint of its Roman counterpart. Another significant structure built in the post-earthquake period is the House of Eustolius, which despite bearing the form of a Roman villa with an associated bath complex, appears to have been used as a public building. A number of non-monumental buildings, which were composed of many small rooms, were also built during this period, and occupied parts of the forum and the surrounding area.24

Kourion was occupied until the seventh century, when the city was destroyed by Arab fleets from Tyre.25 After Kourion’s destruction, its population relocated to the nearby site of Episkopi, which has been continuously occupied up to the present day. Aside from the use of the city’s monuments as a source for lime between the eighth century and the end of the Medieval period, Kourion remained undisturbed until the arrival of antiquarians in the 19th century.26

<table>
<thead>
<tr>
<th>Cultural Period</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cypro-Archaic</td>
<td>750-475 BCE</td>
</tr>
<tr>
<td>Cypro-Classical</td>
<td>475-325 BCE</td>
</tr>
<tr>
<td>Hellenistic</td>
<td>325-58 BCE</td>
</tr>
<tr>
<td>Roman</td>
<td>58 BCE-400 CE</td>
</tr>
<tr>
<td>Early Christian/Early Byzantine</td>
<td>400-700 CE</td>
</tr>
</tbody>
</table>

*Table 2: Chronological table for Cyprus, covering the periods during which Kourion was occupied. Dates are from Costello 2014.*

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25 Costello 2014, 16.
26 Costello 2014, 15-17.
The Sanctuary of Apollo Hylates experienced a different trajectory of development from Kourion city. The sanctuary first came into use as an open-air site around the early seventh century BCE, during the Cypro-Archaic period (750-475 BCE). Between the sixth and mid-fourth centuries BCE (Cypro-Archaic to Cypro-Classical periods), the sanctuary began to develop architecturally with the addition of the main road and the predecessor to the Temple of Apollo Hylates (whose precise form is unknown). At the beginning of the Hellenistic period, the sanctuary underwent a major period of construction, attesting to its popularity during the period. The start of the Roman period was also marked by an intense period of construction and renovation. The Temple of Apollo Hylates was built during this time, along with the West Building, and probably the Southeast Building. The next period of building activity happened under Trajan, and included buildings such as the bath complex. After the Trajanic additions, the sanctuary remained unchanged, aside from some minor modifications, until its abandonment in the late fourth century (Figure 1.4). The abandonment of the sanctuary is commonly attributed to the earthquake, although many buildings had already gone out of use prior to this event. Squatters occupied parts of the sanctuary in the decades following the earthquake, but the site was otherwise ignored until the 19th century.

27 Costello 2014, 8.
28 Also known as the West Complex.
Interest in the site of ancient Kourion began in 1873, when General Luigi Palma di Cesnola came to Kourion in search of valuable artifacts. Cesnola appears to have dug at a number of places.

1.3.2: History of excavations

Interest in the site of ancient Kourion began in 1873, when General Luigi Palma di Cesnola came to Kourion in search of valuable artifacts. Cesnola appears to have dug at a number of places.
around the acropolis of Kourion, as well as at the Sanctuary to Apollo Hylates.\textsuperscript{32} As his objective was to recover objects, he left very few records of his work, and thus the extent of his investigations at the site are not well understood.\textsuperscript{33}

Excavations at the site conducted by the University of Pennsylvania Museum, starting in 1934, marked the beginning of modern archaeology at the site. Bert Hodge Hill served as the director of the project, although the excavations were primarily conducted under the supervision of the project’s financial backer, George McFadden, and his assistant John Franklin Daniel.\textsuperscript{34} The University Museum excavations ceased in 1954,\textsuperscript{35} as McFadden had passed away unexpectedly the year prior, and Daniel had passed away in 1948.\textsuperscript{36} A number of preliminary articles on their work at the site were published, but final publications were never produced. While the preliminary reports lack the systematic reporting now expected in archaeological publications, they do contain a surprising amount of information about the excavation processes. These excavations were responsible for at least partially uncovering a great number of buildings at Kourion city, including the Early Christian Basilica, the House of Eustolius, the theatre, the Fountain House, and the House of the Achilles Mosaic (see Figure 1.3). They were also responsible for clearing the stadium, as well as the majority of the architecture in the Sanctuary of Apollo Hylates.\textsuperscript{37}

The University Museum excavations also resulted in the hypothesis that Kourion was struck by an earthquake in the fourth century. In 1934, while excavating a test trench on the acropolis, Daniel uncovered two skeletons within a building. McFadden hypothesized that the building had

\begin{footnotesize}
\begin{enumerate}
\item See Cesnola 1877, 293-350.
\item Buell et al. 2010, 262; Costello 2014, 17.
\item Costello 2014, 17.
\item However, excavations were interrupted by the Second World War.
\item Costello 2014, 18.
\item Christou 1986, 12.
\end{enumerate}
\end{footnotesize}
collapsed as a result of an earthquake, killing the two occupants.\(^{38}\) As they continued to excavate the site, the excavators attributed evidence of destruction elsewhere at Kourion to this earthquake. McFadden argued in 1940 that the earthquake at Kourion was likely the same earthquake assumed to have destroyed the temple at Soli, and thus could be dated to the second quarter of the fourth century based on numismatic evidence from the temple.\(^{39}\) Later, in 1950, as he was excavating the sanctuary’s baths, McFadden stated that Kourion had been struck by the two earthquakes which has hit Salamis in the second quarter of the fourth century (one in 332/333, the other in 342).\(^{40}\) These theories would remain uncontested until David Soren’s excavations in the 1980s.

Since the University Museum Excavations, there have been a number of projects undertaken at Kourion. A.S. Megaw continued excavations of the Christian Basilica in the 1950s and later in the 1970s, M.C. Loulloupis excavated the House of the Gladiators and the Apsed Building between 1967 and 1974, and Demos Christou, starting in 1975, excavated at the city centre, as well as at the Amathus Gate Cemetery.\(^{41}\) The proponent of the most recent hypothesis regarding the earthquake, David Soren, excavated at the Sanctuary of Apollo (along with Diana Buitron-Oliver), and at the Earthquake House from 1978 to 1985. In addition, in the 1960s, the Cyprus Department of Antiquities restored a number of buildings on the acropolis. More recently, Danielle Parks excavated at the Amathus Gate Cemetery in the late 1990s, and directed the Kourion Mapping Project from 2004 to 2006, which produced updated maps of the site and many of its architectural features.\(^{42}\) Excavations at Kourion are presently being conducted by the

\(^{38}\) McFadden 1935, 13; Soren 1985, 55-56.
\(^{39}\) McFadden 1940.
\(^{40}\) McFadden 1950, 24.
\(^{41}\) Costello 2014, 18-19.
\(^{42}\) Costello 2014, 19.
Kourion Urban Space Project (KUSP), beginning in 2012, which has focused its efforts on an area of the site to the west of the Earthquake House (Figure 1.5). They are in the process of uncovering Building 4, an elite structure which likely collapsed as a result of late fourth century seismic activity.43

![Figure 5: Map of Kourion city, including areas excavated by KUSP. Grimsley et al. (forthcoming, 3).](image)

1.4: David Soren’s interpretation of late-fourth-century seismic activity at Kourion

David Soren’s investigations into late-fourth-century seismic activity arose from his excavations at the Sanctuary of Apollo Hylates, which according to McFadden, had been damaged as a result

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43 Grimsley et al. (forthcoming); Grimsley et al. 2018.
of the same earthquake which struck the city.\footnote{McFadden 1940.} After publishing several articles in the early 1980s based primarily on data from the University Museum excavations (accompanied by literary and geological evidence), Soren had come to the conclusion that McFadden’s dating of the earthquake to the second quarter of the fourth century was incorrect, and that Kourion’s destruction was not linked to earthquake that struck Soli.\footnote{Soren 1981, 117; Soren and Lane 1981, 178. Seismic destruction at Kourion had also been linked to an earthquake at Salamis, but Soren argued against this as well.} In order to test his hypothesis, Soren reopened the trench in which Daniel had initially found the two skeletons, and continued to excavate the rest of the building, which was termed “the Earthquake House.”\footnote{Soren 1985, 55-56.} Despite his interest in seismic activity at Kourion, his publications on the topic are comprised of only a handful of journal articles and book chapters, many of which only focus on a certain aspect of the evidence for seismic activity at the site. A final report on the Earthquake House was also never published, although a full study of the building, undertaken by Benjamin Costello, was published in 2014.

Soren’s final theory on late-fourth-century seismic activity at Kourion, published in 1987, states that Kourion city and the Sanctuary of Apollo Hylates were destroyed on July 21, 365 at 5:30 am by the Mediterranean-wide earthquake discussed by fourth-century historian Ammianus Marcellinus. He also claims that the Sanctuary was not rebuilt, but was inhabited by squatters, and that the city of Kourion was abandoned until 383 CE, a conclusion which he reached based on a gap in the coinage record at the site.\footnote{Soren 1987, 41-43.} Soren’s final theory differs somewhat from his initial hypothesis regarding seismic activity at Kourion; the articles which he published prior to his excavations at the Earthquake House date the earthquake to around 370 CE.\footnote{Soren and Lane 1981, 178.} Soren’s theory

\footnote{McFadden 1940.} \footnote{Soren 1981, 117; Soren and Lane 1981, 178. Seismic destruction at Kourion had also been linked to an earthquake at Salamis, but Soren argued against this as well.} \footnote{Soren 1985, 55-56.} \footnote{Soren 1987, 41-43.} \footnote{Soren and Lane 1981, 178.}
remains the most widely accepted interpretation of late-fourth-century seismic activity at Kourion. However, a recent criticism of Soren’s approach to the numismatic evidence from Kourion has called his dating of the earthquake into question. As a result, the current excavation team gives the earthquake a date range of 370 to 380.

While Soren’s research undoubtedly resulted in a more accurate picture of seismic activity at Kourion, undertaking an analysis of late-fourth-century seismic activity at Kourion is beneficial for several reasons. First, Soren’s methodological approach was flawed, as he did not consider all of the available data when coming to his conclusions about the earthquake; he also made several other methodological errors which will be treated in detail in the body of this work. Second, new data, both geological and archaeological, and new methodologies for identifying ancient seismic activity have become available since Soren’s work in the 1980s. Finally, the disaster-oriented approach I apply to the material from Kourion can yield insight into people’s responses, a perspective missing from Soren’s research.

1.5: Outline of the project

Given the problems with David Soren’s interpretation of seismic activity at Kourion, responses to this disaster cannot be discussed solely based on the evidence he provides. I thus begin in Chapter 2 by analyzing the evidence for late-fourth-century seismic activity at Kourion using a methodological approach developed for identifying evidence of seismic activity in the archaeological record. I also discuss literary evidence for late-fourth-century seismic activity in the Mediterranean region, and I consider some methodological issues with linking literary

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50 Grimsley et al. (forthcoming, 1).
earthquakes to archaeological evidence of seismic activity. Chapter 3 is focused on dating the seismic event, primarily by using numismatic evidence. I consider how coinage circulation has shaped the numismatic record at Kourion, demonstrating the importance of considering site formation processes when interpreting numismatic evidence. In Chapter 4, I discuss how occupants of individual buildings, or building complexes, responded to structural damage caused by seismic activity, and I suggest site-wide patterns for responses to seismic activity at Kourion. By considering the decision-making processes involved in responses, and how they are shaped by socioeconomic status, I can evaluate how the site was altered by human action following the earthquake, and thus provide a more accurate picture of the disaster and its outcomes.

Using my methodological approach for investigating seismic activity in antiquity, I have come to the following conclusions about the late-fourth-century seismic disaster at Kourion. First, the Kourion earthquake is a separate event from the 365 CE earthquake discussed by Ammianus, and cannot be associated with any earthquake in the historical record. Second, Soren’s dating of the earthquake specifically to 365 CE is not supported by the available numismatic evidence, and neither is his suggestion that the site was abandoned until 383. Instead, the earthquake most probably occurred between 370-380 CE, and Kourion continued to be occupied after the event. Third, there was no universal reaction to the earthquake among the residents of Kourion, as responses differ between the sanctuary and the city, and within the city itself; however, some larger patterns are able to be drawn from the available data. Cult worship at the sanctuary ceased prior to the earthquake, thus indicating that seismic activity was not responsible for the sanctuary’s abandonment. Meanwhile, following the earthquake, public space at Kourion city took on new forms; this transformation of the urban landscape is reflective of broader cultural changes occurring across Cyprus and the empire during the late antique period.
Chapter 2: Identifying ancient earthquakes

2.1: Introduction

Despite the longstanding hypothesis that Kourion was destroyed by an earthquake in the late fourth century, there has never been a systematic evaluation of evidence for seismic activity during this period at the site. Soren did seek out the opinions of several geologists for a few of his publications on seismic activity at Kourion, but they were largely concerned with estimating the intensity of the event and its epicentre, and for the most part did not discuss the evidence for a seismic event.\(^{51}\) Therefore, prior to discussing people’s responses to seismic activity at Kourion, it is necessary to determine that the site was hit by an earthquake. In addition, I would like to question Soren’s assertion that the Kourion earthquake is the same event described by Ammianus Marcellinus, as this interpretation perpetuates a problematic methodological approach, and misrepresents the probable scope of the disaster. I thus begin by presenting a methodological approach developed for identifying evidence of seismic activity in the archaeological record, and I apply this approach to the data from Kourion. I then re-examine the association drawn by Soren between Ammianus’ earthquake and the Kourion earthquake by discussing problems with the traditional approach to these literary sources, and by reviewing the geological evidence for seismic activity during the late fourth century.

2.2: Identifying earthquakes in the archaeological record

Archaeologists have been attempting to identify traces of earthquakes in the archaeological record since the late 19th century. However, methodological approaches for identifying seismic

\(^{51}\) Soren 1981; Soren and Lane 1981; Soren and Davis 1985. Dr. Reuben Bullard does discuss some possible evidence for the earthquake in Soren and Davis 1985.
events only started to be developed in the 1970s, with the majority of advances in methodology not occurring until the 1990s.\textsuperscript{52} Accompanying these methodological developments was the creation of a new sub-discipline, archaeoseismology, the primary goal of which is to better understand past seismicity in order to develop predictions for modern earthquake hazards.\textsuperscript{53} However, archaeoseismological methodology has yet to be adopted on a wide scale by archaeologists, with the result that many uncritical applications of earthquake hypotheses to archaeological data remain unchallenged. This is problematic because almost all indicators of seismic activity in the archaeological record can be caused by other factors.\textsuperscript{54} Kourion is one such site where seismic activity has been used to explain aspects of the archaeological record, although it must be noted that this site has some unusually convincing evidence for the occurrence of an earthquake.

In order to re-evaluate the evidence for earthquake damage at Kourion, I have chosen to make use of a methodological approach put forth by Galadini, Hinzen, and Stiros.\textsuperscript{55} It is one of the most recent attempts to develop a methodological approach for archaeoseismological research, and the authors put forth a number of clear indicators of seismic impact on archaeological remains, making it an approach which can be more easily used by non-seismologists. They stress the importance of identifying multiple different indicators of seismic activity, since, as noted above, most of these indicators can be the result of non-seismic processes.\textsuperscript{56}

\textsuperscript{52} Jones and Stiros 2000, 25-28.
\textsuperscript{53} Galadini, Hinzen, and Stiros 2006, 396.
\textsuperscript{54} Galadini, Hinzen, and Stiros 2006, 398-399.
\textsuperscript{55} Galadini, Hinzen, and Stiros 2006.
\textsuperscript{56} Galadini, Hinzen, and Stiros 2006, 398-399.
As Galadini, Hinzen, and Stiros developed their methodology primarily for the purpose of understanding the seismological characteristics of past earthquakes, certain aspects of their methodology require the use of seismological techniques. A number of indicators of seismic activity can either only be identified using seismological techniques, or require the application of these techniques to confirm that the indicator in question was actually caused by seismic activity. The authors also recommend modelling the seismic event and the responses of buildings at the site to see if the seismic event could have caused the type of destruction visible in the archaeological record. I will thus not be able to provide the level of certainty and detail about the seismic event as suggested by Galadini, Hinzen, and Stiros.

Galadini, Hinzen, and Stiros have divided evidence of seismic impact on archaeological remains into six categories. Four of these categories are characterized as direct evidence of seismic activity (Table 2.1).

The first category is “displacement along shear planes,” which is when part of a structure is displaced from the rest, either vertically or horizontally. This can be caused by the activation of a fault during a seismic event, or as a result of landsliding induced by seismic activity, but it can also occur because of differential settlement (when a building’s foundation settles unevenly after construction, or because of landsliding unrelated to seismic activity). Seismological investigations can determine whether displacement is the result of seismic activity. For example, the analysis of soils beneath the foundations of affected buildings can help determine the cause of the displacement, since buildings which sit atop both compressible and uncompressible sediments can experience differential settlement without a seismic event.

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57 Galadini, Hinzen, and Stiros 2006, 396.
59 Galadini, Hinzen, and Stiros 2006, 399-400.
The second category is “coseismic geological effects due to shaking and related effects on building structures,” which are geological events that are associated with seismic activity. These include liquefaction, in which the soil loses its stability as a result of seismically-induced shaking, lateral spreading, which is the lateral movement of soils that have experienced liquefaction, and landsliding. Liquefaction and lateral spreading can leave behind features that can be identified by seismologists. Landsliding can be identified in the archaeological record, but as mentioned above, is not necessarily the result of seismic activity.60

The third category is “deformation of building remains still in primary position.” Buildings can experience a wide variety of deformations as a result of seismic activity, but some of these deformations can have other causes. For instance, walls may be tilted and distorted as a result of seismically-induced shaking, but these deformations can also be the result of landsliding soil creeping, or poor construction practices. However, the presence of multiple types of deformation, or the same type of deformation on multiple structures may indicate the occurrence of an earthquake.61

The fourth category is “evidence of destruction from the archaeologically defined site history.” The sudden destruction of a building can be differentiated in the archaeological record from a structure which decayed over time; sudden collapse is marked by the presence of large portions of walls, roof, or ceiling materials which maintain their internal organization. The collapse of numerous columns in one direction is particularly good evidence for seismic destruction. In addition, collapse layers will often lie directly above a floor surface bearing evidence that the structure was still in use. The destruction of buildings cannot necessarily be attributed to seismic activity, and may be the result of human conflict, or some form of accident.

60 Galadini, Hinzen, and Stiros 2006, 400.
61 Galadini, Hinzen, and Stiros 2006, 400-402.
The historical record may indicate whether there was any conflict in the region that could have resulted in building destruction, although the absence of such events in the historical record does not necessarily indicate that conflict did not occur.\textsuperscript{62}

<table>
<thead>
<tr>
<th>Category of Evidence</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Displacement along shear planes</td>
<td>The upward displacement of part of a building</td>
</tr>
<tr>
<td>Coseismic geological effects due to shaking and related effects on building structures</td>
<td>Building remains partly buried in landslide debris</td>
</tr>
<tr>
<td>Deformation of building remains still in primary position</td>
<td>The movement of a single block within a wall</td>
</tr>
<tr>
<td>Evidence of destruction from the archaeologically defined site history</td>
<td>The collapse of a large section of wall directly onto a floor surface</td>
</tr>
</tbody>
</table>

\textit{Table 3: Categories of direct evidence for the occurrence of a seismic event in the archaeological record.}

Galadini, Hinzen, and Stiros provide two other categories characterized as indirect evidence, which are less reliable indicators of a seismic event. The first category, “the archaeologically detected abandonment of a site,” can be linked to seismic activity, but it has also been demonstrated that people may continue living in a region despite the occurrence of repeated seismic events.\textsuperscript{63} The second category, “evidence of rebuilding and restoration,” also cannot be clearly linked to seismic activity, although restoration which reinforces buildings against future seismic events may demonstrate a relationship between rebuilding activities and a seismic event.\textsuperscript{64}

\textsuperscript{62} Galadini, Hinzen, and Stiros 2006, 402-403.

\textsuperscript{63} Galadini, Hinzen, and Stiros 2006, 403. They provide the town of Egna, Italy as an example of the continued use of land after an earthquake. In the third century CE, an earthquake caused the activation of a fault, resulting in the vertical displacement and destruction of buildings. Immediately after the earthquake, rebuilding took place over top the recently activated fault.

\textsuperscript{64} Galadini, Hinzen, and Stiros 2006, 403-404.
2.3: Evidence of seismic activity at Kourion

Evidence of an earthquake at Kourion falls into three of Galadini, Hinzen, and Stiros’ six categories: deformation of building remains, evidence of destruction, and abandonment. Abandonment will not be discussed in this chapter, as I re-evaluate the traditional view that Kourion was abandoned as result of the earthquake in Chapter 3. Therefore, abandonment cannot serve as a primary piece of evidence for seismic activity at the site. In addition, there are apparently a number of buildings that were destroyed as a result of the vertical displacement of the ground (up to 1 m) in the north are of Kourion. However, as there is no further information available about this displacement, and it is not visible in any photos or site plans, this displacement also cannot be taken as evidence in support of the seismic hypothesis.

Some of the most dramatic evidence of earthquake destruction at late-fourth-century Kourion comes from the Earthquake House (Figure 2.1). Excavations at the building revealed a domestic structure that was clearly in use at the time of its collapse, as a significant quantity of *in-situ* artifacts were discovered. In addition, seven human skeletons were found, along with the skeleton of a horse which appears to have been attached to a wall of the building at the time of its demise. The deformation of an in-situ feature is also present in the building, as a 363 kg stone trough was lifted up and cracked down the centre.

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65 Grimsley et al. (forthcoming, 1).
66 Soren 1981, 123.
68 Soren 1985, 57. In the original publication, the weight of the trough is measured in pounds.
Figure 6: Plan of the Earthquake House with the locations of the human skeletons, the horse skeleton, and the cracked stone trough. Costello 2014, 98.
Contributing to the picture of earthquake damage presented by the Earthquake House are recent excavations by the Kourion Urban Space Project at a nearby structure termed Building 4.\textsuperscript{69} The finds from the building suggest that it was an elite domestic structure, although a thick layer of cooking refuse in one of the rooms indicates that at least part of the building was abandoned prior to its collapse. Four skeletons, which were fragmentary and commingled, were found in a room within the building. The state of the bones suggested they were crushed by falling stones, further supporting the earthquake hypothesis.\textsuperscript{70} The excavators have also identified a wall which they believe was deformed in a manner consistent with the impact of a seismic event (Figure 2.2).\textsuperscript{71}

\textsuperscript{69} In the preliminary report by Grimsley et al. (forthcoming, 4), the structure is described in terms of the letter given to the area of excavation, and the numbers of the squares it occupied within the area (A3,4,7,9,10).
\textsuperscript{70} Grimsley et al. (forthcoming, 8-9).
\textsuperscript{71} Grimsley et al. 2018.
There is also some evidence of a seismic event from the Sanctuary of Apollo Hylates. The sanctuary, which was in use from the Cypro-Archaic period up until the Roman period\textsuperscript{72}, contained a number of religious buildings. This included a temple to Apollo Hylates, the remains of which bear signs that it collapsed as a result of seismic activity. Six rows of masonry from the rear facade of the temple were found to have collapsed in one cohesive block (Figure 2.3),\textsuperscript{73} which may signify that it was toppled by seismic activity.\textsuperscript{74} It is sometimes possible for large

\textsuperscript{72} Soren 1987, 39-42. At what point the sanctuary ceases to be used will be discussed in further detail in Chapter 4.
\textsuperscript{73} Soren 1987, 140.
\textsuperscript{74} Galadini, Hinzen and Stiros 2006, 403.
portions of a building to collapse at once as a result of natural decay over time, although usually this can be distinguished from earthquake-related collapse by looking at the surrounding stratigraphy.\textsuperscript{75} Unfortunately, since this structure was excavated in the 1930s by McFadden, no such data regarding the stratigraphy exists. In addition, this deposit may have been disturbed by Cesnola in the 1800s, placing more uncertainty on the integrity of the data.\textsuperscript{76}

\begin{figure}[h]
\centering
\includegraphics[width=\textwidth]{figure8.png}
\caption{The remains of the Temple of Apollo Hylates, including its collapsed back wall. Buitron and Soren 1980, 57.}
\end{figure}

According to Soren, several other structures at the sanctuary may also provide evidence for an earthquake. Walls from the Southeast Building (otherwise known as the palaestra) collapsed in large section, as did a number of ashlar blocks from the exedra of the central court, and the

\textsuperscript{75} Galadini, Hinzen and Stiros 2006, 402-403.  
\textsuperscript{76} Soren 1987, 119-123.
entire colonnade of the South Building fell to the Northeast.\textsuperscript{77} However, as all of these areas were excavated by McFadden, we lack the stratigraphic information that would verify these claims.

While the data supporting seismic activity at late-fourth-century Kourion is not without problems, an overall pattern which supports the earthquake hypothesis does emerge. By far the most secure evidence comes from the Earthquake House and Building 4, as the presence of two distinct structures which appear to have collapsed on their occupants indicates that they likely did not collapse as a result of structural issues alone. The material assemblage from the Earthquake House in particular indicates that the cause of destruction should not be attributed to violence, as there is no evidence of the destruction of goods within the household, nor does it appear that any valuables were looted. The evidence from Kourion city also impacts our interpretation of the data from the Sanctuary of Apollo Hylates. Although it is not possible to affirm McFadden’s reports, casting some uncertainty on the integrity of the data, the collapsed wall from the temple and the data from the city suggest that the sanctuary was affected by seismic activity. In addition, numismatic evidence discussed in the next chapter seems to confirm that at least one structure at the sanctuary went out of use at the same time as the houses in the city. Therefore, the most plausible explanation for the destruction visible in the archaeological record at Kourion is that it was caused by an earthquake.

\textsuperscript{77} Soren 1981, 118-119.
2.4: Literary and geological evidence for seismic activity in the Mediterranean region during the late fourth century

Kourion is not the only city in the Mediterranean region to have been affected by seismic activity in the second half of the fourth century. A large corpus of literary evidence suggests that peoples across the Mediterranean were severely affected by earthquakes during this period. While it is evident that this corpus refers to a number of different seismic events, many of these sources are often associated with a single seismic event that took place in 365 CE. The primary literary source for this earthquake is Ammianus Marcellinus, who describes the earthquake as a universal event which occurred on July 21, 365, and which created a tsunami that destroyed the city of Alexandria.\textsuperscript{78} Archaeological evidence of destruction from Sicily, Crete, Greece, Libya, and Cyprus has been attributed to this event.\textsuperscript{79}

The 365 CE universal earthquake was first associated with destruction at Kourion by Richard Jensen in the 1985 publication of Report of the Department of Antiquities, Cyprus (RDAC), in which he discusses literary evidence which may be associated with the Kourion earthquake. In the same volume, Soren and Davis voiced their support for Jensen’s theory, citing numismatic evidence from Soren’s excavations at the Earthquake House which places the event between 364 and 367.\textsuperscript{80} Soren continued to associate seismic activity at Kourion with Ammianus’ 365 earthquake in his publications, including his final volume on his excavations at the Sanctuary of Apollo Hylates.\textsuperscript{81} However, issues with both Jensen’s approach to the literary evidence and Soren’s interpretation of the coinage, along with recent geological investigations, indicate that

\textsuperscript{78} 26.10.15-19.
\textsuperscript{79} Stiros 2000, 558-560.
\textsuperscript{80} Soren and Davis 1985, 299.
\textsuperscript{81} Soren 1987, 41.
the evidence from Kourion should not be associated with Ammianus’ earthquake. I discuss the interpretation of the literary evidence and the recent geological investigations below; the methodological issues with Soren’s interpretation of the numismatic evidence will be addressed in the next chapter.

Jensen’s attribution of seismic damage at Kourion to Ammianus’ 365 earthquake is based upon the fact that the *terminus post quem* for the earthquake at Kourion is 364 (a date with which I agree), and thus it is possible that the Kourion earthquake could have occurred in 365; he does note, however, that the Kourion earthquake cannot definitely be associated with Ammianus’ seismic event.82 Soren affords a higher to degree of certainty to this association because Ammianus’ earthquake fits within his narrow date range for the Kourion earthquake.83 Regardless of whether Soren’s interpretation of the numismatic evidence is correct, there are still several issues with the association he draws between the literary and archaeological evidence. It is highly unlikely that all destructive earthquakes of the late fourth century CE are present in the historical record, thus meaning that earthquakes present in the archaeological record may be missing from the historical sources. Therefore, the association of archaeologically attested seismic events with historically-attested ones has likely resulted in multiple events being interpreted as a single earthquake.84 The association between the Kourion earthquake and Ammianus’ is particularly unreliable because this association is not present in the historical record. Literary evidence for seismic activity on Cyprus around this period is limited to a few brief references lacking specific dates, and Kourion in particular is not mentioned at all.85

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82 Jensen 1985, 311.
83 Soren and Davis 1985, 299.
84 Guidoboni, Muggia, and Valensise 2000, 46-47.
85 Lib. *Or.* 2.52; Gregory of Nyssa *PG* 45.108.
Therefore, Soren’s association between the archaeological evidence at Kourion and the earthquake described by Ammianus is untenable from a methodological standpoint.

Geological investigations regarding seismic activity in the Mediterranean region during the late fourth century also support the theory that the Kourion earthquake is an event not mentioned in the historical record. Radiocarbon dates from seismically uplifted shorelines around the Mediterranean indicate that between the mid fourth and mid sixth centuries CE, there were an unusually large number of major seismic events; this phenomenon has been termed the “Early Byzantine Tectonic Paroxysm.” Therefore, it is probable that a number of destructive seismic events from this period were not recorded in surviving historical accounts.

In addition, geologist Stathis Stiros argues that it is not possible from a geological standpoint for a single earthquake to have caused damage in all of the regions considered to have been affected by Amminus’ 365 CE earthquake. This is a result of the characteristics of different types of seismic waves. Only short-period waves (waves which oscillate very quickly) are capable of destroying the one or two storey buildings which were common around the Mediterranean region during this period. These waves dissipate quickly, and cease to be destructive around 200 km from the epicentre of the earthquake. Taller structures, such as columns or towers, can be vulnerable to destruction further from the epicentre of an earthquake, as they are affected by long-period waves, which can be destructive more than 500 km from the epicentre of an earthquake. Based on this data, Stiros suggests that a number of earthquakes occurred around 365 CE, and as a result of their close temporal proximity, ancient authors assumed these earthquakes were a single, Mediterranean-wide event. He also suggests that seismically-induced damage in Cyprus could likely be attributed to an event off the coast of the island, an explanation

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which was also proposed by the geologists consulted by Soren. Ammianus’ description of the seismic event can thus be considered a literary fiction, and should not be used to date late-fourth-century earthquakes.

2.5: Conclusion

The methodologies used by David Soren to identify the earthquake at Kourion and to discuss its relationship to the historical record were flawed. These methodological errors are not limited to Soren, but are representative of how many Mediterranean archaeologists attempt to research earthquakes. While the earthquake hypothesis has proven to be correct in the case of Kourion, seismic activity has been used to explain destruction at other sites which do not have such conclusive evidence. Misunderstanding the causes of destruction at a site has consequences for our overall understanding of a site’s history; destruction interpreted as a result of conflict can lead to very different conclusions than destruction interpreted as a result of seismic activity. In addition, it is not uncommon to link earthquakes with texts without considering methodological problems, or examining the geological evidence. Uncritically assigning earthquakes in the archaeological record to texts results in the inflation of the geographical scope of individual events. This can not only impact archaeological research, but also seismological investigations, as seismologists can make use of archaeological and historical data to understand long term patterns of seismicity in a region. Incorporation of the methodological considerations discussed in this chapter into investigations of late fourth century seismic activity would greatly improve our understanding of this topic.

Chapter 3: Dating the Kourion earthquake

3.1: Introduction

Establishing an accurate date for the earthquake at Kourion is another essential step in discussing people’s responses, as it is necessary to be able to ascertain whether archaeological evidence from across the site dates to before or after the earthquake. As discussed in Chapter 2, the widely accepted date for the earthquake is Soren’s date of 365 CE. While his dating of the earthquake is partly based upon his association of the seismic event with the one described by Ammianus Marcellinus, it is also based on his particular interpretation of numismatic evidence from the Earthquake House and the West Building, a structure at the Sanctuary of Apollo Hylates. His analysis suggests that the earthquake likely happened between March 364 CE and September 365 CE, and almost certainly happened between 364 and 367 CE.88 He also uses numismatic evidence from the city to argue that it was abandoned between 365 and 383.89 This latter argument is particularly significant for this project, as it is Soren’s only claim concerning people’s responses to the earthquake.

Soren’s dating of the earthquake to 365 has been challenged in recent years. Lichocka and Meyza, in their publication on dating a late-fourth-century seismic event at Paphos, criticized Soren’s interpretation of the numismatic evidence from the Earthquake House and the West Building;90 this has resulted in the current team of excavators suggesting an approximate date of 370-380 CE for the seismic event.91 However, a re-analysis of all of the coinage relating to the earthquake at Kourion has yet to be undertaken. In addition, Soren’s assertion that the site was

88 Soren 1985, 56, 59.
89 Soren 1987, 42.
91 Grimsely et al. (forthcoming, 1).
abandoned between 365 and 383 has never been challenged. The aim of this chapter is thus to re-evaluate Soren’s claims regarding the dating of the earthquake event and the subsequent abandonment of Kourion by examining the numismatic evidence from areas of the site affected by seismic activity, along with areas associated with the post-earthquake reoccupation of the site.

3.2: Numismatic evidence from Kourion

3.2.1: Coinage from the Earthquake House

Re-evaluating Soren’s interpretation of the coinage from the Earthquake House is somewhat challenging, as he never published the numismatic evidence upon which his argument is based. The coinage was eventually published in Costello’s volume on the Earthquake House, but Costello did not study the coins himself.92 It is therefore possible to examine the numismatic evidence from the Earthquake House, but the coinage mentioned by Soren cannot be definitely associated with particular coins from the catalogue.

Out of the hundreds of coins recovered from the Earthquake House during the excavations, only seven coins are both legible and associated with a stratigraphic context (Table 3.1). Two of these coins, one of Constans (330 CE), and the other of Probus (276-282 CE) are associated with collapse or deposition after the earthquake, and thus cannot be used to date it.93 Four of the remaining five coins are located in the collapse material, and are mostly issues from mid- to late-fourth-century emperors, the latest of which is of Valens (365 CE).94 There is a singular coin associated with the final occupation layer in the Earthquake House, which was not attributed to any emperor and was given a date range from the fourth century to 470 CE.95

92 Costello 2014, 28.
93 C228; C371. Catalogue numbers are from Costello 2014.
94 C3723-1934; C5; C9; C15.
95 C37.
Table 4: Coinage from destruction layers at the Earthquake House. Costello 2014, Appendix A.

<table>
<thead>
<tr>
<th>Catalogue Number</th>
<th>Emperor</th>
<th>Date</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>C3723-1934</td>
<td>Valens</td>
<td>365</td>
<td>collapse layer</td>
</tr>
<tr>
<td>C5</td>
<td>Jovian?</td>
<td>363-364</td>
<td>collapse layer</td>
</tr>
<tr>
<td>C9</td>
<td>Claudius/Nero</td>
<td>41-68</td>
<td>collapse layer</td>
</tr>
<tr>
<td>C15</td>
<td>Constantius II?</td>
<td>mid fourth century</td>
<td>collapse layer</td>
</tr>
<tr>
<td>C37</td>
<td>illegible</td>
<td>fourth century to 470</td>
<td>occupation layer</td>
</tr>
<tr>
<td>C228</td>
<td>Constans</td>
<td>330</td>
<td>post-earthquake layer</td>
</tr>
<tr>
<td>C371</td>
<td>Probus</td>
<td>276-282</td>
<td>post-earthquake layer</td>
</tr>
</tbody>
</table>

Soren’s dating of the earthquake to 365 CE is based in part on his interpretation of coinage of Valens from the Earthquake House.96 He argues that these coins can only date from March 364 CE to September 365 CE, because the issues have his name in a broken form (VALEN-S), a feature which he claims is only present early in Valens’ reign.97 In addition, since there are no coins of Procopius (who briefly took over control of the Empire in September 365 CE) or Gratian (who became emperor in 367 CE), Soren argues that the earthquake must have occurred prior to the reigns of these emperors.98

There are a number of problems with Soren’s interpretation. First of all, the broken form of Valens’ name also appears on later issues of Valens’ coins, which Soren himself has admitted.99 The absence of Procopius’ coins should also not be used to constrain the date, since he ruled for less than a year, and his coins were not struck at every mint in the empire.100 Another error is Soren’s failure to consider how coinage circulation patterns may have shaped the numismatic evidence from the Earthquake House. Roman coinage could circulate for a long time, and could take years to reach certain parts of the empire, especially in areas where there was no mint or

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96 Since Soren states that he examined multiple coins of Valens, he presumable must have looked at coinage that was not definitively from the debris layers.
97 Soren 1985, 59.
98 Soren 1985, 56.
99 Lichocka and Meyza 2001, 192.
100 Lichocka and Meyza 2001, 192.
significant military presence (such as Kourion). In addition, Kourion appears to have been primarily involved in trading within Cyprus, meaning coinage had to first pass through another city before it reached the site. Therefore, the date range in which the latest coins from the Earthquake House were minted is not necessarily representative of when they came into circulation at Kourion, meaning we cannot use this coinage to provide a specific date or range of dates for the earthquake. However, we can use the coin of Valens from the debris layers to provide a *terminus post quem* for the destruction of the Earthquake House. Since Valens’ reign began in 364 CE, we can assume that the house was destroyed by the earthquake after this date.

### 3.2.2 Coinage from the West Building

Soren also draws numismatic evidence for dating the earthquake from the West Building at the Sanctuary of Apollo Hylates. Prior to excavating at the Earthquake House, Soren used this coinage from this building to argue that the earthquake occurred around 370. Destruction layers from the West Building cannot be definitely associated with seismic activity, but given that the destruction of other buildings at the sanctuary can be attributed to an earthquake, it seems highly likely that it was destroyed in this event. Seventeen identifiable coins were found within earthquake debris throughout the building, although the identification of seven of these coins is uncertain (Table 3.2). The earliest coins were of Constantius II (346-361 CE), and the latest coins belong to either Valens or Valentinian I (364-378 CE). This evidence thus supports a *terminus post quem* of 364 for the earthquake.

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101 Cox 1959, x; Davis 2010, 9; Guest 2012, 110-111. Military pay was a method by which new coinage could be circulated in large volumes to parts of the empire (Lichocka and Meyza 2001, 185-186).
102 Kaldeli 2009, 368.
103 Soren 1981, 117.
<table>
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<tr>
<td>8</td>
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<td>9</td>
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</tr>
<tr>
<td>17</td>
<td>Valentinian I</td>
<td>364-375</td>
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</table>

Table 5: Coinage from destruction layers at the West Building. Soren 1981, 131.

These seventeen coins from the West Building also provide some insight into patterns of coinage circulation at Kourion. Since all of the coins fall into a relatively small range of dates (346-378), we can take this as evidence that Kourion was consistently receiving new coinage. The city may not have received new coins immediately, as discussed above, but this set of coins suggests that they received enough new coinage for older coins to go out of circulation.

### 3.2.3 Coinage from the Episcopal Precinct

The Christian basilica within Kourion’s Episcopal Precinct is one of the first monumental buildings to be constructed after the earthquake, and is also the only post-earthquake building from which we have numismatic evidence, making it useful for constraining the date of the seismic event. A coin of Honorius (395-423 CE), was found in the fill of the sanctuary floor,
providing a *terminus post quem* for its deposition.\textsuperscript{105} This fill appears to have been added during the construction of the Christian basilica to create a higher floor level for the sanctuary.\textsuperscript{106} Since the basilica is the first building to be built after the earthquake from which we have numismatic evidence, the coin of Honorius can be used to establish the *terminus anti quem* for the earthquake. Therefore, our *terminus anti quem* for the earthquake is 423 CE.

### 3.2.4 Coinage from elsewhere at Kourion

Coinage from several other buildings at Kourion, such as the theatre and Building 4, may help provide a date for the earthquake. Evidence regarding the date of the collapse of the theatre comes from a publication by Stillwell, who examined data collected during excavations in the early to mid 20th century.\textsuperscript{107} As his publication is largely focused on the development of the architecture of the theatre, he did not publish a catalogue of the coins. In addition, the destruction layers at the theatre cannot be definitively associated with the earthquake. Coins of Valentinian and Valens (364-375 CE) were located under destruction layers in rooms within the stage building, which further supports a *terminus post quem* of 364 CE for the earthquake.\textsuperscript{108} The datable materials from Building 4 may also indicate that this is an appropriate *terminus post quem*, although the analysis of material culture from this structure is still in its early stages. Six coins were found within the destruction layer, which date from the first to the fourth centuries.\textsuperscript{109} The ceramics and glasswares from the house have also been helpful for dating; a Late Roman I amphora can be dated to the late fourth century, while a glass cage cup (fourth century) and a

\textsuperscript{105} No. 89 in the catalogue in Hendy 2007.
\textsuperscript{106} Hendy 2007, 401-402.
\textsuperscript{107} Stillwell 1961, 37.
\textsuperscript{108} Stillwell 1961, 78.
\textsuperscript{109} Grimsley et al. 2018.
millefiori glass plate (fourth to fifth century) could also come from this period (see Figures 3.1 and 3.2).\textsuperscript{110}

\begin{figure}[h]
\centering
\includegraphics[width=0.5\textwidth]{figure9.png}
\caption{Fragment of a cage cup from Building 4. Grimsley et al. 2018.}
\end{figure}

\begin{figure}[h]
\centering
\includegraphics[width=0.5\textwidth]{figure10.png}
\caption{Millefiori glass plate from Building 4. Grimsley et al. 2018.}
\end{figure}

Numismatic evidence from the theatre may also contradict Soren’s theory that the city was abandoned between 365 and 383 CE. Coinage from Constantius II (345-361 CE) to Honorius

\textsuperscript{110} Grimsley et al. (forthcoming, 9); Grimsley et al. 2018.
(433 CE) was found on the floors of rooms attached to the back wall of the stage building, which Stillwell argues were not associated with the stage building in the final period of their use, and may have been used as cellars.\(^{111}\) If Stillwell’s interpretation is correct, this suggests that while the theatre itself went out of use after the earthquake, these spaces continued to be used during the period in which Kourion was supposedly abandoned.

### 3.2.5: Post-earthquake abandonment and Cox’s coin catalogue

In order to fully address Soren’s assertion that Kourion city was abandoned between 365 and 383 CE, it is necessary to ascertain whether there is a gap in the numismatic record at Kourion between these years, as his theory is based on the presence of this gap. Our evidence for patterns in the amount of coinage across the site comes from the catalogue of coins from McFadden and Daniel’s excavations, since no other project has collected coinage from numerous areas on Kourion’s acropolis.\(^{112}\)

To evaluate whether Soren’s coinage gap exists, I have organized all of the coinage dating from 333 to 408 by the probability that each coin comes from any year in the date range to which it has been assigned.\(^{113}\) When this data is plotted on a graph (Figure 3.3), no pattern is evident, and there is certainly no clear gap between 365 and 383. The lack of a pattern is likely attributable to the small size of the data set; the average number of coins which can be attributed to each year is 10. We can assume that this must represent a very small fraction of the coinage circulating at the site. Because of the size of the data set, a small difference in the number of

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\(^{111}\) Stillwell 1961, 62.
\(^{112}\) This publication does not provide any stratigraphic information for the coinage, making it useless for dating the earthquake.
\(^{113}\) Cox 1959. For example, if a coin’s date range is 333-334, there is a 50 percent chance that the coin comes from either year. The coin thus gets represented as 0.5 for both years. I have assumed that there is an equal chance that a coin may date to any of the years within its date range. See Appendix A for the data used to create the graph.
coins can appear to be a dramatic shift in coinage at the site. For example, the number of coins attributed to the year 368 is less than half the number of coins attributable to the previous year, which in a larger data set would be significant, but the actual difference in the number of coins attributable to each year is only nine coins. In addition, there are several hundred coins in the set whose possible date range spans a number of decades, which makes identifying a pattern in the coinage spanning less than 20 years difficult. Therefore, it is not possible to establish that the site was abandoned after the earthquake on the basis of site-wide patterns in the numismatic evidence.

Figure 11: Probable number of coins in Cox’s coin catalogue from each year between 333 and 408.
3.3: Conclusion

After reviewing the evidence for the date of the earthquake and the subsequent occupation at Kourion, it is evident that the specificity of Soren’s date cannot be supported, as he makes several methodological errors in his interpretation of the numismatic evidence. As the evidence from Kourion is not able to give a singular date to the earthquake, I instead suggest a range of dates within which the earthquake could have happened. The numismatic evidence from the Earthquake House provides us with our *terminus post quem*, 364 CE, and this conclusion is further supported by coinage found at a number of other buildings around Kourion. Establishing a *terminus anti quem* is more challenging, as our only piece of evidence is the coin of Honorius from the basilica. This coin gives us a *terminus anti quem* of 423 CE. However, given that coins seem to be arriving at the site in fairly regular intervals prior to the earthquake, we can assume that the earthquake either occurred sometime during Valens’ reign (364-378), or not long after. Therefore, the current excavators’ approximate date of 370-380 for the earthquake seems appropriate.

Numismatic evidence from Kourion also indicates that the complete abandoned of the site between 365 and 383 suggested by Soren is improbable. The coinage from Cox’s catalogue provides no evidence for a gap in the numismatic record between 365 and 383, and coins from the theatre suggests that there may have been occupation at the site during the immediate post-earthquake period. It is thus unlikely that the site was completely abandoned after the earthquake.

I would also challenge Soren’s assertion that an absence of coinage at a site after a catastrophic seismic event is a good indicator that the site was abandoned. An absence of coinage only indicates a lack of economic transactions which involve the exchange of coinage. Given
that a severe earthquake is likely to cause an interruption in economic transactions, a reduction in
the amount of coinage coming into the site immediately after the earthquake is probable, even if
the site continues to be occupied. As will be demonstrated in the next chapter, the examination of
people’s individual responses is a more effective and nuanced approach for understanding site-
wide patterns of response to seismic activity.
Chapter 4: Responses to seismic activity at Kourion

4.1: Introduction

While conclusions have been reached regarding the impact of seismic activity on the city of Kourion and the Sanctuary of Apollo Hylates, little has been said about its inhabitants’ responses to the disaster. Soren’s final theory about seismic impact at Kourion proposes that as a result of the destruction wrought by the earthquake, the city was abandoned for a period of almost twenty years, and the sanctuary permanently went out of use.\(^\text{114}\) Aside from stating that abandonment occurred on a settlement-wide scale, an interpretation which we have established is incorrect, Soren does not attempt to discuss the residents’ responses or motivations, an approach which largely removes human agency from this event. The ways in which Kourion developed after the earthquake were not solely a consequence of the seismic event, but resulted from decisions made by the surviving residents. In this chapter, I thus examine evidence of people’s responses to seismic activity at the sanctuary and at the city in order to understand how the disaster fits into the site’s history. I also contextualize people’s responses within the broader changes happening to urban and religious spaces during the Late Antique period. As we only have a few buildings whose destruction can be definitely associated with seismic activity, I assume that buildings whose destruction likely dates to the late fourth century were destroyed as a result of the earthquake.

In order to frame this discussion, I make use of both Shimoyama’s concept of assessment, and the access model. Taking into consideration the assessment and actions of the residents in relation to one another allows the possible reasoning behind the residents’ responses to be reconstructed, along with the responses themselves. The access model makes it possible to

\(^{114}\) Soren 1987, 41-42.
discern how the socioeconomic status of residents of Kourion affected their assessment of how to respond to the problems caused by seismic activity.

4.2: The Sanctuary of Apollo Hylates

To better understand the state of the Sanctuary of Apollo Hylates before and after the earthquake, it is helpful to examine the religious landscape of Cyprus during the Late Antique period, and in particular the condition of other cult centres on the island. Both of these topics have only recently become the subject of academic investigation, and thus there is still significant uncertainty surrounding the religious identities and practices of Cypriots during this period. However, it is evident that the four main centres of Roman-period cult practice on the island, the Sanctuary of Aphrodite at Palaepaphos, the Temple of Aphrodite at Amathus, the Temple of Zeus Olympios at Salamis, and the Sanctuary of Apollo Hylates, were all at least in diminished use, if not entirely abandoned, by the late fourth century. The scholars who have discussed the abandonment of the major cult centres on the island differ somewhat in the dates they provide; Rautman places the abandonment of each site somewhere within the late third and fourth centuries, while Deligiannakis argues that the cult centres at Palaepaphos, Salamis, and Kourion did not go out of use prior to the 360s.

The reasons behind the abandonment of these cult centres are also not fully understood. Undoubtedly the growing importance of Christianity on the island played a significant role; the Cypriot church expanded rapidly over the fourth and the beginning of the fifth centuries, first in

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115 Deligiannakis 2018, 326.
116 Deligiannakis 2018, 327.
117 Deligiannakis 2018, 327-328; Rautman 2001. Deligiannakis notes that the Temple of Aphrodite at Amathus may have been abandoned at some point during the third century, but argues that the public worship of Aphrodite may have continued into the fourth century elsewhere in the city.
terms of personnel, and then in terms of infrastructure.\textsuperscript{118} However, both Rautman and Deligiannikis, along with Davis, the director of KUSP, suggest that seismic activity also contributed to the declining use and eventual abandonment of these sites.\textsuperscript{119} Historical sources suggest that both Salamis (as noted earlier) and Paphos were struck by earthquakes during the fourth century,\textsuperscript{120} although there is no mention of Amathus being damaged by an earthquake in the historical record. These earthquake hypotheses have not been confirmed using modern archaeoseismological methods (although there are late-fourth-century destruction layers at Paphos),\textsuperscript{121} and thus it is not possible to say with certainty that any of the other cult centres were affected by seismic activity.

At Kourion, the traditional interpretation is that the earthquake ended religious activities at the sanctuary. Soren does not argue this explicitly, although he describes the sanctuary as being in “diminished use” prior to the earthquake, suggesting that it was still being used for religious purposes.\textsuperscript{122} Davis, meanwhile, states that the sanctuary was still being maintained for cult activities.\textsuperscript{123} However, as I will demonstrate below, evidence regarding the pre and post-earthquake use of the sanctuary suggests that seismic activity was not responsible for its abandonment.

\textsuperscript{118} Davis 2010, 12.
\textsuperscript{119} Davis 2010, 10-12; Deligiannakis 2018, 329; Rautman 2001.
\textsuperscript{121} Lichocka and Meyza 2001, 149.
\textsuperscript{122} Soren 1987, 41.
\textsuperscript{123} Davis 2010, 9. Davis claims that parts of the temple of Apollo Hylates were repaved during the second quarter of the fourth century, citing Soren, but I was not able to find evidence of this. In any case, the second quarter of the fourth century is well before the proposed date of 370-380 for the earthquake.
4.2.1: The West Building

The West Building is one of only two spaces in the Sanctuary of Apollo Hylates that were definitively in use up until the earthquake. The building as it stands is composed of seven rooms, although McFadden states that it likely had an upper floor (Figure 4.1).\textsuperscript{124} Some of the walls are made of large ashlars, while others are constructed from rubble and rough masonry; McFadden argues that the ashlar walls belong to an earlier building, and that the rubble walls were added later. An ashlar stylobate, on top of which stood three columns, divided Rooms 6 and 7. The floors of Rooms 1 and 2 were composed of beaten earth, while the rest of the floors were likely paved, although paving stones were missing from Rooms 4, 5, 6 and 7. Burn marks appear on the lower courses of the walls and on the floors in Rooms 1, 2, 5, 6, and 7, and cooking pots were found beneath the earthquake debris, suggesting that cooking took place throughout the building. Other small finds include three lamps from Room 5 (likely Vessberg 18, the same type found in the Earthquake House),\textsuperscript{125} several terracotta pipes and some pieces of a marble inscription.\textsuperscript{126}

\textsuperscript{124} McFadden suggests this based on the fact that the masonry appeared strong enough to support a second floor in most of the rooms. McFadden 1940.
\textsuperscript{125} Costello 2014.
\textsuperscript{126} McFadden 1940.
The use of this building during the mid fourth century is indicated primarily by the numismatic evidence presented in Chapter 3, which consisted of twenty two coins sealed beneath debris layers, the latest of which display Valentinian I (364-375 CE).\textsuperscript{127} Late occupation of this building is also suggested by a number of fourth century coins sealed in the fill beneath the floor in Room 2. The latest of these coins is of Urbs Roma (335-337 CE), suggesting that this floor was replaced somewhere between 335 and the earthquake.\textsuperscript{128} Although we lack the stratigraphic

\textsuperscript{127} Soren 1981, 121, 131.
\textsuperscript{128} Soren 1981, 125-126, 131.
information that would allow us to determine if the debris layers in this building are the result of collapse caused by seismic activity, I argue that the abandonment of the West Building can be attributed to the impact of seismic activity because of the close similarity between the numismatic evidence from this building and the Earthquake House.

The area occupied by the West Building was evidently abandoned after the earthquake, as there are no traces of occupation above the debris layers.¹²⁹ Scranton does suggest the outer wall enclosing Room 3 was constructed by squatters after the earthquake,¹³⁰ but given that no disturbance in the debris layers was noted by McFadden,¹³¹ it seems more likely that the wall was constructed prior the building’s collapse. It is possible that the building’s occupants were killed during the earthquake, and thus the space was never reoccupied. This would have had to have occurred outside of the building, since the sealed debris layers indicate that no bodies were removed for burial. However, I would also like to explore the possibility that they survived, and had to make a decision about how to respond to their damaged dwelling. Assuming that the West Building was damaged so as to no longer be habitable (which is entirely possible, given the state of the Earthquake House and Building 4), the inhabitants would have had to decide whether to reconstruct the building, or to seek shelter elsewhere.

The final occupants of the West Building appear to have been reusing a space that was initially meant for some other purpose. The building opens directly onto the Propylon and the steps of the Northwest Building (referred to as Temple A by McFadden), which, along with its architectural features, suggests that it was initially part of the monumental architecture of the Sanctuary. By the late fourth century, the paved floors of the building had been removed, and its

¹³⁰ Scranton 1967, 45.
¹³¹ Soren 1981, 125. Soren, who had access to McFadden’s notes, describes the debris layers as “sealed.”
inhabitants were cooking on the floor in every space in the house. The state of the building and the activities of the inhabitants suggest that they had taken over the building to use as domestic space after it had fallen out of use for its original purpose. This meant that they likely lacked the resources to clear away the destruction left by the earthquake and to reconstruct a new building. In addition, the fact that this building was being used for domestic purposes suggests that the Sanctuary was no longer being used for cult practice at a large scale.

4.2.2: The baths

The baths are the other structure at the sanctuary which was occupied prior to the earthquake, although the evidence regarding its occupation is less straightforward than the evidence from the West Building. The baths were located at the east edge of the sanctuary, just outside the precinct wall, and were composed of ten rooms, three of which (Rooms 7, 8 and 9), had hypocaust floors (Figure 4.2). The building was likely constructed around 101 or 102 CE, since an inscription found within the baths states that a bath building was constructed during this period. As with the West Building, we have evidence of modification of the building during the fourth century, although we lack coinage from the baths and thus must rely on ceramics, making precise dating difficult. On top of piles of ash in the hypocausts of Room 7 and in the flue between rooms 8 and 9, a number of lamps were found, indicating that they were deposited after the final use of the hypocausts. These lamps likely belong to the type Vessberg 18, which dates to the fourth and fifth centuries CE; they are the same lamps found in the West Building and in the Earthquake

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132 McFadden 1950, 18.
133 Scranton 1967, 62.
House. In addition, the same type of lamp was also found in the fill between an earlier and a later (earthen) floor of Room 10 (the praefurnium); McFadden suggests that this room was used as a dump for building materials before the installation of the new floor. The presence of the same type of lamp atop the debris in the hypocaust and the flues, and beneath the new floor of the praefurnium suggests that the hypocausts went out of use before the new floor was installed. Other structural changes to the building were probably made at this time, such as the blocking of certain doorways and the creation of new ones, and the addition of another foundation wall on the outside of the east and north sides of the structure.

134 Costello 2014; McFadden 1950, 24. McFadden states that these lamps are Broneer Type 28, but Costello notes that the lamps found by McFadden are either Vessberg 18 or unidentifiable. Therefore, it is probable that McFadden misidentified these lamps.
135 McFadden 1950, 24-25.
McFadden’s interpretation of the building is that the hot baths went out of use after being struck by the first Salamis earthquake in 332-333 CE, and that at least this part of the building, if not the entirety of the structure, was remodelled for some other purpose. He states that the building’s final destruction may have been due to the second Salamis earthquake ten years later.\textsuperscript{136} Unfortunately, we are unable to determine whether the baths went out use during the late

\textsuperscript{136} McFadden 1950, 24.
fourth century, as we lack numismatic evidence which would provide us with a more specific date. However, given that the only other sanctuary building known to be in use during the mid to late fourth century (the West Building) appears to go out of use as a result of earthquake collapse, the best explanation is that the occupation of the bath building also ends with an earthquake. McFadden’s suggestion that the building was destroyed in the 342 CE earthquake can be discounted, as all other evidence of destructive seismic activity from the site suggests that it occurred after 364; whether the building’s renovation was spurred by earlier seismic activity cannot be ascertained. The renovation of the baths also resembles the changes being made at the West Building; the buildings are both subject to low quality or inexpensive alterations (e.g. installation of earth floors) that indicate they were no longer being used for their original purposes. This suggests that these changes may have also occurred during the mid fourth century, prior to the baths’ destruction as a result of the earthquake. We cannot fully discount the possibility that the building was not destroyed as a result of seismic activity, and that the renovations therefore occurred post-earthquake, but it seems less likely given our other evidence. Therefore, it is possible that the baths may be an example of abandonment as a result of seismic activity. Moreover, if the baths were repurposed prior to the earthquake, this would suggest that the sanctuary was no longer operational during this period.

4.2.3: Post-earthquake use of the sanctuary

The Sanctuary of Apollo Hylates is generally understood to have been occupied by squatters after its destruction in the earthquake. This assertion appears to have largely come from Scranton’s 1967 analysis of the architecture of the Sanctuary of Apollo Hylates, in which he states that squatters performed “crude repairs and remodellings of parts of a few buildings,” in
particular the West Complex, the baths, the stoa, and the Southeast Building. However, the final alterations to the West Complex, and likely to the baths, occurred before the earthquake. Scranton provides no evidence of alterations to the stoa, and the only changes which he attributes to squatters in the Southeast Building are a few cuttings in the jambs and sill of a doorway. Therefore, Scranton’s evidence that squatters were present at the sanctuary after its destruction is unconvincing.

However, other authors have provided conclusive evidence of post-earthquake activities at the sanctuary. Excavations conducted by Soren revealed that areas around the Southeast Building had been occupied by squatters after the earthquake. A structure attached to the building was found to be primarily constructed from earthquake debris, and was occupied sometime after the late fifth century CE. Beneath this building was a floor made of caliche, likely constructed not long after the earthquake, which may have belonged to a road or to a squatter construction. A stable in the northwest room of this building may also belong to the post-earthquake period, but it was excavated by McFadden and never published. Other evidence of occupation during the post-earthquake period comes from the Archaic Precinct, and includes several coins, along with a grave dating to either the Early Christian or Medieval periods.

Based on the fact that neither the West Building nor the baths were being used for their original purposes prior to the earthquake, and on the evidence of post-earthquake squatting presented above, I argue that the earthquake did not fundamentally alter the ways in which the sanctuary was being used. The individuals who occupied each building were severely impacted, as they lost their source of shelter and many of their belongings, but others (or perhaps the same

137 Scranton 1967, 74.
138 Scranton 1967, 50.
139 Soren 1981, 118-119.
individuals) chose to reoccupy other parts of the sanctuary in a manner similar to that of the occupants of the West Building and the baths. As the immediate pre-earthquake use of the sanctuary does not appear to be religious in nature, the late-fourth-century Kourion earthquake cannot be held responsible for the cessation of cult practices at the sanctuary.

### 4.3: Domestic space at Kourion city

It is somewhat challenging to discuss people’s responses to the destruction of domestic spaces, as these have, for the most part, not been the focus of excavations at the site. Three pre-earthquake houses have been excavated at Kourion, and only two of them, the Earthquake House and Building 4, have been properly published.\(^\text{141}\) However, both of these houses are located in the same part of the site, as are some traces of post-earthquake domestic spaces, making it possible to suggest some patterns in responses to the destruction of domestic space.

#### 4.3.1: The Earthquake House

The Earthquake House is our best example of a domestic building occupied until the earthquake within the city, providing us a glimpse into people’s lives prior to the earthquake. This building is highly informative partly because of the presence of human skeletons within the building, but also because of the characteristics of the artifact assemblages. Hundreds of objects were found within the building, including the previously discussed coinage, vessels for storage, cooking, and serving, items for personal adornment, furniture, and various other objects.\(^\text{142}\) Many of these items were complete, and some (such as rings found in association with the skeletal remains)\(^\text{143}\)

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\(^\text{141}\) The third house, the House of the Achilles Mosaic, was excavated by McFadden.
\(^\text{142}\) See the artifact catalogue (109-134) in Costello 2014.
\(^\text{143}\) Costello 2014, 133.
were found in locations which suggest that the objects were being used at the time of the earthquake.

In his analysis of the Earthquake House, Costello interprets the building in its final phase to be a two-storey, multi-unit residential complex, shared by two or possibly three groups of people (Figure 4.3). The first group of residents (two adults and a juvenile), whose remains were found in Rooms 1 and 2, likely occupied the main part of the building (Rooms 1, 2, and 3, along with the upper floor). They appear to have possessed a certain degree of wealth, since objects of personal adornment (a gold ring and a silver-sheathed bone pin), a mule, and a large number of coins were found in Rooms 1, 2 and 3. The second group of residents (two adults and an infant), were found in Room 20, and likely also occupied Room 25. They largely lacked personal possessions, adornment items, coins, and other luxury items, and thus Costello interprets them to be of lower socioeconomic status than the first group. An adult individual found in Room 11 may represent a third group of residents who also occupied Room 8, as this part of the building is architecturally isolated. However, he may also belong to one of the other groups. Despite the wealth of some of the residents, Costello argues that the residents of the building were not elites. This is based on the architecture of the building, which lacks “aristocratic elements,” such as mosaics or peristyle courtyard.

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144 Costello 2014, 106.
145 Costello 2014, 97, 106.
146 Costello 2014, 105. It is worth noting that elements which Costello describes as aristocratic do appear in buildings elsewhere at the site.
Given that the residents of the Earthquake House were killed in the earthquake, how they responded to the collapse of this structure cannot be discussed (although it possible that some residents could have escaped). Instead, I have chosen to investigate why the remaining residents of Kourion did not reuse the area occupied by the Earthquake House after its collapse, and why they did not retrieve the bodies of the deceased. The latter question is of particular importance, since, as noted by McFadden, leaving bodies *in situ* was an abnormal practice.147 The presence of the skeletons within the Earthquake House indicates that the surviving residents either had no

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147 McFadden 1940.
interest in recovering the bodies, as suggested by Davis,\textsuperscript{148} or that they decided it would be too challenging to remove them from the rubble. Another possibility is that other residents of Kourion had no idea that people’s bodies were trapped in the structure, although this seems less likely in a medium-sized city like Kourion. The occupants of the Earthquake House were also clearly interacting with other residents of Kourion, as evidenced by the amount of coinage in their house, which suggests that someone would have noticed their absence. If residents knew that there were bodies beneath the rubble of the building, this may have been one factor in their decision not to reoccupy this area of the city.\textsuperscript{149} In addition, since this building was occupied by residents who were not of high socioeconomic status, and was located some distance from the forum, this land may not have been of great value.

4.3.2: Building 4

Building 4, while located nearby the Earthquake House, presents a different story in terms of its pre-earthquake occupation. According to the excavators, the building was likely intended for use as an elite residence, as indicated by architectural features such as ashlar masonry, stone decorative elements, mosaic and gypsum floors, and arched elements. Artifacts from within the building, some examples being rare imported glasswares, pieces of marble sculpture, and a carved limestone vase, also support this conclusion. The remains of four individuals (all of which were adolescent or younger) were found inside the building, suggesting that the building collapsed on top of its residents. However, these individuals were found atop a thick deposit of kitchen refuse (ash, animal bones, eggshells, and cooking pot sherds), which indicates that at least part of the structure was not in use at the time of the earthquake. To confuse the situation

\textsuperscript{148} Davis 2013, 113.
\textsuperscript{149} Davis 2013, 114.
further, the imported glasswares (a millefiori plate and a cage cup) both date to the fourth century, indicating that there were still elite residents making use of the building close to the time of its destruction. Aside from the dumping of refuse atop the collapsed structure, there is no evidence of post-earthquake reuse of the area.\textsuperscript{150}

The most likely scenario regarding pre-earthquake occupation of the building is that it was abandoned by its elite residents not long before the earthquake, and the skeletal remains belong to non-elite individuals who were using the space for shelter. Nonetheless, it is possible only part of the structure was being used for refuse dumping, and that there were still elite residents making use of the space at the time of the earthquake. Should this be the case, it is probable that some of the occupants of the building escaped, since it is unlikely that an elite structure was only occupied by four non-adults. Hopefully, as excavations of Building 4 progress, the socioeconomic status of its final residents will be further clarified.

Despite the differences in pre-earthquake occupation of Building 4 and the Earthquake House, the presence of human remains within Building 4 also prompts the question of why the bodies of these people were not retrieved following the earthquake. Once again, surviving residents either had no interest in recovering the bodies of the deceased individuals, or it was too challenging to remove them from the rubble. However, if the occupants of the building were non-elite peoples using the space for shelter, it is much more likely that no one noticed their absence, or knew they were making use of the building. If the building was abandoned prior to the earthquake, as I suggest is most probable, then residents of Kourion who could afford to construct a building may have already been uninterested in making use of this area of the city. However, if the building was occupied by elite residents up until the earthquake, and some of

\textsuperscript{150} Grimsley et al. (forthcoming, 9); Grimsley et al. 2018.
these residents survived, this building may have been purposefully abandoned as a result of earthquake damage. In either case, the presence of human remains within the structure may have deterred residents of Kourion from using the space after the earthquake.

4.3.3: Post-earthquake occupation of Southeastern Kourion

While the spaces occupied by the Earthquake House and Building 4 were never reused, the KUSP excavations have revealed traces of post-earthquake occupation in other parts of the Southeastern area of the city. These include a settling basin in Area A, a cistern in Area B, a basin structure which probably served as a decorative pool in Area C, two mosaic floors, on in Area D1, the other in Area D2, and an additional five cisterns (see Figure 1.5). The settling basin dates to the mid to late fifth century, both mosaics were constructed sometime after the earthquake, and a compacted earth surface surrounding the cistern in Area B was put in place after 475 CE.\(^\text{151}\) None of these areas show any evidence of pre-earthquake occupation.\(^\text{152}\)

These new findings indicate that new areas of the acropolis were occupied after the earthquake, and that this area may have been home to several elite residences, as evidenced by the mosaics and the pool.\(^\text{153}\) Davis argues that the occupation of new spaces was a deliberate response to the emotional distress caused by the earthquake; regardless of whether people knew there were bodies left in Earthquake House and Building 4, spaces such as these were probably associated with the trauma of the event.\(^\text{154}\) Davis also proposes that this area of Kourion was chosen for reoccupation because it could house a number of cisterns, a technology which he

\(^{151}\) Davis 2013, 107-111.  
\(^{152}\) Davis 2013, 112.  
\(^{153}\) Davis 2013, 112.  
\(^{154}\) Davis 2013, 114.
suggests became popular after the earthquake because it was less vulnerable to the effects of an earthquake than the aqueduct system used during the Roman period.\textsuperscript{155}

\textbf{4.4 Public space at Kourion city}

It is well established that public space at Kourion city after the earthquake looked markedly different from public space prior to the event. However, the reasons behind these changes are not well-understood, and cannot be wholly attributed to the earthquake, since previous destructive earthquakes at Kourion did not result in the transformation of its public spaces.\textsuperscript{156} As a result, it is necessary to compare Kourion’s post-earthquake public infrastructure with that of cities elsewhere in the empire. Therefore, prior to discussing the circumstances of individual structures at the site, I present some patterns in the development of urban spaces in the empire in the Late Antique period.\textsuperscript{157}

During the fourth and fifth centuries, certain aspects of urban landscapes which were present during earlier periods are retained. Throughout most cities in the empire, the forum continues to be the central public space until the sixth century, when the church takes over this role.\textsuperscript{158} During the fourth and fifth centuries, new fora are built, and pre-existing fora are renovated. Church building also takes place during this period, but they are largely built near the edge of the city.\textsuperscript{159}

As will be demonstrated below, these particular trends are significant to the study of Late

\textsuperscript{155} Davis 2013, 114.
\textsuperscript{156} For example, the early-first-century CE renovation of the theatre was likely undertaken because of earthquake damage (Costello 2014, 13).
\textsuperscript{157} Ideally, I would also compare Kourion with other Cypriot cities, but little has been written on the topic of Late Antique Cypriot urbanism.
\textsuperscript{158} Lavan 2006, 195; Liebeschuetz (1992, 26) also suggests that this is true, at least for the Eastern half of the empire.
\textsuperscript{159} Lavan 2006, 196, 199, 202, 233-234.
Antique Kourion, because the abandonment of the forum occurs in the immediate post-earthquake period, and not in the sixth century.

While forms of public architecture remain largely unchanged during the fourth and fifth centuries, the mechanisms by which these spaces get built undergo a transformation. During the first three centuries of the Roman empire, private benefactors (along with emperor) were primarily responsible for the construction of monumental public spaces such as fora. A main motivation for euergetism on the part of private citizens was to increase their social and political standing.\textsuperscript{160} As wealth became consolidated in the hands of fewer people, and as local politics ceased to be a venue for elite competition, private benefaction was directed towards large, politically importance cities (such as Constantinople), and usually took the form of spectacles as opposed to monumental buildings.\textsuperscript{161} When buildings were constructed by private benefactors, the benefactors were usually Christian, and had philanthropic motivations for their euergetism.\textsuperscript{162} The construction of secular public spaces thus became primarily the domain of the emperor.\textsuperscript{163} Therefore, by the time Kourion’s public infrastructure was destroyed by the earthquake, imperial benefaction would have been the only probable source of funding for the reconstruction of the forum.

I argue that because of changes in the mechanisms for funding the construction of public spaces, Kourion’s public infrastructure took on a new form after the earthquake, one which would become standard across the empire a century later. By examining each public space which was in use before and after the earthquake, we can reconstruct how broader changes in the

\begin{itemize}
  \item \textsuperscript{160} Ruggini 2014, 204-206.
  \item \textsuperscript{161} Liebeschuetz 1992, 6-9; Ruggini 2014, 208.
  \item \textsuperscript{162} Neil 2011, 55-56.
  \item \textsuperscript{163} Ruggini 2014, 203.
\end{itemize}
empire shaped the development of public space at post-earthquake Kourion. These spaces are the Northwest Area, the theatre, the Eustolius Complex, and the Episcopal Precinct.

4.4.1: The Northwest Area

The Northwest Area,\textsuperscript{164} located 35 m northeast of the basilica, contains a significant amount of Roman Kourion’s monumental public architecture, including its forum. Since this part of the acropolis was built over with different types of structures after the earthquake, it demonstrates how the earthquake played a role in transforming public space at Kourion. Among the many archaeological remains in the Northwest area, the nymphaeum, the forum, and a number of rooms in the southeast sector of this area are of particular interest to this study (Figure 4.4).

\textsuperscript{164} The Northwest Area is my name for this part of the site, which despite being northeast of the basilica, is on the northwestern end of the Acropolis.
Figure 15: Plan of the excavated remains of the Northwest Area. Christou 1983, 268.
The nymphaeum is a monumental ashlar building which was occupied from the first to the seventh centuries CE, whose architectural history can be divided into four phases. In its first phase, the nymphaeum was composed of two rooms: a smaller room with an apse flanked by two basins, and a larger space, which was either another room or a courtyard. The building underwent repairs and modifications during its second phase, but largely retained its original plan. The third phase, beginning in the third century CE, is marked by the construction of a large hall, decorated with a mosaic floor, on the southwest side of the building. According to Christou, the building was destroyed in the earthquake, bringing an end to its third phase. The nymphaeum’s final phase began in the early fifth century, when the building was reconstructed, and the large hall was divided into a number of smaller rooms using rubble cross-walls. After its destruction in the seventh century, a number of lime-kilns were constructed around the nymphaeum to turn building materials into lime.165

The forum of Kourion was made up of a monumental colonnaded building, which may have gone out of use as a result of the earthquake. In the early fifth century, the majority of its components were removed for use as building material, and a complex of rooms was constructed in the space previously occupied by the colonnaded building. The walls were composed of rough stones and pebbles, and the rooms were described by Christou as “ordinary.”166 This complex is similar to the rooms in the nymphaeum, as well as rooms in the southeast sector of this area, which are also “ordinary” rooms constructed from rough stones. However, these rooms were initially built prior to the earthquake, during the first half of the Roman period, and were rebuilt at the beginning of the Early Christian period.167 As all of these spaces are non-monumental, and

167 Christou 1983, 274.
largely undifferentiated from one another, they were likely used for either domestic or economic purposes.\textsuperscript{168}

In examining the Northwest Area before and after the earthquake, we are left with the question of why this area changes so dramatically in the post-earthquake period. The decision not to rebuild the forum can likely be explained by the decline in private benefaction. As discussed above, the forum was still the centre of public life for most cities in the empire at the time of the earthquake, indicating that this type of public space may still have been useful to the residents of Kourion. However, had they been unable to secure imperial benefaction for the reconstruction of the forum, then they would have had no means of funding this project. Meanwhile, the nymphaeum was probably not rebuilt because of its association with non-Christian religious practices. As evidenced by the abandonment of the sanctuary of Apollo Hylates, and the other sanctuaries around the island, the public worship of traditional deities appears to have been in decline during this period. Additionally, according to Lavan, temples in fora across the empire were being destroyed or repurposed in the fourth and fifth centuries, suggesting that the decision not to rebuild the nymphaeum is part of an empire-wide trend.\textsuperscript{169}

The construction of the numerous small rooms in the spaces formerly occupied by the nymphaeum and the forum of may be related to a trend in Late Antique urban architecture mentioned by Lavan, in which small, cellular shops are built within fora.\textsuperscript{170} While the monumental aspects of the Kourion forum had been destroyed, this area of the city continued to be important, as the Christian basilica was built nearby. In addition, the forum and the

\textsuperscript{168} Christou published a final report on his excavations in 2013, but I was unable to access it. There was also apparently a bread oven set up in the pre-earthquake public baths, which were located in this area (Buell, Mavromatis, and Parks 2010, 277).
\textsuperscript{169} Lavan 2006, 231-232.
\textsuperscript{170} Lavan 2006, 226.
nymphaeum would have provided pre-built foundations, along with a ready supply of building material. Another explanation has been provided by Buell, Mavromatis, and Parks, who, in their discussion of the late antique urban environment at Kourion, suggest that these rooms are examples of a broader phenomenon during the late antique period, in which public spaces are transformed into private spaces.\textsuperscript{171} However, Buell, Mavromatis, and Parks rely heavily on studies from specific regions in the empire to make this claim, which suggests that this may not be an empire-wide phenomenon. I thus suggest that the most likely reason for the construction of these rooms in the nymphaeum and the forum is that the Northwest area continued to act as the city centre, even after the earthquake.

4.4.2: The theatre and associated buildings

The theatre is another monumental public building which went out of use after the earthquake. However, prior to discussing the structure, there are a number of issues with the data that bear mentioning. As noted earlier, Stillwell did not excavate the theatre, and was working off notes left by its excavator, DeCoursey Fales.\textsuperscript{172} Stillwell’s interest in architecture means that the publication contains little information about stratigraphy or artifacts. We thus lack the stratigraphic information about the debris layers that would allow us to definitely assign the destruction of these buildings to the earthquake, although based on numismatic evidence presented below, this is the most likely scenario. In addition, although Stillwell does provide his interpretation of how spaces were used, the paucity of information about artifacts found in these spaces makes it impossible to reanalyze his interpretations, or to discuss the socioeconomic status of the peoples who used these spaces. Finally, since stone was taken from the theatre for

\textsuperscript{171} Buell, Mavromatis, and Parks 272, 276.
\textsuperscript{172} Stillwell 1961, 37.
use elsewhere after the theatre went out of use, it is probable that much of the stratigraphy in and around these buildings has been disturbed.\footnote{Christou 1986, 16; Stillwell 1961, 78.}

The Kourion theatre, which was first built during the Hellenistic period, was repeatedly restored and rebuilt until around 250 CE (Figure 4.5).\footnote{Stillwell 1961, 77-78.} The evidence for its destruction comes not from the theatre itself, but from rooms built on the back wall of the stage building, which Stillwell has interpreted as shops. Beneath debris in Room S.1, slightly above the floor, was found a coin of Valens and Valentinian I, which Stillwell dates between 365 and 375 CE.\footnote{Stillwell 1961, 63, 78.} Given that these rooms share a wall with the stage building, it is probable that this entire structure collapsed, which would have made the theatre no longer useable.
Figure 16: Plan of the theatre. Stillwell 1961, 40.
However, there is also evidence of continued use and construction after the earthquake in and around the theatre. Rooms T.4 and T.5, which are not directly connected to any of the theatre buildings, contained coinage spanning from Constantius II (345-361 CE) through Honorius (433 CE); Stillwell argues that these rooms were used as cellars.\textsuperscript{176} The evidence for construction after the earthquake comes from the corridor behind the cavea, in which a number of rubble cross walls were built; underneath one of the walls a coin of Theodosius I (late fourth century CE) was found.\textsuperscript{177} It is unclear what purpose these walls served.

The main question which arises about the response to seismic damage at the theatre are why it was not rebuilt after the earthquake. It is unclear from Stillwell’s publication whether the theatre itself was being used up until the earthquake; it is possible that only the rooms behind the building were occupied, and were being used for some unrelated purpose. In any case, the theatre building was not again used for its original purpose after the earthquake. I suggest that the decision not to rebuild the theatre could also be, at least in part, attributed to the inaccessibility of benefaction. Although the church opposed theatrical performances, they continued to be popular during the Late Antique period,\textsuperscript{178} indicating that the decision to abandon the theatre was not necessarily due to lack of interest. Therefore, while we cannot definitely explain why the theatre went out of use, a lack of resources for its reconstruction is a probable explanation.

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\textsuperscript{176} Stillwell 1961, 62.  \\
\textsuperscript{177} Stillwell 1961, 78.  \\
\textsuperscript{178} Liebeschuetz 1992, 32. 
\end{flushright}
4.4.3: The Eustolius Complex

The Eustolius Complex is one of two examples of public spaces that were built within the city following the earthquake. However, it is challenging to discuss due to its poor publication.

Although the Pennsylvania Museum excavators did publish some brief articles which discuss the complex,\(^\text{179}\) most of information about this building comes from publications intended for a general audience.\(^\text{180}\) The complex was built on top of an earlier elite private residence possibly dating to the Hellenistic period. Both Christou and Rupp date the construction of the complex to the late fourth century CE, although Rupp believes the baths were built prior to the earthquakes.\(^\text{181}\) It is unclear how the building was used; it is perhaps best described by Rupp as “a Roman peristyle courtyard building with associated baths.”\(^\text{182}\) The building’s form (Figure 4.6), with a hallway (Room 5) leading to a peristyle court (Room 6), and a square (dining?) room facing the court (Room 8),\(^\text{183}\) is reminiscent of a elite Roman house, but epigraphic evidence from within the building suggests that it likely served some sort of public function. The lack of information concerning artifactual remains further obfuscates our understanding of the building’s purpose.

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\(^{179}\) Daniel 1948; Fales 1950.

\(^{180}\) Christou 1986; Rupp 1982.

\(^{181}\) Christou 1986, 22; Rupp 1982, 134. Rupp provides no explanation for his statement that the baths were built prior to the earthquake, although this statement does come from a guidebook for Kourion. Rupp has written an article on the mosaics from the Eustolius Complex that is in a forthcoming volume on Kourion.

\(^{182}\) Rupp 132, 1982.

\(^{183}\) Rupp 1982, 133.
The Eustolius Complex was richly decorated with figural and geometric mosaics, some of which also displayed inscriptions. Some of these mosaics reference Christianity, either directly in the inscriptions, or through figural art (birds and fish) which is thought to be particularly Christian in character; this suggests that whoever commissioned the building was Christian. Most relevant to the discussion of earthquake responses at the site, however, is an inscription which states that someone named Eustolius gifted the complex to the citizens of Kourion. The traditional translation of this mosaic is as follows:

Figure 17: Plan of the Eustolius Complex. Christou 1986, 19.
“Eustolios, having seen that the Kourians, although previously very wealthy, were in abject misery, did not forget the city of his ancestors but first having presented the baths to our city, he was then taking care of Kourion as once did Phoebus (Apollo) and built this cool refuge sheltered from the winds.”\textsuperscript{184}

However, a recent translation by the excavators of the site changes the meaning of the inscription significantly:

“The citizens of Kourion, who once had considerable wealth, were now in abject misery. When Eustolios saw this, he did not forget his land, but naturally remembered her with love, presenting the city with baths. He indeed took care of Kourion, as Phoebus had once done, by restoring calm in the earthquake-struck land.”\textsuperscript{185}

Instead of translating the final clause to say that Eustolius built a refuge for the citizens of Kourion, the excavators’ interpretation states that Eustolius helped restore order after the earthquake. The differences in translation are almost certainly a result of differing reconstructions of the Greek text, as the final line of the mosaic is damaged. As the site excavators almost certainly reconstructed the inscription with the earthquake hypothesis in mind, this inscription cannot be used as primary evidence for seismic activity at Kourion. However, it may provide support for the theory that this complex was built specifically to replace public spaces destroyed by seismic activity.

Based on the available information, the most likely interpretation of this complex is that it was a public space for recreation and maybe administration that was built following the earthquake by Eustolius, a wealthy benefactor who had familial ties to the city.\textsuperscript{186} As noted

\textsuperscript{184} Christou 1986, 23. Based on a reconstruction of the greek from Mitford 1971, 357.

\textsuperscript{185} Grimsley et al. 2018.

\textsuperscript{186} Buell, Mavromatis and Parks, 2010, 277.
earlier, private benefaction was rare during the Late Antique period, although given the Christian elements in the building’s decoration, this can perhaps be considered an example of philanthropic Christian euergetism. This building may have acted as a replacement for monumental public spaces destroyed in the earthquake; why it took this unusual form, and was built at the outskirts of the acropolis, is unclear.

4.4.4: The Episcopal Precinct

The basilica and its surrounding buildings occupied a central location in post-earthquake Kourion. As noted in the preceding chapter, the basilica was built in the early fifth century on the foundations of the Roman basilica; Megaw attributes its construction to the Bishop Zeno.187 According to Megaw, the other main part of the precinct, the baptistry, was likely constructed soon after.188 In addition, fourth century elements were apparently retained in some of the buildings west of the basilica.189 The decision to construct the basilica on the footprint of its Roman counterpart was apparently, at least in part, a cost-saving measure; at the time it was built, it was one of the largest basilicas on the island. However, Megaw also attributes the decision to place the basilica in the space previously occupied by an important administrative building to the authority of the bishop.190 A significant portion of stone from the basilica was reused, probably from the previous basilica and from other buildings in the area; undoubtedly, reusing available stone would have been the most cost-effective manner of construction for such a project. Megaw believes that the Roman basilica was destroyed in the earthquake, but since the

188 Megaw 2007, 558.
189 Megaw 2007, 559.
190 Megaw 2007, 555-556.
building no longer exists, this cannot be confirmed. However, it seems likely, since if the building had survived the earthquake, presumably it would have been renovated to serve as a basilica instead. Megaw also suggested that walls which survived the earthquake were levelled prior to the construction of the basilica, perhaps indicating a process of ritual purification as a result of the building’s association with imperial cult. 

Megaw states that Kourion was likely still “a pagan city” after the earthquake, and that the large size of the catechumens in the basilica indicate that the planners of the basilica constructed the space so that people could be converted en mass (Figure 4.7). His interpretation suggests that the basilica’s construction preceded the popularity of Christianity at the site. However, Megaw may be overestimating the presence of non-Christian religious practices at the site after the earthquake. The Eustolius complex has a number of inscriptions and figural art intended for a Christian audience, suggesting that there was already Christian presence at the site by the time of the construction of the basilica. In addition, non-pagan religious practices appear to have been in decline at Kourion and in Cyprus, as evidenced by the abandonment of the major sanctuaries. Therefore, Megaw’s assertion that seems improbable.

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191 Megaw 2007, 555.
192 Megaw 2007, 555.
193 Megaw 2007, 556.
The more likely explanation for the construction of the basilica in the early fifth century is that there was already a well-established Christian population at Kourion. This is supported by Davis’ study on the impact of earthquakes on the development of Christianity throughout Cyprus. He argues that that the numerous earthquakes which struck Cyprus during created the

Figure 18: Plan of the basilica. Megaw 2007, 75.
correct social landscape for the further proliferation of Christianity, thus resulting in the widespread construction of churches during the late fourth and early fifth centuries.\textsuperscript{194} The church had already developed organizational structures on Cyprus prior to the occurrence of seismic activity, but that it lacked physical infrastructure.\textsuperscript{195} Therefore, the construction of Kourion’s basilica in the early fifth century can be attributed to the presence of a pre-existing population of Christians at the site.

While the religious climate on the island during the early fifth century can explain the construction of Kourion’s basilica, it cannot explain the basilica’s central location within the city. As noted earlier, the construction of basilicas in city centres across the empire is a development which largely occurs during the sixth century, making the Kourion basilica an outlier. I suggest that the earthquake played a part in the basilica’s location, as it cleared the city centre of its previous architecture, and thus provided pre-built foundations (from the Roman basilica) and an ample supply of building materials. Therefore, the earthquake resulted in Kourion developing an urban layout which would not occur in most other cities for another century.

4.5: Conclusion

Archaeological remains from the Sanctuary of Apollo Hylates and Kourion city provide a diverse body of evidence regarding people’s responses to damage caused by the late-fourth-century earthquake. By examining the data within its broader cultural context, it is possible to

\textsuperscript{194} Davis 2010, 13.
\textsuperscript{195} Davis 2010, 12.
investigate how the earthquake contributed to Kourion’s development during the Late Antique period.

When the evidence regarding pre- and post-earthquake occupation at the sanctuary is examined, it becomes clear that the sanctuary was no longer being used for its original purpose, large-scale religious practice, in the period prior to the earthquake. Most of the buildings at the sanctuary went out of use prior to the earthquake, while some structures were reoccupied by people of low socioeconomic status, likely for domestic purposes. These particular structures were abandoned after the earthquake either because their occupants were killed, or because they lacked the resources to repair the buildings, but similar types of occupation continue at the sanctuary after the earthquake. Finally, since the sanctuary ceased to be used for cult practice prior to the earthquake, this event cannot be held responsible for the sanctuary’s abandonment. A definitive conclusion about the state of the Sanctuary of Apollo Hylates after the earthquake can be reached because of the extensive excavation at the site. All of the known architecture at the sanctuary has been uncovered, and it is probable that further fieldwork would add very little to our understanding of the site. There are still problems with the data set, the most notable being the excavation techniques and recording methodology of the University Museum excavations; it is possible that McFadden destroyed valuable evidence while clearing the architecture, or failed to record it. The evidence is also unclear in places such as the baths, which may have been occupied after the earthquake. However, given that we are unlikely to obtain more data about the sanctuary, the theory presented above is the most probable explanation as to how seismic activity affected the sanctuary and its occupants.

In contrast with the sanctuary, it is difficult to draw broad conclusions about people’s responses to the destruction of domestic spaces within Kourion, since very few of these spaces
have been excavated. Both houses in use prior to the earthquake, the Earthquake House and Building 4, differ significantly in the status of their occupants, and in how they were used prior to the earthquake. The Earthquake House was occupied by a number of non-elite peoples, some of whom had amassed a certain amount of wealth. In contrast, Building 4 was likely abandoned by its elite occupants not long before the earthquake, and was probably being used as shelter by people of low socioeconomic status. Neither of these houses can be taken as representative of the overall state of Kourion at the time of the seismic event; at best we can argue that some residents appear to have been economically stable, while others may have experienced some sort social, economic, or political issue which forced them to abandon their property. Since (at least some of) the occupants of these spaces were killed during the earthquake, it is not possible to discuss their particular responses to the destruction caused by the event. However, according to Davis, the development of previously unoccupied space on the Kourion acropolis may indicate that the residents of Kourion responded to the emotional distress caused by the earthquake by avoiding spaces which may remind them of the event.\textsuperscript{196} Additionally, Davis’ investigations suggest that the residents took measures to make their infrastructure more resilient to future seismic events.\textsuperscript{197}

It is easier to discuss patterns in Kourion’s public infrastructure before and after the earthquake, as excavations at the city have primarily focused on public buildings. The types of public space present at Kourion after the earthquake are drastically different from those that existed prior to the event, and these changes are primarily a result of two factors, the decline in private benefaction, and the growing popularity of Christianity. The decision not to rebuild significant aspects of Kourion’s public architecture, such as the forum and the theatre, can most likely be attributed to an inability to fund these projects through benefaction, since traditional

\textsuperscript{196} Davis 2013, 114.
\textsuperscript{197} Davis 2013, 114.
forms of Roman public architecture remain popular throughout the empire until the end of the fifth century. In contrast, the repurposing of the nymphaeum was almost certainly a result of the declining interest in non-Christian religious practices. The small rooms, most likely shops, which were built atop the foundations of the nymphaeum and the forum may suggest that this area of the city remained central, despite the destruction of these buildings. Meanwhile, the Eustolius Complex, which can be understood as an example of Christian euergetism, likely served as a replacement for some of the public buildings destroyed in the earthquake, although the reasoning behind its form and its location remain a mystery. The construction of the other important post-earthquake public building, the basilica, is a result of the increasing importance of Christianity on Cyprus in the late fourth and early fifth centuries. Since the earthquake destroyed the public architecture which had previously occupied the centre of the city, the basilica was built in its place, a development which would not occur widely throughout the empire until the sixth century.
Chapter 5: Conclusion

In order to understand the role destructive earthquakes played in shaping site histories, we must adopt a disaster-oriented approach, which takes into account the influence of both natural processes and human action. Traditional approaches to investigating earthquakes in the archaeological record have largely ignored the latter factor, instead treating them as cataclysmic natural events which determine the course of site development. By focusing on people’s responses to these disasters, I have attempted to address how human agents take part in shaping the outcomes of disasters. In practice, this involves investigating the processes of decision-making which lead to people’s responses, and how these processes affected by socioeconomic status, and the broader cultural context. The application of this methodology provides a detailed picture of people’s responses to the earthquake at multiple scales, allowing us to suggest a relationship between the actions of individuals and site-wide patterns. This in turn permits an assessment of how the disaster fits into the site’s broader trajectory of development.

When we examine late-fourth-century seismic activity at Kourion, the utility of the disaster-oriented approach becomes evident. Soren’s failure to consider the part played by the residents of Kourion in the outcome of the disaster led to a sparse and inaccurate picture of the site after the earthquake, in which seismic activity caused the abandonment of the site, and the site’s eventual reoccupation is not explained. In contrast, my methodological approach has allowed me to trace the development of the site from the pre-earthquake to the post-earthquake period, filling in a significant gap in our understanding of the site’s history.

At the sanctuary, the earthquake led to the abandonment of the buildings which were still occupied prior to the earthquake, likely because their occupants lacked the resources necessary for their reconstruction. Parts of the sanctuary were occupied by squatters after the earthquake, as
Soren has argued.\textsuperscript{198} The structures occupied prior to the earthquake were no longer being used for their original function, the facilitation of large-scale cult practices. This indicates that the cessation of these practices was not related to the earthquake, as has been previously argued, and lends support to the theory that Christianity was already established at Kourion prior to the seismic event.

At the city, we are faced with a more complex set of responses, some of which are more easily accessible than others. Little can be said about the responses of individuals to the destruction of their homes, as the residents of both of our pre-earthquake domestic spaces were killed in the earthquake. However, post-earthquake occupation patterns in the southeastern part of Kourion suggest that trauma may have played a part in the residents’ responses, and the proliferation of cisterns in the same area may indicate that the resiliency of infrastructure was taken into consideration in the process of rebuilding.\textsuperscript{199} Further investigations by KUSP will hopefully provide us with more information about post-earthquake domestic space at Kourion.

Our picture of responses to the earthquake within the city is much improved when we examine people’s responses to the destruction of public spaces. Kourion’s public infrastructure took on completely different forms after the earthquake, which is indicative of religious and cultural changes that were taking place at the site around this period. The decision not to rebuild much of the city’s public infrastructure was the result of changes in the custom of benefaction, and the Eustolius Complex may represent a new, Christian form of this practice. The construction of a Christian basilica as one of the primary pieces of public architecture following the earthquake, along with the abandonment of the nymphaeum, is indicative of the growing power of the church as an institution on Cyprus. Because of destruction caused by the

\textsuperscript{198} Soren 1987, 42.
\textsuperscript{199} Davis 2013, 114.
earthquake, the basilica became the central public space at Kourion, making the city an early adopter of an urban landscape which would become widespread a century later. Changes to public space at Kourion during the late fourth and early fifth centuries are thus not wholly attributable to the earthquake, but arose from interactions between the broader cultural developments happening on Cyprus and in the empire and the destruction caused by the earthquake.

5.1: Other lessons from the Kourion earthquake

My analysis of the Kourion earthquake has also brought to light a number of other methodological considerations. First of all, identifying earthquakes in the archaeological record is a challenging process, since many indicators of seismic activity can also result from other causes. In order to correctly identify a seismic event, an approach is needed which takes into account a variety of archaeological and geological evidence; relying solely on archaeological evidence of destruction is not sufficient. Literary evidence must be used with caution, as the historical record does not provide a complete catalogue of destructive earthquakes in antiquity. Soren’s attribution of the Kourion earthquake to Ammianus’ 365 event demonstrates the problems with using literary evidence, as the earthquake described by Ammianus is probably a literary fiction.

An additional methodological issue raised by this study is the difficulties associated with interpreting coinage. Numismatic evidence is not immune to the site formation processes which shape the rest of our data, and thus we cannot treat the period during which the coin was minted as a precise indicator of when it was deposited. Soren’s failure to consider site formation processes in his treatment of the numismatic evidence led him to an improbably specific date for
the earthquake, and contributed to his incorrect assertion that the site was completely abandoned for a period after the seismic event.

**5.2: The importance of collaboration**

A final conclusion from this study is that our ability to investigate responses to seismic activity in the archaeological record is hindered by the quality of the available data. This is evident at Kourion, where excavations have largely proceeded in a way which makes it difficult to discern whether destruction at the site was the result of seismic activity. This issue could be resolved through the application of some of the techniques suggested by Galadini, Hinzen, and Stiros, such as sampling for coseismic geological effects, or modelling of the seismic event. Not all of the issues in the data from Kourion can be attributed to a lack of the application of archaeoseismological techniques; many of the problems are a result of insufficient recording and publication of data. Regardless, if we had seismological data from Kourion, we would be able to better understand the specifics of the seismic event, and thus would have a better idea of the state of the site immediately after the earthquake. As seismic activity is common in the Mediterranean region, it is imperative that archaeologists begin to work with seismologists should they suspect that their site was impacted by an earthquake.

However, collaboration does not mean consulting a seismologist who has no understanding of archaeological research, or uncritically making use of seismological data. Both archaeologists and seismologists have attempted to use each other’s data without understanding how those datasets are formed. A prime example comes from the interpretation of the intensity of the Kourion earthquake suggested by Dr. Neophytou, one of the geologists with whom Soren collaborated. He states that the Kourion earthquake may have measured IX on the Modified
Mercalli scale. However, this scale is based on the severity of the structural damage to buildings, and cannot be easily applied to archaeological materials, which have been altered by taphonomic processes. Similarly, Soren proposed that the Kourion earthquake affected a much broader region than is possible from a geological standpoint. Effective collaboration comes from each party gaining a basic understanding of each other’s disciplines; the work of Stiros is an excellent example of the benefits of such an approach.

Finally, collaborating with seismologists can also allow archaeologists to contribute to modern disaster research. Understanding patterns of seismic activity in the past allows seismologists to better predict the occurrence of future earthquakes. The more accurate understanding of past seismicity gained from archaeoseismologic research thus not only leads to a better understanding of ancient earthquake disasters, but also improves our comprehension of the risks seismic activity may pose to modern peoples.

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200 Soren 1981, 118.
201 For example, Galadini, Hinzen and Stiros 2006; Stiros 2001. The Modified Mercalli scale uses Roman numerals.
Bibliography


Appendices

Appendix A: Data from Cox’s coin catalogue

A.1: Coins in Cox’s catalogue dating between 333 and 408

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