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Terra Terror: An Interdisciplinary Study of Earthquakes in Ancient Near Eastern Texts and the Hebrew Bible

A dissertation submitted in partial satisfaction of the

requirements for the degree Doctor of Philosophy

in Near Eastern Languages and Cultures

by

Ryan Nathaniel Roberts

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ABSTRACT OF THE DISSERTATION

Terra Terror: An Interdisciplinary Study of Earthquakes in
Ancient Near Eastern Texts and the Hebrew Bible

by

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Doctor of Philosophy in Near Eastern Languages and Cultures
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The relationship between tectonic environment and human activity has a long history that intimately involves the Ancient Near East and Levant. Texts from the third millennium onward attest to earthquake imagery while records of actual earthquakes cluster in two periods in the Middle and Neo-Assyrian periods. The research first examines the relationship between the tectonic environment and earthquake imagery that is found amidst Storm-god imagery. Next, close attention is paid to the textual and archaeoseismic evaluation of earthquakes recorded in Middle and Neo-Assyrian texts and the extent to which historical information from these texts can inform a reconstruction of the earthquake's effects. Within the Levant, a detailed archaeoseismic evaluation of Iron IIB sites with purported mid-eighth century seismic damage suggests better methodological controls are needed to identify seismic damage in the archaeological record. A number of interdisciplinary approaches, including post-disaster

housing, earthquake eyewitness accounts, and gender and vulnerability studies are applied to Amos in order to provide a fresh perspective on identifying earthquake imagery within the book. These approaches help reconstruct the socioeconomic, political, and religious effects of the earthquake mentioned in Amos and illustrate how his oracles and prophetic validity would have been authenticated through the earthquake. These approaches also shed new light on "social justice" texts within Amos and how the aftermath of an earthquake would have underscored, anew, the gap between the rich and poor.

The dissertation of Ryan Nathaniel Roberts is approved.

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2012

For Jess

פיה פתחה בחכמה ותורת־חסד על־לשונה׃

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ABBREVIATIONS

AAA	Annals of Archaeology and Anthropology
AAG	Association of American Geographers
AAPG Bulletin	*American Association of Petroleum Geologists*
AB	Anchor Bible
ABD	Anchor Bible Dictionary
ADAJ	*Annual of the Department of Antiquities of Jordan*
ADG	*Annali Di Geofisica*
AF	Altorientalische Forschungen
Afo	*Archiv für Orientforschung*
AG	*Annals of Geophysics*
AJA	*American Journal of Archaeology*
AJEM	*The Australian Journal of Emergency Management*
AJSL	American Journal of Semitic Languages and Literature
AnOr	Analecta Orientalia
ANE	Ancient Near East
AO	*Der Alte Orient*
AOAT	Alter Orient und Altes Testament
AS	*Ageing and Society*
ASLU	Archaeological Studies Leiden University
AUSS	*Andrews University Seminary Studies*
AUS	American University Studies
BA	*Biblical Archaeologist*
BAR	*Biblical Archaeology Review*
BARIS	British Archaeological Reports International Series
BASOR	*Bulletin of the American Schools of Oriental Research*
BEATAJ	Beiträge zur Erforschung des Alten Testaments und des antiken Judentum
BF	Baghdader Forschungen
BGTA	*Boll. Geofis.Teorica Applica*
BIES	*Bulletin of the Israel Exploration Society* (= *Yediot*)
BiOR	*Bibliotheca Orientalis*

BIS	Biblical Interpretations Series
BSac	*Bibliotheca Sacra*
BSSA	*Bulletin of the Seismological Society of America*
BZAW	Beihefte zur Zeitschrift für die alttestamentliche Wissenschaft
CAD	The Assyrian Dictionary of the Oriental Institute of the University of Chicago.
CAH	The Cambridge Ancient History
CahRB	Cahiers de la Revue biblique
CANE	Civilizations of the Ancient Near East
CBQ	*Catholic Biblical Quarterly*
CBQMS	Catholic Biblical Quarterly-Monograph Series
CMHE	*Canaanite Myth and Hebrew Epic*
COS	*The Context of Scripture*
CPS	Contributions in Political Science
CSMS	Journal of the Canadian Society for Mesopotamian Studies
CUSAS	Cornell University Studies in Assyriology and Sumerology
DDDB	*Dictionary of Deities and Demons in the Bible*
DMNG	*Denkschriften der medizinisch-naturwissenschaftlichen Gesellschaft*
EA	El-Amarna tablets
EGWS	*Environmental Geology and Water Sciences*
EI	*Eretz Israel*
EJGE	*The Electronic Journal of Geotechnical Engineering*
EPSL	*Earth and Planetary Science Letters*
ER	*Epidemiologic Reviews*
ESPL	Earth Surface Processes and Landforms
ETAGU	*Eos, Transactions, American Geophysical Union*
EvT	*Evangelische Theologies*
FAT	Forschungen zum Alten Testament
FLOP	Fitch Laboratory Occasional Paper
FO	*Folia orientalia*
FRLANT	Forschungen zur Religion und Literatur des Alten und Neuen Testaments

GH	Geographica Historica
GJI	*Geophysical Journal International*
GORABS	Geography of Religions and Belief Systems
GSA	Geological Society of America
GSSP	Geological Society Special Publications
GSASP	The Geological Society of America Special Papers
HAR	*Hebrew Annual Review*
Hdo	Handbuch der Orientalistik
HHN	*Home Healthcare Nurse*
HSM	Harvard Semitic Museum
HSR	*Historical Social Research*
HSS	Harvard Semitic Studies
HTR	*Harvard Theological Review*
HTS	Harvard Theological Studies
HUCA	*Hebrew Union College Annual*
ICC	International Critical Commentary
ICEE	Proceedings of the International Conference on Earthquake Engineering
IEG	Informe Técnico
IEJ	*Israel Exploration Journal*
IGR	*International Geology Review*
IJMED	*International Journal of Mass Emergencies and Disasters*
ILN	*Israel – Land and Nature*
IP	*Injury Preservation*
IRT	Issues in Religion and Theology
JABEECR	John A. Blume Earthquake Engineering Center
JANER	*Journal of Ancient Near Eastern Religions*
JAOS	*Journal of the American Oriental Society*
JAS	*Journal of Archaeological Science*
JBL	*Journal of Biblical Literature*
JCSMS	*Journal of the Canadian Society for Mesopotamian Studies*
JET	*Journal of Earthquakes and Tsunamis*

JGR	*Journal of the Geophysical Research*
JGS	*Journal Geological Society*
JHS	*Journal of Hebrew Scriptures*
JNES	*Journal of Near Eastern Studies*
JNSL	*Journal of Northwest Semitic Languages*
JPOS	*Journal of the Palestine Oriental Society*
JQR	*Jewish Quarterly Review*
JS	*Journal of Seismology*
JSOTS	Journal for the Study of the Old Testament Studies
JSOTSup	Journal for the Study of the Old Testament: Supplement Series
JSS	*Journal of Semitic Studies*
KAI	*Kanaanäische und aramäische Inschriften*
KAR	*Keilschrifttexte aus Assur religiösen Inhalts*
LAS	Letters from Assyrian Scholars to the Kings Esarhaddon and Assurbanipal
MGWJ	*Monatschrift für Geschichte und Wissenschaft des Judentums*
MHJ	*The Medieval History Journal*
MIL	Memorie dell'Istituto lombardo-accademia di scienze e lettere, Classe di lettere, scienze morali e storiche
MMA	Maxwell Museum of Anthropology
MRS	Mission de Ras Shamra
NAA	New Aspects of Antiquity
NEA	*Near Eastern Archaeology*
NEAHL	*The New Encyclopedia of Archaeological Excavations in the Holy Land*
NEQ	*New England Quarterly*
NH	*Nat Hazards*
NovT	Novum Testamentum Supplements
NS	*New Scientist*
OAC	Orientis Antiqui Collectio
OBO	Orbis Biblicus et Orientalis
OEANE	*The Oxford Encyclopedia of Archaeology in the Near East*
OIMP	Oriental Institute Museum Publications

OIS	Oriental Institute Seminars
OLA	Orientalia Lovaniensia analecta
OLZ	*Orientalistische Literaturzeitung*
Or	*Orientalia*
OTL	Old Testament Library
OTS	Old Testament Studies
PDS	*Psychology and Developing Studies*
PEFQSt	Palestine Exploration Fund Quarterly Statement
PEPI	*Physics of the Earth and Planetary Interiors*
PEQ	*Palestine Exploration Quarterly*
PT	*Psychology Today*
QI	*Quaternary International*
RA	*Revue d'assyriologie et d'archéologie orientale*
RA	*Res Antiquae*
RAI	Rencontre Assyriologique International
RAOA	Rev. d' Art Orient et Archeo., Syrie
RBL	*Review of Biblical Literature*
RIMA	The Royal Inscriptions of Mesopotamia, Assyrian Periods
SAA	State Archives of Assyria
SAAS	State Archives of Assyria Studies
S & CB	*Science and Christian Belief*
SAHL	Studies in the Archaeology and History of the Levant
SAMD	Studies in Ancient Magic and Divination
SBLMS	Society of Biblical Studies Monograph Series
SBTS	Sources for Biblical and Theological Study
SEL	*Studi Epigrafici e Linguistic*
SH	*Scripta Hierosolymitana*
SHCANE	Studies in the History and Culture of the Ancient Near East
SHP	*Sciences historiques et philologiques*
SJ	Studies in Judaism
SJC	Studies in Jewish Civilization

SO	*Studia Orientalia*
SQ	*Sociological Quarterly*
SVT	*Supplements to Vetus Testamentum*
SWBAS	Social World of Biblical Antiquity Series
TA	*Tel Aviv*
TA	*Teologinen Aikakauskirja*
TBC	Texts from the Babylonian Collection
TCH	Technology and Change in History
UF	*Ugarit-Forschungen*
VKMF	Veröffentlichungen der Kommission für Mykenische Forschung
VT	V*etus Testamentum*
WBC	Word Biblical Commentary
WMANT	Wissenschaftliche Monographien zum Alten und Neuen Testament
WTJ	*Westminster Theological Journal*
WVDOG	Wissenschaftliche Veröffentlichungen der Deutschen Orient-Gesellschaft
ZA	*Zeitschrift für Assyriologie*
ZAW	Zeitschrift für die alttestamentliche Wissenschaft
ZDPV	*Zeitschrift des deutschen Palästina-Vereins*

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The catalyst for this research began with a conversation with my advisor, Professor William Schniedewind, about what we know—or do not know—about ancient Israel during the first half of the eighth century BCE. His curiosity for understanding the social milieu in ancient society helped me recognize how little we understand about the earthquake mentioned in Amos 1:1 and its socioeconomic, political, and religious effects. In addition, his humble ability to approach texts from fresh perspectives serves as a constant reminder of how much we assume we know about the ancient world and how much more there is to learn. As I pursued study on the earthquake recorded in Amos, the lack of scholarly research on earthquakes within the Ancient Near East soon expanded the scope of the project. Professor Aaron Burke helped clarify questions on archaeological method, raised important questions about the viability of mudbrick structures in seismic areas, and served as a constant source of encouragement. Special thanks are due to Professor Daniel Smith-Christopher for his careful reading and suggestions. His application of social science research to his own work helped me see its usefulness for studying the aftermath of earthquakes in the ancient world.

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INTRODUCTION: SHAKING OUT THE PAST

1. Reconstructing a Fateful Day…

Around 760 BCE a large earthquake struck the Levant leveling family and administrative structures, turning children into orphans and spouses into widows, and skewing the socioeconomic stability.[1] Based upon the most recent paleoseismic evidence (the study of pre-instrumental earthquakes and their location, timing, and size) the earthquake was at least magnitude 7.0 on the Richter Scale with an epicenter most likely near the Sea of Galilee. If the quake struck between sundown and sunrise, it inflicted greater injuries and death due to the population's confinement inside buildings, especially housing structures. Entire villages would have been completely flattened; especially as the house walls of villages were often linked together, while other villages, perhaps even close to flattened villages, would have escaped any serious damage.[2] In turn, nuclear and extended families would have been decimated and new social roles between surviving family members would have had to evolve.

The health effects of the quake on the Levantine population would have been enormous. For those who escaped death, common injuries included head and back injuries, leg fractures, broken ribs, multiple fractures of limbs, clavicle fractures, spinal damage, paraplegia, cuts, bruises, lacerations, burns, and crush injuries.[3] While demographic estimates in the Iron II vary,

---

[1] The date of the earthquake has varied with dates ranging from 760 through 749 BCE. Amos's superscription defines the period through three dates: the reigns of Uzziah and Jeroboam and two years before the earthquake. Central to the dating of the quake is the dating of the reigns of Uzziah and Jeroboam and if one takes Josephus's claim that the earthquake was linked to Uzziah's disability, requiring the co regency of his son Jotham, and the chronology one uses to date the monarchy. See the end of this introduction for a more detailed discussion of the dating of the quake.

[2] See Avi Faust, "Differences in Family Structure between Cities and Villages in Iron Age II," *TA* 26 (1999): 233–52; Faust, "The Rural Community in Ancient Israel during Iron Age II," *BASOR* 317 (2000): 17–39.

[3] Earthquake epidemiology is a young but growing field. See David Alexander, "The Health Effects of Earthquakes in the Mid-1990s," *Disasters* 20 (1996): 231–47, esp. 237 for discussion on the types of earthquake injuries. See the helpful chart of comparative earthquake mortalities from 1985 to 2003 in Marizen Ramirez and Corinne Peek-Asa, "Epidemiology of Traumatic Injuries from Earthquakes" *ER* 27 (2005): 47–55.

Magen Broshi and Israel Finkelstein provide a useful estimate suggesting that there were 400,000 inhabitants in Iron II Palestine.[4] By then breaking the 400,000 inhabitants down into regions, it is probable that about 340,200 people could have been in a quake prone area[5] with an average death to injury ratio of one death to every three significant injuries in a large earthquake.[6] The elderly were almost three times more likely to suffer injury than younger people and women had more than two times the risk of injury than men.[7] Among children, the next to youngest child suffered the greatest injuries, since the youngest child was near the mother

[4] Magen Broshi and Israel Finkelstein, "The Population of Palestine in Iron Age II," *BASOR* 287 (1992): 47–60. William F. Albright, "The Administrative Division of Israel and Judah," *JPOS* 5 (1925): 17–54 suggested 600,000 in the northern kingdom and 200,000 in Judah; Roland de Vaux, *Les institutions de l'Ancien Testament* (2 vols.; Paris: Éd. du Cerf, 1989), 104–106 suggests 800,000 in the north and 200,000 in the south. In sum, Broshi and Finkelstein's numbers provide the lowest demographic estimates. See also the summary in Mojemu Ojcu, *Amos and the Officialdom in the Kingdom of Israel. The Socio-economic Position of the Officials in the Light of the Biblical, the Epigraphic, and Archaeological Evidence* (1998), 60–67.

[5] This number was compiled by adding together the six most likely regional areas from Broshi and Finkelstein's (49) survey map where quake would have caused the most damage (Upper Galilee-25,000, Lower Galilee-22,500, Huleh Valley-18750, Jordan Valley-13,750, Jezreel Valley-27,500, and Samaria including Mount Gilboa and Mount Carmel-102,500=210,000, if the coastal plain is included the number increases to 222,500). In addition, if the same population density (31 per square kilometer) is used for the Trans-Jordan, it would add around 130, 200 people. In turn, the following regions were excluded: Judah including the Shephelah, the Northern Coastal Plain, Central and Southern Coastal Plain, Beersheba and Arad Valleys. For a more detailed explanation of the extent of the earthquake see chapters three and four. It is important again to emphasize that the calculations are only a best estimate for suggesting a plausible scenario of the earthquake.

[6] See the discussion in Alexander, "The Health Effects," 233–37, regarding the difficulties of a precise death to injury ratio. The estimated number of deaths and injuries for Amos's earthquake is only a suggestion based upon cautious employment of previous earthquake epidemiology studies. Since it is impossible to suggest how many of the northern kingdom's population would have been affected by the quake (in addition to some in the southern kingdom and in areas east of the Jordan), the exact areas where the quake hit hardest, and how much building collapse would have caused death and injury, there is no way to provide anything more than an estimate. At the same time, cautious methodology and nuanced conclusions are meant to project what could have been, but these projections will not be used for any substantive arguments. See the methodology in Max Wyss, "Real–Time Prediction of Earthquake Casualties," in *Proceedings, Disasters and Society – From Hazard Assessment to Risk Reduction*: *Proceedings of the International Conference, Universität Karlsruhe (TH), Germany, July 26-27, 2004* (ed. D. Malzahn and T. Plapp; Karlsruhe: Logos Publishers, 2004), 165–73.

[7] C Peek-Asa, M Ramirez, H Seligson, and K Shoaf, "Seismic, Structural, and Individual Factors Associated with Earthquake Related Injury" *IP* (2003): 62-66; M. J. Gibson and M. Hayunga, "We Can Do Better: Lessons Learned for Protecting Older Persons in Disasters," n.p. [cited 19 February 2011]. Online: http://assets.aarp.org/rgcenter/il/better.pdf; K. Lamb, C. O'Brien, and P. J. Fenza, "Elders at Risk during Disasters," *HHN*, 26 (2008): 1, 30–38; Ali Ardalan, Monir Mazaheri, Kourosh Holakouie Naieni, Mohsen Rezaie, Fariba Teimoori, and Farshad Pourmalek, "Older People's Needs Following Major Disasters: A Qualitative Study of Iranian Elders' Experiences of the Bam Earthquake," *AS* 30 (2010): 11–23.

at almost all times, and older children were stronger and more likely to avoid as serious injury or death as those younger.[8] Likewise, due to the roof collapse of the homes, especially those with second stories, animals penned in the courtyard of the traditional Israelite house also suffered great injury or death. If the quake struck during the daylight hours, most of those working agriculture would have felt intense shaking for thirty seconds to a minute, depending on how close they were to the epicenter and where the soil and rock structure amplified the seismic waves. Those working in administrative roles, either as part of the elite class, or employed on behalf of the palace, were dependent on the structural integrity of the ashlar masonry and other materials that the administrative buildings were built. As the quake shook the ground, oil lamps or ovens near combustible objects like straw, hay, or thatching caught these materials on fire compounding what was already a difficult situation.[9]

The typical Iron II house, made of a stone foundation, mud brick walls, and a brushwood roof, would have come crashing down.[10] As vertical posts fell which helped to shore up the flat roofs (*gaggôt*), the brushwood roof, coated in plaster began to collapse into the house below. The thickness of the roof, if it was one or two stories, and the weight of the roof would have

[8] Roger I. Glass, Juan J. Urrutia, Simon Sibony, Harry Smith, Bertha Garcia, and Luis Rizzo, "Earthquake Injuries Related to Housing in a Guatemalan Village," *Science* 197 (1977): 638–43.

[9] It is difficult to know how widespread earthquake caused fires would have been. H. J. Franken, "Texts from the Persian Period from Tell Deir 'Alla," *VT* 17 (1967): 480– 481, argued that an earthquake caused a fire at Deir 'Alla. Other than Franken, archaeologists have not suggested fire within the earthquake damage they believe is linked to Amos's earthquake.

[10] On the reconstruction of the Iron II house see, Philip J. King and Lawrence E. Stager, *Life in Biblical Israel* (Louisville: Westminster John Knox, 2001), 21–35; Larry G. Herr and Douglas R. Clark, "Excavating the Tribe of Reuben," *BAR* 27 (2001): 36–47, 64, 66. Herr and Clark reconstructed part of a typical Iron I, four-room house and suggested that the total weight of a four-room house was 470 tons. 27 tons of lumber to support the second story of the house, for beams spanning walls and for branches to give additional support to the first-floor ceiling and roof, 280 tons of stones in the walls, 14 tons of mortar and plaster, 14 tons for the ceiling and roof, and 124 tons of mud brick walls for the second story. While taking a much broader view than just the Levant see the work of Gus W. Van Beek and Ora Van Beek, *Glorius Mud! Ancient and Contemporary Earthen Design and Construction in North Africa, Western Europe, the Near East, and Southwest Asia* (Washington D.C.: Smithsonian Institution, 2008).

determined the extent of injury or death.[11] As the house collapsed, many of the mud bricks would have fallen in an imbricate, rather than disorganized pattern, consistent with seismic damage.[12] While the population initially felt the P-Wave (primary wave)—because it is a surface wave with the motion of a slinky it does not create serious damage—this only served as a split second foreshadowing of impending doom. Those closest to the epicenter would first have experienced the destructive S-wave (secondary or shear wave), which in the motion of waves in a rope, creates the sad destruction associated with earthquakes.[13] As the shear waves hit building structures, the wave like motion literally picked up mud bricks (and finer quality ashlar masonry) from their stone foundations—and each other—thus negating the effects of friction and shifted the mud bricks from its foundation, from a few millimeters to a meter or more. Since collapsed buildings are the primary means of injury during an earthquake, as the walls of structures failed, and the roofing above fell in, this caused most of the earthquake related injuries and deaths.

Of vital importance to survival was the preservation of storage units holding water and wine and the contamination or blockage of water sources. Many storage vessels made from the well-known red slip, burnished pottery of the Iron II period would have been destroyed like the earthenware jug (*baqbuq*), the ceramic pitcher (*kaddîm*), and storage jars that were precursors of

[11] Herr and Clark, "Excavating Reuben," 45, suggest the first floor timber posts supported about 140 tons. Based on the average size of the house as 30x33=990, this means that there would have been approximately 280 lbs of falling debris per square foot when a house collapsed. Mud brick buildings are extremely susceptible to seismic damage, see the literature in Dominic M. Dowling and Bijan Samali, "Low-Cost and Low-Tech Reinforcement Systems for Improved Earthquake Resistance of Mud Brick Buildings," in *Proceedings of the Getty Seismic Adobe Project 2006 Colloquium* (ed. M. Hardy, C. Cancino, and G. Ostergren; Los Angeles: Getty Conservation Institute, 2009), 23–33. See the discussion on the use of timber reinforcing and roofs in G. R. H. Wright, *Ancient Building*, 412–413; 456–463.

[12] Shmuel Marco, "Recognition of Earthquake Related Damage," 151.

[13] See the detailed explanation of seismic waves in Robert S. Yeats, Kerry Sieh, and Clarence R. Allen, *The Geology of Earthquakes* (New York: Oxford, 1997), 60–87. Traditionally, locating an earthquake epicenter is based on three single-component seismographs that record the difference in time between the P wave and the slower moving S wave, see Yeats, Sieh, Allen, *Geology of Earthquakes*, 64–65.

the famous *lmlk* seal types.[14] Of even greater concern were sources of water, via streams, springs, wells, cisterns, and reservoirs.[15] If the earthquake occurred during the rainy season (October to May, especially December through February), there were greater possibilities of collecting rainwater, while a quake during the dry season (June to September) prevented any collection of rainwater. If springs were stopped up from the earthquake, especially in areas with nearby settlements, a serious water shortage could have quickly developed.[16] Similar to the spring, if the rough fieldstone at the top of a well (*be'er*) shaft collapsed into the well shaft, access to water would have been limited until the shaft was cleared. In addition to potential blockage of the well shaft, the earthquake also would have affected the water table, raising water in some wells and lowering it in others.[17] Depending on the area in the Levant, cisterns (*bôr, bō'r*) would have been affected in different ways. Those cut from impermeable rock needed no plaster while those with cracked or permeable rock were then waterproofed with lime plaster. Some of the cisterns carved from permeable rock likely suffered cracks in the plaster, and much of the water was lost, if not contaminated.[18] While most houses in the Iron II appeared to have

[14] See the helpful summary of water vessels and sources in King and Stager, *Life in Biblical Israel*, 122–128.

[15] See the taxonomy in Tsvika Tsuk, "Hydrology," *OEANE* 3:132–33.

[16] See, for example, the comparative seismic effects on water at Yellowstone National Park (Hebgen Lake, Montana, USA August 17, 1959). A 7.1 magnitude earthquake hit before midnight, sending a landslide down Madison River Canyon, blocking the river and creating a 175-foot-deep lake. In Yellowstone National Park, several geysers and springs stopped flowing while others started. Even Old Faithful's schedule became unpredictable. The temperature of some hot springs increased 6 degrees.

[17] Yaacov Nir and Iris Eldar-Nir, "Construction Techniques and Building Materials used in Ancient Water Wells along the Coastal Plain of Israel," in *The Engineering Geology of Ancient Works, Monuments and Historical Sites: Preservation and Protection* (eds. Paul G. Marinos and George C. Koukis; vol. 3; Netherlands: Balkema, 1988), 1765–1774. Nir and Eldar-Nir focus on coastal wells noting that wells closer to the sea had a groundwater table that was shallower. They note the excellent quality of the wells from a hydrological and technical point of view, illustrating that many of the wells, once re-excavated, and if the current ground-water table corresponds to the ancient one, can be used in the present day.

[18] See King and Stager, *Life in Biblical Israel*, 126–127. See also, Tsvika Tsuk, "Cisterns," *OEANE* 2:12–23. Jer 2:13 is an intriguing verse which might allude to earthquake damage "for my people have committed two evils: they

cisterns (2 Kings 18:31; Isa 36:16),[19] more densely populated areas such as towns and cities that were dependent on underground reservoirs would have faced immediate water shortages if their cisterns cracked.[20]

In addition to the health, housing, and hydrology challenges, the Levant would have experienced geological changes that would have impacted the food supply. Areas of terracing would have been susceptible to landslides following the quake, affecting both housing at the bottom of terracing and crops within the terracing system. Since terracing helps with cultivation on steep slopes, soil loss prevention, retaining moisture, and promoting root penetration, landslides would have created a daunting environment to overcome.[21] The time of year would again play a key role in determining if viable crops were wiped out, if they could be replanted, or if the agricultural area needed to be re–terraced before planting. While most study on terracing in the Levant has focused on the Iron I, Avi Faust has brought together evidence of terracing in the Iron II, suggesting that agricultural terraces were found around many villages.[22] Based upon the

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have forsaken me, the fountain of living water, and dug out cisterns for themselves, cracked cisterns that can hold no water."

[19] 2 Kings 18:31 and Isaiah 36:16 are parallel accounts. 2 Kings 18:31 reads, "Do not listen to Hezekiah; for thus says the king of Assyria: 'Make your peace with me and come out to me; then every one of you will eat from your own vine and your own fig tree, and drink water from your own cistern." Tsuk, "Cisterns," 13, notes the Iron II period saw in an increase in the numbers of cisterns.

[20] Water systems, especially in the north, at Hazor and Megiddo would have been crucial to helping larger cities survive the quake. See the survey of various types of "public works" water systems in G. R. H. Wright, *Ancient Building in South Syria and Palestine*, (2 vols.; Leiden: Brill, 1985), 166–171. Yadin, *Hazor*, 177, saw the water-system at Hazor in use till it was destroyed in 732 BCE. He does not mention if there were noticeable cracks from the earthquake, but given the vessels in the water-system from Stratum V, it appears that the earthquake, even if it did cause minor damage, did not cause irreparable damage to the system.

[21] J. Moody and A. T. Grove, "Terraces and Enclosure Walls in the Cretan Landscape," in *Man's Role in the Shaping of the Eastern Mediterranean Landscape* (ed. S. Bottema, G. Entjes-Niebog, and W. Van Zeist; Rotterdam: Balkama, 1990), 183–191.

[22] Avraham Faust, "The Rural Community in Ancient Israel during Iron Age II," *BASOR* 317 (2000): 17–39. For the Iron I, see the seminal work of Larry E. Stager, "The Archaeology of the Family in Ancient Israel," *BASOR* 260 (1985): 1–35; D. C. Hopkins, *The Highlands of Canaan: Agricultural Life in the Early Iron Age* (SWBAS 3;

important work of David Keefer, he argues that the number of landslides triggered by an earthquake is almost always greatly underestimated.[23] Although the number of landslides per earthquake is variable, Keefer argues that for extremely large earthquakes, there could be several thousand landslides. After the quake, efforts would have turned to repair or mitigation of terraces that were destroyed.

Moving from the effects of the quake on the Levantine population and its landscape, in the aftermath of the quake's destruction human drama would have unfolded rapidly. As the survivors accounted for their nuclear and extended family members, they would have maddeningly scrambled to remove rubble and search for those still trapped. At the same time that the survivors sifted through the rubble, most would have been in a state of immediate shock and could not comprehend or be ready to mourn the loss of loved ones. In small villages in the countryside where an entire extended family would have resided, severe destruction could have killed a majority of the members. Those with external, visible injuries would have been greatly dependent on help around them, while those with internal injuries such as bleeding, broken ribs, or head injuries would have struggled to survive without even knowing what was killing them. Without any kind of professional physicians, those injured might have turned to religious officials or natural remedies. In the initial hours after the quake, the population would have

Sheffield: Almond, 1985); M. Broshi, "Fire, Soil and Water: Three Elements that Enabled the Settlement of the Hilly Regions of Palestine in the Iron Age," EI 25 (1996): 94–98 (Hebrew), 90*-91* (English Summary).

[23] See most recently, David K. Keefer, "Investigating Landslides Caused by Earthquakes–A Historical Review" *Surveys in Geophysics* 23 (2002): 473–510. See also, David K. Keefer, "Landslides Caused by Earthquakes," *Geological Society of America Bulletin* 95 (1984): 406–421. Keefer studied forty historical earthquakes in order to quantify the relationship between prehistoric landslides and earthquakes. More applicable to the Levantine climate is David K. Keefer and R. C. Wilson, "Predicting Earthquake–induced Landslides, with Emphasis on Arid and Semi–arid Environments," in *Landslides in a Semi–arid Environment* (ed. P. M. Sadler and D. M. Morton; Riverside: Inland Geological Society of Southern California Publications, 1989), 118–149. In this work, Keefer and Wilson demonstrated that many earthquake–induced landslides begin in dry materials. See the helpful discussion on the geology and mechanics of landslides in Yeats et al., *Geology of Earthquakes*, 427–444.

worked together irrespective of a rich/poor divide, as immediate survivors remain the most immediate and best means of emergency relief.

Along with searching for survivors, immediate attention would have turned to temporary shelter, water, and food. Where there was near total destruction of structures, survivors would have created temporary sheltering, salvaging materials from the rubble. In this same area where water was difficult to find or contaminated, parasitic diseases could have easily taken hold. At the same time, frequent aftershocks would have continued to shake the area causing greater fear that more buildings might collapse and creating a psychological wall that no end was in sight. After the initial period of looking for survivors, setting up temporary sheltering, and finding water, over the next few days the post-disaster euphoria of togetherness would have turned to anger, frustration, and stress over the lack of help by the administration and the fragmenting of society in which the rich, elite, and administrative leaders would have had better access to food, water, and temporary housing, than the poor. This would have led desperate poor to loot and steal food for basic survival.[24] Food storage areas like those in houses and villages as well as larger storage areas of grain would have been prime targets for desperate looters.

Compounding the immediate problems of health, housing, and hydrology, the very fact that a large earthquake occurred likely shocked the population. While earthquakes in the Levant are certainly not a new phenomenon, paleoseismologists believe that prior to the 760/750 BCE earthquake, the previous quake with magnitude over 5.5 occurred around 1050 BCE.[25] Even though it is nearly certain that smaller quakes occurred between 1050 and 760/750 BCE, none of

[24] Looting is a common element following disaster. See Donald G. McNeil Jr., "The Moral Ambiguity of Looting," New York Times (March 6, 2010). Cited February 1, 2011. Online: http://www.nytimes.com/2010/03/07/weekinreview/07mcneil.html.

[25] Claudia Migowski, Amotz Agnon, Revital Bookman, Jörg F. W. Negendank, and Mordechai Stein, "Recurrence Pattern of Holocene Earthquakes along the Dead Sea Transform Revealed by Varve-Counting and Radiocarbon Dating of Lacustrine Sediments," *EPSL* 222 (2004): 301–14.

the quakes approached a large magnitude. Thus, it is difficult to suggest that the population had handed down any lessons in seismic preparedness from the 1050 BCE earthquake, specifically in building construction.[26] Hence, when the 760/750 BCE earthquake struck, it caught the population off guard both literally and figuratively.

2. The Interdisciplinary Task of Studying Ancient Earthquakes

The above reconstruction of the earthquake mentioned in Amos 1:1, though specific to ancient Israel, has a number of shared insights that can be applied to the study of earthquakes in the ancient world. While differences between civilizations, such as the floor plan of a domestic house, the administrative structure of a monarchy, or the use of cisterns and wells versus other means of water collection all can be nuanced for an individual quake, the health effects of a quake as well as who they predominantly affect, how those afflicted will respond following a large disaster, and how the study of modern disaster can inform ancient disasters are applicable across cultures. Though Amos's earthquake is the best known quake in the Ancient Near East and Levant, partially due to the majority of scholars who study the Hebrew Bible and ancient Levant, it is but one of several quakes that are found in the textual record.

The project of reconstructing ancient earthquakes is interdisciplinary; insights from textual sources along with methodology from paleoseismology (the pre-instrumental study of earthquakes, especially their location, timing, and size), archaeoseismology (the study of earthquakes in the archaeological record), historical seismology (the study of written sources that mention earthquakes), and social scientific/natural disaster studies (earthquake epidemiology, post-traumatic stress disorder, study of quakes in third world countries that are applicable to the

[26] Various scholars have suggested architectural features that may have been made for improved earthquake resistance. For example, at Deir ʿAlla, M. Ibrahim and G. van der Kooij, "The Archaeology of Deir ʿAlla Phase IX," *The Balaam Text from Deir ʿAllā Re-evaluated. Proceedings of the International Symposium held at Leiden 21–24 August 1989* (ed. J. Hoftijzer and G. van der Kooij; Leiden: E.J. Brill), 16–29 suggest that walls were built on reed foundations, possibly as a measure to mitigate earthquake damage.

ancient world) all provide necessary components needed in order to study these momentous events. By weaving together these newer approaches that previous Ancient Near Eastern and Levantine scholars did not have access to, it is possible to reconstruct a more informed picture of an ancient quake. This is certainly not an easy task and caution must be exercised when working outside of one's field of expertise, but using a interdisciplinary approach buttressed with careful methodological justification provides the best means of reviving the past.

3. The Probable Dating of Amos's Earthquake

Attempts to pinpoint the date of the earthquake mentioned in Amos 1:1 rest in a date range of around twenty years in which the end point (*terminus ad quem*) is much easier to locate than the earliest time period (*terminus post quem*). The dating is built around two chronological pegs found in the superscription: the reigns of the two kings, Uzziah and Jeroboam, and the reference to the earthquake.[27] At the same time, there are numerous difficulties surrounding the chronologies of the kings of Israel and Judah that cloud our ability to pin down certain dates specifically. These difficulties include accession and non-accession year reckoning, co-regencies, and the general absence of absolute dates due to the lack of correlation of biblical dates with extra biblical sources. While a date for the exile can be found tied to either 587 or 586 BCE, other dates such as the end of Jeroboam II's reign or the beginning of Hezekiah's reign are subject to far more speculation.

[27] One other possible chronological peg outside of the superscription comes from a possible eclipse in Amos 8:9, "On that day, says the Lord GOD, I will make the sun go down at noon, and darken the earth in broad daylight." An eclipse from an Assyrian eponym list dates to 763, though the eclipse would have only been partial over ancient Israel. On the eponym list see, Millard, *Assyrian Eponyms*, 58. Regarding the eclipse see, F Stephen Richardson, *Historical Eclipses and Earth's Rotation* (Cambridge: Cambridge University Press, 1997), 93–127; Hermann Hunger, "Zur Datierung der Neuassyrischen Eponymenliste," *AF* 35 (2008): 323–325. Numerous astrological reports mention eclipses, see Hunger, *Astrological Reports to Assyrian Kings*, 4, 13, 42, 46, 47, 55, 67, 87, 94, 98, 100, 103, 104, 179, 207, 208, 230, 250, 251, 253, 279, 280, 294, 300, 305, 308, 311, 313, 316, 320, 321, 328, 336, 344, 346, 382, 384, 385, 388, 399, 409, 417, 433, 447, 467, 469, 487 502, 535.

Edwin Thiele's well-known chronological work, which first started as a University of Chicago dissertation completed in 1943, has set the standard for all other chronological works since that time.[28] Thiele's approach is built around the harmonistic reading of biblical texts through coregencies, two different New Year starting dates for the northern and southern kingdoms (Nisan and Tishri), accession and non-accession methods of calculating the lengths of reigns, and the inclusion (sometimes) of coregency years in the total reigns.[29] Thiele's three editions, published in 1951, 1965 and the third edition, completed in 1983 just three years before his death, ensured that all subsequent chronologies use his work as a reference point, whether in agreement or disagreement. Since the publication of Thiele's third edition, other more recent chronological works include those of Gershon Galil, John Hayes/Paul Hooker, and Mordecai Cogan/Hayim Tadmor.[30]

As mentioned above, all recent approaches to chronology have all started from their acceptance or deviation from Thiele's methodology. Gershon Galil most closely follows Thiele's work in four out of five principles but rejects Thiele's idea that data relating to the kings of Israel were reckoned by Judah's system and vice versa. In the end, Galil agrees with the starting and ending dates of Thiele's chronology of the Hebrew kings though he modifies, through a number of innovative suggestions, some dates in the middle reigns. To take one other example of a

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[28] Edwin R. Thiele, *The Mysterious Numbers of the Hebrew Kings* (New York: Macmillan, 1951; 2d ed.; Grand Rapids: Eerdmans, 1965; 3d ed.; Grand Rapids: Zondervan/Kregel, 1983). Prior to his first edition in 1951, Thiele produced a preliminary study in Edwin R. Thiele, "The Chronology of the Kings of Judah and Israel," *JNES* 3 (1944): 137–186.

[29] Regarding the non-accession years and the date of a New Year, Thiele and Valerius Crouke both independently argued that the northern kingdom used non-accession years and a spring New Year while the southern kingdom used accession years and a fall New Year. See, Thiele, *Mysterious Numbers*, 3 ed., 59, n. 17; citing Valerius Coucke, "Chronique biblique," in *Supplément au Dictionnaire de la Bible* (ed. Louis Pirot; Paris: Letouzy et Ané1928).

[30] Gershon Galil, *The Chronology of the Kings of Israel and Judah* (SHCANE, 9; Leiden: Brill, 1996); John H. Hayes and Paul K. Hooker, *A New Chronology for the Kings of Israel and Judah and Its Implications for Biblical History and Literature* (Atlanta: John Knox, 1988); Mordecai Cogan and Hayim Tadmor, *2 Kings* (AB 11; New York: Doubleday, 1988), 341.

perspective on chronology, Hayes and Hooker believe a single chronological system was used, against Thiele's accession and non-ascension year reckoning. One of the strengths of Hayes and Hooker's approach is their greater reliance on Assyrian and Babylonian sources, as Galil and others have heavily critiqued Thiele for his mishandling of inscriptions from Tiglath-Pileaser III and other abuses of Mesopotamian sources.[31] With some of these methodological considerations in mind, the tables below illustrate differences in the chronologies of the eighth century kings.

Table A: Dates of Israel's Kings in the Mid Eighth Century BCE

Dates of Israel's Kings in the Mid Eighth Century BCE					
Kings	**Thiele**	**Hayes/Hooker**	**Galil**	**Bright**	**Cogan/Tadmor**
Jeroboam II	793-753	788-748	790-750/749	786-746	789-748
Zechariah	753-752	6 months	750/49	746-745	748-747
Shallum	752	1 month	749	745	747
Menahem	752-742	746-737	749-738	745-737	747-737

Table B: Dates of Judah's Kings in the Mid Eighth Century BCE

Dates of Judah's Kings in the Mid Eighth Century BCE					
Kings	**Thiele**	**Hayes/Hooker**	**Galil**	**Bright**	**Cogan/Tadmor**
Azariah (Uzziah)	792-740	785-760 [734]	788/7-736/5	783-742	785-733
Jotham	750-732	759-744	758/7-742/1	750-735	758-743

Stepping back from these tables, a few comments on the differences on the end dates of the reigns of Jeroboam II and Azariah will help contextualize how this influences the date of the earthquake. The heavily Judean and Deuteronomic slant in Kings inhibits our historical reconstruction of Jeroboam II's reign as the description of his reign is confined to 2 Kings 14:23-

[31] See the comments by Mordecai Cogan, "The numerous extrabiblical synchronisms he invokes do not always reflect the latest refinements in Assyriological research. In many cases, he posits an undocumented event in order to save a biblical datum (e.g., the circumstances surrounding the appointment of Jeroboam II as coregent; Thiele 1983: 109)," "Chronology," ABD 1: 1002–1011. A number of scholars have provided helpful reviews that interact with Thiele's work, while still reviewing Galil and Hayes and Hooker's works, see, John W. Walton, review of John H. Hayes and Paul K. Hooker*, A New Chronology for the Kings of Israel and Judah and Its Implications for Biblical History and Literature*, *JAOS* 110 (1990): 767–770; Mordechai Cogan, review of John H. Hayes and Paul K. Hooker*, A New Chronology for the Kings of Israel and Judah and Its Implications for Biblical History and Literature*, *JQR* 84 (1993-1994): 298–300; Andrew G. Vaughn, review of Gershon Galil, *The Chronology of the Kings of Israel and Judah, BASOR* 318 (2000): 74–76; J. Maxwell Miller, review of Gershon Galil, *The Chronology of the Kings of Israel and Judah, JAOS* 119 (1999): 157–159; Leslie McFall, review of Gershon Galil, *The Chronology of the Kings of Israel and Judah, VT* 49 (1999): 572–574.

29.[32] Following Jeroboam II's reign, Zechariah will only rule six months before being assassinated by Shallum (2 Kings 15:10), who himself lasted only one month before Menahem killed him at Samaria (2 Kings 15:13-14). In sum, there is no co-regency in the northern kingdom. There is a straight succession from Jeroboam II to Zechariah, though following Jeroboam II's death, the Jehu dynasty will end with Zechariah, and there will be no monarchial stability until Menahem's reign. Similar to the absence of any meaningful information about Jeroboam II, the Deuteornomistic History also supplies scant information about Azariah. What information remains, however, describes a co-regency during the end of Uzziah's reign where Jotham is co-regent for ten or more years (2 Kings 15:5) because of Uzziah's incapacity due to leprosy. Josephus will take the affliction of leprosy even further by linking the earthquake with the Chronicler's description of Uzziah's leprosy (2 Chron 26:15–23) because of his actions in the temple. Josephus writes in book nine of his *Antiquities of the Jews*, "a great tremor shook the earth, and, as the temple was riven, a brilliant shaft of sunlight gleamed through it and fell upon the king's face so at once leprosy smote him."[33] Josephus's move to link leprosy with the co-

[32] One implication—among many—of the earthquake striking during the end of the reign of Jeroboam II, is when and to what extent Jeroboam II might have gained control over Hamath and Damascus (2 Kings 14:28). Mordechai Cogan, "The Rise and Decline of the Empire of Jeroboam ben Joash," *VT* 17 (1967): 266–297, argues for a northward expansion during the final years of Jeroboam II's reign when Assur-nirari V was on the Assyrian throne. Others, such as Miller and Hayes, *A History of Ancient Israel and Judah*, 352–353, have pointed to the reference meaning paying tribute to Israel or allowing Jeroboam to have commercial concessions in their cities rather than face him in battle. Whether this territory could have been taken earlier in Jeroboam II's reign (so, Cogan and Tadmor, *2 Kings*, 13, who place the date of hegemony around 770 BCE) and therefore, before the quake would seem more likely than for Israel to take the cities after the quake and still before the end of Jeroboam's life. Nadav Na'aman, "Azariah of Judah and Jeroboam II of Israel," *VT* 43 (1993): 227–234, argues that the last years of Jeroboam II consisted of battle between Israel and Judah. Na'aman's argument largely depends on the some textual alterations surrounding the transposition of the *lamed* in 14:28 so that the clause reads, "and the war(s) of Judah against Israel." The lack of understanding about the implications of a large natural disaster can be seen in this statement which fails to understand the consequences of large scale natural disasters, "If we date the earthquake to around 760 B.C.E, *this coincides with Jeroboam's reconquest of Transjordan* (italics mine), which also occurred around 760 B.C.E., and with Uzziah's impiety and subsequent leprosy." Bruce E. Willoughby, "Amos, Book of," *ABD* 1:203–212.

[33] Josephus, *Antiquities*, IX.x.4. Josephus will further conflate the earthquake with Zechariah 14:5 writing, "And before the city, at a place called Eroge, half the mountain broke off from the rest on the west, and rolled itself four furlongs and stood still at the east mountain, till the roads, as well as the king's gardens, were spoiled by the

regency of Jotham as well as the earthquake presumably stands behind a later scholary effort explored below to provide a specific date to the earthquake.

The second chronological peg concerns the earthquake, which most scholars date either around 760 to 750 BCE.[34] How one arrives at these dates, however, is subject to conjecture rather than any sound chronological explanation. For example, in William Rainey Harper's 1905 commentary on Amos, he noted that the earthquake intended to mark a date though Harper did not provide a date for the earthquake. In S. R. Driver's famous *An Introduction to the Literature of the Old Testament*, he writes, "The year of Uzziah's reign, in which the 'earthquake,' mentioned in 1^{1} (cf. Zech. 14^{5}), took place, is not known; but internal evidence points to the latter part of Jeroboam II's reign, *after* the successes alluded to in 2 Ki.14^{25}, *i.e.* about 760-746 B.C., as that to which Amos' prophetic ministry begins."[35] Artur Weiser noted that the inscription must date to a time prior to the death of Zechariah in 734 or the downfall of the Northern Kingdom, but he also avoids placing a date on the earthquake.[36] Where modern scholars now attribute specific dates to the earthquake can be traced to the influence of Yigael Yadin's work at Hazor. Yadin first proposed the earthquake struck in 765 BCE, in an article concerning the dating of the Samaria Ostraca. In a lengthy footnote on the second to last page of Yadin's article, he pushed back against a suggestion by Aharoni and Amiran regarding the dating of the last period of Samaria; and, more specifically he down dated Aharoni and Amiran's

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obstruction…" See the useful summary and comments on Josephus and the dating of the earthquake in Radine, *The Book of Amos*, 52–53.

[34] Mordecai Cogan, "Chronology," *ABD* 1:1002–1011; Thiele's chronology is accepted in several recent study Bibles, and is the chronology used for the Hebrew monarchs in the *Cambridge Ancient History* (T. C. Mitchell, "Israel and Judah until the Revolt of Jehu (931-841 B.C.)" *CAH* 3, Part 1, p. 445); Kenneth A. Strand, "Thiele's Biblical Chronology As a Corrective for Extrabiblical Dates," *Andrews University Seminary Studies* 34 (1996) 295-317.

[35] S. R. Driver, *An Introduction to the Literature of the Old Testament* (New York: World Publishing Company, 1956), 314.

[36] Weiser, *Die Profetie des Amos*, 255–256.

suggestion of period V of Samaria from (815-765) to (745-735).[37] In Yadin's view, stratum VI of Hazor ended in 765 BCE due to Amos's earthquake, of which Samaria's stratum IV also was destroyed by the same quake. Yadin's article ended by stating that he concluded it in August 1959, a time that was nearly equal with his publication of *Hazor II* in 1960.[38]

Table C: Yadin's Synchronization of the Late Periods between Hazor and Samaria[39]

Hazor	Samaria
Stratum VI: ()–765	Stratum IV: ()–765
Stratum VB: 765–740	Stratum IVA: 765–740
Stratum VA: 740–732	Stratum V: 740–735 (732)
	Stratum IV: 735–722

What complicates this picture is that in Yadin's *Hazor II* volume, he states, "The date of this great earthquake can be fixed at about 760 B.C…" Yadin even footnotes his own article (as 1959 in the *Hazor II* volume, which is when he concluded the article, though it would not appear in print till 1961) in which he stated that the strata ran till 765 BCE. So, even though Yadin initially provided two different dates for the earthquake, in later literature he would adopt the 760 BCE date, though never justifying why he sided with this date.[40] One can only presume that Yadin's approach to biblical archaeology, which emphasized a strong belief in the trust of

[37] Y. *Aharoni* and R. *Amiran*, "A New Scheme for the Sub-division of the Iron Age in Palestine," *IEJ 8* (*1958*): 171–184.

[38] Yigael Yadin, "Ancient Judaean Weights and the Date of the Samaria Ostraca," *SH* 8 (1961): 9–25, esp. 24; Yadin, *Hazor II*, 36. In Area A, located in the Upper City, just west of the six chambered gate, Yadin built a "stratigraphic skeleton" for the Iron Age as he was able to hit bedrock. This area also served as Garstang's trial excavation where he found a row of pillars and linked them with Solomon's stables. Strata VIII-VII covered the ninth century while VI covered the first half of the eighth century and ended in the earthquake.

[39] Samaria present an enigma to the academy: Kenyon's methods were among the most advanced of her day through her detailed records of debris layers and section drawings but her lack of detail in stratigraphic detail remains deeply troubling to settling the stratigraphy of the site. In Ron E. Tappy, *The Archaeology of Israelite Samaria, vol. 2* (HSS 50; Winona Lake: Eisenbrauns, 2001), Building Period (BP) IV is the best candidate to clarifying the stratigraphy of the eighth century. BP V likely starts after the Assyrians take over and may begin even later than that (BP V-VI, as well as Pottery Period V-VI seem to share many similarities and are late eighth-early seventh c. in date).

[40] Yigael Yadin, *Hazor: The Head of All Those Kingdoms* (London: Oxford University Press, 1972), 113, 181.

ancient sources helped push him towards a date that would tie together the events in Josephus.[41] He never provided any justification for his date and over time, what began as an assertion to synchronize the eighth century periods of Hazor and Samaria turned into *de facto* gospel. The table below provides a larger context of suggested dates for the earthquake.

Table D: Various Dates of the Eighth–Century Earthquake by Biblical Scholars

Date	Scholar	Explanation
765	Yadin (1961)	
Around 760[42]	Yadin (1958, 1972); Paul	"The date of this earthquake can be fixed at about 760 B. C…."
760–750	Driver (1907:98)	"probably between 760 and 750"
750	Mogenstern, Watts[43]	
767–742[44]	Stuart	767=year Amaziah died and Uzziah became sole monarch. 740=end of Uzziah's reign and earthquake as two years before it.
745[45]	Cripps, Snaith	
Undateable	Jeremias, Harper, Weiss	"the frequency of earthquakes in Palestine has rendered impossible all attempts to draw historical conclusions"

The table above illustrates the wide variety of dates suggested for Amos's earthquake, with no date providing any concrete rationale for its choice. One suggestion from patterns in the data is that an early date corresponds better with archaeological data as it provides more room for sites with multiple strata in the eighth century, while most textual scholars tend towards a later date, presumably as this puts Amos in closer chronological connection with other eighth century prophets. In sum, the earthquake could date presumably to anywhere within the reigns of Jeroboam II and Uzziah, though a date too close to the end of the reign of Uzziah is unlikely as there is no mention of the co-regency of Jotham in Amos 1:1. On the other hand, based upon

[41] The date of 760 B.C.E is also the earliest date given in the range provided by S. R. Driver, *An Introduction*, 314.

[42] Yadin, *Hazor II*, 36; Yadin, *Hazor: The Head of All Those Kingdoms,* 113, 181; Paul, *Amos*, 35.

[43] Mogenstern, "Amos Studies," 172; Watts, *Amos*, 35

[44] Stuart, *Hosea-Jonah*, 297.

[45] Cripps, *Amos*, 36; Snaith, *Amos*, 8.

Yadin's initial dating of the quake around 765 or 760, there can be roughly a twenty year swing where the earthquake may have struck.[46]

Moving away from archaeology and biblical studies and into scientific perspectives on the earthquake, these scholars, without exception, follow the work of Ari Ben-Menahem. Ben-Menahem's date, October 11, 759, in which he believes the earthquake struck at night is based on his reading of 2 Chron 26 and Josephus in which the quake was likely on the eve of the Tabernacle holiday, 14 Tishrei 3003.[47] Following Ben-Menahem's article, other scholars in the sciences then followed Ben-Menahem's lead in attributing the date to 759 BCE, though the evidence is far from convincing.

Table E: Scientific Dates for the Earthquake

Date	Scholar or Article	Explanation
759	Ben-Menahem	2 Chron 26 and Josephus
759	Ambraseys	Cites Ben-Menahem 1979 article
759	Migowski et al.	
750	Austin et al.	

From examining the various chronological views on the dates of the eighth century monarchs as well as probing the dating of the earthquake the following observations are pertinent. It is important to keep the *circa* prominent in any date that is supplied for the quake. While it is tempting to give a specific date for the quake, there are no factors at this point that

[46] Yadin's chronology continues to be held as the standard. See Israel Finkelstein, "Hazor and the North in the Iron Age" *BASOR* (1999): 55–70, who notes that he sees no reason to challenge Yadin's identification of the destruction of strata VI at Hazor with an earthquake c. 760 BCE.

[47] Ben-Menahem, "Earthquake Catalogue," 261–263; Ben-Menahem, "Four Thousand Years of Seismicity," 20,205–20,208. Ben-Menahem bases his view on 2 Chron 26 and Josephus as well as an encyclopedia entry from Encyclopedia Biblica, though he does not make clear which article he cites. Austin et al., "Amos's Earthquake," state that an earthquake struck in the mid eighth century with dating errors of plus or minus thirty years. Ambraseys, *Earthquakes in the Mediterranean*, 68, places the quake around c. 759 BC and states that modern writes date the quake to 759 BC. He bases this date on Ari Ben-Menahem's 1979 article, though based on table 4.4 above, very few scholars would link the earthquake to this date. who exactly Ambraseys would cite in support of that date (He cites Ben-Menahem, 1979 and Austin et. al.). Likewise, Migowski et al., "Recurrence Pattern of Holocene," 307, place the quake at 759 based on Ben-Menahem's 1991 paper. Ben-Menahem will change the timing of the quake from day to night in his 1991 article.

can support such a specific date. There also is no justification for linking an earthquake with divine judgment via leprosy, which could have resulted in a co-regency of Azariah's son. Further, while echoes of Josephus may stand behind Yadin's and even Driver's dating, Ben-Menahem's heavy reliance on Josephus, unfortunately, points to his uncritical use of Josephus as a historical source.[48] Though lost in almost all scholarly literature, the earthquake could fit a date range from about 780–745 BCE. The long duration of Iron IIB strata at archaeological sites, many of which extend from the ninth into the eighth century, as well as the lack of biographic information concerning when Amos lived or ministered inhibit a tighter date. At the same time, since the conditions painted within the book push the setting towards a time when there was clear economic and military strength, it would lend support to a later date. Beyond these considerations there is little that can be said.

4. Synthesis-Research Objectives and Moving Forward

Before moving forward, a few additional comments will help anchor the following pages. The implications of studying ancient earthquakes will provide avenues for a number of new research areas and questions. For example, how does disaster influence political instability and where might it be possible to suggest this in the historical record? Or, since disaster studies have shown that those in higher socioeconomic standing are able to recover and move on with their lives much quicker than those in lower socioeconomic brackets, how does this influence our reading of social justice texts? For Middle Assyrian earthquakes, can the study of royal inscriptions shed light on earthquakes or does the formulaic language in these inscriptions obscure any pertinent information? In the Neo-Assyrian period, how do tablets sent from scribes to kings provide insight into the administrative response to a disaster and do apotropaic rituals against

[48] On evaluating Josephus as a source, see *Making History: Josephus and Historical Method* (ed. Z. Rodgers; Leiden: Brill, 2007).

earthquakes give insight into how Assyrians coped with earthquakes? In the Levant, how does careful study of Amos's earthquake shed new light on the middle of the eighth century BCE, a period of which there is little historical evidence? Even further, can a large earthquake influence different prophetic schools and serve as a source of prophetic validity? How would an ancient Israelite conceptualize disaster as divine communication, and how would the historical memory of natural disasters be transmitted? By studying ancient earthquakes through multi-disciplinary methodology, avenues for further research as well as new suggestions for long standing problems or theories await.

The following chapter will introduce the various methods to be used and survey how they have been/are being applied primarily to Amos's earthquake. In specific, it will focus on the most important works related to Amos's earthquake in biblical studies, historical seismology, paleoseismology, archaeoseismology, and social scientific/natural disaster studies. The dissertation examines all known, textually recorded earthquakes in the Ancient Near East and Levant from the inception of writing until the advent of Hellenism. Chapter two will survey geographic and tectonic conditions in the Ancient Near East and Levant, and how the presence of a tectonic environment, or lack thereof, shaped descriptions of Storm-god imagery. Chapter three will examine Middle and Neo-Assyrian inscriptions that record earthquake events. The chapter will differentiate between textual information that is formulaic and information that likely preserves accurate historical information about the quakes. Chapter four will weigh the evidence of the 760/750 BCE quake in the archaeological record as over twenty different archaeological sites have claimed evidence of seismic damage in the eighth century BCE. The methodology will be based on evaluating current archaeoseismic methodology and how it can be adapted and applied to Iron Age archaeology. In chapter five, a number of methodologies will be used to

identify clues to Amos's earthquake and its implications within the biblical book itself. Though traditional studies on Amos's earthquake have focused on examining words and phrases that convey shaking within Amos, this approach will use comparative evidence from Mesopotamia, social scientific study of natural disasters, and anthropological studies of political and religious revival following earthquakes as a vehicle to identify texts within Amos that were influenced by the earthquake. In light of a better understanding of the scope of the quake, chapter six will reexamine social justice passages and the interchange between Amos and Amaziah and how these passages may be better understood through an earthquake that highlighted the disparity between rich and poor while confirming the prophetic message of Amos. In addition, it will focus on the composition of Amos and how the use of wordplay helped to validate Amos as a prophet. Last, chapter seven will provide synthesis and conclusions.

CHAPTER ONE: THE INTERDISCIPLINARY STUDY OF ANCIENT EARTHQUAKES

1. Historical Earthquakes Recorded in Ancient Near Eastern/Levantine Literature

From the advent of writing until the rise of Hellenism, we know of five earthquakes that are recorded as actual events within the Ancient Near East and Levant. The earthquakes cluster around two separate periods: the Middle Assyrian period with two separate quakes recorded within 100 to 150 years of each other, and the Iron IIB/Neo-Assyrian period where the Hebrew Bible and Neo-Assyrian letters mention earthquakes. Outside of these texts and periods, though earthquakes may be suggested in some texts and earthquake imagery is found textually in virtually all periods, there are no other historical records of earthquakes within the Ancient Near East or the Levant.

Table 1.1: Historical Earthquakes Recorded in Ancient Near Eastern/Levantine Literature

DATE/LOCATION	RULER	TEXT
1274–1245 BCE, Nineveh	Shalmaneser I	"the temple of the goddess Ishtar, mistress of Nineveh, my mistress – (its) wall and ziggurat had been damaged in an earthquake and were in ruin"
1178-1133 BCE, Nineveh	Assur-dan I	"a second time they (temple of Ishtar/towers of great gate) were shaken by an earthquake"
760/750 BCE, Israel/Judah	Uzziah/Jeroboam	"two years before the earthquake"
672–669 BCE, Assur	Esarhaddon	"There was an earthquake on the 21st of Elul."
669–627 BCE, Dur Sharrukin[1]	Ashurbanipal (scribe=?)	"an earthquake took place in the city of Dur-Sharrukin on the ninth day of the month Adar."
669–627 BCE, Dur Sharrukin	Ashurbanipal (scribe=Issar-šumu-ereš)	"Now it has again quaked in the daytime"
669–627 BCE, Dur Sharrukin	Ashurbanipal (scribe=Balasî)	"Now this one: if he will be slighted, its explanation can only be the earthquake. It has quaked: that is bad."
669–627 BCE, Dur Sharrukin	Ashurbanipal (scribe=Adad-šumu-uṣur)	"Concerning the crown prince's visiting the king, my lord, is it because of the earthquake that he has said: 'The crown

[1] For the four earthquake references during the reign of Ashurbanipal it is unclear how many different quakes occurred. The records come from four different scribes but it is not possible to distinguish which letters may be referring to the same quake.

		prince should not go outdoors?' It is (already) a fortnight today since the earth quaked…"

The clustering of quakes during these periods, as well as the absence of earthquake records during other periods certainly does not mean that these two periods were the only times when earthquakes struck this area. More Assyrian tablets, that either await translation or still remain hidden in the dirt, one presumes, certainly hold records of other earthquakes and perhaps one day, an inscription will be discovered from the Levant or near Ugarit attesting to other quakes. In the meantime, the pages below will examine the underpinnings of earthquake scholarship in the Ancient Near East and Levant over the last 100 years.

In surveying scholarship, what is immediately apparent is that biblical scholars have yet to understand and treat natural disasters as totalizing events, which affect all aspects of society. Thus, the implications of how a disaster could have destabilized the political environment, engendered religious revival, or even altered the sensitivities of religious belief remain untouched. Second, because several of the earthquakes struck at times that coincide with important political shifts—such as the end of Jeroboam II's life and the genesis of renewed Assyrian presence in the Levant, or within the last year or two of Esarhaddon's life—these events allow for another layering of factors that might stand behind these historical situations. Third, as interdisciplinary research is now a *de facto* part of the academy, its application by Assyriologists and biblical scholars to the study of earthquakes is only in its infancy.[2] Thus, the studies below have focused overwhelmingly on earthquakes from a textual perspective, more interested in ideas such as earthquake motifs in Amos or divine punishment manifested through earthquakes, rather than how scribes would have edited earthquake language into Amos or how

[2] On the history of interdisciplinary research, see Julie Thompson Klein, *Interdisciplinarity: History, Theory, and Practice* (Detroit: Wayne State University, 1990).

ancient Israel would have responded in public and private life to an earthquake. In sum, the present research is indebted to the last 100 years of scholarship that has advanced our thinking and raised important questions but there is still much work to accomplish.

2. Assyrian Earthquakes: A Half-Century of Quiescence

R. C. Thompson's 1937 article in the journal *Iraq* is a seminal article on Assyrian earthquakes. It both summarizes previous scholarship on Near Eastern earthquakes as well as remains the most comprehensive article to date.[3] During the 1930-1931 season at Nineveh, a tablet excavated there and dating to the time of Esarhaddon mentioned an earthquake, which Thompson's article served as the *editio princeps* and also set the tablet within the existing body of knowledge on Near Eastern earthquakes. Following Thompson's initial transliteration, translation and brief commentary, he guided the reader to Robert Harper's nine-volume work on *Assyrian and Babylonian Letters* where Harper, over the course of seventeen years, published the cuneiform texts to hundreds of letters found at Nineveh.[4] The text from Harper that Thompson cites has more to do with apotropaic rituals to ward off an earthquake rather than an actual earthquake. Following this citation, Thompson then turns to the two Middle Assyrian texts that reference specific quakes, and were originally published in 1932, noting that they represent the world's oldest references to actual earthquakes.[5]

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[3] R. Campbell Thompson, "A New Record of an Assyrian Earthquake," *Iraq* 4 (1937): 186–189.

[4] Robert Francis Harper, *Assyrian and Babylonian Letters* (Chicago: University of Chicago; London: Luzac and Company, 1892–1909). In Harper's preface to the first volume (I: vi), he lays out three purposes for the volumes: 1) publish all letters in the K collection in which the name of a scribe is found, 2) publish the best preserved of other letters without scribal names, 3) transliterate and either translate or provide a *résumé* of the contents. Harper's volumes are a collection of texts published for the first time as well as texts that had been previously published by a number of other scholars. See the list of other publications in I:v-vi.

[5] R. C. Thompson and R. W. Hamilton, "The British Museum Excavations on the Temple of Ishtar at Nineveh 1930-1," *AAA* XIX (1932): 19. See E. R. Lacheman, "An Omen Text from Nuzi," *RA* 34 (1937): 1–8. For the later Assyrian rituals, see Erica Reiner, *Astral Magic in Babylonia* (Philadelphia: American Philosophical Society, 1995), 90–92; Hermann Hunger, *Astrological Reports to Assyrian Kings* (SAA 8. Helsinki: Helsinki University Press,

Since Thompson's article, scholarship had not returned to earthquakes in the Ancient Near East until the last few years with the publication of Nicolas Ambraseys's 1000 page monograph, *Earthquakes in the Mediterranean*.[6] Ambraseys has advanced the field unquestionably far more than anyone in the 20th century, but his work is not without its flaws, some very serious. These flaws are due largely to his training as an engineer that enables him to provide an informed scientific perspective; conversely, his lack of training in Near Eastern studies greatly diminishes his handling of the textual sources. For example, in his treatment of the Middle Assyrian earthquakes, Ambraseys quotes R. C. Thompson's early translations or the woefully outdated texts by Leroy Waterman instead of using the standard and updated volumes by A. K. Grayson in *The Royal Inscriptions of Mesopotamia Assyrian Periods* series.[7] The translations lack the benefit of better precision in terminology and thus more depth in his treatment of the quakes results in an overall rudimentary treatment of the evidence.

3. Amos's (Invisible) Earthquake in 20th Century Scholarship

Modern scholarship has presented readers with an enduring irony of Amos's earthquake: scholarship has never doubted the historicity of the earthquake nor its great size, but has divorced the earthquake's magnitude from its socioeconomic impact. Thus, while social scientists point to natural disasters as systemic events and social catalysts, Levantine scholarship has viewed Amos's earthquake through its literary implication—since it was severe it was noted in the

1992); Simo Parpola, *Letters from Assyrian and Babylonian Scholars* (SAA 10. Helsinki: Helsinki University Press, 1993); Hermann Hunger and David Pingree, *Astral Sciences in Mesopotamia* (Hdo 44. Leiden, Brill, 1999).

[6] Nicholas Ambraseys, *Earthquakes in the Mediterranean and Middle East: A Multidisciplinary Study of Seismicity up to 1900* (Cambridge: Cambridge University Press, 2009). See also, Stefan M. Maul, Erdbeben zur Entsprechenden Deutung von Erdbeben in Mesopotamischen Omina vgl.," NEP IV 1998. Karen Pollinger Foster, Robert K. Ritner, and Benjamin R. Foster, "Texts, Storms, and the Thera Eruption," *JNES* 55 (1996): 1–14, while not an article about earthquakes, explores the notion of a natural disaster in the ancient world.

[7] See, for example, A. Kirk Grayson, *Assyrian Rulers of the Third and Second Millennia BC (to 1115 BC)* (RIMA I; Toronto: University of Toronto, 1987). Ambraseys quotes from Leroy Waterman, *Royal Correspondence of the Assyrian Empire* (2 vols.; Ann Arbor: University of Michigan, 1930).

textual record—while ignoring the socioeconomic implications.[8] For example, in Julius Wellhausen's seminal work, *Prolegomena to the History of Ancient Israel*, Wellhausen writes, "Under King Jeroboam II, two years before a great earthquake that served ever after for a date to all who had experienced it…"[9] Wellhausen clearly saw the earthquake as an important event, but an event that served as a date and not an event that would have drastically altered family structure, societal norms, or even the physical landscape.

The view espoused by Wellhausen that the earthquake was real, large in scale, and left an indelible mark on its eighth century inhabitants would proliferate in twentieth century scholarship. A few decades after Wellhausen, William Harper, writing in the influential International Critical Commentary series, largely followed his thinking. Harper states, "Since earthquakes are not infrequent in Palestine, as may be gathered from their frequent mention in poetic descriptions, this must have been an especially severe one."[10] Subsequent to Harper, as the stream of literature in favor of a large earthquake continued, the late 1950's opened a new chapter into the quake, as textual scholars would soon incorporate supportive archaeological evidence. In short, "biblical archaeology" took hold in Israel and Yigael Yadin's excavations at Hazor provided new evidence. Yadin's belief that he had uncovered evidence of Amos's earthquake at Hazor—quickly published within a few years—would serve as the benchmark to which later archaeologists or biblical scholars would turn for supportive evidence. Hence, in the late 1960's, James May, bolstered by Yadin's work at Hazor would write, "The excavators of Hazor found traces of an earthquake in the eighth century which they dated to around 760." This

[8] See Gary A. Kreps, "Disaster as Systemic Event and Social Catalyst," in *What is a Disaster? Perspectives on the Question* (ed. E. L. Quarantelli; New York: Routledge, 1998), 31–55.

[9] Julius Wellhausen, *Prolegomena to the History of Ancient Israel* (Edinburgh: Adam & Charles Black, 1878), *478.*

[10] William Rainey Harper, *Amos and Hosea* (ICC; T & T Clark: Edinburgh, 1905), 7. See also, the earlier work by M. Rahmer, "Das Erdbeben in den Tagen Uria's," *MGWJ* 21 (N.F. 2) (1870): 241–252; 289–297; 549–558.

prefaced his next statement that, "The reference to a point two years before a catastrophic disaster gives the impression that those who remembered the connection thought of Amos's activity in Israel as having been short, not more than a year."[11] Thus, following Yadin's work at Hazor, scholars would follow a common refrain of first mentioning earthquake damage at Hazor before commenting on its reference in the superscription.[12]

More recent studies of Amos have followed the same thread of highlighting the literary impact of the quake while not pursuing the socioeconomic. For example, Shalom Paul, in his magisterial commentary on Amos writes, "Because earthquakes are not rare in Israel and have occurred at all times, this one must have been extremely violent and unparalleled; it not only was used for dating this prophetic book but also was referred to hundreds of years later by the prophet Zechariah…"[13] He also would note, "Most exegetes relate this earthquake to the one attested at stratum VI of Hazor and dated to around 760 B.C.E."[14] This view continues in the most recent works on Amos, such as Jason Radine's 2010 study in which he summarizes, "Archaeologically, evidence for an earthquake has been seen at the contemporary strata of Hazor VI, Lachish IV, and at Gezer, dated to the eighth century."[15] In sum, from the father of modern critical scholarship until today, scholarship has never doubted that a large earthquake occurred in

[11] James Luther Mays, *Amos* (Great Britain: SCM Press, 1969), 20.

[12] A few years after Mays's commentary, Hans Walter Wolff, *Joel and Amos* (Philadelphia: Fortress, 1977), 120, writes, "The terse notice 'two years before the earthquake' was unequivocal only for the generation which had experienced the event. Later on, the addition of a royal name (as in Zech 14:5) would have become absolutely necessary."

[13] Shalom Paul, *Amos* (Minneapolis: Fortress, 1991), 35. Francis I. Anderson and David Noel Freedman, *Amos: A New Translation with Notes and Commentary* (AB 24A; New York: Doubleday, 1989), 193–199 have a robust view of the impact of the earthquake. They argue that Amos foresaw and predicted an earthquake. Freedman, see below, will later coauthor a paper with Andrew Welch where they further pursue this idea.

[14] Paul, *Amos*, 35.

[15] Jason Radine, *The Book of Amos in Emergent Judah* (FAT 45; Tübingen: Mohr Siebeck, 2010), 52.

the eighth century BCE as recorded in the superscription of Amos. Within this steady stream of earthquake proponents however, scholarship has plied the text for its literary implications of underscoring the severity of the quake without exploring or understanding the quake as a true natural disaster.

Scholars who have turned their focus to the tantalizing, but brief, mention of שׁנתים לפני הרעשׁ "two years before the earthquake" in the superscription have been hindered by the scant context. F. E. Peiser's 1916 article, one of the earliest studies on the phrase, argued that "two years before the earthquake" was a later addition.[16] He first posited that 1:2b was drawn from Joel 1:18-19, while 1:2a was from Joel 2:10-11 and 3:16 (4:16). Since both these verses contain references to earthquakes, he argued that this led to the addition at the end of 1:1. Further, he saw "two years" as a corruption of "heavens" in Joel 2:11. In a series of articles before the dawn of World War II, Theophile Meek examined the accusative of time שׁנתים "two years." He first argued that the accusative of time שׁנתים "two years" expressed duration of time, thus, Amos prophesized for a period of two years.[17] Within the same year, he backed away from this view and returned to his earlier view that Amos 1:1 expressed point of time "two years before the earthquake."[18]

More recent studies of the earthquake clause in Amos 1:1 have also been hindered by the phrase. Gene Tucker's study, though not focused on Amos's superscription, has remained important for his work on the wider purview of prophetic superscriptions. He compared and contrasted the long superscription of Amos against other prophetic superscriptions and saw the

[16] Felix Ernst Peiser, "שׁנתים לפני הרעשׁ Eine Philologische Studie," *ZAW* 36 (1916): 218–224.

[17] Theophile J. Meek, "The Accusative of Time in Amos 1:1," *JAOS* 61 (1941): 63–64.

[18] Theophile J. Meek, "Again the Accusative of Time in Amos 1:1," *JAOS* 61 (1941): 190–191. Meek set out his original view of the accusative of time in Theophile J. Meek, "The Hebrew Accusative of Time and Place," *JAOS* 60 (1941): 224–233.

structure of the superscription as the title of a book, "The words of Amos," and then an elaboration of the title through a phrase with a series of relative clauses appended.[19] J. Alberto Soggin's study would also examine chronological questions, but he focused on the date of the earthquake in relation to the reigns of the kings.[20] In his view, a date of 759 or 756 rather than 750 was more likely for "Uzziah's sin" or the beginning of Jotham's reign. Last, Jörg Jeremias has argued that though the superscription refers to a serious earthquake, there are too many earthquakes in the Levant to be able to draw historical conclusions.[21] In his view, this shows that Amos prophesized for little more than a year and that the quake served as the beginning of actualizing the word of God as proclaimed by Amos.

Outside of the focused work on Amos's superscription, Samuel Loewenstamm wrote an important study of earthquake imagery and theophanies that continues to be overlooked.[22] Loewenstamm first evaluated Hermann Gunkel's earlier work where he studied earthquake imagery along with the motif of God's war with the sea.[23] After finding Gunkel's conclusion

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[19] Gene M. Tucker, "Prophetic Inscriptions and the Growth of the Canon," in *Canon and Authority: Essays in Old Testament Religion and Theology* (ed. G. W. Coats and B. O. Long; Philadelphia: Fortress, 1977), 56–70. See also, Gene M. Tucker, "Amos the Prophet and Amos the Book: Historical Framework," in *Israel's Prophets and Israel's Past: Essays on the Relationship of Prophetic Texts and Israelite History in Honor of John H. Hayes* (OTS 446; ed. B. E. Kelle and M. B. Moore; New York: T & T Clark, 2006), 85–102, esp. 90–91.

[20] J. Alberto Soggin, "Das Erdbeben von Amos 1,1 und die Chronologie der Könige Ussia und Jotham von Juda," *ZAW* 82 (1970): 117–21.

[21] Jörg Jeremias, "Zwei Jahre vor dem Erdbeben (Amos 1:1)," in *Altes Testament, Forschung und Wirkung: Festschrift für Henning Graf Reventlow* (ed. P. Mommer and W. Theil; Berlin: Peter Lang, 1994), 15–31. Reprint *Hosea und Amos: Stuidien zu den Anfängen des Dodekapropheten* (FAT 13; Tübingen: Mohr, 1996). See also, Jörg Jeremias, *The Book of Amos: A Commentary* (trans. D. W. Stott; OTL, Louisville: Westminster John Knox, 1995), 11–13.

[22] Samuel E. Loewenstamm, "The Trembling of Nature during the Theophany," in *Comparative Studies in Biblical and Ancient Oriental Literatures* (AOAT 204; Kevelaer: Bercker & Butzon; Neukirchen-Vluyn: Neukirchener, 1984), 173–89. On Loewenstamm's overlooked study, see for example, the comments of Frank Polak in his review of Thomas Dozeman's book: Frank H. Polak, review of T. Dozeman, *Exodus*, *RBL* 9 (2010).

[23] Hermann Gunkel, *Schöpfung und Chaos in Urzeit und Endzeit* (Göttingen: Dandenhoed und Ruprecht, 1895), 29–114. See also, Theodor H. Gaster, "Psalm 29," *JQR* 37 (1946): 55–65.

wanting that the Sinai theophany account influenced other Israelite theophany texts, Loewenstamm assembled an impressive list of Hebrew words for shaking preserved within the Hebrew Bible. Loewenstamm then concluded that God's theophany, which frightens nature, is "The description of God as a warrior possessing superhuman strength against whom no one can stand."[24] Thus, for Loewenstamm, God as a powerful warring force created trembling for the world as seen in biblical texts. This motif, however, also common in Akkadian literature, led Loewenstamm to conclude that the model of nature-shaking theophany came to Israel under Canaanite influence that borrowed it from Akkadian literature. While Loewenstamm is confident that the model of God as a warrior, whose appearance terrifies the whole world, came from Canaanite literature into Israelite literature, he is less sure that Canaanite literature borrowed it from Akkadian when Akkadian was an international language.[25]

While Loeswenstamm turned his attention to earthquake imagery in Semitic texts, several studies have concentrated on earthquake imagery in the eighth century. Jacob Milgrom used historical, ideological and literary evidence to suggest that Isaiah 1:10–6:13 came from Uzziah's time.[26] He also drew special attention to Isaiah 2:10 and following, suggesting "trees, mountains high walls, towers and ships would suffer the greatest devastation during an earthquake."[27] Milgrom's work was ahead of its time in many ways. He drew on N. Shalem's seismological work, whose research was at the forefront of Israeli seismology.[28] By using Shalem's

[24] Loewenstamm, "Trembling of Nature," 179.

[25] Loewenstamm, "Trembling of Nature," 189, unfortunately, does not suggest when this borrowing may have taken place.

[26] Jacob Milgrom, "Did Isaiah Prophesy During the Reign of Uzziah?," *VT* 14 (1964): 164–182.

[27] Milgrom, "Did Isaiah," 182.

[28] See most importantly, N. Shalem, "The Earthquakes in Jerusalem," *Jerusalem* 2 (1949): 22–60 (Hebrew). Milgrom also cites the unpublished manuscript, N. Shalem, *Seismicity in Palestine and in the Neighboring Areas*

seismological research, Milgrom went a step farther than previous biblical scholars who studied Amos's earthquake. At the same time, many of the conclusions that Milgrom reached regarding the scope and size of the earthquake's reach have now been overturned by modern seismological study.

Several decades later, D. Kelly Ogden inaugurated a study of the earthquake motif in Amos where he argued for its robust presence. He began his article with the usual reference to a large earthquake, writing, "Though seismic disturbances are anything but rare in the land of Amos, this very earthquake, the only one explicitly mentioned in the Bible, was apparently so severe that it was used for some time to date historical events."[29] By weaving together archaeological references to the earthquake, Ogden suggested that the earthquake "caused damage over a wide area if (sic) Jerusalem, Bethel, Samaria, and Deir Alla – the center of the country – and Hazor and Beersheba – the northern and southern ends of the country…"[30] Thus, for Odgen, he saw an "underlying earthquake motif" in Amos that was told in the boldest way possible: force of nature.

David Noel Freedman and Andrew Welch opened new lines of inquiry by arguing that the earthquake validated Amos's prophecy and legitimacy.[31] By first linking earthquakes with theophanies, they argued that the earthquake demonstrated that Amos was a true prophet,

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(Macroseismical Investigations) (Jerusalem: Geological Survey Library, 1953). To suggest that an earthquake induced tsunami "would have made matchsticks of whatever ships were tied up in the Elath harbor," Milgrom turns to, N. Shalem, "The Tsunami in the Eastern Mediterranean," *BIES* (1956): 159–170 (Heb.).

[29] D. Kelly Ogden, "The Earthquake Motif in the Book of Amos," in *Golden Äpfel in Silbernen Schalen: Collected Communications to the XIIIth Congress of the International Organization for the Study of the Old Testament, Leuven 1989* (ed. K. D. Schunk and M. Augustin. BEATAJ 20; Frankfurt am Main: Peter Lang, 1992), 69–80.

[30] Ogden, "The Earthquake Motif," 71.

[31] David Noel Freedman and Andrew Welch, "Amos's Earthquake and Israelite Prophecy," in *Scripture and Other Artifacts* (ed. by M. D. Coogan, J. C. Exum, and L. E. Stager; Louisville: Westminster John Knox, 1994), 188–198.

because "his message of Yahweh's judgment is followed by Yahweh's definitive action."[32] They suggest that testing prophecy by its realization was of serious interest in pre-exilic and exilic Israel and Judah. This led them to assert that Amos was the first prophet to move outside the model of Elijah/Elisha's "wonder-working, direct transmission of prophetic mantle, and (in Elisha's case) groups of prophets" thus freeing other prophets to do the same.[33] Their work raises a number of intriguing, unanswered questions related to how natural disasters influence religious renewal, how their view of the rise of classical prophecy would compare to other explanations, and the extent to which other prophets would be influenced by Amos's model.[34]

Most recently, Katherine Dell's study argues that for Amos, God has and will use earthquakes as punishment.[35] After surveying a number of texts that she sees as preserving earthquake imagery, she suggests three possibilities for what Amos saw as God's purpose in using earthquakes.[36] First, they express God's power as he can reverse his creation. Second, earthquakes are punishment in line with retributive justice. Third, earthquakes cause the loss of security.

What becomes intriguing in reviewing scholarly study of Amos's earthquake is the sheer lack of interaction between each work.[37] For example, while Dell frequently cites the Anchor

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[32] Freedman and Welch, "Amos's Earthquake," 190.

[33] Freedman and Welch, "Amos's Earthquake," 196.

[34] Freedman and Welch, "Amos's Earthquake," 197, write regarding Haggai, Jeremiah, Ezekiel, Nahum, Joel and Zechariah: "All these prophets bear witness to the power of the memory of the earthquake 'in the days of Uzziah'."

[35] Katherine J. Dell, "Amos and the Earthquake: Judgment as Natural Disaster," in *Aspects of Amos: Exegesis and Interpretation* (ed. A. C. Hagedorn and Andrew Mein; New York: T & T Clark, 2011), 1–13.

[36] One other recent study on Amos's earthquake is, R. Reed. Lessing, "The Big Bang in the Book of Amos and the Book of the Twelve." Paper presented at the annual meeting of the Society of Biblical Literature National Meeting. New Orleans, LA, November 22, 2009.

[37] See also, Amos Nur, *Apocalypse: Earthquakes: Archaeology, and the Wrath of God* (Princeton: Princeton University Press, 2008). Nur, a Stanford seismologist, tries to make a strong case that earthquakes have been

Bible commentary of Freedman and Anderson, she never turns to Freedman and Welch's work that focuses solely on Amos and the quake, nor does she cite the earlier works of Ogden or Milgrom. Likewise, Freedman and Welch do not cite Ogden or Milgrom's work, and Ogden does not interact with Milgrom's study. Further, none of the studies above interact with Loewenstamm's important work. This observation is not meant to slight any of these scholars; and, in fact, each has provided valuable contributions to the study of Amos's earthquake. It does raise an important point: research has advanced on independent lines without synthesis or consensus.

Thus, part of our investigation will provide an in-depth discussion of the role of earthquake imagery in the eighth century works of Amos, Isaiah, and Micah. The abundance of earthquake imagery in Isaiah and Micah suggests the 760/750 BCE quake and its aftershocks not only invigorated Amos, but also encouraged Isaiah and Micah to follow Amos's prophetic example. At the same time, Isaiah and Micah only provide allusions to earthquake imagery and never mention Amos's earthquake.[38] Zechariah 14:5, a text that is three centuries later, provides the only other biblical reference to the quake. Hence, it is important to examine historical memory of how a traumatic event is transmitted over time and why, if the quake was so severe, did it seem to go unmentioned in biblical literature for 300 years.

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overlooked in the Mediterranean both as events and as legitimate shapers of human history. Nur surprisingly never refers to Amos 1:1, but relies on Zechariah 14:5. Unfortunately, he only mentioned the Zechariah reference in passing.

[38] See the early work of Gerhard Von Rad, *Old Testament Theology* (New York: Harper & Row, 1965), 239: "It is now, of course, apparent that when the prophets spoke of coming events, they did not do so directly, out of the blue, as it were; instead, they showed themselves bound to certain definite inherited traditions, and therefore even in their words about the future they use a dialectic method which keeps remarkably close to the pattern used by earlier exponents of Jahwism. It is this use of tradition which gives the prophets their legitimation. At the same time, they go beyond tradition—they fill it even to bursting-point with new content or at least broaden its basis for their own purposes." See the more recent approaches in Paul L. Redditt and Aaron Schart, eds., *Thematic Threads in the Book of the Twelve* (BZAW 325. Berlin: Walter de Gruyter, 2003).

4. Levantine Archaeology and Identifying Amos's Earthquake

As mentioned above, Yigael Yadin's connection between archaeological damage at Hazor and Amos's quake became the archaeological standard that all subsequent Levantine scholars would follow.[39] Stratum V, which consisted of thick layers of ash and eighth century pottery, Yadin connected to the destruction of the city by Tiglath-pileser III in 732 BCE. When he removed the debris and floors of Stratum V in Area A near the top of the tel, Yadin noted two things: "(1) that many of the walls of the lower stratum were tilted, as if shaken by a terrible earth tremor, and (2) that the floors of many of the houses were covered by fragments of the ceilings that had fallen suddenly, another unusual phenomenon in archaeological excavations."[40] In addition to these observations, it is also important to note that geologists from Hebrew University who examined the damage believed that Hazor had been "some distance" from the epicenter. For Yadin, this helped explain why the earthquake damage was confined to the southeastern side of Area A as, "Strong walls had therefore stood up to the shock, while other had been only partially wrecked, even remaining standing in places, albeit at a slant."[41] Yadin presents a different perspective on the relationship between Amos and Zechariah than most others by suggesting that Zech 14:5 describes the effects of the earthquake, while Amos 1:1 describes events that were dated from it.

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[39] Yadin first published the earthquake damage in Y. Yadin, "Excavations at Hazor, 1956," *IEJ* 7 (1959): 118–123. Yadin mentioned that stratum 3—which would later become stratum VI—"seems to have been destroyed during the great earthquake (mentioned at the beginning of the Book of Amos)." For the official publication see Yigael Yadin et al., *Hazor II: An Account of the Second Season of Excavations, 1956*. (Jerusalem: Magnes, 1960), 24–26; 36–37.

[40] Yigael Yadin, *Hazor: The Rediscovery of a Great Citadel of the Bible* (New York: Random House, 1975), 150–153. See also Yigael Yadin et al., *Hazor III-IV, Text* (Jerusalem, 1989), 41, 44; Yigael Yadin, *Hazor: The Head of All Those Kingdoms* (London: Oxford University Press, 1972), 113, 181, "Stratum VI was found to have been destroyed by a violent earthquake… although the walls of Stratum VI were still standing after the earthquake, they were so tilted that only their tops could be used, and even those only as a base for the new foundations. The earthquake which destroyed Stratum VI seems to be the one referred to in the Bible, which occurred during the reign of King Uzziah (c. 760 B.C.)." Yadin was more cautious in connecting the damage with Amos's quake in his 1972 work ("seems to be the one referred to in the Bible"). In his 1975 work, he states that it "is indeed referred to in the Bible." Interestingly, some of the Hazor artifacts in the museum housed at Kibbutz Ayelet HaShahar were damaged during an earthquake in 2008.

[41] Yadin, *Hazor II*, 26.

Without providing any rationale in the original publication, Yadin dated the earthquake to about 760 B.C.[42] Thus, Yadin's stratum VI, became the benchmark from which other scholars would then make seismic comparisons.

Following Yadin's work, archaeologists began suggesting possible eighth century earthquake damage at other Levantine sites. At Lachish, where the end of Level IV appeared to come to a sudden end, David Usshiskin, on the basis of a suggestion by Moshe Kochavi, suggested that the end of Level IV at Lachish was linked to an earthquake.[43] Ussishkin did not adduce any evidence for this conclusion and his suggestion was cautious, but nonetheless, he proceeded forward. Kochavi, who had begun digging at Hazor with Yadin in 1955, and was no doubt influenced by the earthquake damage he saw at Hazor, provided the suggestion to Usshiskin.[44] At the same time that Lachish's damage became associated with an earthquake, M. Ibrahim and Gerrit van der Kooij, in their work at Deir 'Alla, published their preliminary reports from the 1976–1978 seasons in which they believed they had identified earthquake damage.[45] Deir 'Alla sits on the eastern side of the Jordan, close to the Dead Sea Transform. Thus, an eighth century earthquake would have a strong probability of striking the site. In Phase IX, also

[42] In an article submitted just after the publication of Hazor II (Yadin submitted it in August 1959), Yadin proposed 765 BCE as the date of the earthquake. See Yigael Yadin, "Ancient Judaean Weights and the Date of the Samaria Ostraca," *SH* 8 (1961): 9–25.

[43] David Ussishkin, "The Destruction of Lachish by Sennacherib and the Dating of the Royal Judean Storage Jars," *TA* 4 (1977): 28–60, esp. 52. Ussishkin writes, "Of interest in this connection is the earthquake mentioned in Amos 1: 1 and Zech. 14:5, which occurred around 760 B.C.E. during the reign of Uzziah, king of Judah."

[44] For an overview of Kochavi's excavation activities see, D. D. R., "Moshe Kochavi 1928–2008," *BAR* 34 (Nov. 2008): 8. When Kochavi visited Lachish he was in the midst of a long-term project at Aphek.

[45] M. Ibrahim and Gerrit van der Kooij, "Two Seasons of Excavations at Tell Deir 'Alla, 1976–1978," *ADAJ* 22 (1977–1978): 56–79. See also, H. J. Franken, "Texts from the Persian Period from Tell Deir 'Alla," *VT* 17 (1967): 480– 481; H. J. Franken, "Archaeological Evidence relating to the Interpretation of the Text," in *Aramaic Texts from Deir 'Alla*, (ed. J. Hoftijzer and G. van der Kooij; Leiden: Brill, 1976), 3–16; M. Ibrahim and Gerrit van der Kooij, "Excavations at Tell Deir 'Alla, Season 1979," *ADAJ* 23 (1979): 41–50; M. Ibrahim and Gerrit van der Kooij, "The Archaeology of Deir 'Alla Phase IX" in *The Balaam Text from Deir 'Alla Re-Evaluated, Proceedings of the International Symposium, Leiden, 21–24 August 1989* (ed. J. Hoftijzer and G. van der Kooij; Leiden: Brill, 1991), 16–29.

called Phase M, Ibrahim and van der Kooij noted cracked foundations and fallen walls. Further evidence was seen through the walls that were constructed of mud bricks and tended to fall in a southerly direction.[46]

While archaeologists continued to suggest seismic damage related to Amos's earthquake, William Dever's article, "A Case-Study in Biblical Archaeology: The Earthquake of ca. 760 BCE," proved to be a seminal work.[47] Dever first illustrated the skepticism brought to bear on Claude Schaeffer's argument that an earthquake—dated to around 1365 BCE—could be used to date the chronology of the Levant in the Late Bronze Age.[48] He then turned to Yadin's attempt to fix chronology at Hazor to the 760 BCE earthquake and surprisingly suggested that Yadin's view did not attract many followers.[49] These illustrations were used by Dever as evidence of the difficulty of assessing earthquake damage in the archaeological record. With these caveats, Dever then turned to evidence on the north side of Gezer in Field XI (Area 20) in which an "Outer Wall" showing three courses of well-drafted ashlars, cracked from top to bottom; the stones of each higher course were displaced increasingly to the north.[50] Stratum VI with the earthquake damage, was terminated by military damage that Dever attributed to Tiglath-Pileser

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[46] Andre LeMaire, "Fragments from the Book of Balaam Found at Deir 'Alla, Text Fortells Cosmic Disaster," *BAR* 11 (1985): 26–39.

[47] W. G. Dever, "A Case Study in Biblical Archaeology: The Earthquake of ca. 760 BCE," *EI* 23 (1992): 27*–35*. The only scholars to challenge Dever's earthquake conclusions has been expressed in Alexander Fantalkin and Israel Finkelstein, "The Sheshonq I Campaign and the 8th Century BCE Earthquake-More on the Archaeology and History of the South in the Iron I IIA," *TA* 33 (2006): 18–42.

[48] See C. F. A. Schaeffer, *Stratigraphie Comparée et Chronologie de l'Asie Occidentale* (London: Oxford University Press, 1948). For a critical review of Schaeffer, see G. M. F. Hanfmann, "The Bronze Age in the Near East: A Review Article [Part I]," *AJA* 55 (1951): 355–365.

[49] Dever suggests Yadin's lack of followers was due to his use of "biblical archaeology," but as the survey above has shown, Yadin's views regarding Amos's earthquake has gained traction over time.

[50] Dever, "A Case Study," 659. See also, R. Younker, "A Preliminary Report of the 1990 Season at Tel Gezer, Excavations of the "Outer Wall" and the "Solomonic" Gateway (July 2 to August 10, 1990)" *AUSS* 29 (1991): 19–60; Michael Gerald Hasel, "New Early Eighth-Century B.C. Earthquake Evidence at Tel Gezer: Archaeological, Geological, and Literary Indications and Correlations" (M.A. thesis, Andrews University, 1992), 5–13.

III (733–732 BCE).[51] Dever saw further evidence of earthquake damage in Area 20 where a long wall curved radically, with a long section bowed outward yet still intact.[52] In his article Dever then probed archaeological criteria to distinguish earthquakes from other naturally or historically caused disturbances and suggested how biblical references to particular historical events be critically assessed and used as reliable sources.

One last paper to mention is the collaboration of Shmuel Marco, Amotz Agnon, Israel Finkelstein, and David Ussishkin. Shmuel Marco, a specialist in paleoseismology, archaeoseismology, and neotectonics at Tel Aviv University has pioneered a number of important advances in the field as well as Amotz Agnon, a specialist in earthquake geology and mechanics at the Hebrew University. These scientists, along with Finkelstein and Ussishkin worked together to produce a chapter in the Megiddo volumes on Megiddo's Earthquakes.[53] The chapter was the first systematic survey of structural damage at Megiddo that might be linked with earthquakes and since Megiddo sits along the Carmel fault line, it is a prime candidate to conduct archaeoseismic studies.[54]

5. The Emerging Field of Archaeoseismology

While archaeoseismology (the identification of pre-instrumental earthquakes in the archaeological record) has only begun to be more fully integrated into archaeological excavations over the past few decades, its roots extend much earlier. The field attributes its

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[51] William G. Dever, "Gezer" in *The New Encyclopedia of Archaeological Excavations in the Holy Land* (vol. 2; New York: Simon & Shushter, 1993), 496–506, esp. 505.

[52] Dever, "A Case Study," 30*.

[53] Shmuel Marco, Amotz Agnon, Israel Finkelstein, and David Ussishkin, "Megiddo Earthquakes," in *Megiddo, vol. 4/2, The 1998–2002 Seasons* (ed. I. Finkelstein, D. Ussishkin, and B. Halpern; Tel Aviv: Tel Aviv University, 2006), 568–575.

[54] Regarding earthquakes at Megiddo, see also the comments of Amos Nur and Haggai Ron, "Earthquake! Inspiration for Armageddon," *BAR* 23 (1997): 49–55.

beginnings to Arthur Evans's 1928-work, *The Palace of Minos at Knossos*, where he used earthquake destruction horizons as stratigraphic benchmarkers.[55] Henry Schliemann at Hissarlik in Western Turkey had already used earthquakes as "stratigraphic benchmarkers" forty years earlier, but Evans incorporated geological data in addition to historical data to create a true multidisciplinary approach.[56] The term "archaeoseismology," that would define the early efforts of Schliemann and Evans is derived from "archaeoseismic" first introduced as a figure caption in a 1977 *Nature* article by Iaakov Karcz, Uri Kafri, and Zeev Meshel.[57] Karcz and Kafri built on their brief note, publishing a longer article the following year where they argued for greater caution in linking archaeological damage with seismic damage.[58] They concluded by suggesting fifteen points to consider when weighing potential archaeoseismic damage.

Karcz and Kafti would lay the foundation on which modern archaeoseismic study would be made. George Rapp, in his reassessment of the earthquake damage at Troy would suggest an analytical framework to interpret structural damage in archaeological remains in which he acknowledged the earlier work of Karcz and Kafti.[59] A. Nikonov supplied a detailed study of

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[55] Arthur Evans, *The Palace of Minos at Knossos* (London: McMillian, 1928). See also the helpful literature review in Victoria Buck, *Archaeoseismology in the Atalanti Region, Central Mainland Greece: Theories Methods, and Practice* (BARIS 1552. Oxford: Archaeopress, 2006), 4–17.

[56] Henry Schliemann, *Ilios: The City and Country of the Trojans* (London: John Murray, 1880), 21 "the tones of these housewalls appeared as if they had been separated from one another by a violent earthquake"; Henry Schliemann, *Troja* (London: John Murray, 1884). Regarding Evans's use of geological data he writes (316), "The upper part of a masonry pillar of recent construction which was moved bodily several centimeters due South supplied, indeed, a good index of the prevalent direction form which the waves of disturbance came."

[57] Iaakov Karcz, Uri Kafri, and Zeev Meshel "Archaeological Evidence for Sub-Recent Seismic Activity Along the Dead Sea-Jordan Rift," *Nature* 269 (1977): 234–235.

[58] Iaakov Karcz and Uri Kafti, "Evaluation of Supposed Archaeoseismic Damage in Israel," *JAS* 5 (1978): 237–253. Karcz and Kafti, 244–45, interact with the tilted pillars at Hazor and suggest that titled pillars are not clear evidence of seismic damage.

[59] G. Rapp and J. Gifford, Troy: The Archaeological Geology Supplementary Monograph 4. (Cincinnati: Princetown University Press, 1982); George Rapp Jr., "Assessing Archaeological Evidence for Seismic Catastrophes," *Geoarchaeology* 1 (1986): 365–379.

destruction at archaeological sites and how it could be used in examining architectural and archaeological monuments.[60] In addition to these individual efforts, other collaborative work, primarily in Italy and Greece continued to lay a strong foundation for modern archaeoseismic study.[61] Much of the ongoing research was synthesized in the 1995 volume in *Annali di Geofisica* dedicated to "Earthquakes in the Past" and the 1996 edited volume by S. Stiros and R. E. Jones, *Archaeoseismology*.[62] The edited volume by Stiros and Jones brought together the work of over thirty seismologists and archaeologists and addressed case studies at individual sites and monuments while devoting another section to individual methods and approaches. In the last few years, the *Journal of Seismology* dedicated an entire issue to archaeoseismology and quite recently, a volume on *Ancient Earthquakes* provided a number of valuable perspectives relating to theory and practice.[63] The volume concentrates on four main areas: understanding earthquakes in the ancient world, historical earthquakes and their societal impact, commentaries and perspectives on archaeoseismological research, and practices in archaeoseismology. In sum, while the field is still new, advances in theory and practice have progressed quickly over the past two decades.

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[60] A. Nikonov, "On the Methodology of Archaeoseismic Research into Historical Monuments," in *Engineering Geology of Ancient Works, Monuments & Historical Sites* (ed. G. Marinos and G. Koukis; Balkema: Rotterdam, 1988), 1315–1320.

[61] See, for example, S. Stiros, "Archaeology, a Tool to Study Active Tectonics–the Aegean as a Case Study," *ETAGU* 13 (1988): 1633–1639; E. Guidoboni, *I Terremoti Prima del Mille in Italia e Nell 'Area Mediterranea: Storia, Archaeologia, Sismologia* (Bologna: SGA-Istituto Nazionale di Geofisica, 1989); R. E. Jones and S. Stiros, "The Advent of Archaeoseismology in the Mediterranean," in *The Archaeology of Geological Catastrophe* (GSSP 171; ed. W. J. McGuire, D. R. Griffith, P. L. Hancock, I. S. Stewart; London: Geological Society, 2000), 25–32.

[62] See the brief but useful overview by S. Stiros and R. E. Jones, "Introduction," in *Archaeoseismology* (ed. S. Stiros, and R. E. Jones, FLOP 7. Great Britain: British School at Athens, 1996), 1–2. The papers were first presented at a conference in 1991, but not published till 1996. To help ensure the quality of the papers, the peer-review process went through an archaeologist, earth scientist, as well as the editors.

[63] *Journal of Seismology* 10 (2006); *Ancient Earthquakes* (ed. M. Sintubin, I. S. Stewart, T. M. Niemi, and E. Altunel; GSASP 471; Boulder: Geological Society of America, 2010).

Chapter four, then, will weigh the evidence of the 760/750 BCE quake in the archaeological record as recent advances in archaeoseismology allow for better assessment. Each site's evidence will be examined through this improved methodology; the following list shows the extent to which purported seismic damage from the 760 BCE quake has been found: Hazor, En Gev, Tell Abu Hawam, Samaria, Deir 'Alla, Tell Qasile, Bethel, Gezer, Jerusalem, Timnah (Tel Batash), Tell Judeideh, Tell es-Safi, Tel 'Erani, Lachish, Beersheba, Arad, and En 'Haseva. Along with studying the merits of the damage, investigating how mud brick structures stand up to seismic waves through experimental archaeology and engineering studies will provide useful data.[64]

6. Historical Earthquake Catalogues and their Proclivity for Circular Reasoning

As early as the mid fifteenth century scholars have compiled earthquake catalogues that provide crucial data in understanding the historical frequency and significance of regional seismicity. This data, in turn, enables seismologists to understand better the history of a fault as well as its likelihood for future failure. Thus, a catalogue's value is closely tied to its careful use and evaluation of historical sources. Amos Salamon's recent paper on the use of historical sources within the Levant for earthquake catalogues has proved extremely helpful.[65] He calls attention to a number of earlier studies that have evaluated Levantine sources for their accuracy and have

[64] See, for example, the work of George R. H. Wright, *Ancient Building Technology: Volume 1, Historical Background* (TCH 4; Brill, Leiden, 2000).

[65] Amos Salamon, "Patterns of Seismic Sequences in the Levant—Interpretation of Historical Seismicity," *JS* 14 (2010): 339–367. See also the work of R. Caputo and B. Helly, "The Use of Distinct Disciplines to Investigate Past Earthquakes," *Tectonophysics* 453 (2008): 7–19; John D. Rucker and Tina M. Niemi, "Historical Earthquake Catalogues and Archaeological Data: Achieving Synthesis without Circular Reasoning," in *Ancient Earthquakes* (ed. M. Sintubin, I. S. Stewart, T. M. Niemi, and E. Altunel; GSA 471; Boulder: Geological Society of America, 2010), 97–106. Rucker and Niemi focus on the 551 CE earthquake in the Levant and how circular reasoning developed among the four primary sources of evidence for historical earthquakes (historical texts, epigraphy, archaeology, and geology).

found the sources wanting.[66] For example, in his study of Levantine sources, he notes that ten Levantine reports described earthquakes as, "such as had not occurred before."[67] It follows logically then, that in earlier catalogues, references to seismic events were often accepted uncritically and subsequent catalogues often perpetuated what are effectively erroneous accounts. While Appendix A will provide a comprehensive study of earthquake catalogues related to Amos's quake, below, the most important research will be mentioned.

Bailey Willis provided the first modern earthquake catalogue in the Levant. His 1928 work compiled a catalogue of Earthquakes in the Holy Land from 1606 B.C. to February, 1928.[68] Catalogues are frequently compiled after large earthquakes, and Bailey's was no exception as it followed the 6.2 magnitude earthquake in Palestine on July 11, 1927. Willis's uncritical acceptance of dates and confusion over literary imagery of earthquakes lead to disappointing results; for example, the first quake he lists in his record is a 1606 BCE earthquake at Mount Sinai, accompanied by thunder and lightening, on the occasion of the delivery of the law.[69] For

[66] Similar conclusions have been drawn by a number of other scholars. See, for example, the comments of N. N. Ambraseys, "Value of Historical Records of Earthquakes," *Nature* 232 (1971): 375–379; N. N. Ambraseys, J. A. Jackson, C. P. Melville, "Historical Seismicity and Tectonics: the Case of the Eastern Mediterranean and the Middle East," in *International Handbook of Earthquake and Engineering Seismology, Part A* (ed. W. HK Lee, H. Kanamori, P. C. Jennings, C. Kisslinger; New York: Academic, 2002), 747–763; Iaakov Karcz, "Implications of Some Early Jewish Sources for Estimates of Earthquake Hazard in the Holy Land," *AG* 47 (2004): 759–792; Emanuela Guidoboni, Alberto Comastri, and Guisto Traina, *Catalogue of Ancient Earthquakes in the Mediterranean Area up to the 10th Century* (Rome: Istituo Nazionale di Geofisica, 1994), 1–42.

[67] Salamon, "Patterns of Seismic Sequences," 347.

[68] Bailey Willis, "Earthquakes in the Holy Land," *BSSA* 18 (1928): 73–103. While Willis based his catalogue on several sources, for earthquakes before the Common Era, he relied on two sources: Robert Mallet and John W. Mallet, *The Earthquake Catalogue of the British Association* (London: Taylor and Francis, 1858 and G. L. Arvanitakis, "Essai sur le climat de Jerusalem," *Bulletin de l'Institut Egyptien* 4 (1903): 178–89. See the critique of Willis by N. N. Ambraseys, "A Note on the Chronology of Willis's List of Earthquakes in Palestine and Syria," *BSSA* 52 (1962): 77–89. An earthquake catalogue compiled within a few years of Willis' was A. Sieberg, "Untersuchungen über Erdbeben und Bruchschollenbau im östlichen Mittelmeergebiet," *DMNG* 18 (1932): 159–273.

[69] Willis, "Earthquakes in the Holy Land," 77. Willis lists the next quake as occurring between 1604 to 1586 in Arabia where he thought Numbers 16 preserved a quake where Korah, Dathan, and Abiram were swallowed up.

Amos's earthquake, he does not associate it with the prophet, but suggests a date of 783 BCE, and notes that it affected Palestine, both sides of the Jordan, Jerusalem, and was "very strong."[70]

D. H. K. Amiran's work is frequently cited in biblical and archaeological literature and presents a much more balanced study of ancient earthquakes than Willis's earlier work. Amiran's first study in 1950–1951, was then updated and revised in 1994, but unfortunately, it only examines quakes from 100 BCE forwards.[71] Amiran et al. do make a passing comment on Amos's earthquakes, noting, "It is reasonable to assume that accounts of the aftermath of major catastrophic earthquakes persist for many generations, such as the biblical case of Amos who prophesized 'two years before the earthquake' (Amos 1:1)."[72]

Ari Ben-Menahem's 1979 earthquake catalogue of the Middle East has been cited frequently in scholarly literature and he presents a strong view of Amos's earthquake. In short, Ben-Menahem scoured the book of Amos for allusions to an earthquake.[73] To Ben-Menahem's mind, he found many allusions, as he argued for a large seismic event felt throughout Israel, Egypt and Mesopotamia with an epicenter east of Hazor, largely based upon Yigael Yadin's work. Ben-Menahem, however, went even further in his assessment of the quake, linking the quake with an eclipse in 763 known from an Assyrian Eponym List[74] and placed the date of the

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[70] Willis, "Earthquakes in the Holy Land," 78.

[71] D. H. K. Amiran, "A Revised Earthquake-Catalogue of Palestine 1," *IEJ* 1 (1950–1951): 223–46; D. H. K. Amiran, "A Revised Earthquake-Catalogue of Palestine 1," *IEJ* 2 (1952): 48–65; D. H. Amiran, E. Arieh, T. Turotte, "Earthquakes in Israel and Adjacent Areas. Macroseismic Observations since 100 B.C.E.," *IEJ* (1994): 260–305. Around the same time of Amiran's catalogue was the work of N. Shalem, *Seismicity in Palestine and in the Neighboring Areas* (Macroscopic Investigations) (Israel: Water Planning for Israel, 1951).

[72] Amiran et al., "Earthquakes in Israel," 261.

[73] A. Ben-Menahem, "Earthquake Catalogue for the Middle East (92 B.C.–1980 A.D.)," *BGTA* 21 (1979): 245–310. Ben-Menahem's later article, Ari Ben-Menahem, "Four Thousand Years of Seismicity Along the Dead Sea Rift," *JGR* 96 (1991): 20,195–20,216, argues that "Solomon's Temple" was severely damaged as well.

[74] *i-na* ^{arah}*simāni* ^{d}*šamaš attalû ištakan*^{an} "in Siwan, the sun had an eclipse." See Alan Millard, *The Eponyms of the Assyrian Empire 910–612 BC* (SAAS 2; Helsinki: Neo-Assyrian Text Corpus Project, 1994), 41, 59.

quake on Yom-Kippur, Oct 7, 759 B.C.[75] Beyond those assertions, he argued that Amos 5:8 and 9:5–6 hinted of a tsunami in the Sea of Galilee.[76] Not surprisingly, Ben-Menahem's work must be used with great caution due to his exuberant reading of the biblical material.[77]

E. Guidoboni, A. Comastri, and G. Traina helped move historical seismology forward in their work, *Catalogue of Ancient Earthquakes in the Mediterranean Area up to the 10th Century*. They provide a summary of Amos's earthquake in what they see as "the only earthquake mentioned in the Bible for which there is sound and direct historical evidence."[78] Guidoboni et al. focused on textual references to historic quakes and did not incorporate other evidence such as archaeoseismic or paleoseismic. This is surprising since their specialty is in the sciences and it

[75] Ben-Menahem, "Earthquake Catalogue," 262 suggests that evidence for the proximity of the earthquake to the eclipse is found in three references. Amos 8:8–9, "Shall not the land tremble on this account, and everyone mourn who lives in it, and all of it rise like the Nile, and be tossed about and sink again, like the Nile of Egypt? On that day, says the Lord GOD, I will make the sun go down at noon, and darken the earth in broad daylight." Zechariah 14:4–7 "On that day his feet shall stand on the Mount of Olives, which lies before Jerusalem on the east; and the Mount of Olives shall be split in two from east to west by a very wide valley; so that one half of the Mount shall withdraw northward, and the other half southward. And you shall flee by the valley of the LORD'S mountain, for the valley between the mountains shall reach to Azal; and you shall flee as you fled from the earthquake in the days of King Uzziah of Judah. Then the LORD my God will come, and all the holy ones with him. On that day there shall not be either cold or frost. And there shall be continuous day (it is known to the LORD), not day and not night, for at evening time there shall be light." Jeremiah 4:(23)–24 " I looked on the earth, and lo, it was waste and void; and to the heavens, and they had no light. I looked on the mountains, and lo, they were quaking, and all the hills moved to and fro."

[76] Amos 5:8, " The one who made the Pleiades and Orion, and turns deep darkness into the morning, and darkens the day into night, who calls for the waters of the sea, and pours them out on the surface of the earth, the LORD is his name." Amos 9:5–6 "The Lord, GOD of hosts, he who touches the earth and it melts, and all who live in it mourn, and all of it rises like the Nile, and sinks again, like the Nile of Egypt; who builds his upper chambers in the heavens, and founds his vault upon the earth; who calls for the waters of the sea, and pours them out upon the surface of the earth—the LORD is his name."

[77] To provide one other example of his uncritical reading, he suggests an earthquake in 854 BCE near the Sea of Galilee based on 1 Kings 20:20, Ben-Menahem, *Earthquake Catalog*, 263. Since the reference does not mention any vestige of an earthquake, it is unclear what verse Ben-Menahem intends to cite: "Each killed his man; the Arameans fled and Israel pursued them, but King Ben-hadad of Aram escaped on a horse with the cavalry." Ben-Menahem will further list earthquakes at 1250 BC for the destruction of Jericho and other cities as well as 2150 plus or minus 100 years for the destruction of Sodom and Gomorah. Regarding Ben-Menahem's approach, see also the cautious note of Ambraseys, *Earthquakes*, 6.

[78] Guidoboni, E., A. Comastri, and G. Traina, *Catalogue of Ancient Earthquakes in the Mediterranean Area up to the 10th Century* (Istituto Nazionale di Geofisica, Rome, 1994), 105–108. See also, the earlier work, E. Guidoboni, "I terremoti prima del Mille in Italia e nell'area mediterranea" in *Storia Geofisica Ambiente* (Bologna 1989), 622–717.

results in an uneven treatment where their work is useful for its collection of sources in their original language, but their interaction with the original languages is extremely strained. For Amos's quake, they compare Amos, Zechariah, Kings, Chronicles, Josephus, Rabbinic sources, and Jerome's commentary on Amos and conclude: "historical fact and legendary elements are superimposed on one another. They further summarize the available data by saying that the sources speak of an earthquake at Jerusalem and in the nearby Valley of Hinnom, in the Mount of Olives area."[79]

Steven Austin, Gordon Franz, and Eric Frost in an *International Geology Review* article tried to bring together seismological, archaeological, and textual evidence for the size and scope of Amos's earthquake.[80] They first suggested that archaeological evidence in the Levant preserved seismic damage. Beyond sites such as Hazor, Deir 'Alla, Gezer, and Lachish, they focused on evidence from Tell Judeideh and 'En Haseva and dated the earthquake to 750 B.C., because they saw consistent damage at all the sites at the same time. They then built on Ari Ben-Menahem's earlier approach where they suggested the earthquake was at least magnitude 7.8, but likely 8.2 with an epicenter probably in Lebanon. Austin et al. stated that the earthquake "appears to be the largest yet documented on the Dead Sea transform fault during the last four millennia."[81] They also build on the suggestions of Freedman and Welch regarding the

[79] E. Guidoboni, *Catalogue of Ancient Earthquakes*, 107.

[80] Steven A. Austin, Gordon W. Franz, and Eric G. Frost, "Amos's Earthquake: An Extraordinary Middle East Seismic Event of 750 B.C," *IGR* 42 (2000): 657–71. In their words, "We believe our inquiry should be directed toward answering three important questions. First does archaeological and geological evidence support a major seismic event in the Middle East in the eighth century B.C.? Second, does ancient literature describe a large mid-eighth-century-B.C. earthquake? Third, can data analysis suggest the earthquake's location and magnitude?"

[81] Austin et al., "Amos's Earthquake," 657.

significance of the quake for prophecy by arguing that the quake "propelled Amos to notoriety and fostered the public's reception of writing prophets."[82]

In sharp contrast to Ben-Menahem and Austin et al.'s work, Nicholas Ambraseys takes a decidedly more minimalist view of Amos's earthquake. Ambraseys notes, "Archaeological reports give little or no technical justification to support the conclusion that damage was due to earthquake, and if so, due to the very same earthquake as that mentioned by Amos."[83] Ambraseys further critiques both the maximalist positions of Ben-Menahem and Austin et al., while also casting doubt on archaeological interpretations, writing, "An earthquake that could obliterate man-made structures within an epicentral area of radius about 100 km, an area including all the sites listed as destroyed, is an earthquake of a size beyond the limits of the possible."[84] Ambraseys has long been an important figure in Levantine seismology and this impressive monograph stands as a tribute to his five decades of work.[85] His work is punctuated by his skeptical view of ancient sources that refer to earthquakes as well as his doubts about how much seismic damage is preserved in the archaeological record.

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[82] Austin et al., "Amos's Earthquake," 657, state that the quake "was synchronous with the introduction of 'seismic theophany' imagery into Hebrew literature, with the appearance of the 'Day of the Lord' eschatological motif, and with the explosive emergence of 'writing prophets' in Israel."

[83] Nicholas Ambraseys, *Earthquakes in the Mediterranean and Middle East: A Multidisciplinary Study of Seismicity up to 1900* (Cambridge: Cambridge University Press, 2009), 70. Regarding the possibility of clarifying the size and scope of the quake, Ambraseys, *Earthquakes in the Mediterranean*, 70 sounds a pessimistic note, "The date of this earthquake is very uncertain, since archaeological evidence is hampered by the unresolved differences between conventional chronology and New Chronology. The description by Josephus, whether really of the earthquake mentioned by Amos, Josephus and Nathan or not, is at least evidence of the effects of an earthquake that had occurred before their time somewhere in Judaea for which there are no means today of assessing its location and magnitude."

[84] Ambraseys, *Earthquakes in the Mediterranean*, 70.

[85] See most importantly, N. Ambraseys, C. Melville, and R. Adams, *Seismicity of Egypt, Arabia and the Red Sea* (Cambridge: Cambridge University Press, 1994); N. N. Ambraseys, "Historical Earthquakes in Jerusalem–A Methodological Discussion," *JS* 9 (2005): 329–340; N. N. Ambraseys, "Earthquakes and Archaeology," *JAS* 33 (2006): 1008–1016; N. N. Ambraseys, "Descriptive Catalogues of Historical Earthquakes in the Eastern Mediterranean and the Middle East: Revisited," in *Multidisciplinary Advancements in Historical Seismology* (eds. J. Frèchet, M. Meghraoui, and M. Stucchi; New York: Springer, 2008), 25-39.

7. Paleoseismology and Working with an Inexact Science

Paleoseismology, as defined by its seminal work, is "the study of prehistoric earthquakes, especially their location, timing, and size."[86] It is important and perhaps ironic to point out that while Near Eastern scholarship defines "prehistoric" as dating to several tens of thousands years ago, seismology defines prehistoric as "the time before written accounts with some quantitative observation of earthquakes."[87] Over the last fifteen years a number of studies have focused on sediment cores from recently emerged shorelines along the Dead Sea. In the fall of 1997 three cores were drilled along the Dead Sea shoreline: one each from Ein Gedi, Ein Feshkha, and the Ze'elim fan, located east of Masada.[88] In addition to these cores, drilling for a fourth core began in November 2010.[89] The cores preserved deformed, unconsolidated, sedimentary, layers in the Dead Sea Basin—now known as intraclast breccias—and are a new clue to understanding the earthquake history of the Dead Sea Transform.[90] In short, intraclast breccias are made as deposits are formed in the Dead Sea lakebed but then are disrupted and deformed by ground shaking—in

[86] James P. McCalpin, ed., *Paleoseismology* (2d ed.; New York: Elsevier, 2009), 1. For the Levant, two works inaugurated Dead Sea Transform studies. See Z. Reches, and D. F. Hoexter, "Holocene Seismic and Tectonic Activity in the Dead Sea Area," *Tectonophysics* 80 (1981): 235–254, and R. Gerson, S. Grossman, R. Amit, and N. Greenbaum, "Indicators of Faulting Events and Periods of Quiescence in Desert Alluvial Fans," *ESPL* 18 (1993): 181–202.

[87] McCalpin, *Paleoseismology*, 4.

[88] See Claudia Migowski, Amotz Agnon, Revital Bookman, Jörg F. W. Negendank, and Mordechai Stein, "Recurrence Pattern of Holocene Earthquakes along the Dead Sea Transform Revealed by Varve-Counting and Radiocarbon Dating of Lacustrine Sediments," *EPSL* 222 (2004): 301–14.

[89] Asaf Shtull–Trauring, "Drilling the Dead Sea to Unmask the Secrets of the Past," n.p. [cited 18 Nov 2010]. Online: Nov 17, 2010.

[90] A number of terms have been used to describe the term now known as intraclast breccias. Amotz Agnon, Claudia Migowski, and Shmuel Marco, "Intraclast Breccias in Laminated Sequences Reviewed: Recorders of Paleo-Earthquakes," in *New Frontiers in Dead Sea Paleoenvironmental Research* (ed. Y. Enzel, A, Agnon, and M. Stein. Special Papers 401. Boulder: Geological Society of America, 2006), 195–214, document the terms used to describe, "various types of deformed unconsolidated sedimentary layers associated with earthquakes." They believe intraclast breccia is the best terms since "intraclast" refers to the origin of the clasts being reworked from within the sedimentary section and "breccia" refers to the texture of the deposit (198). See originally, Shmuel Marco, and Amotz Agnon, "Prehistoric Earthquake Deformations near Masada, Dead Sea Graben," *Geology* 23 (1995): 695–698.

other words—an earthquake. As more sediment builds on top of the deformed layer, the topography of the deformed ground is no longer visible, but by trenching through the layers, it is possible to identify deformations that align with historical earthquakes.[91] Dating the first undisturbed layer overlying the disturbed sequence constraints the timing of each event.[92] Once the correlation is made between an historical earthquake and a breccia layer, estimates of earthquake magnitude and epicentral distance can also be made.

Claudia Migowski et al.'s 2004 study continued to advance the work on breccia layers and use of coring for paleoseismology.[93] By using radiocarbon dating and counting layers in the core, they were able to collate and identify the disturbed sections in the core with recent and historical strong quakes, including the major earthquakes of 1927, 1837, 1212, 1033, 749 CE, and 31 BCE.[94] Once they established the correlation between disturbed layers and historic earthquakes, they also suggested earthquake estimates. For Amos's earthquake, they estimated a

[91] Agnon et al., "Intraclast Breccias," 198–200 provide a more technical description of this formation, "The formation of intraclast breccias involves five stages. First, layered deposits at the lakebed are disrupted and deformed by ground shaking, motion of the water column, and water escape from the underlying uncompacted sediment. During this stage, the pressure of pore fluids in the sediment exceeds the confining pressure of the overlying lakebrine, resulting in liquefaction of the sediment. Subsequently, the top of the sedimentary succession becomes fluidized and suspended at the bottom of the water body; fault ruptures can create topographic steps at the lake bottom. Seismic waves can trigger mechanical instability in the sediment, expelling pore fluid into the overlying suspension. Long water waves that oscillate the entire lake (seiche) carry significant momentum at the bottom of the lake, keeping the sediment suspended. After the waves have dispersed and attenuated, an intraclast breccia is deposited from the suspension by grain settling and water escape. After settling, the intraclast breccia is capped by the continuing deposition of laminated sediments that gradually bury any fault-related topography." See also, Nadav Wetzler, Shmuel Marco, and Eyal Heifetz, "Quantitative Analysis of Seismogenic Shear-Induced Turbulence in Lake Sediments," *Geology* 38 (2010): 303–306.

[92] Migowski et al., "Recurrence Pattern," 305.

[93] In the words of Agnon et al., 196, "The young discipline of paleoseismology applies geological methods to two aspects of destructive earthquakes: geological faults as earthquake sources and the recognition of geological evidence of strong ground shaking."

[94] See also Revital Ken-Tor, Amotz Agnon, Yehouda Enzel, and Mordechai Stein, "High Resolution Geological Record of Historic Earthquakes in the Dead Sea Basin." *JGR* 106 (2001): 2221–2234; Migowski et al., "Recurrence Pattern," 306–7.

magnitude of 7.3 due to local intensities of previous studies.[95] Based upon the disturbed layers, they also suggest the recurrence of large earthquakes; in other words, how often one can expect a large quake in the region. Between 2100 BCE and 1 BCE they calculate a mean recurrence interval of approximately 190 years.[96] The disturbed layers in the core appear to bear out the mean recurrence interval argued by Migowski et al. as they believe quakes occurred around 1050 BCE, 700 BCE, and 525 BCE. This insight provides the most current information on Levantine earthquakes during the biblical period and has yet to be integrated into Near Eastern scholarship. In addition to identifying historic quakes, they also believe they can approximate epicenter location. In the words of Migowski et al., "Between 1000 B.C. and A. D. 1063, and from A. D. 1600 to recent time the epicenters are all located on the northern segment of the DST, whereas prior to 1000 B.C. and between A.D. 1000 and 1600 they appear to scatter along several segments of the Dead Sea Transform."[97] Thus, for Amos's earthquake, they locate the epicenter in the north, and more specifically place it about 100 kilometers north of the Sea of Galilee.

Building off of this overview, the relevant geological and paleoseismological aspects of the quake will be examined. While the research will not be a comprehensive treatment of the geology and seismology of the Levant, special attention will be paid to the coring of the Dead Sea shore and how intraclast breccias provide the most accurate means of studying pre-

[95] Migowski et al., rely on the work of A. Salamon, A. Hofstetter, Z. Garfunkel, H. Ron, "Seismotectonics of the Sinai Subplate—the Eastern Mediterranean Region," *GJI* 155 (2003): 149–73 and Amiran et al., "Earthquakes in Israel." Interestingly, neither work interacts with the 760/750 BCE earthquake.

[96] Migowski et al., "Recurrence Pattern," 310, see six events with disturbed sediment of at least 5 cm, and five events of disturbed sediment between 1 and 5 cm. Unfortunately, the thickness of the seismite does not correspond to intensity. Migowski classifies the sediment sequences into three types based on thickness (Type I–>5 cm; Type II- 1-5 cm; Type III <1 cm). Quoting Migowski, "For the 1st Millennium (A.D. 0 – 1000) only a single seismite of Type-I is identified, so the recurrence interval changes to ~ 1000 years. Between 0 and 2100 B.C. six events of Type-I, and five events of Type-II can be identified. Here, the mean recurrence interval is approximately 190 years, whereas during 2100 – 4600 B.C. only two of Type-I and four of Type-II can be found, with the corresponding recurrence interval of 420 years."

[97] Migowski et al., "Recurrence Pattern," 301. See also, the map in Migowski et al., "Recurrence Pattern," 311.

instrumental, Levantine quakes. This methodology allows for more nuanced study and is a key tool for studying Levantine earthquakes.

8. Social Scientific Approaches

Anthony Oliver-Smith has pioneered anthropological research into how earthquakes affect society. His research has focused on Central America and especially on the massive Peruvian earthquake of May 31, 1970 where 70,000 people died and almost seventy percent of the buildings were destroyed. Among his important works is his seminal monograph*, The Martyred City: Death and Rebirth in the Andes*, where he examined the natural disaster via social anthropology.[98] He documented the post-disaster struggle to rebuild or relocate, as well as the accompanying stress and racial tensions. Oliver-Smith's work is important not only for his painstakingly detailed, first hand account of the tedious, long-term recovery of the Peruvians, but also for his pertinent observations that greatly moved the field forward. While Oliver-Smith's work on the Peru quake of 1970 is among the most foundational for disaster research, and especially earthquake study, it is certainly not the only earthquake or natural disaster to base anthropological conclusions.

Beyond Oliver-Smith's work, a number of documented historical disasters provide overlapping relevance for the Ancient Near East. For earthquakes, the oldest quake that scholarship derives useful anthropological data is the 1755 Lisbon earthquake, one of history's deadliest, and seen as influencing the Enlightenment.[99] More recently, on Sept 19, 1985, an 8.1 earthquake struck off the coast of Mexico but caused extensive damage to Mexico City and

[98] Anthony Oliver-Smith, *The Martyred City: Death and Rebirth in the Peruvian Andes* (2 ed; Prospect Heights, Waveland, 1992).

[99] The quake provides valuable insight into a strong religious community as the quake struck on a religious holiday and the city and country were composed of devout Roman-Catholics. Also, its study is one of the first quakes in pre-modern society where somewhat accurate accounts to study from are found.

surrounding areas. This quake is especially insightful for how government woefully reacted to the quake and how this resulted in massive shifts in political power.[100] Moving to a different part of the world, the 1995 Kobe or Great Hashin-Awaji earthquake has received considerable attention as the quake caused over 100 billion dollars in damage making it the most expensive natural disaster to ever hit one country.[101] And most recently, the massive earthquake and tsunami that struck Japan on March 11, 2011 will certainly engender rigorous study in future years. Posttraumatic stress disorder has received great attention in natural disaster study, and researchers have focused on the survivors of the Kobe earthquake. Beyond earthquakes, disaster research into hurricanes, famines, and terrorism among other things are often mutually investigated due to their many societal response parallels. As these examples show, issues to each specific quake help drive areas of study and methodological caution is needed to avoid blind comparisons between quakes, cultures, and time periods.

These studies, thus, present a number of challenges to natural disaster research in the Ancient Near East. First, the quest to apply natural disaster study from modern environments forces distilling of the issues. For example, though study of pre disaster vulnerability of housing is an important topic, it can be difficult to apply its findings because topics concern issues such as building according to older, less stringent codes, lower quality design, building in known disaster prone areas, and inability to pay for natural disaster insurance. Thus, applying pre-disaster vulnerability of housing studies to the ancient world requires careful, methodological justification. Moreover, a second example of studies of the impact of natural disasters on social

[100] The group in charge at the time, the Institutional Revolutionary Party, was largely seen as ineffective due to its reluctance of foreign aid, aid preference for those who were members of the party, and an overall authoritarian approach to the disaster. Partido Revolucionario Institucional (PRI). But see the review of C. Lomnitz, "Book Review of E. L. Quarantelli (ed.): *What is a Disaster?* Routledge, London, United Kingdom" *Natural Hazards* 18 (1998): 87–88, who notes that social changes were already underway since the 1960's.

[101] Research on this quake has also focused on posttraumatic stress syndrome and its effects on the Japanese people.

attitudes and behavior points to difficulties in applying modern theories. Study of modern cultures produced marked differences between Nicaraguan and American social behavior following quakes in the two countries.[102] Also relevant are post disaster studies of economic recovery since assumptions concerning differences in an agrarian versus modern industrial driven society, post-disaster relief via foreign aid and non-governmental agencies all complicate the applicability of this data. Coincidentally, foreign aid is one of the greatest causes of strife among post-disaster victims. Ancient social structure such as patrimonialism and extended families under one roof present a different view of disaster recovery than modernity where families usually turn to relationships less tightly knit such as neighbors or close friends. In sum, comparisons and parallels of natural disaster research logically demands well-articulated justification, but especially so as the field is still in its infancy.

Though scholarly attention has focused on the modern study of natural disaster both from a scientific and anthropological view, research into natural disasters of the ancient world have been far less studied. A large step forward came from a collection in 1996 of 38 papers from the sixth meeting of the Stuttgart Colloquium on the Historical Geography of Antiquity focused on the theme of "Natural Catastrophes in the Ancient World."[103] The colloquium brought an interdisciplinary approach to natural catastrophes though the focus was on Greco-Roman antiquity. More recently, Gerrit Jasper Schenk provided an important summary of historical disaster research in his 2007 article, "Historical Disaster Research. State of Research, Concepts, Methods and Case Studies."[104] Schenk reviews historical disaster research within Europe since

[102] Robert C. Bolin and Patricia A. Bolton, "Recovery in Nicaragua and the U.S.A.," *IJMED* 1 (1983): 125–144.

[103] Eckart Olshausen and Holger Sonnabend, *Stuttgarter Kolloquium zur Historischen Geographie des Altertums 6, 1996: Naturkatastrophen in der Antiken Welt*. (Geographica Historica 10. Stuttgart: Franz Steiner Verlag, 1998).

[104] Gerrit Jasper Schenk, "Historical Disaster Research. State of Research, Concepts, Methods and Case Studies," *HSR* 32 (2007): 9–31.

antiquity and outlines a number of approaches and concepts. While the studies are important, their focus on ancient Greece or Europe in antiquity still does provide direct insight into the Levant. Within the Levant, Daniel Smith-Christopher's work, *A Biblical Theology of Exile*, briefly interacts with refugee and disaster studies in order to elucidate Ezekiel and Lamentations.[105] He also examines trauma studies and posttraumatic stress disorder as further means to help understand Ezekiel.

Few studies have applied social scientific approaches to the book of Amos. Daniel Carroll has raised problems and limitations related to the use of social science approaches to the book of Amos.[106] He rightly points to how quality of research can be affected by the experience of the researcher as well as the availability of reliable data. To overcome these problems, Carroll turns to the work of sociologist W. G. Runciman who has posited a four-fold task for constructing a rigorous social science study. Beyond Carroll's work, Izabela Jaruzelska has put forth a number of social science studies related to Amos, but most English-speaking scholars have had limited interaction with her work.[107] In Jaruzelska's work on the socio-economic

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[105] Daniel Smith-Christopher, *A Biblical Theology of Exile* (Minneapolis: Fortress, 2002). See also, the more recent work on refugees by Aaron A. Burke, "An Anthropological Model for the Investigation of the Archaeology of Refugees in Iron Age Judah and Its Environs," in *Interpreting Exile: Interdisciplinary Studies of Displacement and Deportation in Biblical and Modern Contexts*, (AIL 10; ed. B. E. Kelle, F. R. Ames, and J. Wright; Atlanta: Society of Biblical Literature, 2011), 41–56; Aaron Alexander Burke, "Coping with the Effects of War: Refugees in the Levant during the Bronze and Iron Ages," in *Disaster and Relief Management in Ancient Israel, Egypt and the Ancient Near East* (ed. Angelika Berlejung, Ariel Bagg, and Gunnar Lehman; FAT; Tübingen: Mohr Siebeck, forthcoming).

[106] Mark Daniel Carroll R., *Contexts for Amos: Prophetic Poetics in Latin American Perspective* (JSOTSup 132; Sheffield: Sheffield Academic Press, 1992), 31–44.

[107] Izabela Jaruzelska, "Social Structure in the Kingdom of Israel in the Eighth Century B.C. as Reflected in the Book of Amos," *FO* 29 (1992–1993): 91–117; Izabela Jaruzelska, "People Pronouncing Sentences in Court: Amos 5, 7–12, 16–17: An Attempt at Sociological Identification," *FO* 30 (1994): 77–94; Izabela Jaruzelska, *Amos and the Officialdom in the Kingdom of Israel: The Socio-Economic Position of Officials in the Light of the Biblical, the Epigraphic and Archaeological Evidence* (Seria Socjologia 25; Poznán, Poland: Poznánska Drukarnia Naukowa, 1998). Beyond Jeruzelska's work, see also the work of J. David Pleins, *The Social Visions of the Hebrew Bible: A Theological Introduction* (Louisville: Westminster John Knox, 2000). For a more detailed survey of social science approaches to Amos, see Daniel Carroll, M. R. *Amos–The Prophet and His Oracles: Research on the Book of Amos* (Louisville: Westminster John Knox Press, 2002), 41–43.

position of officials during the time of Amos, she is able to draw together an impressive amount of evidence that balances social scientific inquiry with biblical studies. To date, little to no work on social science approaches related to natural disasters have addressed Amos's earthquake.

Chapter Two: The Tectonic Environment and Ancient Near Eastern Storm-god Imagery

1. Introduction: What is behind the trembling of nature?

Descriptions of nature shaking, trembling, rocking, and reeling due to the activity of weather-gods have been part of Ancient Near Eastern Literature from as early as the Early Dynastic period and extending through the First Millennium. The phrase "trembling of nature" often is used by scholars as a blanket term to describe imagery that involves objects shaking, but little attention has been given to what specific types of imagery are covered by "trembling of nature." In other words, how geographic and environmental concerns can alter what is encompassed in the trembling of nature. For example, it is clear that storm imagery frequently stands behind the causes of nature shaking, but focusing on storm imagery excludes other types of phenomena that shake the earth more completely and more violently, most notably earthquakes. Since parts of Iraq and Syria, as well as most of Lebanon and Israel are situated in active seismic areas, it is inconceivable that the ancients would have been ignorant of earthquakes or that earthquakes would not appear in the textual record in some way. Rather, though earthquakes have always existed, there is an intimate connection between moving earlier in history and the concomitant result of fewer records of earthquakes. This obviously does not mean that fewer earthquakes occurred 3000 or 4000 years ago than today, but that the ancients, for whatever reason, chose not to studiously record every event. At the same time, echoes of earthquakes stand behind literary texts but scholarship has not focused on tracing when and where this can be seen in Ancient Near Eastern texts.

This chapter, then, will examine how the notion of "trembling of nature" must be seen as a reflection of attributing other natural phenomena such as earthquakes to the description of a

god, rather than the usual appropriation to describe solely thunderstorm imagery. It will probe the connection between geographic and environmental locations and show earthquake imagery can be connected to imagery that usually is strictly appropriated to weather-god imagery. Since such little work has been done elucidating earthquake imagery in literary texts, this chapter can only survey different time periods, locations, and genres without giving the texts and time periods the fullest treatment they deserve. The selection of texts aims to raise awareness of the intimate connection between tectonics and human civilization as dictated by regional seismicity, first through the Great Rift Valley in Africa and then into Mesopotamia. By tracing this connection through evolutionary thought and Mesopotamian texts, the potential for future research and refined thinking should be readily apparent.

Next, following the general time frame of the Ancient Near East from the Old Babylonian Period, through Mari into the Late Bronze period at Emar and Ugarit, and ultimately to the Hebrew Bible, the reader will again be able to follow the overarching pattern that demonstrates a close connection or distant separation between employing "trembling of nature imagery" and the seismic and geographic location of which texts were written. Within the Levant, a case study of a theophany text from Psalm 29 will provide an additional perspective on earthquake imagery and literary texts. Though the trembling of nature is linked closely with theophanies, this chapter will not focus exclusively on theophany texts. The size of texts as well as scholarly literature is vast and beyond the scope of this research; rather, general patterns associated with earthquake imagery will be the focus. This chapter, then, with its focus on earthquake imagery in literary texts will set the stage for the following chapters that will examine specific references to historical quakes in Mesopotamian sources as well as the Hebrew Bible.

2. Historical Earthquakes Recorded in Ancient Near Eastern/Levantine Literature

While Near Eastern history centers around Mesopotamia (and Egypt), these locations have played a more peripheral role in seismicity compared to more active regional areas such as the Aegean (Hellenic) Arc, the Anatolian fault systems, the Dead Sea Transform, and along the Zagros–Tauros belts which subduct the Arabian plate into the Iranian and Anatolian plates.[1] The lack of references to specific earthquakes in Mesopotamian and Egyptian sources is, on the one hand, a welcome problem as research on earthquake catalogues in the ancient world has demonstrated that descriptive earthquake catalogues often exaggerate the size and frequency of past earthquakes.[2] Thus, scholarship benefits from not being unduly burdened with evaluating potential spurious references to earthquakes in the Ancient Near East. On the other hand, prior to Amos's reference to an earthquake in the mid-eighth century, outside of two Middle Assyrian references to earthquakes, no other references to historical quakes can be found in Mesopotamian or Egyptian sources. And between Amos's reference to an earthquake until the well-known quakes of 64 and 31 BCE appear in the textual record, only four Neo-Assyrian texts refer to actual earthquakes (Assur, 672–669 BCE; Dur Sharrukin, 669–627 BCE).[3] In sum, in the Ancient Near East from the advent of writing until the Hellenistic period, six Mesopotamian

[1] N. N. Ambraseys, C. P. Melville, and R. D. Adams, *The Seismicity of Egypt, Arabia, and the Red Sea: a Historical Review* (Cambridge: Cambridge University Press, 1994), 3. See the references in Sahil A. Alsinawi and Zia O. Al-Qasrani, "Earthquake Hazard Considerations for Iraq" (paper presented at the Fourth International Conference of Earthquake Engineering and Seismology, Tehran Iran, 12–14 May 2003). Alsinawi and Al-Qasrani note that the seismicity of Iraq is greatest in the north and northeast areas and tapers off further south. For historical Syrian earthquakes, see Mohamed Reda Sbeinati, Ryad Darawcheh, and Mikhail Mouty, "The Historical Earthquakes of Syria: An Analysis of Large and Moderate Earthquakes from 1365 B.C. to 1900 A.D.," *AG* 48 (2005): 347–435.

[2] On the difficulty of assessing ancient earthquakes see the case study by Roberta Mazza, "The Supposed Egyptian Earthquakes of 184 and 95 B.C.," *ADG* 41 (1998): 121–126.

[3] Ambraseys, *Earthquakes in the Mediterranean*, 78–102.

texts and one text from the Hebrew Bible preserve a reference to an earthquake as an actual event.[4]

3. Tectonics and Human Evolution

The relation between environment and seismicity is relevant not only for Ancient Near Eastern societies but also for prehistoric civilization. Scholarly interest in geography and human evolution has focused on active tectonics and prehistoric civilization suggesting that societal change is linked to tectonic activity.[5] In this regard, Geoffrey King's work deserves attention as he has proposed a new model for the origins of humans and their adaption. Quoting King and Bailey at length:

> The active tectonics of the African Rift creates features that we believe are essential to understanding the ecological basis of human evolution. Tectonics provides the physical basis for a diversified environment with varied food resources and abundant water supplies: the environmental mosaic so often referred to as a primary advantage of the African Rift. It offers physical protection in the form of cliffs, lava flows and topographic enclosures, and hence small-scale topographic complexity in which a relatively defenceless species can find protection from predators. It creates a larger scale topographic complexity of fault scarps, folds, lava fields and natural traps, which can provide tactical advantage in pursuit of prey. Finally, it results in geologically unstable conditions that lead to greater variability in the precise configuration of topographic variables in time and space, and thus sharpens the selective pressures in favour of multiple speciation and/or adaptable behaviour. These are distinctive and unique attractions of the African Rift and ones that are the product of its unusual tectonic history. Tectonic environments outside the African Rift provide comparable if less distinctive features, and the opportunity afforded by digital elevation

[4] For reference, see the table in the previous chapter. This point should be nuanced in two ways. First, earthquakes have been suggested in other places in Ancient Near Eastern literature but the quake must be surmised and the text does not make it explicit. For example, Ambraseys, *Earthquakes in the Mediterranean*, 62–68, traces arguments for earthquakes at Sodom and Gomorrah, Jericho, and Mizpeh (1 Sam 7), before concluding that they are all spurious. Second, archaeologists have suggested earthquake damage at various sites and time periods but without textual support. This certainly does not imply that an earthquake did not occur, but that we are missing corroborating data.

[5] G. Bailey, G. King, and D. Sturdy, "Active Tectonics and Land-Use Strategies: A Paleolithic Example from Northwest Greece," *Antiquity* 67 (1993): 292–303; G. King, G. Bailey, and D. Sturdy, "Active Tectonics and Human Survival Strategies," *JGR* 99 (1994): 20063–20078; V. G. Trifonov and A. S. Karakhanian, "Active Faulting and Human Environment," *Tectonophysics* 380 (2004): 287–294; Geoffrey King and Geoff Bailey, "Tectonics and Human Evolution." *Antiquity* 80 (2006): 265–286; Eric R. Force, "Tectonic Environments of Ancient Civilizations in the Eastern Hemisphere," *Geoarchaeology* 23 (2008): 644–653.

> data to map their distribution over large areas offers predictions about likely pathways for human dispersal more widely within and beyond Africa.[6]

Thus, King and Bailey raise the possibility that there is a link between the geography of the African Rift with factors needed for early human survival. While they focus on the emergence and expansion of the genus Homo, they also suggest that these same conditions were needed for *Homo sapiens sapiens*, our own species. King and Bailey are careful to point out the evidence they adduce for the role of the African Rift can be coincidental, but suggest that a number of independent lines of evidence support their thesis. King's theory has bearing on Ancient Near Eastern scholarship as the African Rift moves north into the Levant and explanations of early humans trace human movement from the African Rift into what would eventually become the first cities in Mesopotamia. In sum, in King's view, there always has existed a close connection between human activity and the tectonic environment, so much so that tectonics helped drive human survival.

Eric Force's work examines the relationship between ancient civilizations and plate tectonic boundaries and challenges King's assertion that tectonic activity is essential to the ecological basis for human evolution. Instead of examining prehistoric civilization, for his study, Force uses thirteen prominent ancient civilizations such as the Romans, Etruscans, Assyrians, Chinese; thus it is important to note that his methodology moves beyond human evolution and into human civilization.[7] Nonetheless, his conclusions are relevant for studying the connections between Ancient Near Eastern seismicity and earthquake imagery in the textual record. Force asserts that there is some evidence between active tectonism on cultural complexity, but a strong

[6] King and Bailey, "Tectonics and Human Evolution," 282.

[7] For the full list of civilizations Force studies, see Eric R. Force, "Tectonic Environments of Ancient Civilizations," 644–653.

variable exists between "primary" and "derivative" civilizations in his study.[8] Force follows existing methodology that maintains the classification between civilizations that evolved based entirely on internal evolution (primary: Mesopotamia, Egypt, China, and the Indus-Saraswati) and those that were influenced in some way by pre-existing civilizations (derivative: Roman, Etruscan, Mycenaean, Greek, Minoan, Southwest Asian, Assyrian, Persian, and Aryan Indian civilizations). With this background in mind, Force concludes,

> Ancient civilizations are remarkably associated with plate boundaries near the southern margin of the Eurasian plate, but it appears that this association is weaker for the civilizations called primary and for those that remained relatively static over long time periods. The two characters vary together; that is, primary civilizations were both at greater distances from plate boundaries and were longer lasting. Conversely, it appears that derivative civilizations were both closer to tectonic boundaries and evolved more rapidly.[9]

In other words, Force argues that indigenous civilizations borrowed from existing civilizations to develop their own civilization but did so in light of seismic disadvantages. To account for why civilizations would develop in spite of seismic disadvantages, Force raises two suggestions proffered by other scholars. First, based on the work of Hickman et al., springs along stressed active faults are more productive than those along old inactive faults due to the presence of a set of open fractures.[10] Second, the long-term societal responses to natural stress and disaster suggests natural events can be potential catalysts of positive societal change.[11] The connection

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[8] On "primary" and "derivative" civilizations, see most recently the approach in Fernand Braudel, *The Mediterranean in the Ancient World* (trans. S. Reynolds; London: Penguin Press, 2001).

[9] Force, "Tectonic Environment," 650.

[10] Force, "Tectonic Environment," 650; S. Hickman, S., et al. "Fracture Permeability and in situ Stress in the Dixie Valley, Nevada, Geothermal Reservoir," U.S. Department of Energy Geothermal Program Review, 1998.

[11] Force, "Tectonic Environment," 650. On disaster as catalysts for societal change, see, C.L. Dyer, "The Phoenix Effect in post-disaster Recovery," in *The Angry Earth: Disaster in Anthropological Perspective* (eds. A. Oliver-Smith and S.M. Hoffman; New York: Routledge, 1999), 278–300; R. V. Fisher, G. Heiken, and J. B. Hulen, *Volcanoes: Crucibles of Change* (Princeton: Princeton Press, 1997); Garth Bawden and Richard M. Reycraft, eds., *Environmental Disaster and the Archaeology of Human Response* (MMA 7; Albuquerque: University of New Mexico, 2000); V. G. Trifonov and A. S. Karakhanian, "Active Faulting and Human Environment," *Tectonophysics*

between disaster and societal change will be discussed more fully in chapter four, but Force's study suggests an interesting reason why Mesopotamia and Egypt survived for so long. In Force's view, because they were not as close to plate boundaries (and thus tectonic activity) Mesopotamia and Egypt were able to survive for so long.

There is no correlation, unfortunately, between distance from plate boundaries and textual references to earthquakes. In Nicholas Ambraseys's et al. study of the seismicity of Egypt, they note how Egypt is of moderate seismicity compared to other areas such as the Aegean (Hellenic Arc), and the Anatolian fault systems and note that Egyptian sources contain no explicit references to earthquakes.[12] The Hittites, a civilization who existed in a highly tectonic area also have a dearth of earthquake references and as mentioned above, though ancient Israel sat close to the Dead Sea Transform, the Hebrew Bible explicitly records only one earthquake. This paucity of data is better explained by a lack of concern for rigorous documentation of natural events, a concern that the Greco-Roman world would later assert. In this way, starting around 550 BCE, records of earthquakes become much more frequent in Greek sources. For example, Nicholas Ambraseys lists nineteen earthquakes recorded in Greek sources just in the fifth century before the Common Era demonstrating the new Greek perspective on natural disasters.[13]

4. What is in a Name?: Weather-god vs. Storm-god

Returning to the Near East, the connection between earthquake imagery and deities is seen clearly in the conception of the weather-god, but the terminology between storm-god and weather-god must be addressed. German scholarship first applied the term *Wettergott* "weather-

380 (2004): 287–294.

[12] Ambraseys et al., *The Seismicity of Egypt*, 3.

[13] Ambraseys, *Earthquakes in the Mediterranean*, 80–85.

god" or "thunderstorm god" to imagery around thunder, shaking, lightning, and other weather phenomena.[14] Following this label, most scholars of the English language adopted the terminology "storm-god," while French scholars employed "Dieu de l'Orage."[15] These labels, however, call into question whether there is semantic difference between a "weather-god" and a "storm-god" and if these terms are interchangeable or separate. As will be seen below, to my mind, "storm-god" is too narrow a term and "weather-god" provides a broader label by which certain actions, iconography, and descriptions may be attributed to a god.[16]

The last decade has been witness to substantial contributions to weather-god studies most notably by Daniel Schwemer. Schwemer traces the historical and literary contexts of ancient Near Eastern weather (i.e., "storm") gods Ishkur, Adad (Hadda), Baal, and Teshub in his imposing, if not exhaustive, 1000 page monograph on weather-god imagery.[17] Schwemer's monograph is impressive in scope, filled with exhaustive lists of transliterations and translations of primary texts, so much so that the extent of his research prevented Schwemer from offering detailed analysis within his monograph. To address this lack of synthesis, which he recognized, Schwemer recently authored two articles on the storm-gods of the Ancient Near East in the *Journal of Ancient Near Eastern Religions*, admitting that due to several reasons, his monograph was not easily accessible.[18] Schwemer's concern for the typological classification of storm-gods

[14] See H. Schlobies, *Der Wettergott in Mesopotamien* (Maog 1/3; Leipzig: Pfeiffer, 1925).

[15] A. Vanel, *L'iconographie du Dieu de l'orage* (CahRB3; Paris: Gabalda, 1964).

[16] See also, G. van Driel, "Weather: Between the Natural and the Unnatural in First Millennium Cuneiform Inscriptions," in *Natural Phenomena: Their Meaning, Depiction and Description in the Ancient Near East* (ed. D. J. W. Meijer; Amsterdam: Royal Netherlands Academy of Arts and Sciences, 1992), 39–52.

[17] Daniel Schwemer, *Die Wettergottgestalten Mesopotamiens und Nordsyriens im Zeitalter der Keilschriftkulturne: Materialen und Stuiden nach den schriftlichen Quellen* (Wiesbaden: Otto Harrassowitz, 2001).

[18] Daniel Schwemer, "The Storm-Gods of the Ancient Near East: Summary, Synthesis, Recent Studies Part I," *JANER* 7 (2008): 121–168; *idem*, "The Storm-Gods of the Ancient Near East: Summary, Synthesis, Recent Studies Part II," *JANER* 8 (2008): 1–44.

manifests itself in his criticism of the overly broad definition of the storm-god in works such as W. Gerhardt's Dropsie dissertation on the Weather-God in the Ancient Near East and Alberto Green's monograph, *The Storm-God in the Ancient Near East*.[19] At issue for Schwemer are gods that are associated with phenomena like wind, storm and flood (Enlil, Ninurta (Ningirsu), Marduk, Andu, Dagan, and Iturmer) but that are not clearly manifested in profile and basic function as a storm-god. Schwemer's logic, however, on what constitutes a storm-god is built around coherence rather than definition. So, rather than defining what constitutes a storm-god, Schwemer begins with the need for a typologically coherent group; and, in his eyes, the starting point should be "a manifestation of the particular type of god that is well documented in text and image, whose *modus operandi*, profile and basic functions serve as basis for the definition of the type."[20] He then states that Adad is the obvious starting point and that deities typologically related in texts or images should be included in the list of storm-gods. The closest Schwemer comes to defining a storm-god is his statement, "Storm and tempest (along with lightning, thunder, clouds, rain and wind) belong to those natural phenomena that cannot be influenced by human intervention and, at the same time, are of immediate significance in agrarian societies for the survival of humans."[21]

While Schwemer heavily criticizes Alberto Green's monograph for what he sees as methodological, philological, and interpretive flaws, Green's work is still important to evaluate

[19] Walter Gerhardt Jr., "The Weather-God in the Ancient Near Eastern Literature with Special Reference to the Hebrew Bible" (Ph.D. diss., Dropsie College, 1963). Schwemer does not reference in his monograph or articles, Gerhardt's summary of his dissertation, Walter Gerhardt Jr., "The Hebrew/Israelite Weather-Deity," *Numen* 13 (1966): 128–143. Alberto R. W. Green, *The Storm-God in the Ancient Near East* (Winona Lake: Eisenbrauns, 2003).

[20] Schwemer, "The Storm-Gods of the Ancient Near East I," 124.

[21] Schwemer, "The Storm-Gods of the Ancient Near East,"129.

in its own light.[22] Green sets out to provide a thematic study of storm-gods, which includes mythic, iconographic and literary evidence. While Green's work was published in 2003, he either did not have access to or did not use Schwemer's 2001 monograph; in addition, Green does not list in his bibliography Gerhardt's dissertation or summary article of storm-god imagery in the Ancient Near East. Like Schwemer, Green does not provide an explicit definition of a weather-god but introduces his work by noting, "For millennia the ominous impact of the thunderstorm, accompanied by its frightening roars, fiery streams of lightning, and foreboding heavy black clouds, constituted a typical and awesome description of a theophany among ancient peoples."[23] Green's goal is to interpret the ideological and social significance of the storm-god and his attendants within the deity's ideological and social functions as well as the dynamics of intercultural and intracultural developments in the ancient Near East as a whole.

Schwemer and Green both constrain weather-god imagery to the affects of a thunderstorm and implicitly isolate earth shaking to a thunderstorm. It is obvious that storms are far more prevalent than earthquakes; however, Iraq has a long history of seismicity, and it is inconceivable that an earthquake would not be mythically linked to some deity.[24] Some

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[22] Schwemer, "The Storm-Gods of the Ancient Near East,"121–122, notes in the abstract to his two part *JANER* article that Green's study suffers from "serious flaws with regard to methodology, philology and the interpretation of texts and images." Yet, Schwemer hardly provides any direct criticism of Green, sufficing to note that he hopes his synthesis of the data can serve as a response to Green. The criticisms of Green's work with specific examples are found in part I, 130 (tendency to transfer natural phenomena to religious imagery by oversimplifying the evidence), 137 (misreadings of Adad and Addu in Pre-Sargonic material based upon an uncritical assumption of earlier work) and part II, 17 (use of outdated source for Anatolian section), 29 (treating Ilumer and Iturmer as phonetic variants), 32 (poor treatment and use of iconographic sources). See also the critique of Green's lack of engagement with more recent sources in, Stephen J. Garfinkle, review of Alberto R. W. Green, *The Storm-God in the Ancient Near East, JHS* 5 (2004-2005): n.p.

[23] Green, *The Storm-god in the Ancient Near East*, 1.

[24] For a survey of the seismicity of Iraq, see, N. N. Ambraseys, C. P. and Melville, *A History of Persian Earthquakes* (Cambridge: Cambridge University Press, 1982), fig. 5.8; A. Haghipour, *Seismotectonic Map of the Middle East* (1:5000,000): Commission for Geological Map of the World (1992); Manuel Berberian, "Master 'blind' Thrust Faults Hidden under Zagros Folds: Active Basement Tectonics and Surface Morphotectonics," *Tectonophysics* 241 (1995): 193–224.

Mesopotamian texts paint a clear connection between the trembling of nature and thunder, such as a prayer to a thunderstorm hoping to avert portended evil. The prayer exists in copies from Sargon II as well as a fragmentary Middle Babylonian manuscript from Hattusha, attesting to the long tradition surrounding the prayer. Part of the prayer, composed between 1500 and 1000 BCE, states, "O Adad, at whose clamor people are struck dumb with terror, The meadows [quake], the steppe heaves…"[25] The prayer paints thunder as an overwhelming force that causes people to be in terror, forces entire meadows to quake, and even enables the steppe to heave. In this instance, there is a clear connection between storm and the trembling of nature in imagery related to clouds and lightning bolts. A clear connection between trembling, shaking, and even thundering, with the catalyst being a storm however, is not always the case, as comparative evidence below demonstrates that a number of events besides a thunderstorm may be associated with this imagery.

5. *Eyewitness Accounts Describing an Earthquake*

Descriptive accounts of earthquakes by earthquake survivors challenge the notion that language traditionally associated with storm, and especially thundering, cannot be used to describe an earthquake. For example, after the 1927 earthquake in Israel, a German survivor described the quake in this way: "A sudden subterranean clap of thunder shaking the entire city, like a whirlwind suddenly blowing up out of nowhere to rip off the roofs."[26] If this description were transposed to an Ancient Near East text, one would assume that the survivor recounted a description of a thunderstorm rather than an earthquake. As the context of the quote shows, however, the survivor describes an earthquake, not a thunderstorm. Returning to the prayer

[25] Benjamin R. Foster, *Before the Muses: An Anthology of Akkadian Literature* (3d ed; Bethesda: CDL Press, 2005), 637.

[26] Max Blanckenhorn, "Das Erdbeben im Juli 1927 in Palästina," *ZDPV* 50 (1927): 288–298.

against thunder, the parallels between an earthquake survivor's language and storm language is striking. The descriptive word "whirlwind," which would seem to be associated with a thunderstorm is found in the earthquake account as well as in the language of the prayer against thunder, "O overwhelming, perfect one, furious and fierce, Unrelenting and a whir[lwind], O Adad, overwhelming, perfect one, furious and fierce, Unrelenting and a whir[wind]…" (lines 8–10). Also, "thunder," which the survivor used to describe the quake is curiously not found in the prayer against thunder. These two examples of how a whirlwind is used to describe both an earthquake and a thunderstorm and that thunder is used to describe the sound of an earthquake but not a thunderstorm is one example of the interchangeable nature of words that describe thunderstorms and earthquakes.

A second example that demonstrates that language is interchangeable between earthquakes and thunderstorms comes from a source from the 1886 earthquake in Charlestown South Carolina, one of the most damaging quakes to hit the southeastern United States. One story of an earthquake survivor's description of this quake is as follows:

> Another observer of intelligence was seated in the park at the Battery, near the statue of Jasper. He suddenly became conscious of a deep murmur, which swelled in volume, and which appeared to come from the open bay, lying southeastward. Very soon there was a sound of agitation in the leaves of the trees overhead, and at the same instant, he thinks, he became aware of a tremor in the ground. Springing to his feet, there suddenly broke upon his ear a rapid swell in the sound, which became a mighty roar, and with the roar came a shock.[27]

In this eyewitness account, the term "roar" is used twice to describe the sound of the earthquake. He notes that a deep murmur swelled in volume, describing it as a mighty roar.[28] More recently,

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[27] Clarence E., Dutton, "The Charleston Earthquake of August 31, 1886," Ninth Annual Report, 1887-88, U.S. Geological Survey, Washington D.C., (1889): 203–528. Cited 24 September 2011. Online: http://earthquake.usgs.gov/learn/topics/booms.php.

[28] Based on the study of seismic waves, the roaring described by earthquake survivors are the waves generated by the fault track. See, P. D. *Hill, F. G. Fischer, K. M. Lahr, and J. M. Coakley, "Earthquake Sounds Generated by*

a survivor of the devastating Japanese earthquake and tsunami described the quake as: "The walls were swaying from side to side as we struggled to understand what was happening. We stood there in shock as the roar of the earthquake surrounded us."[29] Both earthquake accounts point to the fear experienced during an earthquake. In South Carolina, the eyewitness sprung to his feet while in Japan the survivors struggled to understand what was occurring and they stood in shock. Returning to the prayer against thunder, similar fears are expressed as people are "struck dumb with terror" (22) following the thunderstorm. A comparative reading between these two earthquake accounts and a prayer to avert a thunderstorm show a number of overlapping concepts and words that are used to describe sounds of earthquakes and thunder as well as the unnerving feeling associated with both phenomena. At the same time, one would expect fear to be more closely associated with earthquakes as they are much more rare than thunder and lightning, and devastate society far more than thunderstorms.

To be clear, these three examples from earthquake accounts demonstrate the fluidity by which survivors describe earthquakes.[30] In accounts spanning several hundred years and from different cultures and eyewitness languages, storm imagery often becomes intermixed with more clearer earthquake imagery as people struggle to quantify what they experienced and heard.

Body-wave Ground Motion," BSSA 66 (1976): 1159–1172; I. O. Kitov, J. R. Murphy, O. P. Kusnetsov, B. W. Barker, and N. I. Nedoshivin, "An Analysis of Seismic and Acoustic Signals Measured from a Series of Atmospheric and Near-surface Explosions," BSSA 87 (1997): 1553–1562.

[29] Mark Russell, "'We Stood in Shock as the Roar of the Earthquake Surrounded Us'," n.p. [cited 25 Sept 2011]. Online: http://www.smh.com.au/environment/we-stood-in-shock-as-the-roar-of-the-earthquake-surrounded-us-20110312-1bsf6.html#ixzz1a6Vcuu9W.

[30] These are but three of a never exhausting list of accounts. For example, following a 1683 earthquake in England, Tho Pigot, "An Account of the Earthquake that Happened at Oxford and the Parts adjacent Sept. 17. 1683. By a Fellow of a College in that University and of the Royal Society," *PT* 13 (1683): 311–321, "…I judged that to be an earthquake, which otherwise I might have thought to have been only a distant thunder…" One survivor of the 1811 New Madrid Earthquake described the quake as, "we were visited by a violent shock of an earthquake, accompanied by a very awful noise, resembling loud but distant thunder, but more hoarse and vibrating." See, Norma Hayes Bagnell, *On Shaky Ground: The New Madrid Earthquakes of 1811–1812* (Columbia: University of Missouri, 1996), 28.

Indeed, precise terminology to describe the sound of an earthquake has never existed. Rather, terms like roar, thunder, clap, shock, shake, whirlwind are used to convey an auditory, visual, and sensory experience. Applying this knowledge to weather god language should cause scholars to consider the breadth of modern as well as ancient descriptions of various terrestrial phenomena. Thunder, shouting, roaring, clapping, and a whirlwind all have been used to describe an earthquake and a thunderstorm, demonstrating how these phenomena are interchangeable. In addition, expressions of fear and vulnerability accompany both experiences and further intermesh these phenomena.

6. Akkadian Texts that Connect Earthquakes to Weather Imagery

Beyond the study of descriptive words to describe natural phenomena, Akkadian texts also link various forms of terrestial phenomena together including thunderstorms and earthquakes. This is first seen in an earthquake omen text from Nuzi found during the 1931-1932-excavation season, the oldest exemplar of other omen tablets that were copied in the first millennium. The formulaic language of the omens start with the protasis, "If the earth quakes in Month Name," before providing a number of scenarios that may befall the land, the ruler, or both. Line eighteen provides a reading that links earthquakes with thunder: *šumma irsitu eli mi-na-ti-sa i-ru-ub 1-su2 2-su2 3 su2 rigim(KA)-a iddi-ma hi-pi* "If the earth quakes more than usually, once, twice, three times, there will be thunder."[31] A later text from the celestial omens found in *Enūma Anu Enlil* ("When Anu (and) Enlil"), comprised of seventy tablets, has a similar version to the Nuzi tablet, and was found in the library of Aššurbanipal at Nineveh. Francesca Rochberg summarizes the omen series as devoted to "celestial" signs, "meaning any visible (or anticipated) phenomenon occurring in the sky during the day or night. Weather phenomena, especially cloud

[31] Ernest R. Lacheman, "An Omen Text from Nuzi," *RA* 34 (1937): 1–8.

formations and other features of the daytime sky, counted as 'celestial phenomena' along with lunar, solar, stellar, and planetary phenomena."[32] While the tablets can be grouped into different thematic elements (lunar omens, solar omens, weather omens, omens from stars and planets), tablets 37–49/50 "relate to the storm god Adad, and include such occurrences as lightning, thunder, rainbows, cloud formations, earthquakes, and winds."[33]

While tablets 37–49/50 provide a thematic linkage to Adad and storms and earthquakes, tablet 22 of *Enūma Anu Enlil* is listed as part of a meteorological series. Four categories are addressed in this tablet: eclipse, rain and thunder, earthquakes, and mudslides and these omens all have parallels in texts as early as the Old Babylonian Period demonstrating the long history of these omens as well as the groupings within the omens.[34] The grouping, then, of Adad thundering in storms as well as earthquakes in tablets 37–49/50 and tablet 22, has a long history in Mesopotamia and provides another means of support to the interchangeable language and Mesopotamian grouping of storms and earthquakes.[35]

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[32] Francesca Rochberg, *The Heavenly Writing: Divination, Horoscopy, and Astronomy in Mesopotamian Culture* (Cambridge: Cambridge University Press, 2004), 66.

[33] Rochberg, *The Heavenly Writing*, 67.

[34] See the outline in Francesca Rochberg-Halton, *Aspects of Babylonian Celestial Divination: The Lunar Eclipse Tablets of Enūma Anu Enlil* (*AfO* 22; Horn, Austria: Ferdinand Berger and Söhne Gesellschaft, 1988), 28–29, 252. Rochberg notes that the meteorological protases all have parallels in the series *Iqqur īpuš* and may have provided the source for these omens. On Adad thundering and the earthquake omens, see R. Labat, *Un Calendrier Babylonien des Travaux des signes et des Mois (series iqqur ipus). Bibliotheque de l'Ecole des hautes etudes,* 4 (SHP 321; Paris: Champion, 1965), §§ 80, 90, 91, 100. Francesca Rochberg, *In the Path of the Moon: Babylonian Celestial Divination and Its Legacy* (SAMD 6; Leiden: Brill, 2010), 213, states that four unpublished Old Babylonian celestial omen tablets stand in direct relation to the lunar eclipse section *Enūma Anu Enlil* 15–22. She also notes that greater standardization can already be seen in the Old Babylonian period challenging the conventional understanding of Babylonian canonization due to Kassite scribes.

[35] On the difficulty in constructing a literary history of Mesopotamian divination see, Rochberg, *In the Path of the Moon*, 212–222. A fragmentary tablet (cuneiform only, no transliteration or translation) on thunder, earthquakes and Adad was published by D. J. Wiseman and J. A. Black, *Literary Texts from the Temple of Nabû* (Great Britain: British School of Archaeology in Iraq, 1996), 11, plates 16 and 17.

As the above survey demonstrates, weather imagery is a much broader concept than usually conceived of in today's scholarship, and earthquake imagery should be included in the discussion of "storm-god" imagery. As the beginning of the chapter illustrated, only four Assyrian references to earthquakes are known, but a long history of earthquake omens are preserved dating as early as the Old Babylonian period. This omen history demonstrates that earthquakes were a part of Mesopotamian life and that there may have been attempts to avert earthquakes or interpret what an earthquake would portend.[36] Thus, even though historical, literary evidence of actual earthquakes is minimal, literary evidence in genres such as omen texts attests both that earthquakes occurred in Mesopotamia and that imagery used to describe an earthquake could also be used to describe a storm.

By tracing the dominant conceptions of weather-god imagery through geographic location and time, special attention will be paid to the trembling of nature and how this imagery changes due to the environmental conditions surrounding geographic areas of literary influence.[37] Alberto Green in his volume on *The Storm-God in the Ancient Near East* makes a connection between geography and the conception of deity, even though he does not focus on the trembling of nature. Green writes, "In the cultural evolution of any region, certain inherent geographical, ecological, and climatological factors contribute significantly to the conception of deity."[38] Green further writes, "The ecological and topographical differences between the hilly north and the flat riverine south were responsible for the development of different patterns of

[36] As numerous scholars have noted, not all scenarios found in omen texts occurred or were even plausible. See the discussion in Rochberg, *In the Path of the Moon*, 19–30.

[37] On religious geography see Petri Raivo, "Comparative Religion and Geography: Some Remarks on the Geography of Religion and Religious Geography," *Temonos* 39 (1997): 137–149.

[38] Green, *The Storm-God*, 9.

thought. This is particularly evident with regard to the perception of the supernatural."[39] Daniel Schwemer also draws a similar connection between the significance and sphere of activities of a weather god. In his view, the storm-god was dependent on climatic conditions of a region; thus, the bringer of rain for a storm-god in Babylonia has no role because of irrigation, while destructive storms and dust-storms are more common.[40]

The climatic and geographic conditions that are connected by Green and Schwemer also extend to our present knowledge of earthquakes texts. The record of four Mesopotamian earthquakes that are known all come from texts in the north of Iraq (Nineveh, Nimrud, Dur Sharrukin), which, not coincidentally, boasts the highest seismicity in the country. Further, the early earthquake omen text found at Nuzi also comes from the northern part of the country providing another link between where the texts are from and the higher seismicity of those areas. Not surprisingly, it is Assyrian sources that attest to earthquakes, while Babylonian sources are quiet. While it is prudent to avoid arguments from geographic determinism and silence, textual records of earthquakes presently cluster in the northern part of Iraq where higher seismicity occurs.

7. Uncovering Earthquake Imagery in Ancient Near Eastern Texts

Though weather-god evidence is found textually as early as 2400 BCE in Sumerian hymns, Akkadian evidence from the Old Babylonian period provides a better starting point for this inquiry. This is because our focus is on the development of weather god imagery in Semitic sources and while Iškur is known in Sumerian sources as the god of wind and storm, by the Sargonic period, Iškur had merged with Adad. In the Ur III period no distinction between the two

[39] Green, *The Storm-God*, 11.

[40] Schwemer, "The Storm-Gods of the Ancient Near East, Part I," 129–130.

is possible.[41] Since Adad became elevated as a great god in the Old Babylonian period, with an extensive cult throughout Babylonia, this provides a more suitable starting point.

Old Babylonian hymns make a connection between Iškur and thunderstorms, tightly linking thundering with storms. For example, in a late Old Babylonian hymn lamenting Iskur's rage, trembling imagery is seen in warrior imagery:

> The word of the great warrior: When there is rage…
> The august word of Iškur: When there is rage
> The word of Roaring Storm: When there is rage…
> The word of Shouting Storm: When there is rage…
> Because of it, heaven shakes, earth is shocked;
> Heaven is pounded, earth is pelted.[42]

Another Old Babylonian hymn connects Iškur-Adad's anger with Storm–god imagery:

> When the lord is raging, the heavens tremble.
> At Iskur's wrath, the earth on its part also shakes.
> The great mountains…. are all thrown down.[43]

As Green argues, these texts portray Iškur-Adad as a violent god during the Old Babylonian Period. The earthquake imagery appears to be linked to the mythic projection of thunderstorms onto the weather god's anger: because of his rage the heavens and earth shake.

Situating these texts in their historical and geographic environment helps contextualize the focus on Iškur-Adad as a violent god. The collapse of the Ur III period created political fragmentation in Babylonia along with a growing Amorite hegemony. Over time, the shifting political winds would push far northwestward into Mari, but the political division of Babylonia

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[41] Schwemer, "Storm gods of ANE I," 137–138.

[42] Green, *Storm-God*, 56–57; Doyle, *Storm-God Iskur-Adad*, 151–152; R. Borger, *Handbuch der keilschriftliteratur* (Berlin: de Gruyter, 1967–1975), 1.277. Doyle focuses on the importance of the lament as he suggests it might have been used during the ceremonial razing of a temple prior to its reconstruction.

[43] Green, *Storm-God*, 57; Doyle, *Storm-God Iskur-Adad*, 166–169. Doyle notes that the text adds little to understanding the mythic personality of Iskur-Adad and that the god's impact is still seen primarily as a thunderstorm.

during the early second millennium still was concentrated around Isin and Larsa (during the Isin-Larsa period). At the same time other cities, most notably Babylon, became powerful due to the ongoing political fragmentation.[44] Historically scholars have classified Isin and Larsa as southern cities while Babylon is farther north, but geographically the entire sphere of influence during the Old Babylonian period from Ur to Sippar sat in an area of lower seismicity. Daniel Schwemer provides an important point about the role of Iškur-Adad noting, "On the whole the storm-gods venerated in those parts of the ancient Near East more characterised by rainfall agriculture and dry farming, i.e. in Upper Mesopotamia, Syria, Anatolia and also in Assyria, occupy a more significant position among the great gods than in Babylonia, where Iskur-Adad as a rule belongs to the less important of the great gods."[45] Thus, Iškur-Adad, soon to be Adad, had a number of hymns that linked rainfall with his image, but at the same time, during this time, his diminished role as a god stands in contrast to later time periods and cultures.

8. Mari and Warrior-god Imagery

At Mari (Tell Hariri), located northwest of most of the great Mesopotamian cities, weather god imagery became channeled into Warrior-god imagery.[46] Green notes that the destructive power of Adad/Addu is not projected mythically into storm, winds, and rain but, "*Rather, his importance is highlighted time and again as the Warrior–god of the kings of the region in their conquests around the kingdom of Mari and in the neighboring regions. He is*

[44] See the maps in Michael Roaf, *Cultural Atlas of Mesopotamia and the Ancient Near East* (Oxford: Andromeda Oxford, 2004), 109.

[45] Schwemer, "Storm Gods of ANE, Part I," 130.

[46] On the role of landscape, topography and landscape in the development of religion, see the extensive bibliography from "Geography of Religions and Belief Systems Working Bibliography**,** Compiled for the Geography of Religions and Belief Systems (GORABS) Specialty Group of the Association of American Geographers (AAG)," n.p. [cited 19 September 2011]. Online: http://gorabs.org. See also, Raivo, *"Comparative Religion and Geography,"* 137–149. Further afield, see work of Mayan scholars in David Carrasco, editor, *To Change Place: Aztec Ceremonial Landscapes* (Niwot: University Press of Colorado, 1991).

characterized as a terrible 'Warrior–god.'"[47] Green's conclusion focuses on the political events surrounding Mari but the shift to Warrior-god imagery also fits well with the geographical and environmental location of Mari.[48] First, Mari sits in an area of extremely low seismicity. Studies of historical seismicity in Iraq and Syria, compiled by Sahil Alsinawi/Zia Al-Qasrani and Mohamed Sbeinati et al., demonstrate there is virtually no seismicity near Mari.[49] Though Mari sits near the Euphrates Fault System, the recent work by Litak et al. shows that this system is an aborted continental rift and "faulting essentially ceased by the Paleocene."[50] Further, based on historical seismicity over the last 100 years, from 1900-1993, only one earthquake (magnitude around 4.0 on the Richter Scale) struck within 100 kilometers of where Mari is located. Second, Mari's location in a quasi-desert steppe prevents rainfall agriculture, thus redirecting the Euphrates was critical to irrigation.[51]

These two geographic factors present compelling reasons why imagery at Mari shifted from storm-god to warrior-god. Sitting in an area lacking seismic activity and without much rain, Mari had no reason to project earthquakes or even thunderstorms into the mythical power of a weather-god. Rather, friction over expansion, differing allegiances, and struggle for political

[47] Green, *Storm–God*, 59 (italics his).

[48] Wolfgang Heimpel, *Letters to the King of Mari* (Winona Lake: Eisenbrauns, 2003), 7–13, does not address any issues of seismicity in his description of the geographic orbit of Mari.

[49] See most importantly, Graham Brew, Muawia Barazangi, Ahmad Khaled Al-Maleh, and Tarif Sawaf, "Tectonic and Geologic Evolution of Syria," *GeoArabia* 6 (2001): 573–616, esp. 597; Sbeinati et al., "Historical Earthquakes of Syria," 349, figure 2. See also the historical isointensity maps in, Sahil A. Alsinawi and Zia Al-Qasrani, "Earthquake Hazards Considerations for Iraq" (paper presented at the Fourth International Conference of Earthquake Engineering and Seismology, Tehran, Iran, 12-14 May 2003), 4.

[50] Robert K. Litak, Muawia Barazangi, Graham Brew, Tarif Sawaf, Anwar Al-Imam, and Wasif Al-Youssef, "Structure and Evolution of the Petroliferous Euphrates Graben System, Southeast Syria," *AAPG Bulletin* 82 (1998): 1173–1190. The Paleocene period runs from about 65.5 to 56 million years ago.

[51] Jean-Claude Margueron, "Mari" (OEANE) 3: 413.

control to the west of Mari, as preserved within the Mari archives, point to the shifting imagery to a Warrior–god.[52]

Stepping back to assess the overall seismic picture from Mesopotamia, the low historical seismicity around Mari pales in comparison to the greater historical seismicity of the Fertile Crescent, due to its proximity to the Zagros fold belt. A fold is a geologic term to describe layered deposits that may or may not be deformed by faulting in addition to (or instead of) faulting while ridges and basins that are relatively long with respect to their width mark a fold-thrust belt.[53] Well-known examples of fold-thrust belts besides the Zagros fold belt include the Appalachian and Canadian Rocky Mountains. As Yeats et al. show, "The Zagros fold belt is largely aseismic, but earthquakes are common in the basement *beneath* the fold belt."[54] This phenomenon, along with low-strength salt horizons, which also limit large earthquakes, results in earthquakes mainly under magnitude 7.[55] Thus, seismicity would have been greatest around the foothills of the Zagros but would have been more moderate near the Euphrates. Applying this to the Ancient Near East, cities in the Fertile Crescent would have felt earthquakes and damage

[52] The Mari archives date to the time of Yasmah-Addu (c. 1790–1775 BCE) and Zimri-Lim (c. 1775–1761 BCE), the last two rulers of Mari before Hammurabi captured and destroyed Mari around 1760 BCE. The patron deity of Mari, (Ilu)mer or Itur-Mer (*^{d}I-tur-Me-er)*, also supports a shift away from weather-god imagery connected to rain or thunderstorms. Green, *Storm–God*, 63 suggests a Semitic etymology from the Arabic root *nwr* (violent blowing of the wind, especially when it raises dust storms) and emphasizes that the primary characteristic of Ilu(mer) was the manifestation of violent winds and dust storms.

[53] Yeats et al, *Geology of Earthquakes*, 29–35; 338–340.

[54] Yeats et al, *Geology of Earthquakes*, 307. See also, the important work by Manuel Berberian, "Master "Blind" Thrust Faults Hidden under the Zagros folds: Active Basement Tectonics and Surface Morphotectonics," *Tectonphysics* 241 (1995): 193–224.

[55] Al-Sawani, "Earthquake Hazards of Iraq," 4, suggests intensity on the Modified Mercalli Scale around the Fertile Crescent of up to seven or eight. At intensity VII in the Modified Mercalli Scale, everybody runs outdoors. The damage is negligible in buildings of good design and construction, damage is slight to moderate in well-built ordinary structures; damage is considerable in poorly built or badly designed structures and some chimneys are destroyed. Persons driving cars would notice an earthquake at this size. At intensity VIII, damage is considerable in ordinary substantial buildings with partial collapse and great in poorly built structures. Other effects include the falling of chimneys, factory stacks, columns, monuments, and walls. There are also changes in well water. Overlooking the role of earthquakes in the Ancient Near East is typified by the omission of earthquakes in Karl W. Butzer, "Environmental Change in the Near East and Human Impact on the Land," *CANE* 1: 123–151.

could have been severe to mud brick structures with no seismic retrofitting, but the primary area of concern would have been closer to the foothills of the Zagros and the northern area of Iraq.

9. Dagan

As Mari stands in the Middle Euprathes area, it is also important to address the possible weather-god aspects of Dagan.[56] The etymology of Dagan remains uncertain with a number of different suggestions; pertinent to this study was the suggestion, first offered by W. F. Albright and most recently argued by N. Wyatt, that Dagan is connected to the Arabic word *dağana* meaning "stormy or cloudy."[57] In addition to this suggestion, Dagan has been identified with Enlil in southern Mesopotamia, leading to the suggestion that Dagan was a Weather-god. That Enlil and Dagan are compared as gods seems certain from the impressive evidence collected by Lluís Feliu; what is less certain is the role of Dagan in relation to Enlil. As Feliu summarizes, based upon his collection of Enlil/Dagan comparisons, "Dagan is not the Syrian copy of Enlil…"[58] Further, in these texts, specific attributes that are the same or similar to Enlil, are not

[56] While the study of Dagan, for decades, was limited to Harmut Schmökel, *Der Gott Dagan: Ursprung, Verbreitung und Wesen seines Kultes* (Borna–Leipzig: Universitätsverlag von Robert Noske, 1928), see now the important contributions of Bradley L. Crowell, "The Development of Dagan: A Sketch," *JANER* 1 (2001): 32–83 and Lluís Feliu, *The God Dagan in Bronze Age Syria* (Trans. Wilfred G. E. Watson. Leiden: Brill, 2003).

[57] W. F. Albright, "Gilgames and Engidu, Mesopotamian Genii of Fecundity," *JAOS* 40 (1920): 307–335; Nicholas Wyatt, "The Relationship of the Deities Dagan and Hadad," *UF* 12 (1980): 375–379; "Baal, Dagan, and Fred: A Rejoinder," *UF* 24 (1992): 428–430. See also, J. J. M. Roberts, *The Earliest Semitic Pantheon: A Study of the Semitic Deities Attested in Mesopotamia before Ur III* (Baltimore: John Hopkins Press, 1972), 18–19.

[58] Feliu, *The God Dagan*, 29; see the similar conclusion by J. F. Healey, "Dagan," Dictionary of Deities and Demons in the Bible (eds. K. Van der Toorn; B. Becking, and P. W. Van der Horst; 2d ed.; Leiden: Brill, 1999), 216–219, "In southern Mesopotamia Dagan was sometimes identified with the god Enlil. This may suggest some 'storm-god' aspect (supporting the etymology linking the name with the possible Arabic cognate noted above [Arabic *dajj* or *dajana*], though the significance of the equation may not be this aspect and the Arabic cognate is extremely remote)." Brackets mine. Crowell, "Development of Dagan," lists three areas where he saw an Enlil/Dagan connection: two bilingual Sumerian–Akkadian vocabulary lists at Ebla, in an Old Babylonian god list as Dagan ŠU Enlil (AO. 5376: 67= TCL 15, 25ff.) which would continue into copies of the An=Anum list of the first millennium, and in a *tākultu* ritual text of the first millennium (KAR 214). On these sources, see, Giovanni Pettinato and Harmut Waetzoldt, "Dagan in Ebla und Mesopotamien nach den Texten aus dem 3. Jahrtausend," *Or* 54 (1985): 234–256; Richard L. Litke, *A Reconstruction of the Assyro-Babylonian God-Lists, AN: ^{d}A-nu-um and AN: Anu šá amēli* (TBC 3; New Haven: Yale Babylonian Collection, 1998); R. Frankena, *Tākultu. De sacrale maaltijd in het Assyrische ritueel* (Leiden, 1953).

placed onto Dagan, and no Enlil epithets exist which connect him to a storm.[59] This is not to deny various connections, and even syncretism between the two, but Dagan should be seen most clearly as a powerful Syrian god whose etymology remains unclear.[60] Claiming Dagan is a Syrian or Middle Euphrates weather-god, based upon a connection to Enlil, over reads the evidence. Indeed, Daniel Schwemer also concludes that Dagan is characterized as father and lord of the gods and is associated with Hurrian Kumrabi and Babylonian Enlil but other than ensuring abundance of crops, there is no evidence to associate Dagan with weather-god imagery.[61]

10. Emar and Late Bronze Age Texts

Another area to delimit is Emar's connection to weather-god imagery. Emar's texts remain undervalued for their comparative contributions to Israelite religion and while the weather-god Baal at Emar was the chief deity, seen through the temple of Baal as well as texts such as the installation of the high priestess (Emar 369), it is difficult to piece together a clear picture of the weather-god at Emar. This difficulty is due in part to the influence of the Hittite-Luwian cults, Hurrian traditions, and contact from Assyria and Babylonia as well as the overall paucity of information on the mythology of Baal at Emar.[62] In sum, more information from Emar

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[59] At Emar, Dagan has the epithet "the very father" (*Abuma*), and is paired with Ninlil (the wife of Enlil), while at Mari Dagan is called Mullil or Nunamnir, "which are both learned names of Enlil imported from Babylonia," Feliu, *The God Dagan*, 297–298.

[60] A similar, unclear relationship like Enlil/Dagan is found at Ugarit with El/Dagan. Dagan is referred to as the father of Ba'al (KTU 1.2 I 18–19, 35, 37; 1.5 VI 23–24; 1.6 I 6; 1.10 III 12–14; 1.12 II 24–25) while also calling Ba'al the son of El (KTU 1.3 IV 48–53; 1.4 I 4–13; 1.4 IV 47–57; 1.17 I 23; 1.17 VI 28–29). Scholars have tended to see Dagan synchretized with El (Gregorio del Olmo Lete, *Canaanite Religion: According to the Liturgical Texts of Ugarit* (Bethesda: CDL Press, 1999), 30, 71, 74) or as a weater-god (Nicholas Wyatt, "The Titles of the Ugaritic Storm-God," *UF* 24 (1992): 403-424.) Crowell, "Development of Dagan," 65, makes a strong argument that the "the reference to Dagan as Ba'al's father represented an attempt to incorporate other pantheons into the mythology…"

[61] Schwemer, "Storm gods of the ANE, Part I," 129; *Wettergottgestalten*, 282, fn. 1944.

[62] Schwemer, "Storm gods of the ANE, Part I," 159; Schwemer, "Storm gods of the ANE, Part II," 14; *Wettergottgestalten,* 548–573. On the iconographic traditions of the weather god found on cylinder seals at Emar, see D. Beyer, *Emar IV: Les sceaux* (OBO SA 20, Fribourg—Göttingen 2001), esp. 299–306.

concerning the mythology of the weather-god would help to clarify his depiction at Emar; and, until that time, there is little else that presently can be said.

Returning to the evolution of Adad/Addu in the Late Bronze Age, West Semitic texts and iconography suggest that Hadad[63] and Ba'al are indistinguishable.[64] In the Amarna letters, the weather-god is referred to as either Hadad or Baal and the writing of Baal, Hadad, and Teššub (the Hurrian deity), were all written in the same way: ^{d}IŠKUR.[65] At Ugarit, Cooper and Pope illustrated that *b'l* moved from a generic use to the proper name for one god: Hadad.[66] This is seen most clearly in texts such as lists of mythical divinities in which "Adad, lord of Mount Hazzi" corresponds to "Baal Ṣaphon."[67] This shift to Baal, as a storm and warrior god central to West Semitic belief, is clear by his thundering voice which gives evidence of his power over storms, lightning, and clouds (KTU 1.4 v:8–9; vii 29, 31; 1.5 v:7; 1.101:3–4). Also, Baal's

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[63] One of the Panammu inscriptions (KAI 213:14, 16) refers to *hdd zn* ("this Hadad") suggesting multiple Hadads.

[64] See, Green, *Storm–God*, 173, "It is evident from a number of Semitic sources in which the name *Hadad* is the equivalent of *Baal*, that *Baal*, initially an appellation for the great Syrian Storm–god, subsequently became the proper name." Jonas Greenfield, "Hadad," *DDDB*, 377–382, suggests that in the 9th century when Arameans were settling in the western marshes of the Assyrian empire, that a clear bifurcation had taken place in the names Ba'lu and Hadad. Often overlooked is how the imagery made its way to the coast. The Old Babylonian texts occur during the same period that the Mesopotamian political environment was shifting towards Amorite hegemony. Green, *Storm–God*, 57, notes the Amorite hegemony during this period but does not explore the potential ways in which this shift could have served as a means to spread weather-god imagery to the West. Crowell, "Development of Dagan," 54–57, uses a world–systems approach for the "utilization of ideological information networks by the ruling elite of expanding regional hierarchial systems." Thus, Crowell argues that while Dagan was a regional deity, seen by his association with Terqa and Tuttul, rulers of Mari accepted and venerated Dagan in order to integrate and retain Terqa within the Mari network.

[65] Richard S. Hess, "Divine Names in the Amarna Correspondence," *UF* 18 (1986): 149–168; Schwemer, *Wettergottgestalten*, 502–548.

[66] Jerrold Cooper and Marvin Pope, "Divine Names and Epithets in the Ugaritic Texts," in *Ras Shamra Parallels: The Texts from Ugaritic and the Hebrew Bible, Vol. 3* (ed. S. Rummel; AnOr 51; Rome: Pontifical Biblical Institute, 1981), 335–469. See also the discussion in Green, *Storm–God*, 170–178.

[67] In the Hebrew Bible, there is no distinction between Hadad and Baal. The only possible exception is in Zech 12:11 where the term Hadad-rimmon used.

iconography of carrying his lightning and thunderbolt like a spear, strengthens his imagery as a warrior god.

11. Earthquakes and Ugaritic Texts

Once it is clear that Hadad and Baal are indistinguishable, the question of earthquake imagery within the Ugartic texts provides the next challenge. The location of Ugarit on the coast of Syria, near the northern extension of the Dead Sea Transform created an active seismic zone at Ugarit.[68] This was not lost on scholars, because as early as 1935, Charles Virolleaud suggested that an earthquake struck Ugarit.[69] This was soon followed by Claude Schaeffer's famous assertion that an earthquake, found in the archaeological and textual sources, caused massive damage at Ugarit around 1365 BCE.[70] Other scholars, outside Levantine archaeology, also would assert that earthquake damage was preserved at Ugarit, heightening support for this view.[71] In fact, Schaeffer also suggested that the final destruction of Ugarit might be due to earthquake damage, which Amos Nur and Eric Cline later expanded to suggest that a series of earthquakes (earthquake storms) caused the collapse of the Late Bronze Age.[72] The site's current excavator,

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[68] See Amr Salah-Eldin Elnashai and Ramy El-Khoury, *Earthquake Hazard in Lebanon* (London: Imperial College Press, 2004).

[69] Charles Virolleaud, "Le revolte de Koser contre Baa' I," *RAOA* 16 (1935): 1–29.

[70] Claude F. A. Schaeffer, *The Cuneiform Texts of Ras Shamra–Ugarit* (London: Oxford University Press,1939); C.F.A. Schaeffer, *Stratigraphie Comparée et Chronologie de l'Asie Occidentale (IIIe et IIe millé-naires),* (London: Oxford University Press, 1948), 2; C. F. A. Schaeffer, *Commentaires sur les lettres et documents trouvés dans les bibliothéques privées d'Ugarit*. *Ugaritica V* (MRS 16; Paris: Geuthner, 1968), 607–768.

[71] J. Antonopoulos has argued for earthquakes in several of his studies on tsunamis in the eastern Mediterranean. See, J. Antonopoulos, "Tsunamis of the Eastern Mediterranean from Antiquity to Present Time," *AG* 32 (1979): 113–130. See also, George Rapp, Jr., "Assessing Archaeological Evidence for Seismic Catastrophes," *Geoarchaeology* 1 (1986): 365–379; Mohamed Reda Sbeinati, Ryad Darawcheh and Mikhail Mouty, "The Historical Earthquakes of Syria: an Analysis of Large and Moderate Earthquakes from 1365 B.C. to 1900 A.D.," *AG* 48 (2005): 347–435.

[72] Amos Nur and Eric H. Cline, "Poseidon's Horses: Plate Tectonics and Earthquake Storms in the Late Bronze Age Aegean and Eastern Mediterranean," JAS 27 (2000): 43–63. See also, Amos Nur, "The End of the Bronze Age by Large Earthquakes? in *Natural Catastrophes During Bronze Age Civilisations: Archaeological, Geological, Astronomical and Cultural Perspectives* (ed. B.J. Peiser, T. Palmer, M. E. Bailey; British Archaeological Reports

Marguerite Yon, argues that invaders caused the destruction around 1200 BCE, and has challenged Schaeffer's and Nur and Cline's suggestion of an earthquake or earthquake storm. An earthquake around 1200 BCE has not received many adherents; and, in fact, Manuel Sintubin, an expert on Mediterranean archaeoseismology, comments that Schaeffer's views were used by Cline and Nur for "setting the stage for the myth of the Late Bronze Age seismic paroxysm around 1200 BC."[73]

Regardless whether Ugarit ended because of an earthquake or invasion (though the earthquake storm theory, in my view, lacks strong evidence), two pieces of information related to seismicity are beyond question. First, Ugarit is in a seismically active zone, more active than Mari and the Fertile Crescent. In Mohamed Sbeinati et al. catalogue of historical earthquakes, based upon surveying thirty-five centuries of historical earthquakes, they conclude that Western Syria and Lebanon are host to a high level of seismicity, while areas more east such as Mari and Emar are far less seismically active.[74] Also, not only were earthquakes more severe on the coast than any area further east, any moderate earthquake that struck Lebanon or the Western part of Syria certainly would have shook Ugarit.[75] While it cannot conclusively be proved that an earthquake struck Ugarit during the Late Bronze Age, the site was susceptible to frequent

International Series 1998), 140–147.

[73] Marguerite Yon, "The End of the Kingdom of Ugarit," in *The Crisis Years: The 12th Century B.C.: From Beyond the Danube to the Tigris* (ed. W. A. Ward and M. Joukowsky; Dubuque: Kendall/ Hunt Publishing Company, 1992), 111–122; Marguerite Yon, The City of Ugarit at Tell Ras Shamra (Winona Lake, Eisenbrauns, 2006), 21–26. See also, Robert Drews, *The End of the Bronze Age* (Princeton: Princeton University Press, 1993), 33–34, 42–43; Manuel Sintubin, "Archaeoseismology: Past, Present, Future," *QI* 30 (2011): 1–7.

[74] Sbeinati et al., "Historical Earthquakes of Syria," 405–406. Little research has been completed on the Euphrates Fault System, see most recently, Robert K. Kitak, Muawia Barazangi, Weldon Beauchamp, Dogan Seber, Graham Brew, Tatif Sawaf, and Wasif Al-Youssef, "Mesozoic–Cenozoic Evolution of the Intraplate Euphrates Fault System, Syria: Implications for Regional Tectonics," *JGS* 154 (1997): 653–666.

[75] See, for example, figures 18, 19, 20 in Sbeinati et al., "Historic Earthquakes of Syria," which contain maps of intensity distribution for historic earthquakes.

seismic shaking for the duration of its inhabitation and echoes of this shaking might have crept into Ugaritic oral tradition and literature.

The Baal Cycle is a natural starting point for examining earthquake imagery as the myth recounts Baal's exploits including his defeat of Yammu, the building of his palace, and subsequent death and return to life. After Baal builds his palace and then decides that he indeed wants a window, Baal utters his voice and the earth then shakes:

(KTU 1.4 VII 29-34)

29. qlh.qdš[.]bʿ[l.]ytn	Baal gave forth his holy voice,
30. yṯny.bʿl.ṣ[ʾat (?).š(?)]pth/	Baal repeated the utt[erance of] his [li]ps,
31. qlh.q[dš] k(?)p(?)r. ʾrṣ	His ho[ly] voice [shattered/covered] the earth.
32. ql[h]x ǵrm[.]tḫšn	[At his] voice the mountains quaked,
33. rtq[ṣ? ǵrm?]/qdmym.	The ancient mountains [ ] leapt [up?],
34. bmt.ʾa[rṣ]/tṭṭn	The high places of the ear[th] shook.[76]

This section of the Baal cycle is well known as it demonstrates Baal's control over heaven and earth, culminating in Baal's theophany.[77] The theophany is divided into three parts by Mark Smith and Wayne Pitard, "(1) the uttering of Baal's voice (lines 29–30); (2) the quaking of the earth in response (lines 31–35a) and (3) the fleeing of Baal's human enemies (lines 35b–37a), Baal's taunting question for them (lines 37–39) and the final, climatic image of the god facing his enemies with his cedar spear (which is the lightning) lifted in his hand (lines 40–41)."[78] Baal's appearance is impressive: he not only causes the mountains to shake with fear, but also causes the entire earth to tremble as well as the high places of the earth.

[76] Mark S. Smith and Wayne T. Pitard, *The Ugaritic Baal Cycle Volume II* (SVT 114; Leiden, Brill, 2009), 647–677, argue there are close West Semitic parallels to a deity's appearance in Isa 24:18-22; 2 Sam 22:8-18=Psa 18:8-16 as well as in an Amarna letter (EA 147:13–15) from Abimilki of Tyre written to his suzerain.

[77] See Green, *Storm–God*, 194.

[78] Mark S. Smith and Wayne T. Pitard, *The Ugaritic Baal Cycle Volume II* (SVT 114; Leiden: Brill, 2009), 672.

What is most intriguing about Baal's theophany is that while there is imagery connected with a weather-god, the focus of the theophany is on objects trembling, not a rainstorm. Dennis Pardee, in a close reading of this text, argues that Kotharu-wa-Hasisu opens the window of Baal's palace while Baal himself opens the rift in the clouds. This leads him to conclude: "the Ugaritians were well aware of the metaphors with which they were dealing."[79] This observation can be advanced further by examining another text regarding Baal's actions; CTA 4.5.68–71 states:

wn ʾap. ʻdn mṭrh bʾl	Now, Baal has appointed his rain,
y'dn. ʻdn. ṯr bglṯ	He has appointed the season of driving showers;[80]
w<y>tn. qlh bʻrpt	He has thundered in the clouds,
šrh. lʾarṣ. brqm	He has shot his lightning bolts to the earth.

This text clearly portrays Baal as the weather-god, responsible for the rainy season. This is evident not only from this text but also from Baal's well known epithet *rkb ʾrpt* "driver of the clouds," which emphasizes the predominance of rain over rivers in the Levant.[81] This text, however, when read in comparison to Baal's theophany highlights the difference in descriptive activity around Baal: in the first text the earth quakes in response to Baal while muting traditional storm imagery such as showers and lightning. In the second text, Baal clearly appoints his rain, thunders in the clouds, and shoots lightning to earth. Comparing differences between these texts is not meant as a quasi-exercise in source criticism, trying to find two different weather writers, but to raise awareness about earthquake language that in addition to strong ra ainstorm, may have echoes of actual earthquakes behind its language. A more detailed, sustained

[79] "The Baʾlu Myth," translated by Dennis Pardee (*COS* 1.86:262).

[80] See the discussion of this line in "The Baʾlu Myth," translated by Dennis Pardee (*COS* 1.86:260).

[81] See the classic work by Sigmund Mowinckel, "Drive and/or Ride in O.T.," *VT* 12 (1962): 278–299; W. Boyd Barrick, "The Meaning and Usage of RKB in Biblical Hebrew," *JBL* 101 (1982): 481–503.

interaction with these texts focused on a close reading of weather imagery will provide greater insight into earthquake imagery at Ugarit.

12. Theophoric Imagery in the Hebrew Bible

As is well known, imagery used to describe Baal is similar to imagery found in the Hebrew Bible and numerous parallels have been drawn between Ugaritic texts and the Hebrew Bible. For example, by linking Sapon with Jerusalem (Psa 48:3) and Yahweh's waters and Sapon and clouds in Job 26:7–8, Smith and Pitard conclude, "The use in the Hebrew Bible of the same names for the storm-god's abode, not to mention the same divine enemies such as Yamm, Leviathan and Tannin, indicates that Israelite religious literature belongs to the long West Semitic literary tradition to which the Ugaritic religious narratives are an earlier witness."[82] The number of parallels often returns to one central issue: theophany motifs and where borrowing is relevant versus independent innovation.

The works of Jörg Jeremias and Frank Moore Cross have defined the *Theophanie-Gattung* that encompasses the coming of the deity and nature's subsequent reaction.[83] From these original two parts of a deity arriving and then nature reacting, a number of variations exist that center on expanding or making independent the theophany in biblical narrative. Jeremias, in his work, drew attention between the close resemblance of Mesopotamian hymns and Hebrew Bible imagery while Frank Moore Cross critiqued Jeremias for not examining the form of Baal's theophany.[84] Cross focuses on two patterns in his study: first, the Divine Warrior going into

[82] Smith and Pitard, *The Ugaritic Baal Cycle*, 673–674.

[83] Jörg Jeremias, *Theophanie: Die Geschichte einer Altestamentlichen Gattung* (WMANT 10; Neukirchen-Vluyn: Neukirchener Verlag, 1965); Frank Moore Cross, *Canaanite Myth and Hebrew Epic* (Cambridge: Cambridge University Press, 1972).

[84] Jeremias, Theophanie, 88, n.1; Cross, *CMHE*, 147, n.1.

battle; and, second, the return of the Divine Warrior to take up kingship.[85] Behind these two types of texts Cross sees an archaic mythic pattern which includes the Divine Warrior battling chaos with his weapons, resulting in nature convulsing because of the Divine Warrior's wrath, the Divine Warrior returning to take up kingship enthroned on his mountain, and uttering his voice from the Temple and nature again responding. Cross sees the storm theophany or derivative language as a frequent means of describing YHWH's mode of revelation as early as the tenth century BCE.

A number of texts at Ugarit and in the Hebrew Bible fall under the description of "storm" theophany texts but cannot be evaluated in full here. Carola Kloos in his work, *YHWH's Combat with the Sea*, has studied the distribution of various motifs in Ugaritic texts as well as the Hebrew Bible with the various motifs as follows:[86]

1) battle with Sea or monsters;
2) thunder/lightning;
3) anxiety of nature (mountains, earth, heavens);
4) kingship
5) fertility
6) joy of nature (only in Hebrew Bible)

Kloos then examined the relevant texts from Ugaritic, Amarna and the Hebrew Bible to examine the distribution of the motif. His full chart is produced below:

Table 2.1: Motifs in Theophany Texts

	1	2	3	4	5	6
KTU 1.2 IV	+			+		
KTU 1.5 I 1–5	+		?			
EA147 13–15		+	+			
KTU 1.4 VII 29–35		+	+	+	+	
KTU 1.101 1–4		+		+		

[85] Cross, *CMHE*, 162–163.

[86] Carola Kloos, *YHWH's Combat with the Sea: A Canaanite Tradition in the Religion of Ancient Israel* (Leiden: Brill, 1986), 49–50. Kloos does not include Psa 29 in his chart but argues that the criteria for 2, 3, and 4 are found in the Psalm.

KTU 1.4 V 6–9		+			+	
KTU 1.19 I 42–46		+			+	
Nah. 1:3–6	+	+	+			
Hab 3:3-15	+	+	+			
Ps 18:8-16=						
2 Sam 22:8-16	+	+	+			
Ps 74:12-17	+			+		
Ps 93	+			+		
Ps 104:1-18	+	+		+		
Ps. 65: 6-14	+	+			+	+
Ps. 89:10-19	+			+		+
Ps. 97:1-6		+	+	+		+
Ps. 96			+	+		+
Ps. 98				+		+
Ps. 29		+	+	+		

As seen above, different motifs within the Hebrew Bible are combined and interchanged without any clear pattern. Also, as Kloos observed, it is difficult to speak of two distinct patterns as Frank Moore Cross argued and the lack of narrative structure in Hebrew poetry mitigates any fixed sequence for the events. One problem with Kloos's diagram is that he did not distinguish between thunder and lightning, which, as noted earlier in the chapter, the sound of thunder can be due to phenomena outside of lightning or storm imagery. Nevertheless, examining motifs in theophany texts illustrates that within the Hebrew Bible, kingship is the most dominant theme and other phenomena are found without clearly regularity.

13. Psalm 29 as a Test Case for Theophanic Imagery

Psalm 29 is frequently adduced when discussing theophany texts and their potential influence from Canaanite literature and additionally provides an example of a text that deserves further scrutiny. Patrick Miller's study of the Divine Warrior connects Baal's theophany and destruction of Yamm and the other enemies with warrior and weather-god concepts that are then associated with Psalm 29. Regarding the imagery in the Baal theophany, Miller writes, "The imagery of this scene is strongly reflected in the warrior and storm concepts associated with

Yahweh."[87] The Psalm reappropriates attributes of Baal to Yahweh and a number of features that appear to link Psalm 29 to Phoenician topography and toponymy. Word pairs and linguistic evidence related to Ugaritic, and other evidence has led a number of scholars to see this as originally a Canaanite hymn adapted for the Hebrew Bible.

This psalm provides an opportunity to reexamine imagery within it that is traditionally identified in the narrow context of a storm. After the call to praise in the opening two verses, the body of the Psalm (vv. 3–9) centers around praising YHWH's voice over the natural world. The references to God being victorious over the water (3) and sitting enthroned above the Flood (10) connect the psalm to the Song of the Sea (Exodus 15) and flood story traditions.[88] The body of the psalm focuses on YHWH's power over the natural world, but most of the imagery concerns YHWH's ability to manipulate parts of the earth to start (רקד), convulse (חיל), or strip bare forests (חשׂף). The heavy earthquake imagery in verses six and eight need a closer examination in how they relate to the psalm and whether they are part of a storm.

Psalm 29:6 reads וירקידם כמו־עגל לבנון ושׂרין כמו בן־ראמים׃ "He makes Lebanon start like a calf, Sirion, like a young wild ox." References in verse five and six to Lebanon and Sirion (Mount Hermon, Deut 3:9) serve as one of the primary means of connection to a

[87] Patrick D. Miller Jr., *The Divine Warrior in Early Israel* (Cambridge: Harvard University Press, 1973), 34–35.

[88] Peter C. Craigie, "Psalm XXIX in the Hebrew Poetic Tradition," *VT* 22 (1972): 143–151. Craigie sees Psalm 29 as a Hebrew victory hymn with continuity to Exod 15:1-18. Craigie draws connections between the use of עז "strength" in both texts (Exod 15:2-3; Psa 29:1-2), the conjunction of עז and שׁם "name" (Exod 15:18; Psa 29:10), the reference to the divine assembly (Exod 15:11; Psa 29:1), and the stress on the kingship of God (Exod 15:18; Psa 29:10). The connection between Psa 29 and the Flood story tradition is further argued in Peter C. Craigie, *Psalms 1–50* (WBC 19; Waco: Word Books, 1983), 249, where the use of מבול "flood" is the only other context where the word is used. David Toshio Tsumura, *Creation and Destruction: a Reappraisal of the Chaoskampf Theory in the Old Testament* (Winona Lake: Eisenbrauns, 2005), 152–155 supplies a careful study of *mabbûl* and argues that the term is best understood as "flood or ocean." He appeals to Abraham Malamat, "The Amorite Background of Psalm 29," *ZAW* 100 Supplement (1988): 159, n. 16, who finds an Eblaite cognate *ma-ba-lum*. While this cognate may be far afield, Tsumura provides a convincing argument that *mdb* in Ugaritic texts was never used to refer to a conquered enemy. Returning to the use of *mabbûl* only within Genesis 6-11 (twelve times) and once in Psa 29, YHWH never fights against the *mabbûl*, he uses it to destroy mankind.

Canaanite/Phoenician origin of the Psalm. The imagery, however, of making an entire geographic area shake, as well as one entire mountain rests in literary imagery or an event that is stronger than a storm. Even though the imagery is poetic and not meant to be read literally, events still stand behind the poetry imagery. Most interpreters view verses 3-9 as the description of a thunderstorm; for example, Peter Craigie writes, "The context makes it clear that vv 3-9 contain the description of a thunderstorm in which the divine voice is the dominant motif."[89] What kind of thunderstorm, though, can stand behind a poetic text in which Lebanon skips like a calf and Sirion like a young wild ox? The locations of Lebanon and Sirion along a seismically active area provide a reading that fits better in the context both historically and realistically.[90]

Verse eight also contains earthquake imagery and invites a closer reading and reexamination of the traditional interpretation. Verse eight reads as follows: קול יהוה יחיל מדבר יחיל יהוה מדבר קדֵשׁ׃ "The voice of YHWH causes the Steppe to shake, YHWH causes the Steppe of Kadesh to shake." The two locations of מדבר קדֵשׁ "Steppe of Kadesh," whether in western Syria or the Wilderness of Zin at Qadesh is well known. Preceding verse eight, verse seven reads קוֹל־יהוה חצב להבות אֵשׁ׃ "The voice of YHWH kindles flames of fire," alluding to actual lightning bolts, but this imagery is not built on in verse eight; rather, the verse focuses on the shaking of the steppe. Both locations for the steppe, whether in the north or south are found in highly seismic areas and could preserve a historical memory of actual shaking in addition to the poetic imagery of YHWH's voice shaking the Steppe.

[89] Craigie, *Psalms 1–50*, 245.

[90] Milgrom, "Did Isaiah Prophesy During the Reign of Uzziah?," interprets Isa 2:13 and following and Ezek 38:19-23 as the results of an earthquake. Isaiah 2:13 states that YHWH will strike against the cedars of Lebanon which is quite close to the language of Psa 29:5.

In stressing more interpretive options for the poetic imagery behind Psalm 29 one other kind of imagery should be considered. In addition to the reality that Psalm 29 is a multivalent text that can refer both to thunderstorms as well as earthquakes, another possibility is to consider the effects of a tsunami caused by an earthquake or a sea-quake.[91] Anna Fokaefs and Gerassimos Papadopoulos recently produced a tsunami catalogue for the Eastern Mediterranean and suggested that two large tsunamis struck the Syrian coast during the Second Millennium.[92] Their catalogue examines evidence of large tsunamis but it is important to distinguish between the strength of tsunamis; strong tsunamis are rare in the Eastern Mediterranean (about every 1200 years), but low or moderate tsunamis occur every few years. In their view, one large tsunami struck somewhere during the second millennium and another struck around 1365 BCE. These tsunamis were in addition to the more regularly occurring low and moderate tsunamis.

Scholars such as Jacob Milgrom have suggested tsunamis as the imagery behind certain biblical texts, though not regarding Psalm 29. Milgrom suggested that a tsunami struck the port of Elath and stood behind the imagery in Isaiah 2:16. Here, YHWH acts ועל כל־אניות תרשׁישׁ ועל כל־שׂכיות החמדה׃ "against all the ships of Tarshish, and against all the beautiful craft." In Milgrom's view, the port's V-shape would amplify the sea waves and because the Gulf of Aqabah is in a highly seismic area, it would heighten the likelihood of a tsunami.[93] Though Milgrom wrote his article over forty years ago he relied upon the most current scientific thinking of his day to support his view, which, updating our understanding of Mediterranean tsunamis

[91] Strong tsunamis are rare in the Eastern Mediterranean (about every 1200 years) but low or moderate tsunamis occur every few years. See, Gerassimos A. Papadopoulos, Eleni Daskalaki, Anna Fokaefs and Nicoleta Giraleas, "Tsunami Hazard in the Eastern Mediterranean Sea: Strong Earthquakes and Tsunamis in the East Hellenic Arc and Trench System," *JET* (2007): 1–30.

[92] Anna Fokaefs and Gerassimos A. Papadopoulos, "Tsunami Hazard in the Eastern Mediterranean: Strong Earthquakes and Tsunamis in Cyprus and the Levantine Sea," *NH* 40 (2007): 503–526.

[93] Milgrom, "Did Isaiah Prophesy During the Reign of Uzziah?," 181–182.

today, suggests that a tsunami along the eastern coast of the Mediterranean would provide a more suitable location for tsunami imagery in the Hebrew Bible.

Returning to Psalm 29:3, when YHWH's voice is over the waters, and He thunders over the mighty waters, a thunderstorm at sea need not be the only interpretive option when a tsunami is also viable. Furthermore, in light of low or moderate tsunamis that strike the Levantine coast every few years, this provides an alternate interpretation and understanding to this verse than an enigmatic thunderstorm at sea, inaccessible to all but some select sailors at sea. This is not to suggest that the writer only had a tsunami in mind or that thunderstorm imagery is not present, but to posit that simply viewing the text through a storm lens, especially in light of the broader phenomena that occurred in the Levant, downplays other readings that can reflect the geographic and environmental realities of ancient Israel.

In addition to reassessing the interpretation of Psalm 29 in light of earthquake and tsunami imagery, its Ugaritic influence has more recently been challenged by scholars who have moved away from the Albright–Cross school.[94] While Yitzhak Avishur set forth the seminal article challenging Psalm 29 and its Canaanite influence, more recently, Benjamin Sommer has raised a number of issues regarding how much Canaanite influence exists behind Psalm 29.[95] Both scholars have pushed for a continuation of broader Canaanite or Mesopotamian literature as opposed to the borrowing of Ugaritic or Canaanite poems and have demonstrated that grammatical, syntactic, linguistic, and literary parallels are much broader than a simple one to

[94] See Cross, *CMHE*, 147–177.

[95] Yitzhak Avishur, "Psalm 29: Canaanite or Hebrew?" in *Studies in Hebrew and Ugaritic Psalms* (Jerusalem: Magnes Press, 1994), 39–110. Benjamin D. Sommer, "A Little Higher than Angels: Psalm 29 and the Genre of Heavenly Praise," in the *Festschrift for Adele Berlin* (ed. M. Grossman; College Park, University Press of Maryland, forthcoming).

one connection between Ugaritic texts and poems in the Hebrew Bible.[96] David Tsumura also has argued that similar phrases between Ugaritic poetry and Psalm 29 are metaphorical expressions that are a universal feature of poetry.[97] He supplies a close reading of the relevant Ugaritic texts and argues that a number of the assumed Ugaritic parallels have not been studied in their original context and that storm language is metaphorical rather than borrowed or adapted.[98] In this way, it is important to revisit well-entrenched scholarly views and see how they may be interpreted in light of new or overlooked lines of evidence. Tsumura's suggestion about metaphorical versus borrowed or adapted storm imagery again reminds us that we must continually reassess long held assumptions in light of new evidence and fresh insights.

One other consideration should be brought to bear on the interpretation of Psalm 29. Though this chapter has considered the influence seismicity may play in shaping earthquake imagery in Ancient Near East literary texts, little has been said about the active seismicity of the Levant. In the work of Claudia Migowski et al., they suggest that after the 1365 earthquake, two earthquakes struck the Levant around 1100 and around 1050 BCE.[99] Very little is known about the 1100 quake other than it appears in the paleoseismic record, whereas the 1050 BCE quake appears to be clearer. In specific, Migowski et al. locate the 1050 BCE quake just north of the Gulf of Aquaba, roughly 150 kilometers from Jerusalem (see figure 7 in their work). Migowski et al. suggest the 1050 BCE quake was around 7.0 in magnitude, though unfortunately, little else

[96] Avishur, *Studies in Hebrew*, 34, traces his approach to the earlier work of Umberto Cassuto and Samuel Loewenstamm.

[97] Tsumura, *Creation and Destruction*, 152–155. See also, A. Wager, "Ist Ps 29 die Bearbeitung eines Baal–Hymnus?" *Biblica* 77 (1996): 538–539.

[98] Tsumura, *Creation and Destruction*, 152–155.

[99] Migowski et al., "Recurrence Pattern," 307, 311. Migowski et al. do not have any other sources to correlate the 1100 quake and point to Ben-Menaham, "Earthquake Catalogue for the Middle East," 245–310, for the 1050 BCE quake.

can be said. The timing of these two Levantine quakes, however, present intriguing possibilities concerning when Archaic Hebrew texts[100] such as Judges 5, 2 Sam 22/Psalm 18, Psalm 29, and Habakkuk 3 were written.[101] It is not possible to make any specific correlation between the composition of some of these texts and earthquakes striking the Levant, but the clustering of Archaic Hebrew texts filled with trembling of nature imagery around the 12th and 11th centuries suggests a tantalizing linkage to two large earthquakes that struck the Levant. Until further refining of these texts or the dating of the earthquakes can be made, any cause and effect between quake and text remains a tantalizing mystery.

14. Kuntillet ʻAjrud

Moving away from the case study of Psalm 29, one other text that appears to mention earthquake imagery and is important to examine is a Levantine inscription from Kuntillet ʻAjrud. Portions of six lines were found written on plaster near the entrance to a long storeroom at the western end of the main building. The inscription, written in a Phoenician script but with language that is clearly Hebrew (for example, the use of the paragogic *nun* in *wymsn* and *wydkn*), in all likelihood fell from the doorjamb of the storeroom entrance.[102] Unfortunately, no picture or

[100] While there has been a greater scholarly push to flatten the different stages of Hebrew within the Hebrew Bible, arguments to do away with different strata remain inconsistent. Ian Young and Robert Rezetko have presented the strongest argument suggesting that linguistics cannot independently date biblical texts. See, Ian Young and Robert Rezetko, *Linguistic Dating of Biblical Texts Volume 1: An Introduction to Approaches and Problem*s (Bible World; Equinox, London, 2008); Ian Young, Robert Rezetko and M. Ehrensvärd, *Linguistic Dating of Biblical Texts Volume 2: A Survey of Scholarship, a New Synthesis and a Comprehensive Bibliography* (Bible World; Equinox, London, 2008). Robert Holmstedt and John Cook have supplied able critiques of Young's and Rezetko's work, see most recently, John Cook, "Detecting Development in Biblical Hebrew Using Diachronic Typology," in *Diachrony in Biblical Hebrew* (ed. C. Miller-Naudé and Z. Zevit; Winona Lake: Eisenbrauns, 2012); Robert E. Holmstedt, "Historical Linguistics and Biblical Hebrew Syntax: A Study in Method," in *Diachrony in Biblical Hebrew*, (ed. Z. Zevit and C. Miller-Naudé; Winona Lake: Eisenbrauns, 2012).

[101] Another interesting idea is the appearance of Zion theology around this time. The well-known article by J. J. M. Roberts overturned the previous view of a Jebusite, pre-Israelite origin that Israel then inherited. See, J. J. M. Roberts, "The Davidic Origin of the Zion Tradition," *JBL* 92 (1973): 329–344.

[102] See Zev Meshel, Kuntillet ʿAjrûd: A Religious Centre from the Time of the Judaean Monarchy on the Border of Sinai (Jerusalem: Israel Museum, 1978); Moshe Weinfeld, "Kuntillet ʿAjrûd Inscriptions and their Significance,"

drawing of this inscription has appeared though a number of small studies have still advanced our understanding of this inscription. The best-preserved lines from KAjr 15 read as follows:[103]

1.]*wbzrḥ .ʾl . br*[	]	In quaking and blazing light, El […]
2.]*wymsn hrm*[	]	Then mountains will melt [
3.]*wydkn gbnm* [	]	those with many peaks will be crushed [
5.]*lbrk bʿl bym mlḥ[mh*	]	for the blessed one of Baal[104] on the day of the bat[tle
6.]*lšm ʾl bym mlḥ[mh*	]	for the name of El on the day of batt[le

The connections between the inscription and theophany texts are numerous through words such as *zrh* (Deut 33:2; Isa 60:2) and *wysmn* (Psa 97:5). Mountains melting and then being crushed are contained in the imagery linking God as a Divine Warrior with the trembling of nature. Seth Sanders, in his probing book, *The Invention of Hebrew*, argues that texts like Kuntillet Ajrud find their first public display on the walls of shrines, located on Iron Age pilgrimage routes and occupy a non-royal, non-monumental space.[105] Sanders connects this text with the Deir Alla inscription and in his view, these two texts show what an authority independent of the state might look like.

Sanders's point raises important questions about how the message of Amos can be understood more fully through the lens of Kuntillet Ajrud. In sum, Kuntillet Ajrud's text, written around 800 BCE, and found in the northeast part of the Sinai Peninsula alongside a trade route,

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SEL 1 (1984): 121-28; Zev Meshel "Kuntillet ʿAjrûd," *ABD* 4:103–109; "Kuntillet ʿAjrûd," translated by P. K. McCarter (COS 2.47:173); F. W. Dobbs-Allsopp, J. J. M. Roberts, C. L. Seow, and R. E. Whitaker, *Hebrew Inscriptions: With Texts from the Biblical Period of the Monarchy with Concordance* (New Haven: Yale University Press, 2004), 234–236.

[103] The epigraphic reading follows Shmuel Ahituv, *ha-Ketav ṿeha-mikhtav : asupat ketovot me-Erets Yiśra'el umi-mamlekhot 'ever ha-Yarden mi-yeme Bayit-Rishon* (Jerusalem: Mosad Byalik, 2005), 242–244 and the translation follows Seth L. Sanders, *The Invention of Hebrew* (Chicago, University of Illinois, 2009), 142. Line four is omitted due to its difficult reading. For one suggested reading of line four, see Dobbs-Allsopp et al., *Hebrew Inscriptions*, 234.

[104] In agreement with McCarter, the Israelite character of the inscription suggests that Baal is an epithet of the god of Israel as opposed to the name of a Phoenician or Canaanite god.

[105] Sanders, *The Invention of Hebrew*, 142.

reminded traveler's of "divine violence, for or against people" through divine judgment.[106] This judgment would manifest itself through earthquakes and storms, though as research in paleoseismology has shown, following a quake around 1050 BCE, the Levant went through a long lull in earthquakes, until 760 BCE. Thus, though threatening divine violence appears to have been part of the prophetic arsenal, the warnings functioned like a ticking time bomb that refused to go off. This would all change within roughly forty to fifty years of the Kuntillet Ajrud inscription as the message of the prophet Amos would explode on the scene combining prophetic warning with stunning results and outside of a king's control.

15. Conclusion

The relationship between tectonic environment and human activity has a long history that only recently has begun to be investigated. The role between tectonics and prehistoric civilization, as necessary partners in the movement from the Great Rift Valley, into the Levant, and ultimately resulting in the emergence of civilization in the Fertile Crescent is now in the crosshairs of scholarly attention. Regardless of whether a cause and effect relationship exists between tectonics and where humans first settled, Ancient Near Eastern texts bear witness to the seismic activity or inactivity of their geographic location. This location, perhaps better termed seismic geography, is seen clearly in the witness of Assyrian texts that record earthquakes while Babylonian texts remain silent. Earthquake imagery, whether preserved as faint echoes in ancient texts, in some cases merged with storm imagery, or in other cases stood on its own, but identifying earthquake imagery in ancient texts deserves greater scrutiny. At the same time, the geographic locations and their close relation to, or lack thereof, of earthquake imagery, suggests that along with environmental constraints such as rainfall versus irrigation, seismic geography also can be tracked through textual archives and locations.

[106] Sanders, *The Invention of Hebrew*, 142.

Theophany texts such as Psalm 29 were composed in an environment where far more than storms were at play. Paleoseismic evidence of large quakes around 1100 BCE and 1050 BCE raise intriguing but unresolved questions to how these environmental and geological factors could have played a role in the composition of Archaic Hebrew texts. The environmental and geological context of the Eastern Mediterranean raises interpretive options of earthquake and tsunami echoes in texts that, for example, these same echoes cannot be posited for Babylonian texts. This is important to consider not only because Levantine texts were composed in an area with such phenomena, but also because earthquakes and tsunamis were and are in themselves, phenomenon. That is to say, thunderstorms were certainly the most common terrestrial phenomenon, but they certainly would have been overshadowed by the rarer and far more powerful phenomenon of earthquakes or tsunamis.

Last, the discovery of the Kuntillet Ajrud 15 suggests that outside of royal authority, prophetic activity included messages about divine messages that no royal administration could stop. This is seen clearly at Kuntillet Ajrud where divine violence through earthquake and storms, for or against people, as well as an impending battle is promised. The relevance of this prophetic warning becomes much more profound when a half century later another prophet named Amos will operate outside of existing administrative structure and tie his prophetic work to the threat of an earthquake. Unpacking the implications of Amos's prophetic activity will await chapters five and six, but the next chapter will move from earthquake imagery into historical references to earthquakes in Assyrian sources.

Chapter Three: Records of Earthquakes in Assyrian Texts

1. Introduction: Assessing What is Found and What is Lost

While the previous chapter focused on earthquake imagery and how environmental and geological location could have influenced the inclusion or absence of earthquake imagery, this chapter will examine specific records of Middle and Neo-Assyrian earthquakes. The quakes cluster around two periods: a centuries' span during the later Middle Assyrian period and a fifty-year period within the Neo-Assyrian period. This dense clustering certainly obscures a fuller picture of when other earthquakes may have struck Assyria but it provides a chance to look for scribal or textual influence in how earthquakes were recounted as actual events. Since the Assyrian texts in the Middle and Neo-Assyrian periods all deal in some way with the king, either as Middle Assyrian building inscriptions written on behalf of the king or Neo-Assyrian letters sent to the king from his royal scribes, the texts invite further scrutiny to see if there is any distortion in the events presented.

Carefully weighing the value of historical records for earthquakes, independent of any archaeological finds, is an important methodological step to avoid circular reasoning in quantifying ancient earthquakes. John Rucker and Tina Niemi cogently explain the problem of circular reasoning where sources are used to build on each other without a proper foundation.[1] Here, the problem shows itself where an archaeologist finds a destruction layer and interprets it as evidence of an earthquake, the archaeologist then uses an earthquake catalog to provide a date to the destruction, then, the historical seismologist adds this site to the catalogue of cities damaged by the quake. This cycle of circular reasoning is dangerous because of its historiographical implications. Even though historical records are the most straightforward

[1] John D. Rucker and Tina M. Niemi, "Historical Earthquake Catalogues and Archaeological Data: Achieving Synthesis without Circular Reasoning," in *Ancient Earthquakes* (GSASP 471; Geological Society of America: Boulder, 2010), 97–106.

source (the four sources Rucker and Niemi list are historical texts, epigraphy, archaeology, and geology) considerations of misinformation whether accidental or deliberate, omission, or exaggeration must be taken into account. Ruck and Niemi provide an excellent explanation of the issues at stake in historical seismicity and it is worth quoting them at length:[2]

> Some problems specific to historical seismicity are: There is considerable bias towards regions of denser population and earthquakes of greater magnitude. That is, earthquakes of greater magnitude and/or occurring in areas of denser populations are much more likely to enter the historic record. Also, there is a tendency toward amalgamation of earthquakes for which the occurrences were closely spaced in time. This is due both to the limitations of ancient knowledge and the vagaries of preservation and copying amongst historic texts. When we consider the widely spaced geographic locations of ancient sources, it is not surprising that moderate earthquake with smaller felt areas, though possible quite severe in their local effects, might escape the notice of a distance chronicler entirely. Earthquake catalogues are collections of dates and reports of the effects of earthquakes as recorded from written records. Most catalogues are thought to be complete for major M>7 earthquake but may be silent on less severe or less widespread earthquakes.

While Rucker and Niemi succinctly raise a number of issues, the recent work by Emanuela Guidoboni and John Ebel, *Earthquakes and Tsunamis in the Past: A Guide to Techniques in Historical Seismology* is an important contribution to the field.[3] Guidoboni and Ebel painstakingly detail advances in historical seismology research as well as situate this discipline within other methods that study ancient earthquakes. One drawback to their work is that they focus on earthquakes in the Greek and later time periods and there is little if any interaction with Ancient Near Eastern or Levantine sources.[4] Thus, in studying the Assyrian sources in this

[2] Rucker and Niemi, "Historical Earthquake Catalogues," 98.

[3] Emanuela Guidoboni and John E. Ebel, *Earthquakes and Tsunamis in the Past: A Guide to Techniques in Historical Seismology* (Cambridge: Cambridge University Press, 2009). Guidoboni and Ebel divide their book into three parts: defining historical seismology, issues concerning the interpretation of historical earthquakes (and tsunami data), and practical guidelines for the analysis of historical earthquake data.

[4] As pointed out in the first chapter, two recent works have focused on the use of historical sources in the Levant. Amos Salamon, "Patterns of Seismic Sequences in the Levant—Interpretation of Historical Seismicity," *JS* 14 (2010): 339–367, calls attention to a number of earlier studies that have evaluated Levantine sources for their accuracy and have found the sources while Iaakov Karcz, "Implications of Some Early Jewish Sources for Estimates

chapter, careful methodological consideration will be given to these texts and how the available methodology from historical seismology can be applied, adapted, or ignored when using it with Assyrian earthquakes.

2. Middle Assyrian Earthquakes and Royal Monumental Inscriptions

Records of Middle Assyrian earthquakes are all found in royal building inscriptions though little attention has been focused on this type of genre and even less attention has been given to the references to earthquakes within these inscriptions. An exhaustive history of scholarship behind royal inscriptions is beyond the scope of this chapter but a few studies should be emphasized. Beyond the early flurry of studies completed by Weber, Olmstead, Mowinckel and Baumgartner,[5] A. Kirk Grayson detailed the last 100 years of scholarship on Assyrian and Babylonian inscriptions, devoting several pages to scholarship on Assyrian royal inscriptions.[6] At the time of Grayson's article, he lamented that there never has been a comprehensive analysis of Assyrian and Babylonian royal inscriptions and unfortunately, this problem continues to this day.

Within Assyrian inscriptions, Grayson has categorized four main types: commemorative texts, labels, dedicatory texts, and letters to the gods. Both Middle Assyrian earthquake

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of Earthquake Hazard in the Holy Land," *AG* 47 (2004): 759–792, presents an extremely dour view of the quality of Levantine sources for ancient earthquakes.

[5] Otto Weber, *Die Literatur der Babylonier und Assyrer ein Überlick* (Leipzig: J. C. Hinrichs, 1907), 198–241; A. T. E. Olmstead, "Assyrian Historiography," *The University of Missouri Studies*, Social Science Series III/1 (Columbia: Missouri, 1916); Sigmund Mowinckel's 1923 study, "Die vorderasiatischen Königs- und Fürsteninschriften: Eine stilistische Studie" in *Eucharisterion: Gunkel zum 60* (FRLANT 19; ed. H. Schmidt; Göttingen: Vendenhoeck & Ruprecht, 1923), 278–322, brought royal inscriptions into conversation with biblical texts while addressing the style of royal inscriptions. Mowinckel's study demonstrated form-critical observations such as the Sumerian, Babylonian, and Assyrian royal inscriptions belonged to one literary genre but his study had a number of drawbacks, chief among them was the limited number of inscriptions used which skewed several of his conclusions. A number of these issues were addressed by W. Baumgartner, "Zur Form der Assyrischen Königsinschriften," *OLZ* 27 (1924): 314–318. See also, W. Baumgartner, "Untersuchungen zu den akkadischen Bauausdrücken," *ZA* 36 (1925): 29–40, 123–138, 219–253.

[6] A. K. Grayson, "History and Historians of the Ancient Near East: Assyria and Babylonia," *Orientalia* 49 (1980): 140–194.

references come from building inscriptions, which Grayson argues that Assyrian scribes were conservative in their writing and only a few major innovations developed.[7] Grayson further notes that, "[t]he literary typology of these inscriptions was established by the Sumerians and the later Assyrians and Babylonians followed faithfully the basic styles."[8] Though formulaic expressions in inscriptions have a long history, even with the conservative approach taken by scribes there are still detectable changes in inscriptions over time. In this regard, Kyle Greenwood's article, "The Hearing Gods of the Assyrian Royal Inscriptions" provides one example of how a close reading of the curse and blessing formulae in Assyrian royal inscriptions shows a "systematic and purposeful theological rationale…"[9] Greenwood's successful demonstration of intentional scribal changes invites more close readings of Middle Assyrian royal inscriptions for ways that scribes were intentional in their writing.

Along these same lines, one final comment is needed to address the historiographical sentiment that Assyrian inscriptions are difficult to use to reconstruct history because of exaggeration. For example, William Hallo noted that the formulaic inscriptions led to, "stereotyped phrases, wild exaggerations, and progressive distortions" while Hayim Tadmor wrote, "The Assyrian Royal inscriptions being by their very nature official documents of self-

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[7] A. K. Grayson, "Assyrian Royal Inscriptions: Literary Characteristics," in *Assyrian Royal Inscriptions: New Horizons in Literary, Ideological, and Historical Analysis* (OAC 27; ed. F. M. Fales; Instituto per l'Oriente, Centro per le Antichitè e la Storia dell'Arte del Vicino Oriente: Roma, 1981), 35–47. For an overview of the different types of inscriptions see, Sandra L. Richter, *The Deuteronomistic History and the Name Theology* (BZAW 318; Berlin: Walter de Gruyter, 2002), 136–153. W. Baumgartner, "Untersuchungen zu den akkadischen Bauausdrücken," *ZA* 36 (1925): 29–40, 123–138, 219–253; William W. Hallo, "Royal Inscriptions of the Early Old Babylonian Period: A Bibliography" *BiOr* 18 (1961): 4–14; William W. Hallo, "The Royal Inscriptions of Ur: A Typology," *HUCA* 33 (1962): 1–43; Edmond Sollberger and Jean-Rober Kupper, *Inscriptions Royales Sumériennes et Akkadiennes* (Pares: Les Éditions du Cerf, 1971).

[8] Albert Kirk Grayson, *Assyrian Royal Inscriptions* (2 vols.; Wiesbaden: Otto Harrassowitz, 1972), 1:IX–XXII.

[9] Kyle R. Greenwood, "The Hearing Gods of the Assyrian Royal Inscriptions," *JANER* 10 (2010): 211–218. Greenwood's article builds upon his dissertation, "Then Aššur Will Hear His Prayers: A Study of Middle Assyrian Royal Theology" (Ph.D. diss., Hebrew Union College–Jewish Institute of Religion, 2008).

praise, demand from the historian a judicious critical approach."[10] Though this is a concern, it should not paralyze study of these texts.[11] On the one hand, it is not enough that a temple or palace was repaired but that temples and palaces are built taller and larger than before and their foundations laid deeper.[12] On the other hand, Grayson argues that Assyrian—and Babylonian—royal inscriptions "contain reasonably accurate records of building activities, a fact which is again supported by archaeological excavations."[13] Record of military achievements are much more prone to sins of omission and exaggeration, while building inscriptions are more restrictive in the details they provide and contain fewer opportunities that can be exploited for a king's advantage. Also, the propensity for exaggeration becomes greater in the Neo-Assyrian period as the Neo-Assyrian propaganda machine will reach its apex. At the same time, the implications of where hyperbole and simile may be found in the inscriptions, and especially how it impacts discussion about earthquakes, will be explored when relevant.

3. Shalmaneser I and the First Record of an Historic Quake

The first unequivocal record of an earthquake in the ancient world dates to the reign of Shalmaneser I (1274–1245 BCE)[14] and describes how he restored the temple of Ishtar that had

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[10] William W. Hallo, "New Viewpoints on Cuneiform Literature," *IEJ* 12 (1962): 13–26; Hayim Tadmor, "History and Ideology in the Assyrian Royal Inscriptions" in *Assyrian Royal Inscriptions: New Horizons in Literary, Ideological, and Historical Analysis* (Papers of a Symposium held in Cetona (Sienna) June 26-27, 1980; ed. F. M. Fales; Rome: Isitituto Per L'Oriente, 1981), 13–33.

[11] For a criticism of modern scholars assuming exagerrations in king reports, see Aage Westenholz, "Assyriologists, Ancient and Modern, on Naramsin and Sharkalisharii," in *Assyriologica et Semitica – Festschrift für Joachim Oelsner anlasslich seines 65, Geburtstages am 18 Februar 1997* (AOAT 252; ed. J. Marzahn; Münster, Ugarit-Verlag, 2000), 545–556.

[12] Grayson, *Literary Characteristics*, 44–45.

[13] Grayson, *Literary Characteristics*, 44–45.

[14] All Assyrian king dates, where available, follow the Middle Chronology. For the dates see, Marc Van De Mieroop, *History of the Ancient Near East* (2d ed.; Oxford: Blackwell, 2007), 315–316. The second Middle Assyrian quake occurred during Ashur Dan I's reign and is found in building texts of Assur-resh-isi I (Grayson, *RIMA I*, 311).

been destroyed in an earthquake.[15] Twenty wall pegs preserve some portion of text, though no peg preserves the inscription in its entirety. The inscription is thirteen lines in length, but because all the pegs are fragmentary there is still uncertainty regarding the exact translation. The term "wall peg" is based on the translation of the Assyrian word *sikkatu* (*zikkatu, ziqqatu*), which is translated by the *Chicago Assyrian Dictionary* as "peg, nail, (part of a lock), foundation cone, pyramid, pinnacle, plowshare, or pock."[16] Veysel Donbaz and A. Kirk Grayson note that "clay cone" is an inadequate translation of the original Assyrian, describing the object as follows: "It is a hollow, oblong conical object, which is tapered almost to a point at one end and bears a large semi-spherical head at the other end."[17] The cone has its origins in Sumerian and Babylonian culture, as they are well attested in the third millennium and in the Old Babylonian period.[18] They are found in all three periods of Assyrian history and while their purpose is debated, it

[15] Prior to this explicit reference, scholars have tried to link the destruction of Sodom and Gomorrah as well as the collapse of Jericho's walls to earthquake damage. The location of Sodom and Gomorroah is not certain, though they are located somewhere in the Dead Sea fault zone. The difficult stratigraphy of Jericho prevents a clear connection between destruction and an earthquake. Kathleen M. Kenyon, *Excavations at Jericho III: The Architecture and Stratigraphy of the Tell* (London: British School of Archaeology in Jerusalem, 1981), suggested three layers which might contain evidence of earthquakes: 8500-7500 BC (stratum PPNB), 3400-3100 BC (stratum EB 1), and 2300-1950 BC (stratum EBA IIB). See the discussion on the merits of earthquake damage related to Joshua's account in Ambraseys, *Earthquakes in the Mediterranean*, 65–67; T. M. Niemi and Z. Ben-Avraham, *"Evidence for Jericho Earthquakes from Slumped Sediments* of the Jordan River Delta in the Dead Sea," *Geology* 22 (1994): 395–398; Barbara J. Siversten, *The Parting of the Sea: How Volcanoes, Earthquakes, and Plagues Shaped the Story of the Exodus* (Princeton: Princeton University Press, 2009), 93–102. For a helpful essay on temple building, see, Jamie Novotny, "Temple Building in Assyria: Evidence from Royal Inscriptions," in *From the Foundations to the Crenellations: Essays on Temple Building in the Ancient Near East and Hebrew Bible* (AOAT 366; ed. M. J. Boda and J. Novotny; Münster: Ugarit-Verlag, 2010), 109–139.

[16] "*sikkatu*," *CAD*, 15:247–251.

[17] Veysel Donbaz and A. Kirk Grayson, *Royal Inscriptions on Clay Cones from Ashur now in Istanbul* (RIMA Supp. 1; Toronto: University of Toronto, 1984), 1. For a chronological diagram of the forms see, Walter Andrae, *Coloured Ceramics from Ashur and Earlier Ancient Assyrian Wall-Paintings (From Photographs and Water-Colours by Members of the Ashur Expedition Organised by the Deutsche Orient-Gesellschaft* (London: Kegan Paul, Trench, Trubner & Co., 1925), 64. The work by Richard S. Ellis, *Foundation Deposits in Ancient Mesopotamia* (New Haven: Yale University, 1968), devotes two chapters (three and five) to wall pegs, but focuses on Babylonia exemplars.

[18] Donbaz and Grayson, *Royal Inscriptions on Clay Cones*, 2.

appears that they were built or driven into walls as part of the dedication ritual of important structures.[19]

The twenty fragments of wall peg from the reign of Shalmaneser I have been found at Ishtar's temple in Nineveh as well as Ashurnasipal's palace and other locations in Nineveh.[20] The text begins with a five-line introduction tracing Shalmaneser's lineage to his father Adad-narari (I) (1305-1274 BCE) and grandfather Arik-din-ili (1317-1306 BCE). It also lauds Shalmaneser mentioning how he conquered foreign lands and defeated his foes. Following this introduction, the text then commemorates the reason for these wall pegs (lines 6–9):[21]

⌜e⌝- nu-ma É ^{d}iš$_{8}$-tár ⌜NIN⌝-at	At that time the temple of the goddess Ishtar,
URU ⌜ni⌝-na-a	
NIN-ia [ša ina p]a-na	mistress of Nineveh, my mistress, [which]
^{md}UTU-ši-^{d}IŠKUR LUGAL	Samsi-Adad (I), the king,
	my predecessor, had previously built
a-lik [p]a-ni-ia e-pu-šu e-na-[ḫu EG]IR-	(and which, when) it became dilapidated,
šu ^{md}a-šur-TI.LA ⌜a⌝-bi ud-di-šu É šu-ú i-na	Assur-uballit (I), my forefather, later
	restored – that temple had been damaged
ri-i-be	in an earthquake
e-na-[a]ḫ-ma iḫ-ṭa-bi-it [a-n]a si-ḫír-ti-šu	and was in ruin. [I cleared away] (the debris) entirely
[unekkir] an-ša-ti-šu ak-šèr ù ma-aq-ta iš-tu	and reconstructed its weakened portions.
uš-ši-šu a-di	I rebuilt the fallen sections from top to bottom.
gaba-dib-⌜bi⌝-šu e-pu-uš ⌜ti⌝-[mmennī ša	I restored (and) returned to their places the clay inscriptions
^{md}a-šur-TI.[LA ud-d]i-iš a-na aš-ri-šu-nu-ma	[of] Assur-uballit (I) and deposited
ú-ter ⌜ù ti⌝-me-ni-ia aš-ku-un	my clay inscriptions.

[19] For a clear and in-depth overview of the history of wall pegs, see Richter, *The Deuteronomistic History,* 148–153.

[20] For a full list of locations see, Grayson, *RIMA I*, 205.

[21] All Middle Assyrian texts are based on Grayson's reconstructions in *RIMA I*. See Grayson, *RIMA I*, 206, for a list of editions, copies, and studies of this text. For this text, only two studies have been completed, D. D. Luckenbill, "Notes on the Assyrian Historical Texts," *AJSL* 43 (1927): 208–225, esp. 217 and Rykle Borger, *Handbuch der Keilschriftliteratur* (3 vols.; Berlin: de Gruyter, 1967–1975), 2:20; Ambraseys, *Earthquakes in the Mediterranean*, 67.

The body of the text first mentions Shamshi-Adad I (ca. 1808-1776 BCE), the great ruler who unified Northern Mesopotamia, bringing with him foreign and Sumero-Babylonian customs and altering the style and content of royal inscriptions.[22] Fragments from stone cylinders at Ishtar's temple in Nineveh, composed during the reign of Shamshi-Adad I comprise the first reference in Assyrian sources for the kingly duty of fixing dilapidated temples. Lines 3:11–4:1 from the stone cylinder read, "In the future when the temple becomes old, when Ekituškuga[23] which I built has become dilapidated, and the king whom the god Enlil appoints restores (it): May he not remove my monumental inscriptions and clay inscriptions but restore them to their places as I did not remove the monumental inscriptions of Man-ištūšu."[24] Shamshi-Adad's text would set a precedent for future kings that restoring the temple is part of the required kingly duties just as Shamshi-Adad once restored ("built" in Shalmaneser's inscription) the temple which Man-ištūšu (2269–2255 BCE) first built five centuries earlier.[25] The inscription then notes the restoration work completed by Assur-uballit (I) (1363–1328 BCE) who reigned 100 years prior to Shalmaneser (1273–1244 BCE) and dutifully restored the temple. Shalmaneser I mentions the restoration work of Assur-uballit (I) but skips over Enlil-nirari, Arik-den-ili, and Adad-nirari I,

[22] See the inscriptions in Grayson, *RIMA I*, 47–78; for a summary of Shamshi-Adad I's reign, see Marc Van De Mieroop, *History of the Ancient Near East* (2d ed.; Oxford: Blackwell, 2007), 106–111; Pierre Villard, "Shamshi-Adad and Sons," *CANE* 2:873–883.

[23] Ekituškuga means "her treasure house" and refers to Ishtar's temple, see 2:1–20 of the same text.

[24] Grayson, *RIMA I*, 54.

[25] Man-ištūšu was one of two sons of Sargon, the great founder of Agade. For the little information we know about Man-ištūšu see, Hans J. Nissen, *The Early History of the Ancient Near East, 9000-2000 B.C.* (Chicago: University of Chicago, 1988), 169. There remains debate over whether Man-ištūšu ever had a presence in Assur.

an omission that is likely intentional in order to link him to the strong leadership of Assur-uballit (I).[26]

The text then focuses on Shalmaneser's temple repair that are due to an earthquake: *É šu-ú i-na ri-i-be e-na-[a]ḫ-ma iḫ-ṭa-bi-it* "that temple had been damaged in an earthquake and was in ruin." Since our knowledge of this quake comes from wall pegs of a building inscription, the genre of the wall peg curtails an explanation of when the quake struck or what else might have been damaged. The only information provided is that Shalmaneser first moved debris, reconstructed the fallen portions, rebuilt the fallen sections and finally returned the clay inscriptions of Assur-uballit to their place before adding his clay inscriptions as well. The detail provided in the wall pegs, as will be seen below, is unfortunately formulaic and not specific to Shalmaneser's actual response to the quake.

A second and closely related wall peg text also attests to the reconstruction of Ishtar's temple due to an earthquake and likely refers to the same earthquake. The text begins with six lines of introduction, this time expanding on Shalmaneser's role as king of all people, overseer of Ekur (Enlil's temple at Nippur) and his conquest over the mountains and enemies. He again mentions his father Adad-narari and grandfather Arik-din-ili in the introduction before moving into the body of the text. It reads as follows:[27]

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[26] Kuhrt, *The Ancient Near East*, 1: 348–349 argues that between the reigns of Ishme-Dagan (1775-1741? BCE) and Assur-uballit (1363–1328 BCE) there was a sort of "dark age." What is clear is that Assur-uballit took advantage of the political chaos of the Hittite invasion into Mitanni as well as the assassination of the Mitannian king, Tushratta. This enabled Assur-uballit to assert his independence and expand the Assyrian empire east. Assur-uballit would take the title "king of the universe" in royal inscriptions. Following his reign, Enlil-nirari, Arik-din-ili, and Adad-nirari I all held the ground the Assur-uballit had taken, it was not until Shalmaneser's reign that Assyrian control of Upper Mesopotamia was tightened. See the fuller explanation in Kuhrt, *The Ancient Near East*, 1: 348–355.

[27] See Grayson, *RIMA I*, 208, for a list of editions, copies, and studies of this text. For this text, only two studies have been completed, Riekele Borger, *Einleitung in die Assyrischen Königsinschriften, Erster Teil: Das zweite Jahrtausend v. Chr.* (Leiden: Brill, 1961), 59 n.1, 62 n.2, 63 n.1, 69 n.3, provides brief comments about the text noting the later earthquake inscription of Ashur-resha-ishi I (62), "In Nr. 10 und 11 (aus dem Istar-Tempel von Ninive) wird als Grund des Verfalls ein Erdbeben genannt, ein Missgeschick, das diesen Temple auch spatter noch

e-liš ù š[ap-liš mār adad-ÉRIN]. TÁḪ šá-ak-ni *^{d}AB [ŠI]D aš-šur A GID-DI-DINGIR šá-ak-ni* *^{d}AB ŠID aš-šur-ma e-nu-ma* *É ^{d}INANNA NIN ˹URU˺ ni-n[a]-a NIN-ia BÀD ù* *s[i-qur]-˹ra-tu˺ i[na ri]-˹i˺-bi e-na-ḫu-ma iḫ-* *ṭab-tu si-qur-ta-ta* *ša-a-ti iš-tu ˹uš˺-š[e-ša adi g]aba-dib-bi-<ša>* *e-˹pu˺-u[š…^{d}INANN]A NIN-ia an-šu-su-nu ú-* *Iné-kir$_6$ ma-aq-ta* *iš-tu uš-še-˹šu˺ a-˹di gaba dib-bi-šu e˺-pu-uš* *KÁ X […] X ˹e˺-pu-uš na-re-ia u ti-me-ni-i* *aš-ku-un*	At that time the temple of the goddess Istar, mistress of Nineveh, my mistress – (its) wall and ziqqurrat had been damaged in an earthquake and were in ruin. I rebuilt that ziqqurrat from top to bottom. [The wall and gate of the temple of the goddess Ista]r, my mistress – cleared away their debris (and) rebuilt the ruined sections from top to bottom. The gate [of the temple of the goddess Istar] I rebuilt. I deposited my monumental inscription and clay inscriptions.

This text, found among five different fragments provides more detail than the previous text regarding earthquake damage. Here, the wall, ziqqurat and the gate (of Ishtar's temple) suffer heavy damage but it is unclear why there is a fuller account of the damage here than in the previous text. While the discrepancy remains unknown, it is possible to compare the formulaic language of building inscriptions that predate these texts to see where else buildings are repaired and what language is used to describe their repair.

First, other texts from Shalmaneser's reign have similarities in language about the dilapidation and repair of buildings. Shalmaneser I's longest inscription inscribed on stone tablets details a number of military victories. The final section before the conclusion discusses a fire that destroyed, "The temple, its sanctuary, the chapels, shrines, daises, cult platforms, stools, all the property of the temple of Aššur, my lord, burnt in the fire."[28] The text next says, "At that time, I cleared away (the debris of) that temple entirely (and) removed the dirt down to the

einmal treffen sollte (siehe die grosse Inschrift von Assur-res-isi I., unten VIII g, aus welcher Inschrift auch hervorgeht, dass dieses erste Erdbeben unter der Regierung des Königs selbst stattfand)"; W. G. Lambert and Alan R. Millard, *Catalogue of the Cuneiform Tablets in the Kouyunjik Collection of the British Museum, Second Supplement* (London: British Museum, 1968), 27, 61. Grayson also cites an article from Albert Schott in *Orientalistische Literaturzeitung* 33 (1930): 886-887 but there is no such entry in *OLZ* 33. Ambraseys**,** *Earthquakes in the Mediterranean*, 67, is not aware of this text.

[28] Grayson, *RIMA I*, 185.

bottom of the foundation pit. I laid its foundation in bedrock like the base of a mountain."[29] A second text, found on sixty-seven clay cones from Aššur again notes that a fire destroyed the temple and its sanctuary. The text states, "I cleared away (the debris of) that temple entirely down to the bottom of the foundation pit. I laid its foundation like the base of a mountain. As an addition I built two towers which had not been built before."[30] Two more inscriptions, this time on stone tablets rather than clay cones also detail how Aššur's temple was destroyed and Shalmaneser rebuilt it by clearing away debris, removing dirt to the foundation pit, and then laying its foundation.[31] There are only minor differences between these texts's descriptions of the aftermath of a fire at Aššur's temple and how Shalmaneser I rebuilt it.

In addition to texts that link a fire at Aššur's temple's temple to rebuilding, other texts from Shalmaneser's reign use similar language to describe repairing other buildings. A text on a tablet briefly notes how Shalmaneser rebuilt from top to bottom the temple of Ninuaittu and a stone tablet describes how the ruler, when faced with the dilapidated state of a gate at Aššur "cleared away its debris, reconstructed the weakened portions, and rebuilt the ruined section from top to bottom."[32] Not only was Shalmaneser's attention on shrine buildings, but he also addressed the palace complex at Aššur, where he cleared away the debris and rebuilt it from top to bottom.[33]

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[29] Grayson, *RIMA I*, 185.

[30] Grayson, *RIMA I*, 189.

[31] See Grayson, *RIMA I*, 189–195.

[32] Grayson, *RIMA I*, 198.

[33] Grayson, *RIMA I*, 199.

Comparing language found in earthquake texts against other inscriptions of Shalmaneser demonstrates that these texts employ formulaic language, and it is not possible to uncover historical information about earthquake damage. If one examines inscriptions earlier than Shalmaneser I, formulaic language of repairing dilapidated buildings is a near constant in every ruler's inscriptions. At the same time, however, innovations by royal scribes, especially by those under Adad-narari I, influenced aspects of Shalmaneser's inscriptions.[34] Grayson illustrates that royal scribal production significantly increased both in the detail given to inscriptions, most notably military accounts, as well as the overall number of royal inscriptions during Adad-narari I's reign. This increase in quantity affected scribal quality during Shalmaneser I and Tukulti-Ninurta I's (1243–1207 BCE) reigns, as in the words of A. K. Grayson, it "led them to take shortcuts."[35] These shortcuts are seen through using the same introductions and conclusions as well as limiting the locations where building inscriptions were used.

4. Text of Ashur-resha-ishi I Describing an Earthquake

Another clay cone inscription from Nineveh during the reign of Ashur-resha-ishi I (1132-1115 BCE) both references the earthquake that struck during the reign of Shalmaneser I as well as mentions a second earthquake that struck during the rule of Ashur-Dan I (1178–1133 BCE). In contrast to the royal building inscriptions of Shalmaneser I, Ashur-resha-ishi I does not mention his father or grandfather and instead spends the first seven lines lavishing praise on himself. The

[34] Grayson, *RIMA I*, 128, suggests that the development in royal inscriptions during the reign of Adad-narari I is roughly comparable to the reigns of Shamshi-Adad I (1808–1776 BCE) and Tiglath-pileser I (1114–1076 BCE).

[35] Grayson, *RIMA I*, 128. Though there are no records of earthquakes during the reign of Tikulti-Ninurta I, he describes his conquering of five fortified cities of the land Katmuḫu as, "Like an earthquake I shook their shrines." This comparison to an earthquake is the only simile in Middle Assyrian texts that uses an earthquake. For the rest of the inscription, which is the most detailed royal Assyrian inscription to date, see Grayson, *RIMA I*, 235–236.

inscription then moves to discuss the earthquake damage. Twenty-nine clay cones at Nineveh have some portion of text with the relevant portion quoted here:[36]

e-nu-ma na-mé-ru šá
KÁ GAL-*te ša* S[AG(?)*nēšē*.M]E*Š šà*
ki-KISAL.MAḪ
šá É ^{d}*iš$_{8}$- tár šá*
URU [ninua] NIN-*ia*
ša i-na
maḫ-ra i-na tar-ṣi ^{md}*šùl-ma-nu*-SAG [MA]N
KUR *aš-šur i-na ri-i-be e-nu-ḫu* ^{md}*šùl-ma-nu*-
SAG MAN *a-lik pa-ni-ia an-ḫu-su-nu ud-di-šu*
šá-nu-te-šu i-na ri-i-bi šá i-[*na tarṣi aššur-*
d]*an* [*šar* K]UR *aš-šur ba-nu-ú a-bi-ia i-ru-bu*
na-mé-[*ru šá-t*]*u-nu i-nu-šu-ma e-nu-ḫu iš-tu*
gaba-dib-bi-šu-nu a-di ÙR É 15(?) *ti-ip-ki an-*
ḫu-te lu uḫ-si-ip
i-na ri-be šá i-n[*a*] *tar-ṣi* ^{m}*aš-šur-dan ba-nu*
˹*ú*˺ *[abīia] i-ru-bu-ma e-nu-ḫ*[*u*(?)-*ma*(?]
i-nu-šu iš-tu ˹*gaba-dib-bi-šu*˺*-nu a-di* ÙR ˹É˺
[15 *tipkī ma*]*ḫ*(?)-*ru-te lu uḫ-si-ip lu ú-še-ri-da*
50 *ti-ip-ki lu ul-li* 35 *ti-ip-ki a-na maḫ-ru-te*
lu ut-ter ia-e-ri ša [N]A$_{4}$.MEŠ *lu u*[*l*(?)-*m*]*i-šu-*
nu-ti

At that time the towers of the great gate at the front of [the (monumental) lions] in the main forecourt of the temple of the goddess Ishtar of [Nineveh], my mistress –(the towers) which previously, at the time of Shalmaneser I, king of Assyria, had been damaged in an earthquake (and) which Shalmaneser I, a king who preceded me, restored; a second time they were shaken by an earthquake at [the time of Assur-d]an I [king] of Assyria, my grandfather, those towers had been weakened and become dilapidated. (In the section) from the battlements to the roof of the temple I tore down *fifteen* [layers of brick] (and) [raised (this section) *fifty* [layers of brick] (thus) making it [*thirty]-five* layers of brick higher than before. I put stone rosettes all around them.

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[36] See Grayson, *RIMA I*, 311, for a list of editions, copies, and studies of this text. For this text, only three studies have been completed, Luckenbill, "Notes on the Assyrian Historical Texts," 220; Lambert and Millard, *Catalogue of the Cuneiform Tablets*, exs. 10-26, 29, Ambraseys, *Earthquakes in the Mediterranean*, 67–68. A shortened version of this text is also found at Nineveh, see Grayson, *RIMA I*, 312–313:

A *mu-tàk-kil* ^{d}*nusku* ŠID *aš-šur* A *aš-šur-dan*
ŠID *aš-šur-ma e-nu-ma na-mé-ru šá* KÁ GAL-*te*
šá SAG UR.MAḪ *šá ki-*˹KISAL˺.MAḪ *šá* É [^{d}*i*]*s$_{8}$-*
tár šá URU.NI[NA NI]N-*ia*
i-na ri-be šá i-n[*a*] *tar-ṣi* ^{m}*aš-šur-dan ba-nu*
˹*ú*˺ *[abīia] i-ru-bu-ma e-nu-ḫ*[*u*(?)-*ma*(?]
i-nu-šu iš-tu ˹*gaba-dib-bi-šu*˺*-nu a-di* ÙR ˹É˺
[15 *tipkī ma*]*ḫ*(?)-*ru-te lu uḫ-si-ip lu ú-še-ri-*
da
ti-ip-ki lu ul-li 35 *ti-ip-ki a-na maḫ-ru-te*
lu ut-ter ia-e-ri ša [N]A$_{4}$.MEŠ *lu u*[*l*(?)-*m*]*i-šu-*
nu-ti

At that time the towers of the great gate at the front of [the (monumental) lions] in the main forecourt of the temple of the goddess Ishtar of Nineveh, my mistress which had been shaken by an earthquake at the time of at the time of Assur-d]an (I), [my] grandfather - they had become dilapidated and weak. (In the section) from the battlements to the roof of the temple I tore down [fifteen] old [layers of brick] (thus) making it thirty-50 five layers of brick higher than before. (and) raised (this section) fifty layers of brick I put stone rosettes all round them.

The inscription's of Ashur-resha-ishi I provide greater detail about earthquakes than those of Shalmaneser I and the reference to a quake during the reign of Shalmaneser I (which was examined above) validates Shalmaneser's record that a quake occurred. Whereas Shalmaneser uses more formulaic language about general areas of destruction and repair such as, "[I cleared away] (the debris) entirely and reconstructed its weakened portions. I rebuilt the fallen sections from top to bottom" and in his other clay cone inscription notes that the wall and ziqqurrat had been damaged, for Ashur-resha-ishi I, conversely, it is the towers at the great gate in the main forecourt of the temple that had been damaged and more specifically, he notes the number of brick layers that he increased upon renovation. Along with the greater specificity of Ashur-resha-ishi I's inscriptions, his inscriptions fill a gap in the historical record. Following the reign of Tukulti-Ninurta I, there is a dearth of royal inscriptions for the next eighty years during the reigns of Assur-nadin-apli (1206-1203 BCE), Assur-nirari III (1202-1197 BCE), Enlil-kudurri-usru (1196-1192 BCE), Ninurta-apil-Ekur (1191-1179 BCE), and Assur-dan I (1178-1133 BCE). As Ashur-resha-ishi I stemmed the reversal in Assyrian fortunes through his campaings against the Assyrians, this is seen clearly through the explosion in royal inscriptions, which considering the dearth of inscriptions over the previous five rulers, makes his recollection of Shalmaneser I's quake even more impressive.[37] The greater details in Ashur-resha-ishi I's inscriptions as well as the historical recollection of Shalmaneser's quake both call for further study.

In Ashur-resha-ishi I's reference to earthquake damage that he repaired, he states that the quake struck during the reign of his grandfather, Ashur-dan I though he did not repair the damage. The Aramean threat that grew after the assassination of Tukulti-Ninurta I, the resulting disorganization of the Assyrians, where a rapid succession of three rulers—two of them his

[37] Ashur-resha-ishi I strengthened Assyria political and economically by warring against the Arameans and perhaps even some people groups in the Zagros. He called himself the "avenger of Assyria" and created a new royal center at Apku (modern Abu Maryam).

sons—suggests a violent rivalry, and the defeat of Enlil-kudurri-usur (1196–1192) created a political crisis for the Assyrians.[38]

Table 3.1: Assyrian Rulers in Tumult: Tukulti-Ninurta I through Assur-resha-ishi I

Ruler	Date (in BCE)
Tukulti-Ninurta I	(1243–1207)
Assur-nadin-apli	(1206–1203)
Assur-nirari III	(1202–1197)
Enlil-kudurri-usur	(1196–1192)
Ninurta-apil-Ekur	(1191–1179)
Assur-dan I	(1178–1133)
Ninurta-tukulti-Assur	
Mutakkil-Nuski	
Assur-resha-ishi I	(1132–1076)

Though Assur-dan I ruled for over fifty years and his long reign returned stability to the Assyrian empire, his scant royal inscriptions suggests that Assyria continued to decline. It is Assur-resha-ishi I, who took the moniker "crusher of the enemies of Assur," finally asserted his power and repaired Ishtar's temple. Assur-resha-ishi I's reference to pulling down fifteen layers of brick (*ti-ip-ki)* and adding fifty layers of brick for a total increased height of thirty-five courses (XXXV *ti-ip-ki*^{pl}) raises the question whether the layers of brick is another use of formulaic language or a historical memory of specific repair.[39]

The layering of bricks is found in other Assyrian texts, though not as frequently as other types of formulaic writing such as "I repaired the dilapidated Place Name." In fact, prior to Assur-resha-ishi I's inscription there are only six references in Assyrian texts to brick–layers. Recorded on a clay plaque at the Ashur temple during the reign of Erishum I (1939–1900 BCE)

[38] Amelie Kuhrt, *The Ancient Near East, c. 3000–330 BC* (2 vols.; New York: Routledge, 1995), 1:356.

[39] See *CAD*, T1, 18: 379, which lists Assur-resha-ishi I's inscription as the first entry under "*tibku*." See also, Borger *Einleitung in die Assyrischen Königsinschriften,* 103–104.

is the statement, "mixed ghee and honey and (then) laid one layer of bricks."[40] Adad-narari I (1305–1274 BCE), in a clay tablet which describes the reconstruction of a quay wall facing the Tigris river states, that when Adad-narari I restored the faces of the wall with bitumen and baked brick he made the thickness, "of four and one half bricks."[41] A more intriguing text for comparison describes restoration work on a wall by Adad-narari I at Assur. Here, he compares his completed wall work with Puzur-Assur.[42] Puzur-Assur, whose texts are limited to repair work at Ashur on the Step Gate and Ishtar's temple, built the wall of Ashur, according to Adad-narari I's inscription, "two and one half brick thick and thirty layers of brick high." In contrast, the inscription of Adad-narari I states that when he rebuilt the wall because of flood damage, he made it, "the thickness of ten bricks…" The text, however, does not list how many layers high he rebuilt the wall.[43] A clay tablet describing Shalmaneser's work on the Ehursagkurkurra temple, notes how he destroyed the beer vats of a house to increase the size of the temple. After destroying and removing the house of beer vats he first enlarged and then made, "its inner wall ten layers of brick thick and its outer wall five layers of brick thick."[44] Following the reign of

[40] Grayson, *RIMA I*, 32. A flint-shaped stone (112) records Assur-uballit I filling in a well, stating that "(it was) ten cubits down to water (-level)." Van De Mieropp, History of ANE, 315, does not provide a date for the reign of Erishum I. Kuhrt, *The Ancient Near East*, 84–86, provides the date of 1939-1900 BCE, presumably based, in part, on the Assyrian King List.

[41] Grayson, *RIMA I*, 141; also found on a stone object from Assur (142).

[42] Though the text does not make explicit which Puzur-Assur is meant, it likely refers to the Puzur-Assur who completed restoration work at Ashur. Prior to Adad-narari I, there are two Puzur-Assur's listed in Van De Mieroop's chronology (315), one following the reign of Akija and before Shalim-ahum and a second following the reign of Sargon I and before Naram-Sin. Grayson's volume contains the royal inscriptions of one Puzur-Assur, which Grayson lists between Ashur-narari I and Assur-rabi I. Grayson lists Puzur-Assur as the (III), further complicating the matter. Kuhrt, *The Ancient Near East*, does not refer to any Puzur-Assur's in her volumes.

[43] Grayson, *RIMA I*, 144. Another stone tablet from Adad-narari I's reign states that he rebuilt a wall the thickness of "fourteen bricks" or on a inner wall he built it "ten bricks thick."

[44] Grayson, *RIMA I*, 192. In Tukulti-Ninurta I's recounting of his military conquests he notes that he cleared "fifty *musharu* straight down" though it is unclear what a *musharu* is and the text, unfortunately is fragmentary in this section. In another texts on a stone pillar in the New Palace area, the inscription states that Tukulti-Ninurta I reached eighty musharu down to the bedrock (242, 245).

Shalmaneser I, a stone tablet from the reign of Tukulti-Ninurta I states that at his new capital a little north of Ashur and on the opposite bank of the Tigris, he erected a terrace "120 layers of brick high" that he built his royal dwelling on top.[45]

Table 3.2: Measurement Involving Brick Layer/Height

Ruler	Layers of Brick	Type of Building
Erishum I (1930–1900)	"mixed ghee and honey and (then) laid one layer of bricks."	
Puzur-Assur (?) * Adad-narari I inscription	"two and one half brick thick and thirty layers of brick high"	
Adad-narari I (1305–1274)	"the thickness of ten bricks…"	
Adad-narari I	thickness of "of four and one half bricks"	Quay wall
Shalmaneser I (1273–1244)	its inner wall ten layers of brick thick and its outer wall five layers of brick thick."	Ehursagkurkurra temple
Tukulti-Ninurta I (1243–1207)	"Shalmaneser I…laid its foundation (and) rebuilt that temple making it seventy-two layers of brick high. Then Tukulti-Ninurta I…added to them twenty layers of brick (and) installed beams and doors."	Nunaittu temple
Tukulti-Ninurta I (1243–1207)	"120 layers of brick high"	Terrace for royal dwelling
Ashur-resha-ishi I (1132–1115)	"I tore down *fifteen* [layers of brick] (and) [raised (this section) *fifty* [layers of brick] (thus) making it [*thirty]-five* layers of brick higher than before."	

Tracing brick-layers from the earliest known Assyrian royal inscriptions through the time of Ashur-resha-ishi's inscription demonstrates that the act of recording what was torn down and then rebuilt—in brick height—is a rare phenomenon. When brick-layers are used in an inscription it refers either to the thickness of a wall or the height of an object though it is not clear why some inscriptions note the thickness while others focus on the height. Only Ashur-resha-ishi's inscription recounts how some layers were torn down and then repaired. The small number of inscriptions that use brick layers in their language and Ashur-resha-ishi's sole

[45] Grayson, *RIMA I*, 270. For a Sumerian explanation of construction materials for brick making, see, Wolfgang Heimpel, *Workers and Construction Work at Garšana* (CUSAS 5; Bethesda: CDL Press, 2009), 189–220.

reference to tearing down layers of brick to repair before more layers suggests that there is an historical kernel of truth behind the inscription. In other words, Ashur-resha-ishi is not trying to outdo another king in how high he repaired Ishtar's temple; rather, he pinpoints where he repaired the bricks, *iš-tu gaba-dib-bi-šu-nu a-di* ÙR É 15*(?) ti-it-ki* "from the battlements to the roof of the temple 15 layers of brick."[46] The reason Ashur-resha-ishi mentioned the brick layers appears to stem from the tradition of detailing brick-layers starting in Adad-narari I's inscriptions and then continuing with Shalmaneser I. Tukulti-Ninurta I gives the first example of a king noting how he increased the height of a structure from a previous king that Ashur-resha-ishi then followed this trend. And with Ashur-resha-ishi, the brick-layers are a respectable height, fifty layers in total have been added. Thus, in contrast to Shalmaneser's account of earthquake repair, the inscription of Ashur-resha-ishi may afford a small glimpse into the aftermath of repairing the temple following the earthquake.

5. Archaeoseismology of Earthquake Damage at Middle Assyrian Sites

Archaeoseismic investigation for earthquake damage at Nineveh, unfortunately, provides little evidence to augment the study of the above inscriptions. This is because other than some clay foundation and paved courtyard, few traces of walls were left.[47] The excavation of the Ishtar temple, which Ashur-resha-ishi claimed to have repaired, occurred as part of the British Museum excavations led by R. Campbell Thompson from 1930–1932.[48] During the 1929–1930 season, excavations uncovered the side of a platform of unburnt brick near the top of the mound, which

[46] The Akkadian word *gabadibbu* "battlement, parapet" refers to the highest point of a structure. It is found several times in Assyrian royal inscriptions where kings build from the foundation to its *gabadibbu* (parapet), or in one of Sargon's inscriptions, he demolishes the strong wall starting with the *gabadibbu* until he reached its deepest foundation. See, "*gabadibbu*," *CAD*, 5:1

[47] Thompson and Hamilton, "The British Museum Excavations 1930–31," 57.

[48] Thompson and Hamilton, "The British Museum Excavations 1930–31," 55–56; Renate Vera Gut, *Das prähistorische Ninive: Zur relativen Chronologie der fruhen Perioden Nordmesopotamiens* (BF 19; 2 vols.; Mainz am Rhein: P. von Zabern, 1995), 38–45.

during the 1930–1931 season the excavation subsequently cleared about two-thirds of the platform starting on the northeastern end before clearing the rest in 1931–1932.[49] A number of building inscriptions in the form of bricks, sculpture, stone cylinders, and other forms all provided clear identification that the remaining structure was Ishtar's Temple. At the same time, however, later occupation and erosion damaged the structure such that there were few walls remaining. Sadly, the Global Heritage Fund lists Nineveh as one of its twelve sites most vulnerable to irreparable loss due to vandalism, erosion, and lack of upkeep.[50]

While the Thompson's original excavations yielded little serviceable data about the earthquakes, Julian Reade's masterful article on the Ishtar Temple at Nineveh has helped to clarify the early British excavations. Reade divides the history of the temple and the surrounding area into thirty phases—some hypothetical—though phases eight to seventeen cover the mid-second millennium and phases ten and twelve date to the two earthquakes discussed above. This division is a far cry from the simplistic five main periods of occupation that Max Mallowan devised based on his ninety-foot pit.[51] Reade's discussion of phase ten offers some insight into the implications of earthquake damage on the temple. He suggests that though wall-pegs had been known at Ashur for a long period of time they may have first been used by Shalmaneser I at the Ishtar Temple. Wall-pegs were found mixed together in the same level at Ishtar's temple at Nineveh resulting in some 34 wall-pegs of Shalmaneser I, 32 of Assur-resha-ishi I, 4 of Shashi-Adad IV, and 92 of Ashurnasirpal II. To account for how these wall–pegs were preserved Reade raises two possibilities: either the walls remained upright or later kings replaced old pegs, not

[49] Thompson and Hamilton, "The British Museum Excavations 1930–31," 55–56; Julian Reade, "The Ishtar Temple at Nineveh," *Iraq* 67 (2005): 347–390.

[50] "Saving our Vanishing Heritage," n.p. [cited 26 August 2010]. Online: www.globalheritagefund.org.

[51] Max Mallowan, *Mallowan's Memoirs* (New York: Dodd/Mead, 1977), 79–81; Thompson and Mallowan, "The British Museum Excavations," 127–186.

always in the right places. As Reade notes, "None of the pegs was found in standing architecture, but generally they must have fallen from the exterior walls of the north-western temple frontage, the outer courtyard, and possibly the inner courtyard; presumably there are more, unexcavated, all round the outside of the temple."[52] Reade further suggests that there are a few archaeological remains that can "probably" be ascribed to Shalmaneser I; Thompson originally wrote that there was nothing that could be definitely identified as Shalmaneser I's other than perhaps a long drain section.[53] Among the finds that Reade attributes to Shalmaneser I are a scrap of pavement tiling, a lion vase, alabaster vases, and vase fragments that can be dated close to 1300 BCE.[54] Reade suggests that these objects might have been buried during Shalmaneser I's renovations after the earthquake.[55] Though one can only theorize what occurred after the earthquake, Reade's suggestion makes sense with the information known.

While phase ten contains some material culture that might be linked to Shalmaneser I's earthquake, phase twelve, which corresponds to Ashur-resh-ishi's reign, is limited to wall-pegs. Recalling the inscription that mentions that Ashur-resh-ishi removed fifteen courses of brick in order to add fifty courses of brick, Thompson was led astray. He did not realize that *namāru* meant "tower" and left the Akkadian word untranslated in his report as *namiri*. This caused him to try and associate the increase in brick courses with parts of the temple foundation since the central part of the foundation went down much further than the rest.[56] Thus, the excavation counted the number of bricks in the center of the foundation and found an increase of 54 courses

[52] Reade, "The Ishtar Temple," 371.

[53] Thompson and Hamilton, "The British Museum Excavations 1930–31," 63.

[54] Reade, "The Ishtar Temple," 371–372; P. R. S. Moorey, *Ancient Mesopotamian Materials and Industries: The Archaeological Evidence* (Winona Lake: Eisenbrauns, 1999), 52–53.

[55] Reade, "The Ishtar Temple," 371–372.

[56] Thompson and Hamilton, "The British Museum Excavations 1930–31," 64.

compared to 18 to 20 courses elsewhere. Thompson's "solution" to the problem betrayed his love as an epigraphist rather than an archaeologist and fit with Mallowan's assessment of the work at Nineveh as a "glorified tablet-hunt."[57] Reade, however, demonstrates that a more suitable interpretation where brick-layers meant the parapet from the temple roof to the battlements, which Reade calculates that fifteen courses, would have been less than two meters high while fifty courses would have been about six meters high. He does not delineate how he arrived at the calculations but bricks from phase seven of the temple provide a good comparison and were 33-36cm square and 10-12cm thick.[58] Thus, adding 2cm for mud mortar between brick layers, gives 30cm for mud mortar plus 150cm for the height of the bricks, equaling 180cm, just under two meters high.[59] For the fifty courses of brick, 2cm for mud mortar results in 100cm plus 500cm for the brick layers equaling 600cm even, or six meters.

If we take Ashur-resh-ishi's claims seriously that he raised the façade by about six meters in his renovation, it would be extremely prone to collapse when the next earthquake struck because there would have been little structural stability for a parapet of that height. Earthquake engineering has demonstrated that unreinforced brick masonry is one of the most susceptible forms of construction to earthquake damage due to failure sheer, sliding sheer, and bending.[60] It is therefore almost unconceivable that only fifteen courses of brick could have suffered damage

[57] Mallowan, *Mallowan's Memoirs*, 72.

[58] Thompson and Hamilton, "The British Museum Excavations 1930–31," 64, give dimensions of Ashur-resha-ishi's bricks as "1'03/4" sq. x 31/2" in contrast to the thinner bricks of Shalmaneser I (21/8" to 21/2" as well as a brick of Tukulti-Ninurta I 21/2") Van Beek, *Glorious Mud*, 260, lists the depth of bricks from Tell al-Rimah and Nimrud as 10cm in depth as well.

[59] For 2cm between layers see, Aaron A. Burke, *Walled Up to Heaven: The Evolution of Middle Bronze Age Fortification Strategies in the Levant* (SAHL 4; Winona Lake: Eisenbrauns, 2008), 73–74.

[60] Frederick A. Webster, "Earthen Structures: Assessing Seismic Damage, Performance and Interventions," in *Terra Literature Review: An Overview of Research in Earthen Architecture Conservation* (eds. E. Avrami, H. Guillaud, M. Hardy; Los Angeles, Getty Conservation Institute, 2008), 69–79.

without further damage to other courses, or especially the roof. Further, the addition of almost six meters of a façade without proper support would have been bound to fail no sooner than the last brick was laid.

One other remain from Nineveh has been linked to the Middle Assyrian earthquakes: a "vaulted tomb" structure on the slope northwest of the temple. This structure was found in Squares M, N, and BB which Thompson termed "'cellars' for want of a better name" and suggested that they could have been filled with earth purposely.[61] Further, Thompson noted that they were obviously built at the same time as the foundation. Since the top was lower than the foundations of the temple with no connection between the two and some of the sherds suggest a date later than the mid-second millennium, Reade proposes that the structure may be an attempt by Shalmaneser I or another king to stabilize the slope below the temple.[62] This is an intriguing idea that gains support from Thompson's difficulty in assessing what the structures were for as well as his original assertion that they could have been filled with dirt purposely. In addition, the topography of the slope on the west/northwest side of the temple lends support to a structural reason behind these odd features. At this point, Reade's suggestion makes the best sense with the limited data that is available, and perhaps further excavations in the future can shed more light on the circumstantial evidence.

Outside of the scant archaeological remains at Nineveh, archaeological evidence from Calah (Nimrud) may provide additional evidence of one of these earthquakes. Excavations at the Burnt Palace in the southeast corner of the acropolis took place from 1951–1955 and showed that

[61] Thompson and Hamilton, "The British Museum Excavations 1930–31," 66. Reade, "The Ishtar Temple," 372, states that the "cellars" first became theorized as a bridge linking the Ishtar temple with the eighth-century Nabu Temple and then later as "vaulted tombs" but it is unclear from what sources he draws this claim. In a paper published just a couple years after Thompson and Hamilton's 1930-1931 excavation reports, the top plan lists the "cellars" as vaulted tombs, see R. Campbell Thompson, "The Buildings on Quyunjiq, the Larger Mound of Nineveh," *Iraq* 1 (1934): 95–104.

[62] Reade, "The Ishtar Temple," 372.

the site had been built on over 1000 years. Mallowan found evidence of eight layers and labeled the periods A-H, of which periods A-C are prior to the 9th century BCE because of the dating of fragments of pavement in the courtyard.[63] Phase A rested on a mud-brick platform and B and C showed only a "slight rise in level" while Phase B contained evidence of what Mallowan saw as earthquake damage. Quoting Mallowan, "Phase B was represented also by drains and wall stumps, and the buckling and bending of bricks in the platform shows that at this time Calah experienced an earthquake: more than one was recorded in Assyrian inscriptions."[64] Narrowing the date of Phase B is more difficult as Mallowan did not find enough material to afford precise dating but linked potsherds found in the street east of the palace to the 15th and 14th centuries at Nuzi. This led Mallowan to conclude that one of the three phases (A-C) "coincides with the earliest recorded city of Calah," founded by Shalmaneser I. In sum, though Mallowan saw that "some part" of levels A-C fell within the period of 1300-900 BCE he did not attempt to narrow these dates any further or try to link the earthquake damage in Phase B with the quake during Shalmaneser I or Ashur-dan I.[65]

Nicholas Ambraseys took Mallowan's conclusions and suggested that the damage found at Nineveh may be linked to the time of Ashur-dan I, as recorded in the inscriptions of Ashur-resha-ishi I. Ambraseys's conclusions must be taken with caution due to his overlooking of a number of important scholarly contributions. For example, in his treatment of the Middle Assyrian earthquakes, Ambraseys quotes R. C. Thompson's early translations instead of the standard and updated work by A. K. Grayson missing opportunities for better precision in

[63] M. E. L. Mallowan, *Nimrud and its Remains*, (2 vols.; London: Collins, 1966), 1:223, 286–287.

[64] Mallowan, *Nimrud and its Remains*, 223.

[65] Ambraseys, *Earthquakes in the Mediterranean*, 68, follows Mallowan's argument and concludes, "It is thus possible that the earthquake recorded by Ashur-rish-ishi is the same as that which damaged the phase-B platform in Nineveh."

terminology and thus more depth in his treatment of the quakes. He does not interact with Reade's comprehensive article on Ishtar's temple leading to a rudimentary treatment of the evidence and supplies less confidence that his work, at least for the Near East, is suited for little more than a starting point.

6. Neo-Assyrian Records of Earthquakes

In contrast to Middle Assyrian records of earthquakes that are recorded on wall pegs, their content marked by scant, formulaic descriptions of the quake and its effects, Neo-Assyrian references to earthquakes are found on tablets, composed by various types of scribes and then sent to the king. Neo-Assyrian texts, in contrast to the restrained, if not near muted, Middle Assyrian accounts of earthquakes, provide much fuller details concerning earthquakes and their destructive aftermath. Whereas Middle Assyrian inscriptions offer little useable insight into reconstructing what type of and how extensive damage to structures might have been damaged, Neo-Assyrian tablets present a smorgasbord of information to the reader. The information includes noting areas of the city where earthquake damage existed, mentioning religious and non-religious buildings—and in some cases even architectural features of buildings—that were affected by the quake, and giving insight into the thought process behind ways to avoid future quakes as well as what a quake portended. In sum, Neo-Assyrian accounts of earthquakes provide important insights into how Assyrians viewed earthquakes both in terms of physical destruction and mental psyche. At the same time, as the evidence of Neo-Assyrian quakes is clustered tightly around the reigns of Esarhaddon and Ashurbanipal it remains unclear if this clustering is merely accidental and more records of quakes await discovery. Or, on the other hand, if there is a reason that only the seventh century is marked by concern for quakes.

The clustering of references in the seventh century to both earthquakes as real events and as events that need scholarly interpretation is made even more apparent when examining all known references to earthquakes in the Neo-Assyrian period. As the *State Archives of Assyria* has now placed all text editions online and are working towards making their translations, transliterations and glossaries fully searchable, research into Neo-Assyrian earthquakes has become far easier and more comprehensive. The table below lists every text from the *State Archives of Assyria* volumes where the word "earthquake" is found in Neo-Assyrian texts. The table is ordered first by records of actual earthquakes (first two entries) and then by references to the psychological effects of earthquakes (apotropaic, warning, reflection on event).[66]

Table 3.3: References to "Earthquakes" in Neo-Assyrian Texts

Text	Reference (Volume, line)
Upon my coming from Milqia to Dur-Šarruken, I was told that there had been an earthquake in Dur-Šarruken on the 9th of Adar (XII). Perhaps the king, my lord, now says: "Any damage within the city wall?"	SAA 01, 125, 4 SAA 01= *The Correspondence of Sargon II, Part I: Letters from Assyria and the West*
There was an earthquake on the 21st of Elul (VI). The outer town in its entirety was damaged (lit. "scratched") but the whole wall of the outer city was saved; (only a stretch of) 30.5 cubits was torn out of it and fell into the centre of the city.	SAA 16, 100, 6 SAA=*The Political Correspondence of Esarhaddon*
Concerning the earthquake about which the king [my lo]rd wrote to me, this [is its interpretation]:	SAA 08, 008, 1 SAA 08= *Astrological Reports to Assyrian Kings*
If there is an earthquake in Shebat (XI): the furrow will reduce its yield; there will be campaigns of the enemy. When either Jupiter or Venus [.....] disappear and [do] not [...], either Adad will thun[der], or a storm will come, or [...], or there will be an earth[quake].	SAA 08, 036, 12 SAA 08, 036, r7
This (earthquake) [was predicted] by the (event) when Venus disappeared and [.....]. The place where ... [...].	SAA 08, 036, r12
Tonight there was an earthquake.	SAA 08, 037, 5

[66] Beyond the first two entries of actual earthquakes, some of the other texts refer to earthquakes as real events. Since these references occur in the context of omen literature and there is no information within the text that could help in reconstructing the event, I have focused on the first two references to actual earthquakes.

If there is an earthquake in Tebet (X): the king will dwell in his enemy's city.	SAA 08, 037, 7
[If the earth] quakes [at night]: worry for the land, variant: aban[doning of the land. An earth]quake portends re[volt].	SAA 08, 315, r2
[If there is an earth]quake: [there will be] hostility in the land. [— The earth ...] quaked.	SAA 08, 490, 3
[If in Shebat (XI)] there is an earthquake: [the furrow] will bring its [yiel]d, variant: will reduce (it); there will be [campai]gns of the enemy.	SAA 08, 495, 1
An earthquake portends revolution.	SAA 08, 495, r1
If an earthquake [.....]: the king with [.....].	SAA 08, 555, 1
As to what the king, my lord, wrote to me: "What apotropaic ritual is there?" — there is the apotropaic ritual against earthquake, and it should be performed; [...] should enter the Review Palace. The following (is) [what] is said abo[ut the matter] in the tablet:	SAA 10, 010, 5 SAA 10= *Letters from Assyrian and Babylonian Scholars*
Now this one: if he will be slighted, its explanation can only be the earthquake. It has quaked: that is bad. They should perform the ritual against the earthquake, your gods will (then) make (the evil) pass by. "Ea has done, Ea has undone." He who caused the earthquake has also created the apotropaic ritual against it.	SAA 10, 056, r2
Was there no earthquake in the times of the king's fathers and grandfathers? Did I not see earthquakes when I was small? The god has (only) wanted to open the king's ears: "He should pray (literally 'open his fists') to the god, perform the apotropaic ritual and be on his guard."	SAA 10, 056, r13
Concerning the ritual against the earthquake [...]	SAA 10, 202, 13
Concerning the crown prince's visiting the king, my lord, is it because of the earthquake that he has said: "The crown prince should not go outdoors"?	SAA 10, 203, 5

As seen in the table above, what an earthquake foretells or how it can be avoided rather than records of actual quakes dominates references to earthquakes in the Neo-Assyrian period. Attention will focus first on the two accounts of actual earthquakes and what can be learned from their study. This approach is consistent with the overall goal of the dissertation to study records of actual earthquakes in Ancient Near Eastern and Levantine sources. While the study of

divination and omen texts is, in itself, a fascinating topic in the present study it cannot be given the attention it deserves.

7. An Extensive Account of an Earthquake During the Reign of Esarhaddon

The first record of a Neo-Assyrian earthquake comes from the reign of Esarhaddon and is the focus of a letter from Nabû-šumu-ka to the king. Prior to the edition in the *State Archives of Assyria* volume, R. Campbell Thompson published the *edito princeps* where he noted that the tablet was found during the 1930–1931 excavation season, found above an unburnt brick foundation of the Temple of Ishtar.[67] Text on the front side of the tablet is well preserved but the obverse is much more fragmentary. The text reads as follows:[68]

a-na LUGAL *be-lí-ia*	To the king, my lord:
ARAD-*ka* ^{md}PA-MU-GIN LU.A.BA	your servant Nabû-šumu-ka, the
lu-u DI-*mu a-an* LUGAL *be-lí-ia*	scribe. Good health to the
^{d}PA *u* ^{d}AMAR.UTU *a-na* LUGAL *be-lí-ia*	king, my lord! May Nabû and
lik-ru-bu	Marduk bless my lord.
UD-21-KÁM ša ITI.KIN	There was an earthquake on the 21st
ri-i-bu ir-tu-bu	of Elul.
EDIN URU *gab-bi-šu*	The outer town in its entirety was
i-ta-am-ri-ṭi	damaged
BÀD *ša* EDIN URU *gab-bu*	but the whole wall of the outer city
i-te-ṭi-ra	was saved; (only a portion of)
30 ½ KÙŠ TÀ ŠA-*bi*	30.5 cubits
i-ta-am-la-ah	was torn out of it
ina qab-si URU *i-tu-qu-ut*	and fell into the center of the city.
É-DINGIR *gab-bu i-ta*-[*am-r*]iṭ$^{!}$	The house of god, all of it, was
up-ta-ta-ṣi-[*d*]*i*	was dam[ag]ed and cracked,
DINGIR.MEŠ-*ni ša* LUGAL	but all the gods of the king
gab-bu DI-*mu*	are well.
ši-ib-šú-tú ša ap-te$^{!}$	The top frame of the window -
⌜ša⌝ É-DINGIR	opening of the house of god
[x x]x ⌜^{d}?⌝PA ⌜^{d}⌝IM?⌝	(and) [the … of] Nabu (and) Adad

[67] R. Campbell Thompson, "A New Record of an Assyrian Quake," *Iraq* 4 (1937): 186–189. Ambraseys, *Earthquakes in the Mediterranean*, unfortunately omits this earthquake from his monumental work. This is even more surprising as he refers to Thompson's article for other information on two separate occasions (67–68).

[68] Mikko Luukko and Greta Van Buylaere, *The Political Correspondence of Esarhaddon* (SAA XVI; Helsinki: Helsinki University Press, 2002), 93.

[x x x x x x x x]	[…..]
šu ⌜x x x x⌝ *har* [x x]	
x[x x x]x x[x x x x]	
ša É.*si-qur*$^{/}$*-ra*$^{/}$*-[te*]	of the ziggurat[s … and] of the …
ša É-1-*te ša* ⌜E$^{!}$ x⌝	house of …
i-tu-uq-tu 1-*e*[*n*] ⌜x⌝	fell down; one […] collapsed from
TA ŠÀ-*bi* É ⌜x⌝ *an-ni-te*	this house.
i-tu-qu-ut	
na-mi-ri ša KÁ.GAL *qab-si-te*	The watchtowers of the middlemost
ša KÁ.GAL ⌜*sa*$^{/}$⌝ *qa-ni*	gate and the outer gate have
i-tu-qu-tu	collapsed;
É-[1-*te*] ⌜1$^{?}$-*et*$^{?}$ *ša*$^{?}$⌝ *qa-ni* 0$^{!}$	(and) one […] house outside the city
É-*ma-ṣar-te ša* URU	garrison and one inside it have
É-1-*te* 1$^{!}$-*et* TA ŠÀ-*bi*	collapsed.
ta-tu-qu-ut	
LU.SAG *ša* L[UGAL]	A royal eunuch
lil-l[*i-ka l*]*e-me-ur*	should come and take a look.

Little is known about Nabû-šumu-ka, as his name is found only in this letter, but one piece of information in the introduction to his letter states that Nabû-šumu-ka was a LÚ.A.BA "a scribe," transliterated as *tupšarru*, likely meaning a scribe fluent in Aramaic. No further scholarly terms are used for Nabû-šumu-ka so it is safe to presume that Nabû-šumu-ka was not trained in other branches of scholarly expertise. In the Neo-Assyrian period there was extensive specialties in scribal education which Karel Van der Toorn notes, "In the first millennium, students could train as an astrologer (*ṭupšar Enūma Anu Enlil*, literally, "scribe [specializing in the astrological compendium] *Enūma Anu Enlil*"), an exorcist (*āšipu* or *mašmaššu*), a diviner (*bārû*), a medical practitioner (*asû*) or a cultic singer (*kalû*)."[69] In sum, since there is no hint of additional scribal training, Nabû-šumu-ka's name is unknown other than in this text, and the text he sends to the king simply provides an update about earthquake damage, all signs point to Nabû-šumu-ka as a lesser known and less important court figure during the reign of Esarhaddon.

[69] Karel Van der Toorn, *Scribal Culture and the Making of the Hebrew Bible* (Cambridge: Harvard University Press, 2007), 57.

At the same time, even though Nabû-šumu-ka appears to be a lesser known and less important court figure, his identification as a LÚ.A.BA "a scribe" provides information about what type of scribe he was. William Hallo suggests that a scribe identified as the (LÚ.A.BA) was, "often pictured by his side on Assyrian reliefs, who wrote in the newer and simpler West Semitic Script, using pen and ink on parchment or papyrus."[70] Hallo further points to a suggestion first made by Simo Parpola and then later by Karlheinz Deller and S. J. Lieberman that the name be interpreted as "the man of the alphabet."[71] In a paper presented at the 42nd RAI and around the same time as Hallo's publication, L. E. Pearce argues that the logographic term LÚ.A.BA, "designates individuals who hold positions and exercise duties similar to those of the *ṭupšarru* and *sepīru* in the Neo-Babylonian and subsequent periods."[72] Pearce then addresses the question of equating a LÚ.A.BA with the alphabetic scribe both confirming this is true but also suggesting that the majority of these scribes were "individuals of Aramaic (or, more generally, West Semitic) parentage who bore Assyrian names and who performed their scribal duties in regions known to be heavily Aramaized, and/or in contexts in which the presence and services of an individual literature in Aramaic would facilitate the transaction."[73] In sum, then, Nabû-šumu-ka's title as a (LÚ.A.BA) points to his mastery of the West Semitic script, Aramaic, and for reasons unclear, found himself in Ashur sending word to the king about earthquake damage as

[70] William W. Hallo, *Origins: The Ancient Near Eastern Background of Some Modern Western Institutions* (Leiden: Brill, 1996), 40. Hallo further suggests that the earliest occurrence of the term is found at least as early as the 11th century based upon colophons from the library of Tiglath-pileser I and from 13th century Ugarit where the term is found both in colophons and in the form AB.BA in a lexical list.

[71] See the references in Hallo, *Origins*, 40.

[72] L. E. Pearce, "*Sepīru* and ^{LÚ}.A.BA: Scribes of the Late First Millennium," in *Languages and Cultures in Contact: At the Crossroads of Civilizations in the Syro-Mesopotamian Realm, Proceedings of the 42th (sic) RAI* (OLA 96; ed. K. Van Lerberghe and G. Voet; Leuven: Peeters, 1999), 355–368.

[73] Pearce, "Scribes of the Late First Millennium," 361.

well as suggesting that a royal eunuch should come to Ashur and examine the damage. As the earthquake letter helps provide Esarhaddon with detailed information regarding damages from the earthquake it shines light on how an ancient bureaucracy began to deal with a natural disaster.

Following the introduction to the letter discussed above, the letter states that the earthquake struck on UD-21-KÁM *ša* ITI.KIN, the "21st of Elul." As the Assyrian calendar began with the spring, based on a "lunisolar" calendar, this system defined months by the moon and years by the seasons.[74] Thus, the month of Elul, which was the sixth month in the Assyrian calendar, can be found roughly around our modern months of August/September.[75] Outside of this month name no year is given so presumably, the earthquake could have struck anytime during the reign of Esarhaddon (681–669 BCE); however, the high density of tablets edited by Luukko and Van Buylaere and dateable to between 672–669 BCE provides strong evidence to constrain the quake between these years.[76] Since Nineveh served as Esarhaddon's capital and was roughly 100 kilometers south of Ashur, the letter provides an initial assessment of Ashur's damage and prompted Esarhaddon and his advisors to discuss how to deal with the damage at

[74] See the summary in, Francesca Rochberg–Halton, "Calendars, Ancient Near East," *ABD* 1:810–814; John M. Steele, "The Length of the Month in the Mesopotamian Calendars of the First Millennium BC," in *Calendars and Years: Astronomy and Time in the Ancient Near East* (Oxford: Oxbow, 2007), 133–148.

[75] Simo Parpola*, Letters from Assyrian Scholars to the Kings Esarhaddon and Assurbanipal Part II: Commentary and Appendices* (Neukirchener: Verlag Neukirchen Vluyn, 1983), 381–382, provides a limited reconstruction of dates from the period 680-650. As the lunar year is shorter than the solar year by around eleven days, a second month would need to be intercalculated as either a second Ululu (the sixth month) or a second Addaru (the twelfth month). Based on several Neo-Assyrian letters edited by Parpola (*LAS* 38, 190, 287, 289) the Assyrian added an intercalary month Ululu, to the year 670. Based on the strong likelihood that this text dates between 672-669 BCE, the month of Ulu began on the following dates in the Julian calendar according to Parpola, *LAS*, 382: 672:8/28; 671: 8/18; 670:8/7 (Ulu II 9/6); 669:8/25.

[76] Luukko and Van Buylaere, *The Political Correspondence of Esarhaddon*, xx use prosopographical evidence as well as connect content with actual events. See also, the table on pages xviii-xx which provides more detail on the abundance of letters that are dated to between 672–669 BCE.

Ashur.[77] At the same time, while the letter indicates that the damage was not as severe as it could have been, it is unknown where else the earthquake struck and what towns or cities might have been destroyed or damaged by the quake.

Within Ashur, though, the letter recounts in surprising detail which areas of the city were affected by the earthquake. The letter begins by mentioning the outer town and its wall before focusing on a number of religious buildings, presumably houses of notable people and finally more defensive structures. The table below organizes the fourteen different structures or locations that were mentioned in the letter. The number of structures or locations that were damaged would only grow larger if the tablet's obverse had not been damaged.

Table 3.4: Location in Ashur of Earthquake Damage and What was Damaged

Location	Damage
Outer Town in its entirety EDIN URU *gab-bi-šu*	Damaged (lit. "scratched") *i-ta-am-ri-ṭi*
Whole wall of outer city BÀD *ša* EDIN URU *gab-bu*	Saved (except for 30.5 cubits-see below) *i-te-ṭi-ra*
Wall of outer city	30.5 cubits torn out of it and fell into the center of the city 30 ½ KÙŠ TÀ ŠA-*bi*
House of god, all of it É-DINGIR *gab-bu i-ta-*[*am-r*]iṭ!	Cracked and damaged *up-ta-ta-ṣi-*[*d*]*i*
Top frame of the window-opening of the house of god *ši-ib-šú-tú ša ap-te*!ᵀ ša¬ É-DINGIR	??
[of] Nabu	??
Adad	??
Of the ziggurat[s]	Fell down

[77] See Esarhaddon's account of his rise to power and ascending to his throne in Nineveh in, Martti Nissinen, *References to Prophecy in Neo-Assyrian Sources* (SAA VII; Helsinki: University of Helsinki Press, 1998), 14. The heavy role that advisors play in Neo-Assyrian administrative affairs is well known, see most recently, Karen Radner, "The Assyrian King and His Scholars: The Syro-Anatolian and the Egyptian Schools" *in Of God(s), Trees, and Scholars: Neo-Assyrian and Related Studies in Honor of Simo Parpola* (SO 106; eds. M. Luukko, S. Svärd, and R. Mattila; Helsinki: Finnish Oriental Society, 2009), 221–238. In the words of Radner (221–222), "Some 1300 letters and reports addressed to Esarhaddon (680-669 BC) and his successor Assurbanipal (668-c. 630 BC) show dozens of specialists at work, advising their ruler and hence more often than not directly influencing his political actions. The preserved documents stem from the royal archives of Nineveh, then the main residence of the Assyrian court, and allow us rare insight into the symbiosis and interdependency between the scholars and their patron at that time."

a É.*si-qur*$^{!}$-*ra*$^{!}$-*[te*]	*i-tu-qu-ut*
House of	Fell down *i-tu-qu-ut*
One ?? 1-*e*[*n*] ⌜x⌝	Collapsed from this house TA ŠÀ-*bi* É ⌜x⌝ *an-ni-te i-tu-qu-ut*
Watchtowers of the middlemost gate *na-mi-ri ša* KÁ.GAL *qab-si-te*	Collapsed *i-tu-qu-ut*
Outer gate KÁ.GAL ⌜*sa*$^{!}$⌝ *qa-ni*	Collapsed *i-tu-qu-ut*
One […] house outside the city garrison É-[1-*te*] ⌜1$^{?}$-*et*$^{?}$ *ša*$^{?}$⌝ *qa-ni* 0$^{!}$ É-*ma-ṣar-te ša* URU	Collapsed *i-tu-qu-ut*
One house inside the city garrison É-1-*te* 1$^{!}$-*et* TA ŠÀ-*bi*	Collapsed *i-tu-qu-ut*

After understanding the broad scope of earthquake damage listed by the scribe it is important to study the damage at a much closer level. First, the letter mentions that the outer town was damaged, or literally scratched in its entirety, but that the whole wall of the outer city was saved, only 30.5 cubits or about 14 meters of wall was torn and fell into the center of the city (*ina qab-si* URU *i-tu-qu-ut)*. Clues to what and where the "outer town" refers to can be adduced from understanding the geomorphologic conditions and historical development of Ashur. Since Ashur sat on a triangular-shaped spur of the Makhul ranges and overlooked the tight Tigris valley, this geomorphologic environment led to a town layout different from its Babylonian counterparts.[78] As Mirko Novák points out, while Babylonian towns would place the temple area in the center of the city, the public buildings of Ashur were situated in a chain on the northern edge of the town.[79] At the most visible part of the peak, stood the temple of Ashur (on the northeast corner), then the ziggurat of Ashur, and next to those buildings, the old palace of the king and other important temples such as the temples of Anu, Adad, Sin, Shamash and Ishtar. In sum, the

[78] On the relation of Assur to other important Neo-Assyrian cities see, Karen Radner, "The Assur-Nineveh-Arbela Triangle: Central Assyria in the Neo-Assyrian Period," in *Between the Cultures: The Central Tigris Region from the 3rd to the 1st Millennium BC* (ed. P. A. Miglus and S. Mühl; Heidelberg: Orientverlag, 2011), 321–329.

[79] Mirko Novák, "From Ashur to Nineveh: The Assyrian Town-Planning Programme," *Iraq* 66 (2004): 177–185.

geomorphologic setting of Ashur forced town planning in a triangle shaped arrangement that extended south because the Tigris River abutted the northern and eastern sides of the city. Thus, at periods when town growth exceeded the triangle shaped area, the town was enlarged with a new fortification wall, enclosing a large area south of the old part of the city. The northern area became known as the *libbi āli* "inner town" while areas south of this wall became known as the "outer city." With this information in mind, the description of earthquake damage in the letter began with the most southern end of Ashur and its poorer residents. As the north and east of Ashur were nearly impenetrable because of their rocky face, wall collapse on the southern side of the city would have been of concern as this left the southern flank of the city exposed.

Further, as another Neo-Assyrian letter about earthquake damage illustrates, a king's concern about damage to city walls appeared to be of primary importance. The Assyrian governor of Dur-Šarruken, Kiṣir-Aššur wrote to Sargon II, "Upon my coming from Milqia to Dur-Šarruken, I was told that there had been an earthquake in Dur-Šarruken on the 9th of Adar (XII). Perhaps the king, my lord, now says: "Any damage within the city wall?"'"[80] The letter next states that in fact there was no damage and further there was no damage to other structures such as temples, the ziggurat, the palace, the city wall, and the buildings of the city. As the letter to Sargon II shows, prior to Esarhaddon's correspondence there is another example of a priority of concern for the city wall.

Religious buildings are the next focus of the letter where it states that the É-DINGIR "house of god" in its entirety (*gab-bu*) was damaged and cracked, though the gods of the king were well (DINGIR.MEŠ-*ni ša* LUGAL *gab-bu* DI-*mu*). The "house of god" in the singular is connected to the temple of Ashur, located at the most prominent location in the city, where it

[80] Simo Parpola and Julian Reade, *The Correspondence of Sargon II* (SAA I; Helsinki, Helsinki University Press, 1987), 101.

suffered both damage and cracking.[81] There is no further information concerning the crack, such as if it ran through a foundation, portions of walls, or through the floor, but it seems clear that the temple did not collapse.

The next portion of the letter focuses on damage to a specific architectural feature, the *ši-ib-šú-tú ša ap-te'* "the top frame of the window-opening" as well as some temples and houses. It is unclear how extensive the damage was to these areas as the letter itself is damaged at this point. Mikko Lukko and Greta van Buylaere translate the phrase *ši-ib-šú-tú ša ap-te'* as "the architrave of the window-opening" using a technical architecture term to describe the lintel or beam that rests on the capitals of the columns.[82] The grouping of the verb to fall down (*i-tu-uq-tu*) with ziggurat(s?) and the house of (…) indicates that these structures were shaken by massive damage. While little remains of Ashur's ziggurat, what is known is that it was constructed with adobe bricks, though it presently has a large hole through its base due to past excavations. More complete Neo-Assyrian ziggurats have been found at Dur-Sharrukin and Kalhu and at Dur-Sharrukin, three stages were preserved: painted white, black, and red. Each stage stood eighteen feet high and presumably, if the tower reached seven stages in total like the ziggurat at Babylon, the highest stage would have been fifty feet across with a total tower height of 143 feet, a

[81] The focus on Ashur moved into fever pitch with Sennacherib (704–681 BCE), Esarhaddon's predecessor as he tried to reattribute the mythology of Marduk as well as rituals of the New Year ceremonies onto Ashur. This reappropriating of mythology and even emblems onto Ashur fits with his history where there is no clear tradition or character associated with him. Assuredly, Ashur's most important role was to grant or remove kingship from Assyria.

[82] A recently published fourteen-line Akkadian text from Ugarit (RS 94.2953) records Ea ordering a window to be built: "Take a spade and an axe of rage, make a window above the foundation of stone; my plan, in length and width." See, Wayne T. Pitard, "Temple Building in Northwest Semitic Languages," in *From the Foundations to the Crenellations: Essays on Temple Building in the Ancient Near East and Hebrew Bible* (AOAT 366; ed. M. J. Boda and J, Novotny; Münster: Ugarit-Verlag, 2010), 91–108.

distance in which the height would be equal to the length of the base.[83] As can be expected, a building around this height with some sort of earthquake damage to it would have caused great angst for the city as well as Esarhaddon.

Finding earthquake damage in the archaeological record at Ashur (modern Qalʿat Šerqat) is difficult because little is known about Ashur during the Neo-Assyrian period. Excavations first began with Austen Henry Layard, Hormuzd Rassam, and Victor Place and then took off in earnest with German excavations begun in 1903. The work of Walter Andrae from 1903 until 1914 focused on the elevated part of the Old City in the north and northwest where most of Ashur's temples and palaces were located. Andrae used his architectural training in Dresden as well as his archaeological training with Robert Koldewey in Babylon to advance stratigraphic techniques by examining levels and naming building levels by letter and used watercolor in his publications to reconstruct various buildings and city perspectives.[84] Andrae's work culminated in his book, *Das Wiedererstandene Assur* that provides a detailed account of his excavations at Ashur.[85] During the reign of Esarhaddon some of his texts mention that he repaired the Ashur Temple as well as the Ashur-Enlil Ziggurat. Unfortunetly, archaeological confirmation is lacking due to the successive building and rebuilding of structures over time.

This lack of archaeological remains at Ashur leaves two possibilities: compare archaeological remains from other sites and/or to turn to the well-known architectural

[83] See the discussion in, Henri Frankfort, *The Art and Architecture of the Ancient Orient* (5th ed.; New Haven: Yale University Press, 1996), 149–150.

[84] See, Ernst Walter Andrae and Rainer Michael Boehmer, *Bilder eines Ausgräber: Die Orientbilder von Walter Andrae 1898-1919* (Mann: Berlin, 1989).

[85] Walter Andrae, *Das Wiedererstandene Assur* (2d ed; Munich: Beck, 1977).

reconstructions of Ashur's buildings drawn by Walter Andrae.[86] Andrae, as well as Robert Koldewey, was influenced by Victor Place's reconstruction of Khorsabad's citadel and formed the basis for Andrae's reconstruction of Ashur.[87] The majority of Andrae's reconstructions, however, are based on exemplars from earlier periods such as the Anu-Adad and Ishtar Temples of Tiglath-Pileser I or the Sin-Shamash Temple of Assur-narari I. One of Andrae's reconstructions, the Nabu-Ishtar Temple, is from the seventh century, and demonstrates in his view, how massive this building was in the Neo-Assyrian period. While Andrae's reconstructions can only be viewed as reconstructions, they should not be simply jettisoned. As illustrated above, comparative evidence from ziggurats at other Neo-Assyrian sites point to their imposing presence and the massive building campaigns during the Neo-Assyrian period seen through structures such as Sennacherib's Palace also demonstrates the imposing size of Neo-Assyrian structures. Further, the ideology that stands behind such massive buildings in the Neo-Assyrian period supports the grand drawings of Andrae.[88] These reasons taken together, then, underscore how many of these Neo-Assyrian structures, imposing in their own right, could have had their impressive size work against them in an earthquake.

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[86] See Walter Andrae, *Das wiedererstandene Assur. Zweite, durchgesehene und erweiterte Auflage herausgeben von Barthel Hrouda, 2*. (Aufl. München: CH. Beck, 1977), 54 fig. 37 for a panoramic view from the north and 22, fig. 5 for a reconstruction of the Tabira Gate. See also, the review article on the impact of drawings by Robert Koldewey and Walter Andrae by, Maria Gabriella Micale, "European Images of the Ancient Near East at the Beginnings of the Twentieth Century" in *Archives, Ancestors, Practices: Archaeology in the Light of its History* (ed. N. Schlanger and J. Nordbladh; New York: Berghahn, 2008), 191–203. See also the review of scholarship in Jack Green, "Introduction" in *Picturing the Past: Imaging and Imagining the Ancient Middle East* (OIMP 34; eds. J. Green, E. Teeter, and J. Larson; Chicago: University of Chicago, 2012), 13–24.

[87] Victor Place, *Ninive et l'Assyrie, avec des essays de restitution par F. Thomas* (3 vols.; Paris: Imprimerie impériale, 1867-1870); Walter Andrae, *Die Anu-Adad-Tempel in Assur* (WVDOG 10; Leipzig: J. C. Hinrichs, 1909), 82; see the detailed discussion of Place's influence on Andrae and Koldwey in Micale, "European Images," 193–194. On some of the methodology behind drawing reconstructed buildings see, Jean-Claude Golvin, "Drawing Reconstruction Images of Ancient Sites," *Picturing the Past: Imaging and Imagining the Ancient Middle East* (OIMP 34; eds. J. Green, E. Teeter, and J. Larson; Chicago: University of Chicago, 2012), 77–82.

[88] See John Malcom Russell, Sennacherib's Place without Rival at Nineveh (Chicago: University of Chicago, 1991); Eckart Frahm, "The Great City: Nineveh in the Age of Sennacherib," *CSMS* 3 (2008): 13–20.

Returning to the earthquake report letter, it lastly describes damages to defensive fortifications and how the watchtowers of the middlemost gate and city gate have collapsed as well as housing near the city garrison. The lack of Neo-Assyrian remains at Ashur again forces us to look at other sites for comparative examples, and at Dur Sharrukin, seven gates protect the city. While Ashur's location on a triangle-shaped spur precluded having gates on all sides, three gates are known: the Tabira, West, and South, which the West Gate would be the middlemost gate.[89] Watchtowers are often used in Assyrian inscriptions as projections of power; for example, in an inscription of Enlil-nasir III, it states, "these two pairs of towers such as never had been built before," or from an inscription of Ashur-resha-ishi I, "I built its towers and its ziggurats sky high."[90] In one sense, because watchtowers were projections of power, the scribe could have mentioned their status as they stood as an importance defensive structure as well as a projection of power. At the same time, University of California excavations at Nineveh provide another example of comparative evidence of other Neo-Assyrian gates. The team, led by David Stronach restored the Mashqi Gate at Nineveh and excavated the Halzi Gate at Nineveh during the 1989-1990 seasons.[91] Pickworth notes the superb construction of the gate during Sennacherib's reign as, "smoothly dressed orthostats lined the lower walls of the gate's large inner court and sophisticated waterproof membranes of bitumen-soaked reeds protected the mud-brick superstructure"[92] Along with the gate, they also excavated two watchtowers, labeled as watchtower four (south of the gate) and five (north of the gate). Regarding tower four, Pickworth writes, "Whereas the original wall and towers had been constructed of fine, stone ashlar blocks,

[89] Andrae, *Das Wiedererstandene Assur*, 22, reconstructs the Tabira Gate during the reign of Tukulti-Ninurta I.

[90] "*nāmaru*" *CAD N1* 11:219.

[91] Diana Pickworth, "Excavations at Nineveh: The Halzi Gate," *Iraq* 67 (2005): 295–316.

[92] Pickworth, "Excavations at Nineveh," 295.

the replacement tower had been built using similar-styled blocks to those found in the rough-cut inner core of the wall…"[93] The results of the excavations help us understand the building material of the Neo-Assyrian watchtowers—well-dressed ashlar masonry well as well as how poorly constructed a tower could be if it was due to hasty repair.[94] We are again left to wonder what condition the towers at Ashur were in when they collapsed after the earthquake but comparative evidence from Nineveh suggests that the watchtowers were formidable and their collapse would have caused great concern.

After enumerating the earthquake damage throughout the city, the letter closes by calling on a royal eunuch to see the damage himself.[95] In A. Kirk Grayson's insightful paper on eunuchs in Neo-Assyrian administration, he estimates that of the high ranking officials in Assyria during the ninth and eighth centuries, more than ten percent were eunuchs.[96] Eunuchs served in all types of administrative positions from provincial governors to royal bodyguards and to higher ranks in the Assyrian army.[97] Thus it remains unclear when Nabû-šumu-ka calls for a royal eunuch to

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[93] Pickworth, "Excavations at Nineveh," 303.

[94] The difference in stonework quality is seen clearly in Pl. 1b and Pl. IIa in David Stronach, "Notes on the Fall of Nineveh," in *Assyria 1995: Proceedings of the 10th Anniversary Symposium of the Neo-Assyrian Text Corpus Project Helsinki, September 7-11, 1995* (ed. S. Parpola and R. M. Whiting; Helsinki: University of Helsinki, 1997), 307–324.

[95] On eunuchs see, P. Garalli, "Remarques sur l'administration de l'empire assyrien'," *RA* 68 (1974): 129–140; A. K. Grayson, "Eunuchs in Power: Their Role in the Assyrian Bureaucracy," in *Vom Alten Orient zum Alten Testament* (eds. M. Dietrich and O. Loretz; Neukirchen/Vluyn 1995), 85-98; Piotr O. Scholz, *Der entmannte Eros: Eine Kulutgeschichte der Eunuchen und Kastraten* (Düsseldorf/Zuruich, 1997); K. Deller, "The Assyrian Eunuchs and their Predecessors," in *Priests and Officials in the Ancient Near East: Papers of the Second Colloquium on the Ancient Near East-the City and its Life held at the Middle Eastern Culture Center in Japan (Mitaka, Tokyo), March 22-24, 1996* (ed. K. Watanabe; Heidelberg: Universitatsverlag C. Winter, 1999), 303–311; Karen Radner, "The Assyrian King and His Scholars: The Syro-Anatolian and the Egyptian Schools," in *Of God(s), Trees, Kings, and Scholars: Neo-Assyrian and Related Studies in Honor of Simo Parpola* (SO 106; ed. M. Kuukko, S. Svärd, and R. Mattila; Helsinki: University of Helsinki, 2009), 221–238.

[96] Grayson, "Eunuchs in Power," 93.

[97] On eunuchs role in the Assyrian army see, Stephanie M. Dalley, and J. N. Postgate*, Cuneiform Texts from Nimrud: The tablets from Fort Shalmaneser, III* (London: British School of Archaeology in Iraq, 1984), 28.

examine the damage, if a eunuch came from the king's palace, the army, or elsewhere. At the same time, since Assyrian administration relied so heavily on eunuchs, Nabû-šumu-ka's call for a eunuch to look at the earthquake damage provides a rare insight into the administrative response to a natural disaster.[98]

8. Earthquakes and Conspiracy Theories

The likely dating of Nabû-šumu-ka's letter to between 672–669 BCE provides another factor to weigh when studying the well-known conspiracy against Esarhaddon in 671/670 BCE. In 672 BCE Esarhaddon appointed two of his sons, Assurbanipal and Šamaš-šumu-ukin, as future rulers of Assyria and Babylonia, and a year or two later Esarhaddon would suffer from illness as well as a conspiracy against him.[99] Martti Nissinen provides extensive detail about the conspiracy against Esarhaddon noting that no less than fifteen names are mentioned in

[98] Luukko and Van Buylaere, *Political Correspondence of Esarhaddon*, 93–94, organize another tablet that appears to refer to earthquake damage next to Nabû-šumu-ka's text. Most of the front half of the tablet is broken and only the left side of the rear side of the tablet remains. Nevertheless, the extant tablet reads:

Beginning broken away	
˹LÚ˺.GA[L-*x x x x x x*]	the chi[ef ……]
EN [*x x x x x x*]	
Rest broken away	
Rev. beginning broken away	
˹*a-na* LÚ.GAL˺- [*x x x x*]	May [the king, my lord],
liš-al LUGAL [*x x x x*]	ask the chief […]. The king
a-ki BÀD *x*[*x x x x*]	When the city wall […]
i-me-ri-du-n[*i*ʾ *x x x*]	was damaged […]
a-na ma-qa-t[*e x x x x*]	to fal[l …]
GIŠ.ŠÚ.MEŠ ú-[*x x x x*]	the door-beams […]
a-ki ša LUG[AL *be-lí i-qab-bu-ni*]	I will do as the kin[g, my
le-pu-u[*š x x x*]	lord, commands].
[ŠÀ-*bu ša* LUGAL EN-*ia a-d*]*an-niš lu* DÙG.GA	[The king, my lord] can be glad [in]deed.

[99] Esarhaddon had about nineteen children of which nine are known by name. See, Simo Parpola, *Letters from Assyrian Scholars to Kings Esarhaddon and Assurbanipal* (2 vols.; AOAT 5/1 and 5/2; Kevelaer: Neukirchen-Vluyn, 1983), 2:117–118.

conjunction with the conspiracy.[100] Far more is unclear than clear in reconstructing this conspiracy; letters from a figure named Nabû-rehtu-uṣur show that he believed the life Esarhaddon was threatened and that the leader of the rebellion was a figure named Sasî who had a number of accomplices including the chief eunuch and several other eunuchs. The rebellion took place in Nisan (spring in the Gregorian calendar), 670 BCE based on a statement in Esarhaddon's chronicle that "In the eleventh year the king in Assyria put many of his magnates to the sword." Texts from the reign of Esarhaddon suggest that a prolonged illness plagued Esarhaddon that caused him to withdraw from public, and not eat or drink.[101]

Political upheavals following natural disasters are well known as over time, survivors become despondent with the poor conditions, lose hope in moving forward, and government corruption or inactivity stoke an already frustrated attitudes. This can manifest itself through political instability where citizens band together to try and raise their concerns and criticize the ruling power. This insight into post-disaster recovery provides a new perspective to examine the conspiracy against Esarhaddon, who in the midst of suffering a debilitating illness also had to endure an earthquake that rocked the heart of his empire. The earthquake whether before, during, or after Esarhaddon's illness added another complex component to Esarhaddon's struggle to control power that finally resulted in him killing many of his leaders. It must be stressed though, that the notion of the aftermath of an earthquake as a/the cause of rebellion or as contributing factor to the rebellion can only be raised as a suggestion and conclusive support is lacking.

[100] Nissinen, *References to Prophecy*, 108–153; Karen Radner, "The Trials of Esarhaddon: The Conspiracy of 670 BC," *Isimu* VI (2003): 165–184.

[101] See most clearly, *SAA* 10:43, where the king's advisors plead with Esarhaddon to eat as he has not eaten in three days.

9. Earthquakes and Omen Texts

While the focus of this chapter is on actual earthquakes recorded in Assyrian texts, the number of omen texts in the Neo-Assyrian period that refer to earthquakes and their apotropaic rituals calls for some attention. Working with omen texts is a well-known difficulty, for scholars must try to predict—among other things—how these omens were first used, the trajectory of omen texts from their written origins in the Old Babylonian Period until their apex in the Neo-Assyrian Period, and the sources behind the omens.[102] Omens have been known for over 1,000 years before the Neo-Assyrian period and a complete and standardized form of the best known omen series, entitled *Enūma Anu Enlil*, comprises seventy tablets and is divided into four omen groups: lunar, solar, meterological, and fixed stars and planets.[103] While several of these omen groups have been studied, as of yet there has been no attention given to earthquake omens. In Simo Parpola's masterful commentary on *Letters from Assyrian Scholars to the Kings Esarhaddon and Assurbanipal*, he devotes painstaking detail to lunar constellations and eclipses, planetary movement, and solar eclipses but does not address any earthquake omens. Parpola's focus on eclipses is not surprising, as these in particular seemed to have caused great consternation for the king as lunar eclipses were associated with deaths of kings.[104] Parpola, though, tries to date two earthquakes found in the Neo-Assyrian literature, dating one earthquake to June 22 of the 11th year of Esarhaddon's reign (*LAS* 16; 147-148 "What apotropaic ritual is

[102] See the comments by Francesca Rochberg, *In the Path of the Moon: Babylonian Celestial Divination and Its Legacy* (Brill: Leiden, 2010), 211–222.

[103] The title, based on the three opening words of its bilingual (Sumerian and Akkadian) introduction, "When Anu, Enlil…" was given at an early date.

[104] Francesca Rochberg, "Natural Knowledge in Ancient Mesopotamia," in *Wrestling with Nature: From Omens to Science* (ed. P. Harrison, R. L. Numbers, and M. H. Shank; Chicago: University of Chicago, 2011), 9–36. As Rochberg illustrates, since lunar eclipses could be predicted by this period, this created the ritual of a substitute king who would take the evil portents on himself and then be put to death when the danger period was over.

there? There is the apotropaic ritual against earthquake") and another on June 1 of the 12th year of Esarhaddon's reign (*LAS* 234; 35; 137; 138 "He who has caused the earthquake has also created the apotropaic ritual against it.").[105]

Within the Neo-Assyrian period, over time astrology began to supplant other forms of divination, most notably extispicy.[106] Further, letters from four Assyrian scholars (Marduk-šāpik-zēri, Urad-Gula, Urad-Nanaya, and Adad-šumu-usur) during the reigns of Esarhaddon and Ashurbanipal indicate that there was a shift in the first millennium court personnel from physician to exorcist and diviner.[107] This shifting landscape about ominous events is seen clearly in the Astrological Reports edited by Hermann Hunger where celestial divination is the primary concern of the Assyrian scholars.[108] The Assyrian concerns for physical phenomena by studying celestial phenomena is summed up nicely by Francesca Rochberg,

> The interest in celestial phenomena, from the earliest period of the omen texts to the latest period of the horoscopes, was a reflection of a particular relationship between human and divine in ancient Mesopotamia. That is, the gods were thought to communicate with humankind through the behavior of physical phenomena, which in turn became intensely significant objects of observation and analysis. The results of such inquiry in the realm of celestial phenomena were the development of empiricism, mathematical theoretization of astronomical problems, and methods of predicting the phenomena.[109]

Hence, this focus on studying celestial phenomena through empiricism and predicting the phenomena is reflected in the eight earthquake omens found in Hunger's work (8, 36, 37, 315,

[105] *LAS* 35 is especially intriguing as the text continues, "Was there no earthquake in the times of the king's fathers and grandfathers? Did I not see earthquakes when I was small? The god has (only) wanted to open the ears of the king: 'He should open his fists to the god, perform the apotropaic ritual and be on alert.'"

[106] Jana Pečírková, "Divination and Politics in the Late Assyrian Empire," *AO* 53 (1985): 155–168.

[107] See Markham J. Geller, *Ancient Babylonian Medicine: Theory and Practice. Ancient Cultures* (Chichester/Malden: Wiley-Blackwell, 2010).

[108] Hunger, *Astrological Reports to Assyrian Kings*, xiv.

[109] Rochberg, "Natural Knowledge," 20–21. On fate and divination in Mesopotamia see also, Rochberg, *In the Path of the Moon*, 19–30.

490, 495, 496, 555).[110] These omens raise concerns primarily around four areas: what happens if an earthquake strikes at night (8, 37, 315, 495, 555), foretells an enemy attack or revolt (8, 36, 37, 315, 490, 495, 496, 555), reduces a land's yield (36, 495), increases a land's yield (490).

From a quick overview of these earthquake omens, it is clear that the primary concerns found in these omens are the timing of an earthquake and its ability to destabilize the king's empire. Less frequent, though still notable is how an earthquake could affect land yield negatively, as one would expect through liquefaction, mudslides, and other types of physical trauma, but more surprisingly, positively. The concern for an earthquake striking at night reflects an ongoing societal worry even today as earthquake casualties are highest during the nighttime hours when most people are at home, not only inside but inside structures that are less likely than administrative or military buildings to survive earthquakes. In this way, omen texts expressing concern for nighttime earthquakes provide insight into the worst-case scenario of a king and his administration having to cope with an earthquake that struck at night.

Of greater concern to a king and his administration is how an earthquake could cause enemy attack or revolt. This is a pragmatic concern due to the number of threats to the Assyrian empire and how a quake could weaken physical defenses and divert resources. In turn, outside threats would be presented an excellent opportunity to attack during this period of weakness. This issue was first suggested as a complicating factor in the revolt against Esarhaddon; as stated above, as survivors become despondent with the poor conditions, they lose hope in moving forward, and government corruption or inactivity stokes an already frustrated attitude. This can manifest itself through political instability where citizens band together to try and raise their concerns and criticize the ruling power. In addition, if any of the influential administration or

[110] Hunger, *Astrological Reports to Assyrian Kings*, 357, does not list report 496 in his subject index under earthquakes but is included here since it discusses earthquakes.

upper class side with the *hoi polloi*, a ruling administration is put further on its heels in trying to quell the anger of people who have nothing left and nothing to lose. As evidenced by the Neo-Assyrian earthquake letters studied above, a primary concern following earthquakes was assessment of the city walls and defensive fortifications, areas that would need hasty repair if there were an existing or impending enemy threat.[111] Between loss of life and loss of structures, enemy attack following a large earthquake afforded a tactical advantage to an enemy and could leave less well-defended and peripheral areas vulnerable. In the Neo-Assyrian period, where a provincial form of government necessitated over 70 different governors and a vast array of administrative support to the king, predicting an earthquake to avert a revolt, whether from friend or foe, helps us understand the reason for these earthquake omens.

These small insights represent only the beginnings of what a detailed study on Neo-Assyrian earthquake omens can provide. A more detailed, nuanced study of earthquake omens from their inception in the second millennium to their evolution and expansion in the first millennium will provide even more insight into the character and culture of the Assyrian empire. More specifically, the ability to date earthquake omens in relation to the earthquakes recorded in the textual record will help advance our understanding of this body of literature and give new insights into these omen texts. In the meantime, these broad observations will hopefully spur others into more detailed study.

10. Conclusion

Records of actual earthquakes cluster during two periods in the Middle and Neo-Assyrian periods. Genre helps define, for better or worse, what historical information can be gleaned from these texts. The two earthquakes found in the Middle Assyrian Period were recorded on wall pegs, which consist of formulaic sayings meant to commemorate the rebuilding or repairing of a

[111] Stronach, "The Fall of Nineveh," 316–317, details hasty repairs made to the Halzi, Shamash, and Adad Gates.

building. Within the midst of these texts, specific assertions of the number of bricks torn down and then re-laid suggest that an historical memory may lie behind the text of Ashur-resha-ishi I (1132-1115 BCE). At the same time, Tukulti-Ninurta's texts began to specify how many layers of bricks were laid during a building's construction pointing to his influence over the scribes of Ashur-resha-ishi I. Thus, any possible historical memory found in Ashur-resha-ishi I's inscriptions is due to the lasting influence of Tukulti-Ninurta's agenda to alter royal inscriptions.

In the Neo-Assyrian period, a detailed record of an earthquake during the end of the reign of Esarhaddon allows for a detailed study of a the effects of an earthquake and how an ancient administration began to deal with its aftermath. Scribal concern focuses on the defensive fortifications of the city, in its city walls, garrisons, and towers. At the same time, and as expected, the scribe also details how religious buildings as well as the king's gods survived the quake. The letter served as a first assessment of the earthquake damage as the scribe called for a royal eunuch to examine the damage himself. In this way, the letter provides insight into the early aftermath of a natural disaster.

Lastly, a number of earthquake omens attest to the growing importance of celestial divination over extispicy in the Neo-Assyrian period. While a detailed study is outside the realms of the current research, a general overview of the substance of these omens suggests that they reflect common sense concerns of earthquakes. Earthquakes cause greater injuries and fatalities at night rather than the day, and earthquakes can level an uneven playing field for enemies or discriminated masses. Since earthquakes are equal opportunity events affecting all types of structures and peoples, a prompt response by the ruling administration in the aftermath of a quake can determine how quickly society can rebuild and move forward. In the absence of prompt attention, resources, or willpower, earthquakes can devastate the political fabric of a

society. These issues provide strong support to how the earthquake recorded in the book of Amos also would have affected the socioeconomic and political fabric of the Levant. It is to this area and earthquake that we now turn.

CHAPTER FOUR: THE SCOPE OF AMOS'S EARTHQUAKE

1. Introduction: Tempering Expectations of Biblical Archaeology

Over the past century more than twenty archaeological sites throughout the Levant have been connected to the earthquake mentioned in Amos 1:1. A number of these sites, if not a majority, are, in my view, linked to the quake on dubious grounds either due to a lack of a rigorous archaeoseismic methodology or because of a chronological appeal to explain destruction that fits around a mid-eighth century period. Moving roughly from north to south, the following sites have appeared in scholarly discourse as containing seismic damage related to Amos's quake: Tell el Ḥammah, Dan, Hazor, En Gev, Megiddo, Rehov, Tell Abu Hawam, Tel Mevorakh, Samaria, Deir 'Alla, Tell es-Sa'idiyeh, Iraq al Amir, Tel Qasile, Bethel, Gezer, Tel Michal, Jerusalem, Tell Judeideh, Tel es-Safi, Tel 'Erani, Lachish, Beersheba, Arad, En 'Haseva, and Timnaʿ.[1]

[1] Most of these sites come from Ambraseys, *Earthquakes in the Mediterranean*, 68–78. Though he does not endorse all of the evidence in the list, he provides it to demonstrate the lack of methodological controls and lack of critical inquiry. At the same time, Ambraseys's list is unhelpful as a number of the sites he lists cannot be found in the bibliography he provides. Thus, it is entirely unclear where in the literature scholars have linked a number of these sites to a mid-eighth century earthquake. Ambraseys used a previous article, N. Ambraseys, "Historical Earthquakes in Jerusalem-A Methodological Discussion," *JS* 9 (2005): 329–40, as the foundation for this section of his book. A number of errors found in his article then made their way into his book. As will be seen below, while Ambraseys is a leading expert of paleoseismology of the Levant, caution should be used when consulting his work on the 759 BCE earthquake due to his lack of understanding of Levantine scholarship, archaeology, and geography. For example, he uses non-peer reviewed sources such as a blog (Vern Crisler, *Shechem and Chronology*, for the evidence at Shechem http://vernable/tripod.com/shechem.htm) in which the blog address is no longer active. He confuses geography by identifying Timnaʿ as Tel Batash (Timnah) in the Sheplah rather than Timnaʿ in the Sinai leading to an embarrassing error where he juxtaposes Hazor and Timnah (*sic*) as the most extreme northern and southern evidence for the quake rather than realizing he means Timnaʿ. This error leads to the distance between Hazor and Timnah as 150 km rather than 350 km (70). His understanding of chronology is also suspect as he cites the idiosyncratic work of Donovan A. Courville, *The Exodus Problem and its Ramifications: A Critical Examination of the Chronological Relationships Between Israel and the Contemporary Peoples of Antiquity* (2 vols.; Loma Linda: Challenge Books, 1971), without any type of critical interaction. This leads to his suggestion that damage to 8th century strata can be dated as early as Sheshonk's invasion or as late as Zechariah's earthquake reference (14:5): a span of more than 400 years. See Ambraseys's full quote: "An earthquake that could obliterate man-made structures within an epicentral area of radius about 100 km, an area including all the sites listed as destroyed, is an earthquake of a size beyond the limits of the possible. The destruction of the towns and forts could have been the result of Zechariah's earthquake or of separate events that occurred during the same week, month or year, but were not differentiated in the sources or, more likely, was the result of the invasion of Judaea and Israel by pharaoh Sheshonk I. It is interesting that many of the sites are included in the list of cities conquered by the Egyptians, the names of which are carved into the south



Map 4.1. Sites with Suggested Seismic Damage Related to a Mid-Eighth Century Earthquake
Map by George A. Pierce, University of California, Los Angeles

wall of the courtyard of the temple of Karnak in Egypt, i. e. Timna (Tel Batash), Tel Gezer, Tel Michal, Tell Qasile, Tell el-Mazar, Tell el Saiidiyeh, Tell el Ḥammah, Tel Mevorakh, Tell Abu Hawam and Megiddo." As seen by this quote, a number of sites he lists have no connection to an eighth century quake but he incorporates them as if scholars are actively citing them as preserving evidence of seismic damage.

Thus, this chapter will first survey a number of archaeoseismic methodologies and how they are focused towards later time periods that contain more architectural elements that can be used as diagnostics for seismic damage or are based on archaeological scenarios which are more the exception than the rule (widespread destruction across an entire site, skeletons trapped in rubble). Next, I will nuance existing archaeoseismic methods so that they are more applicable to Iron II and earlier time periods. In addition, I will survey two historic quakes (1837 CE and 1759 CE) whose epicenters, north of the Sea of Galilee, were close to the mid–eighth century quake in order to examine what areas were affected by these quakes. By using a more nuanced archaeoseismic methodology and employing knowledge from these two similar, historic quakes, I will evaluate all archaeoseismic evidence related to a mid-eighth century earthquake. To date there has yet to be a complete critical evaluation of the suggested damage.[2] My goal is two-fold; first, to demonstrate the lack of evidence in the archaeological record that can be linked clearly to seismic damage and second, to suggest better methodological controls to identify seismic damage in the archaeological record.

2. Weighing Scholarly Rigor and Its Influence on Scholarship

Scholarly study of the mid eighth century quake has divided itself into two camps. Some studies, such as by Ari Ben-Menahem and especially Austin et al., accept eighth century archaeological damage without critical reflection and envision a massive earthquake that struck almost all areas of the Levant. Nicolas Ambraseys is much more sober, if not dismissive, in his judgment and argues against almost all damage. Quoting Ambraseys, "An earthquake that could obliterate man-made structures within an epicentral area of radius about 100km, an area including all the sites listed as destroyed, is an earthquake of a size beyond the limits of the

[2] Brief comments on certain cites are made by Dever, "A Case-Study," 27-28*, 35* and by Fantalkin and Finkelstein, "The Sheshonq I Campaign," 22-23.

possible."[3] For Ambraseys, to account for the damage found in the archaeological record, he believes there was another quake during Zechariah's time or separate quakes that occurred in the same week, month, or year but were not differentiated in the sources. Further, he also suggests that some of the damage may stem from Shoshenq I's invasion of Israel.[4]

One other study has tried to examine the full extent of the earthquake though it is a student paper and has never been published.[5] Michael Hasel, now a professor at Southern Adventist University, wrote a master's thesis on archaeological evidence at Tel Gezer related to Amos's earthquake.[6] Though Hasel focused on supposed earthquake damage at Gezer found during the 1990 excavation season, and which would be soon published by William Dever, he also explored earthquake evidence at Hazor, Tel 'Erani, Lachish, Jerusalem, Beersheba, Arad, and Samaria. Hasel's treatment of the archaeological evidence, because of the genre constraints around his thesis, is brief and cannot be taken as comprehensive. In his summary of the limited evidence he examined, he first cautiously stated that an earthquake, "dating to the first half of the eighth century B.C. seems plausible."[7] Hasel would state later in the same paragraph that based

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[3] Ambraseys, *Earthquakes in the Mediterranean*, 70.

[4] While it is clear that Ambraseys has completed a masterful study statements like these remain extremely problematic. See the above footnote.

[5] One other student paper that should be noted, is posted on the academic website, acadamia.edu. David Danzig, "*A Contextual Investigation of Archaeological and Textual Evidence for a Purported mid-8th Century BCE Levantine Earthquake,*" n.p. [cited 5 January 2012]. Online: http://yale.academia.edu/DavidDanzig. Danzig's paper is thirty-eight pages in length, which twenty-six are actual text; he concludes (26), "Biblical evidence points toward an impactful earthquake. As of yet, the archaeological evidence which has been suggested as indicative of this earthquake by several archaeologists and scholars is largely inconclusive." Danzig's paper is not without problems, though, such as his locating Deir Alla in the southern part of Israel, near Beersheba (17). Overall, he does a good job illustrating the flaws in Yadin's reasoning at Hazor and a chart of possible references to earthquakes or earthquake phenomena in Amos is intriguing.

[6] Michael Gerald Hasel, "New Early Eighth-Century B.C. Earthquake Evidence at Tel Gezer: Archaeological, Geological, and Literary Indications and Correlations" (M.A. thesis, Andrews University, 1992).

[7] Hasel, "New Early Eighth-Century," 29.

on his analysis of data, it led him to conclude that there was "strong evidence for an extensive earthquake to have taken place."[8]

Other studies of earthquake damage, such as William Dever's, however, takes a more narrow view, arguing for 8th century earthquake damage at Gezer while avoiding larger discussions of 8th century earthquake damage at other sites.[9] Alexander Fantalkin and Israel Finkelstein proceed differently by seeing evidence in the north for a major seismic event in the 8th century but in their words, "As far as we can judge, no evidence of the kind expected to be left by a major earthquake has ever been found at any Judahite site."[10] While they offer a brief critique of Dever's assessment of earthquake damage at Gezer,[11] they do not comment on other sites such as Lachish, Tell Judeideh, or 'En Haseva but state, "In contrast, the Shephelah and the Beersheba Valley are far from the Rift Valley and show no evidence of earthquakes in other periods either."[12] As these studies illustrate, there is a vast disparity in interpreting what is seen as seismic damage in the archaeological record and no study has attempted a comprehensive treatment of the evidence.

[8] Hasel, "New Early Eighth-Century," 29.

[9] W. G. Dever, "A Case Study in Biblical Archaeology: The Earthquake of ca. 760 BCE," *EI* 23 (1992): 27*–35*.

[10] Alexander Fantalkin and Israel Finkelstein, "The Sheshonq I Campaign and the 8th Century BCE Earthquake-More on the Archaeology and History of the South in the Iron I IIA," *TA* 33 (2006): 18–42.

[11] Fantalkin and Finkelstein, "Sheshonq I," 22 relegate a short footnote to Dever's evidence from Gezer: "Yet, no real evidence for a quake exists at Gezer. The changes described by Dever could have been caused by centuries of fill-pressure on the city wall, which is located on the slope of the mound. Note that the sections of the city wall described by Dever were all part of a sub-structure, which was buried in the ground from the outset and hence could hardly have been affected by a quake; also note that no evidence for a seismic event has ever been found in any free-standing building at Gezer."

[12] Fantalkin and Finkelstein, "Sheshonq I," 22. See the recent paper on the dating of 'En Haseva by David Ussishkin, "'En Haseva: On the gate of the Iron II Fortress," *TA* 37 (2010): 246–53.

3. Archaeoseismic Methodology

Part of the difficulty of using archaeoseismic methodology is that it is by definition a combination of archaeology and seismology. Thus, as Sintubin et al. point out in their introduction, each archaeological site has unique characteristics related to both the archaeological and seismotectonic context, and these factors dictate that a specific approach is required for each site.[13] Moreover, understanding seismotectonics is extremely difficult for those outside the field due to the many subfields it engages. Yeats et al. state that, "*Seismotectonics* is not defined in any recent glossary, but it could be considered as that subfield of active tectonics concentrating on the seismicity, both instrumental and historical, and dealing also with geological and other geophysical data sets."[14] For the Levant, the article by Amos Salamon et al. provides the most current understanding of the seismotectonics of the Levant.[15] By reexamining data from seismic networks and from seismic bulletins, they were able to find forty-eight new focal mechanisms (the direction of slip in an earthquake and the orientation of the fault on which it occurs) and recalculate thirty-three events that occurred during the years 1940-1992.

While this does not have a direct bearing on the study of the archaeoseismology of Amos's earthquake, it allows a better understanding of the underlining mechanisms of how earthquakes affect the Levant when they do strike. At the same time, as Salamon et al.'s study shows, finding forty-eight new focal mechanisms demonstrates that one benefit of archaeoseismic study is that helps provide a more comprehensive picture of the seismicity of an

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[13] Sintubin et al., "Preface," ix.

[14] Yeats et al., *Geology of Earthquakes*, 5, italics in original work. Yeats et al. do not interact with seismotectonics in their work.

[15] See, for example, the study by Amos Salamon, Avraham Hofstetter, Zvi Garfinkel, and Hagai Ron, "The Seismotectonics of the Sinai sub-plate–the eastern Mediterranean region," *GJI* 155 (2003): 149–173. The first article on this topic to cover the Sinai subplate was Ari Ben-Menahem, Amos Nur, and M. Vered, "Tectonics, seismicity and structure of the Afro-Euroasian junction—the breaking of an incoherent plate," *PEPI* 12 (1976): 1–50.

area. This can be seen most clearly in regions where there is low frequency of large seismic events; thus, evidence of seismic damage in the archaeological record helps to inform the seismic hazard of the area.[16] Archaeoseismic study can also bring to light unknown faults that because of their modern quiescence, modern seismographs have not detected an earthquake and are thus unknown to seismologists.[17]

So, while not a focus of this chapter, the scientific benefits of archaeoseismic work help inform a seismic understanding of a region under study. Yet, because these methods are so dependent on multidisciplinary studies, any fieldwork must now employ several different scholars in order to achieve a comprehensive treatment of suggested archaeoseismic evidence. On the other hand, there exist enough diagnostics of what can and cannot constitute seismic damage that there still is value in examining existing suggestions of seismic damage by adjudicating examples of what are or are not seismic damage. In addition, true archaeoseismic work requires the collaboration of archaeologists, architects, engineers, seismologists, geologists, and historians. Thus, collaboration helps to constrain an overly simplistic view of earthquakes, a view that over time has been warped into neocatastrophism.[18]

The articles most relevant to Levantine archaeoseismic study of the Iron Age are uneven in their treatment and value. This is because of their interaction not only with the location but

[16] M. A. *Rodríguez-Pascua,* P. G. *Silva,* V. H. Garduño-Monroy, R. Pérez-López, I. Israde-Alcántara, J. L. Giner-Robles, J. L. Bischoff, and J. P. Calvo, "Ancient Earthquakes from Archaeoseismic Evidence during the Visigothic and Islamic Periods in the archaeological site of "Tolmo de Minateda" (SE Spain)," in *Ancient Earthquakes*, 171-184.

[17] See the paper by Arkadi Karakhanyan, Ara Avagyan, and Hourgi Sourouzian, "Archaeoseismological studies at the Temple of Amenhotep III, Luxor, Egypt" *Ancient Earthquakes* (2010), 199–222. See the comments by Sintubin, "Archaeoseismology: Past, Present, and Future," 2.

[18] See most noteably, Amos Nur and Eric H. Cline, "Poseidon's Horses: Plate Tectonics and Earthquake Storms in the Late Bronze Age Aegean and Eastern Mediterranean," *JAS* 27 (2000): 43–63.

also with the time period.[19] Further, since few scholars have worked in this area views are concentrated around the work that has been done and so there is little nuance among the publications. For example, Amos Nur has authored or co-authored a number of studies that all have argued for a robust view of earthquakes in the Levant and their effects. Not only are earthquakes large disasters, but for Nur, they can cause the collapse of civilization, and in his view, caused the collapse of the Late Bronze Age.[20] Nur's views will be closely linked with work completed with Hagai Ron and Eric Cline.

Eric Cline, whose article on a possible earthquake at Megiddo presents the most recent contribution to Levantine earthquakes, also co-authored an article with Nur on earthquake storms at the end of the Late Bronze Age. Cline, though, in his article on possible earthquakes at Megiddo is too narrow in his approach to archaeoseismology, relying on a work by Stiros, as well as a study he co-authored with Amos Nur. Thus, he supplies a general rubric for identifying seismic damage but it is difficult to apply his methodology because most sites would not have the evidence he lists. Cline cites for earthquake evidence, "The most diagnostic are collapsed,

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[19] Amos Nur, "And the Walls Came Tumbling Down," *NS* 1776 (1991): 45–48; ibid., "Earthquake! Inspiration for Armageddon," *BAR* 23 (1997): 49–55; ibid., "Armageddon's Earthquakes," *IGR* 39 (1997): 532–541; ibid., "The Collapse of Ancient Societies by Great Earthquakes," in *Natural Catastrophes during Bronze Age Civilisations: Archaeological, Geological, Astronomical, and Cultural Perspectives. Biblical Archaeological Review*, (eds. B. J. Peiser, T. Palmer, and M. Bailey; Oxford: Archaeopress, 1998), 140–147; Amos Nur and Haggai Ron, "The Walls Came Tumbling Down: Earthquake History of the Holy Land," in *Archaeoseismology* (eds. S. Stiros and R. E. Jones; Exeter: Short Run, 1996), 75–85; Shmuel Marco, "Recognition of earthquake related damage in archaeological sites: Examples from the Dead Sea Fault Zone," *Tectnophysics* 453 (2008): 148-156; Amos Nur, *Apocalypse: Earthquakes, Archaeology, and the Wrath of God* (Princeton: Princeton University Press, 2008); Eric H. Cline, "Whole Lotta Shakin' Going on: The Possible Destruction by Earthquake of Stratum VIA at Megiddo," in *The Fire Signals of Lachish: Studies in the Archaeology and History of Israel in the Late Bronze Age, Iron Age, and Persian Period in Honor of David Ussishkin* (eds. I. Finkelstein and N. Na'aman; Winona Lake: Eisenbrauns, 2011), 55–70. Two other papers related to biblical studies, though not germane to Amos are Richard Bauckham, "The Eschatological *Earthquake* in the Apocalypse of John," *NovT* 19 (1977): 224–233; Dean Phillip Bell, "The Trembling of the Earth: Jewish Descriptions of Earthquakes in the Early Modern World," in *The Mountains Shall Drip Wine: Jews and the Environment* (SJC 20; Creighton: Creighton University Press, 2011), 1–20.

[20] The problems are manifold for Nur and Cline's thesis of earthquake storms ending the Late Bronze Age, see, for example the comments concerning Nur and Cline's article in Manuel Sintubin, "Archaeoseismology: Past, Present, and Future," *QI* 30 (2011): 1–7, who states, "setting the stage for the myth of the Late Bronze Age seismic paroxysm around 1200 BC."

patched, and/or reinforced walls; walls leaning at impossible angles or offset from their original position; crushed skeletons and unretrieved bodies lying under fallen debris; widespread fires and burning; toppled columns lying like parallel toothpicks; and slipped keystones in archways and doorways."[21]

As Cline's list of diagnostics illustrates, classifying seismic evidence is made more complicated because archaeoseismic methodology has focused around later time periods with architectural features that lend themselves more easily to identification of seismic damage.[22] For example, diagnostics such as the sliding of an arch, aligned falling of columns, horizontal shifting of large blocks, and chipping of block corners provide strong indications of earthquake damage, but these architectural features either do not exist at Iron Age sites or are found chiefly at monumental buildings.[23] On the other hand, indicators such as collapsed walls and/or deformed walls and floors can be identified in Iron Age sites but do not provide as clear cut evidence as the former diagnostics.[24] For instance, deformed, tilted or cracked walls and

[21] Cline, "Whole Lotta Shakin'," 63.

[22] Shmuel Marco, et al. "Megiddo Earthquakes," in *Megiddo, vol. 4/2, The 1998–2002 Seasons* (ed. I. Finkelstein, D. Ussishkin, and B. Halpern; Tel Aviv: Tel Aviv University, 2006), 568–75. Archaeoseismic work from Megiddo points to the difficulties in identifying earthquakes in the archaeological record seen in the following generic explanation of how to identify earthquake damage, "Supportive evidence includes the absence or scarcity of weapons, historical accounts describing the conquest of the given site, historical accounts describing earthquakes, deformation of coeval natural sediments, and the existence of certain types of damage that are uniquely associated with earthquakes."

[23] See, Shmuel Marco, "Recognition of Earthquake-Related Damage in Archaeological Sites: Examples from the Dead Sea Fault Zone," *Tectonophysics* 453 (2008): 148–56. Marco's evidence comes from a wide variety of Levantine time periods ranging from the Crusader Fortress at Vadum Iacob (Ateret) and the Ottoman Mosque built on top of the Crusader Fortress to some Iron II remains at Megiddo.

[24] Marco, "Recognition," 151–52 supplies a number of valuable pictures to augment his methodology. Stathis C. Stiros, "Identification of Earthquakes from Archaeological Data: Methodology, Criteria and Limitations," in *Archaeoseismology* (FLOP 7; ed. S. Stiros and R. E. Jones; Great Britain: British School at Athens, 1996), 129–52, provided nearly identical criteria to Marco, and while Marco mentions Stiros's work in his review of previous literature, he omits any reference to Stiros in his methodology. See also, Manuel Sintubin and Iain S. Stewart, "A Logical Methodology for Archaeoseismology: A Proof of Concept at the Archaeological Site of Sagalassos, Southwest Turkey," *BSSA* 98 (2008): 2209–30, who modifies, "a semiquantitative logic-tree formalism developed for palaeoseismology to explore a methodological scheme that can track uncertainties in successive stages of

structures must be examined for ground instability caused by differential compaction or local sliding or for fill pressure if relevant, whereas aligned falling of columns is more straightforward.[25] Thus, the earlier one moves chronologically in the archaeological record, often results in greater difficulty applying archaeoseismic evaluation. Further, diagnostics such as widespread fire, as will be seen below, is not found at any Iron Age II site again suggesting that while these diagnostics may work well in theory, they are much more difficult to apply to actual archaeological finds.

This results in a treatment by Cline that has overall good diagnostics but relies on far too many markers that would not be present in Iron II contexts and also is dependent on large scale destruction, when almost all Iron II sites with purported damage have only limited areas. The limited areas are largely due to rebuilding and thus when working with methodology, it may be desirous to use criteria like widespread fires and burning, but this is the exception far more than the rule. Another problematic aspect of Cline's work is that most of his explanations of earthquake damage relies on the popular level book by Amos Nur and Dawn Burgess.[26] In addition, more sophisticated archaeoseismic study has moved towards employing logic trees. In

archaeoseismological investigation," and then applies it to Sagalassos. Sintubin and Stewart provide a useful summary of previous methodological schemes for archaeoseismology, although they unfortunately overlook the comprehensive study of Buck, *Archaeoseismology in the Atalanti Region*.

[25] See the discussion and examples in Stiros, "Identification," 141. Other than some pillars at Hazor that were slanted and did not fall, no other Levantine excavator pointed to pillars as evidence of seismic damage.

[26] For example, though Cline cites three primary sources for constructing a methodology, compare the careful articulation in Stiros 1996 with Cline himself: The most diagnostic are collapsed, patched, and/or reinforced walls; walls leaning at impossible angles or offset from their original position; crushed skeletons and unretrieved bodies lying under fallen debris; widespread fires and burning; toppled columns lying like parallel toothpicks; and slipped key- stones in archways and doorways (Stiros 1996: appendix 2; Nur and Ron 1997a: 532, 1997b: 50, 52–53; Nur and Cline 2000: 48).

2008 Manuel Sintubin and Ian Stewart proposed a logic tree with six criteria.[27] The first three dealt with the probability of an earthquake striking the site and the second three dealt with the damages observed. For their evaluation: 1) tectonic environment; 2) site environment; 3) site potential; 4) identification of damage; 5) dating of damage; 6) regional correlation.

Thus, a more accurate methodology for diagnostics of seismic damage in the archaeological record is important. In addition, since most archaeoseismic methodology has its roots in the Greek archaeology and its various time period, creating and modifying archaeoseismic methodology based on Iron Age and earlier Levantine sites is important. To do this, a more suitable starting point is what kind of evidence and diagnostics can be identified in the archaeological record during these earlier time periods. In this way, walls, whether composed of stone or mudbricks, make the most sense as they are ubiquitous at any site in any time period and are not a time dependent diagnostic unlike a feature like a fallen arch. Other diagnostics such as widespread fire or crushed skeletons—which are very rare—are in themselves diagnostics of destruction, but not necessarily earthquake destruction.[28] The below table summarizes a number of archaeoseismic methodologies:

Table 4.1: Archaeoseismic Methodologies

Representative Samples of Archaeoseismic Methodologies[29]	
Karcz and Kafri's (1978) scheme for the description of suspected archaeoseismological damage: • Location and size of the site; • Main periods of occupancy; • Age of damaged structures; • Nature of excavation works; • Mode and mechanism of excavation; • Extent of excavated area and number and size of the exposed buildings and structures;	Rapp's (1982) analytical framework: • Mechanical properties of the building materials; • Nature and quality of the construction; • Special characteristics of the regolith (overburden), including topography, earth and soil materials, and hydrology; • Regional earthquake regime; • Archaeological evidence of destructive human forces.

[27] Manuel Sintubin and Iain S. Stewart, "A Logical Methodology for Archaeoseismology: A Proof of Concept at the Archaeological Site of Sagalassos, Southwest Turkey," *BSSA* 98 (2008): 2209–2230. Especially useful is their summary of previous methodologies used for archaeoseismology, see 2229–2230.

[28] This can be seen clearly in Cline's discussion of the different views on the destruction of Megiddo.

[29] Adapted from Sintubin and Stewart, "A Logical Methodology," 2229-2230.

Type and quality of construction of the damaged buildings and structures • Type of damage; • Extent and distribution of damage across the site; • Occurrence of similar damage at other contemporaneous sites; • Differences between the observed features of damage and those characteristic of man-induced damage; • Physiographic setting of the site; •Type and composition of the ground; • Features of recent ground instability; • Structural setting of the site.	
Nikonov's (1988) main principles: • Any monument of the past can be subjected to archaeoseismological research. The results depend not only on the characteristics of the building, but also on the level of seismic activity of the area and on the competence and experience of the investigators. • The geological environment should be studied in order to identify and compare faulting in nature and in the monument itself. • Investigations should involve all accessible parts of the monument. • All signs of damage and collapse for the monument should be dated based on archaeological, geological, and geomorphological criteria, using dating methods, as well as on a thorough study of written historical sources. • The historical situation and all known facts and indications to be found in written sources should be taken into account. • A comparison of identified signs of earthquake-related damage on the ancient monuments with modern earth-quake-related damage should be performed to enable an estimation of the magnitude of the earthquake. • A step by step analysis of the signs of damage due to different processes should be done.	Nikonov's (1988) scheme of observation and documentation • Location of monument; • Topographical and geomorphological setting of monument; • Ground and geological environment of monument; • A general characteristic of the monument; • Detailed characteristics of construction material, construction techniques, and structural peculiarities of the monument; Details, measurements, and reproductions of signs of earthquake-related damage; Time of construction and of earthquake-related damage; • Indication of all sources used; • Evaluation of reliability of results and corroboration by comparison with neighboring monuments and other sources.
Guidoboni's (1996) questions: • From the geological–geophysical point of view, is an earth- quake, in the form of a shock or macroseismic effect, such as subsidence, a reasonable possibility? • Can human factors or other natural phenomena such as landslips be excluded as the cause of the destruction observed? • Has a good stratigraphical check been carried out (terminus ante quem and post quem) so that one can be sure that the deformations observed are not due to later seismic events? • Does the hypothesis of an earthquake accord with archaeological and historical evidence? • Is the destruction widespread and can it be correlated with other similar situations over a wider area?	Stiros's (1996) criteria for the identification of earth-quakes from archaeological data: • Ancient constructions offset by seismic surface faults (faulted relics, cultural piercing features); • Skeletons of people killed and buried under the debris of fallen buildings; • Certain abrupt geomorphological changes, occasionally associated with destructions and/or abandonment of buildings and sites; • Characteristic structural damage and failure of constructions: displaced drums of dry masonry columns; opened vertical joints and horizontally slid parts of walls in dry masonry walls; diagonal cracks in rigid walls; triangular missing parts in corners of masonry buildings; cracks at the base or top of masonry columns and piers; inclined or subvertical cracks in the upper parts of rigid arches, vaults, and domes or their partial collapse along these cracks; downslid keystones in dry masonry arches and vaults; several parallel fallen columns; several fallen

	columns with their drums in a domino-style arrangement; constructions deformed as by horizontal forces; • Destruction and quick reconstruction of sites, with the introduction of what can be regarded as antiseismic building construction techniques, but with no change in their overall cultural character; • Well-dated destructions of buildings correlating with historical (including epigraphic) evidence of earthquakes; • Damage or destruction of isolated buildings or whole sites, for which an earthquake appears the only reasonable explanation.
Galadini et al.'s (2006) archaeoseismological practice: • Local geology–geomorphology (in situ)—archaeological documentation of past excavations (off situ); • Palaeoseismology of shear planes displacing archaeological remains (in situ)—relationship between archaeological and historical chronological constraints (off situ); • Off-fault palaeoseismological information in the archaeoseismological perspective (in situ)—historical framework of the archaeoseismic event (off situ); • Geotechnical information on the foundation soils (in situ)—numerical modeling of fossile strong-motion seismograms (off situ); • On-building structural analysis of the deformation; • Archaeologic-stratigraphic reconstruction; • Morphology and depositional features of the collapsed material; • Architectural history of monuments—architectural stratigraphy; • Local seismic response; • Dynamic behavior of the buildings; • Territorial check of the archaeoseismological information.	Sintubin and Stewart (2008) Stage 1: Tectonic Setting Stage 2: Site Environment Stage 3: Site Potential Stage 4: Identification of Earthquake-Related Damage Stage 5: Dating Earthquake-Related Damage/Palaeoearthquake(s) Stage 6: Regional Correlation of Archaeoseismological Evidence

As these eight methodologies illustrate, a variety of approaches have attempted to create an applicable methodology for archaeoseismology. Some approaches, such as Galadini et al. are based more on a scientific approach without defining specific archaeological diagnostics while others such as Stiros (1996) are almost entirely focused on archaeological diagnostics. In this way, Stiros's bent towards diagnostics in the archaeological record is, in my view, more applicable to Iron II fieldwork and his diagnostics will be part of the discussion below.

Returning to the use of walls as an initial diagnostic for archaeoseismic methodology in earlier time period, several issues are important. For Cline, his criteria for walls include collapsed walls, walls offset and/or leaning at an angle from their original position, and diagonal cracks in rigid walls. For Stiros, his criteria are: opened vertical joints and horizontally slid parts of walls in dry masonry walls and diagonal cracks in rigid walls. These diagnostics can apply to both walls composed of stone and mudbrick so I will first consider stonewalls before moving to mudbrick walls.

Shmuel Marco's article on the "Recognition of earthquake related damage in archaeological sites: Examples from the Dead Sea Fault Zone" helps illustrate the types of seismic damage that can be associated with damage in stonework:[30]

1. The horizontal shifting of large blocks as earthquakes can overcome friction and displace the blocks.
2. Chipping of block corners. While this can also be due to wear and tear, Marco notes, "During earthquakes, the warping of walls relives the burden on the outer side of a bend and increases it on the inside. The large pressure, which may be applied on the corners of the blocks, can chip off the block corners. Where the chipping crosses bedding planes, joints, and fractures, and is common to many blocks, it can be considered an earthquake-related deformation."[31]
3. Collapsed walls. Horizontal forces are needed to topple walls but to distinguish between the cause of the force, Marco advocates examining the final position of the wall. Walls toppled by earthquakes are usually in contact with each other and fine material can fill voids and gaps. A more ordered arrangement (imbricate) is often one of the results.[32]
4. Deformed walls. Slow deformation should be excluded before labeling the deformation as seismic. In addition, since differential settling produces a similar effect the foundation under the wall must be examined.

Utilizing relevant criteria from Marco such as collapsed walls and deformed walls with the criteria listed by Stiros (1996), these diagnostics work well for a discussion of the seismic

[30] Shmuel Marco, "Recognition of earthquake related damage in archaeological sites: Examples from the Dead Sea Fault Zone," *Tectnophysics* 453 (2008): 148-156.

[31] Marco, "Recognition of Earthquake Related Damage," 151.

[32] Marco, "Recognition of Earthquake Related Damage," 151, cautions, "In the case of slow deterioration, some fine material accumulates in the periods between episodes of block falling, limiting or even preventing block contacts."

diagnostics of mudbrick structures. First, adobe and masonry continue to be the most used construction materials worldwide and remain extremely vulnerable during earthquakes. Assessing the causalities following earthquakes such as the 2001 Gujurat, 2003 Bam, 2005 Kashmir and 2006 Java earthquakes, demonstrates that the main reason for causalities is due to house collapse.[33] The houses collapse as the seismic waves from the earthquake create static and dynamic conditions in which mudbrick structures, consisting of mudbrick walls held together by mortar and a roof consisting of wooden beams and thatch as well as the nature of the material which is high in mass, low in strength, and brittle, all of which can lead to sudden and abject failure.[34] Further, due to the heavy weight of the building materials, this increases the suddenness and severity of failure in an earthquake.[35] In addition, a lack of maintenance also can exacerbate structural damage during an earthquake. Blondet et al. provide a insight into what is usually

[33] Kimiro Meguro, "International Cooperation and Earthquake Disaster Reduction:-Implementation of earthquake safer housing through technological and social approaches-" *The 2nd International Conference on Urban Disaster Reduction, Taipei, Taiwan November, 27-29, 2007*. See also, Blondet et al., "Earthquake Resistant Construction," 7, who note, "In the 2001 earthquakes in El Salvador, more than 200,000 adobe buildings were severely damaged or collapsed, 1,100 people died under the rubble of these buildings, and over 1,000,000 people were made homeless (USAID El Salvador 2001). That same year, the earthquake in the south of Peru caused the death of 81 people, the destruction of almost 25,000 adobe houses and the damage of another 36,000 houses, with the result that more than 220,000 people were left without shelter. (USAID Peru 2001)."

[34] A number of studies have addressed this issue over the past decade. See, M. Blondet, G. Villa Garcia, and S. Brzev, *Earthquake-resistant construction of adobe buildings: A tutorial*. EERI/IAEE World Housing Encyclopedia (2003); A. Coburn and R. Spence *Earthquake Protection* (2d ed; Dowling: John Wiley & Sons, 2002); D. M. Dowling, B. and Samali, "Low-cost, low-tech means of improving the earthquake resistance of adobe-mud brick houses," *Proceedings of the International Conference on Earthquake Engineering (ICEE 2006)*, Lahore, Pakistan. P. Mayorca, "Strengthening of Unreinforced Masonry Structures in Earthquake Prone Regions," Ph.D. Dissertation, The University of Tokyo, Japan (2003); K. Meguro "Technological and Social Approaches to Achieve Earthquake Safer Non-Engineered Houses," *The 14th World Conference on Earthquake Engineering, October 12-17, 2008*, Beijing, 2008; K. Nesheli, N. Sathiparan, R. Guragain, P. Mayorca, F. Ito, H. Kagawa, T. Tsugawa, and K. Meguro, "Full-Scale Shaking Table Tests On Masonry Buildings Retrofitted By PP-Band Meshes," *Proc. of the 5th International Symposium on New Technologies for Urban Safety of Megacities in Asia*, Phuket, 2006; D. Quiun, Á. San Bartolome, and L. Zegarra, "Effective System for Seismic Reinforcement of Adobe Houses," *The 13th World Conference on Earthquake Engineering,* Vancouver, *2004*; L. Zegarra, D. Quiun, Á. San Bartolome, "Performance of Reinforced Adobe Houses in Pisco Peru Earthquake," *The 14 World Conference on Earthquake Engineering, October 12-17, 2008*, Beijing, 2008.

[35] See, Marcial Blondet, Gladys Villa Garcia, and Svetlana Brzev, "Earthquake-resistant construction of adobe buildings: A tutorial," in the *EERI/IAEE World Housing Encyclopedia* (Oakland: Earthquake Engineering Research Institute, 2003), 1–25.

damaged during an earthquake. They note, "severe cracking and disintegration of walls, separation of walls at the corners, and separation of roofs from the walls, which, in most cases, leads to collapse." Dowling states, "It is widely known that the predominant failure modes of common adobe houses subjected to earthquake loads are vertical corner cracking at the intersection of orthogonal walls, and horizontal, vertical, and diagonal cracking due to out-of-plane flexure."[36]

Some features of the Israelite, four-room house, whether by sheer coincidence or actual design appear to have seismic preparedness as part of their design. First, according to Blondet et al., for mudbrick structures, "The wall height should not exceed eight times the wall thickness at its base, and in any case should not be greater than 3.5 m."[37] As King and Stager note for the Israelite house, "The first story averaged less than two meters in height, which would seem low to us."[38] In this way, the wall height of an Israelite house is lower than the modern suggestions of 3.5 meters in height. Second, in Blondet et al., they recommend that no opening should be wider than 1.2 m. As King and Stager mention, since the original walls of Israelite houses have not been preserved, reconstructions of walls and windows are made from depictions on ivory plaques. Josh 2:15 provides one of the few textual references to windows, noting that ותורדם

[36] Dowling and Samali, "Low-cost and Low-Tech," 24. See also, Leroy E. Tolles and Helmut Krawinkler, *Seismic Studies on Small-Scale Models of Adobe Houses* (JABEECR 90; Palo Alto: John A. Blume Earthquake Engineering Center, 1990) and L. E. Flores, M. A. Pacheco, and C. Reyes. *Algunos estudios sobre el comportamiento y rehabilitación de la vivienda rural de adobe*. *Informe Técnico* (IEG/03/01; Mexico City: Centro Nacional de Prevención de Desastres, 2001).

[37] Blondet, "Earthquake Resistant," 12.

[38] King and Stager, *Life in Biblical Israel*, 30.

בחבל בעד החלון "She let them down by a rope through a window," with the word for window coming from the root חחל meaning "to separate." Thus, the window was likely a slit.[39] Also, the size of the doorway in a typical Iron II house would not exceed 1.2 meters in width, again conforming to a modern understanding of seismic preparedness for mudbrick structures. Last, the idea that little light penetrated the first floor of an Iron II house also would suggest that the walls were mostly solid with small (and few) openings for windows. These observations on Iron II houses demand more study but from a cursory overview of the architecture of the structures alongside modern definitions of seismic preparedness suggests that the architecture of Israelite domestic structures fits well with our understanding of seismic preparedness.

Returning to the problem of unreinforced brick masonry, a number of retro-fitting techniques have been created that are low cost and would work for non engineered buildings. The chart below illustrates a number of examples:[40]

Table 4.2: Methods for Retrofitting Unreinforced Brick Masonry

Method	**Developing Institute**	**Description**
Polypropylene (PP) Meshing	Institute of Industrial Science (IIS), Tokyo University, Japan	Encasing masonry walls with a mesh constructed of polypropylene strapping [*Mayorca*]
Wire Meshing	Pontificia Universidad Católica del Peru, Peru	Similar to pp-meshing, but using a steel wire mesh [*San Bartolome*]
External Vertical Bamboo Reinforcement	Sydney University, Australia	Vertical bamboo canes placed adjacent (inside and outside) to main external wall [*Dowling*]
Internal Vertical Bamboo Reinforcement	Pontificia Universidad Católica del Peru, Peru	Applied to double-leaf walls. Bamboo placed vertically

[39] King and Stager, *Life in Biblical Israel*, 30. There are eighteen references to windows in the Hebrew Bible. 2 Kings 19:32 may provide the only other text that might give a scale of a window, "He looked up to the window and said, "Who is on my side? Who?" Two or three eunuchs looked out at him."

[40] See, J. Macabuag, "Dissemination of Seismic Retrofitting Techniques to Rural Communities" EWB-UK National Research Conference 2010 'From Small Steps to Giant Leaps...putting research into practice' Hosted by The Royal Academy of Engineering 19th February 2010.

		between inner and outer leaves
Geogrid mesh reinforcement	Pontificia Universidad Católica del Peru, Peru	Similar to pp-meshing, but using civil engineering geogrid, used for slope stabilisation

While methods such as encasing masonry walls with a mesh constructed of polypropylene strapping are modern techniques, methods such as placing bamboo or another type of wood vertically in strategic wall locations is a technique that is not necessitated around modern material technology. In this way, suggestions that some type of wood provided bracing or a method to absorb seismic shock has a long history in the Levant though it remains unclear how accurate this suggestion is.[41] Another insight from retrofitting unreinforced brick masonry could shed light on ancient Israel. J. Macabuag in a survey of dissemination programs conducted in the Himalayan region of Nepal and the Peruvian high Andes found a number of interesting results:

1. Directly engaging masons is an effective way of transferring knowledge of earthquake-safe construction directly to those responsible for the construction.
2. Communities and officials are keen to retrofit homes but despite the low-cost, were still concerned over expense for low- income communities where supply of basic needs was more urgent.
3. Subsidization schemes are required to make retrofitting an attractive option for low-income households. The increased number of retrofits would in-turn lead to a substantial reduction in loss of life and cost following the next strong earthquake, for both governments and homeowners.

Thus, even though many of these fixes are low cost, they are not adopted by the local villagers because of basic needs were more pressing than the total installation cost which was less than 5% of the total construction cost.[42] In Arequipa, Peru, after 360 reinforced adobe homes were built along with a training program for representatives from rural communities which each

[41] This can be seen in places such as the Megiddo Gate structure or as part of the high place at Dan. The area for wooden inserts at Dan is no more than one to two inches in width and it is difficult to conceive that this would provide any type of seismic retrofitting. Amihai Mazar at a presentation on the archaeology of Tel Rehov (Tel es-Safi field school, summer 2010) noted that an engineer was studying how wood found at Tel Rehov might have been used for seismic retrofitting.

[42] Macabuag, "Dissemination of Seismic Retrofitting," 3.

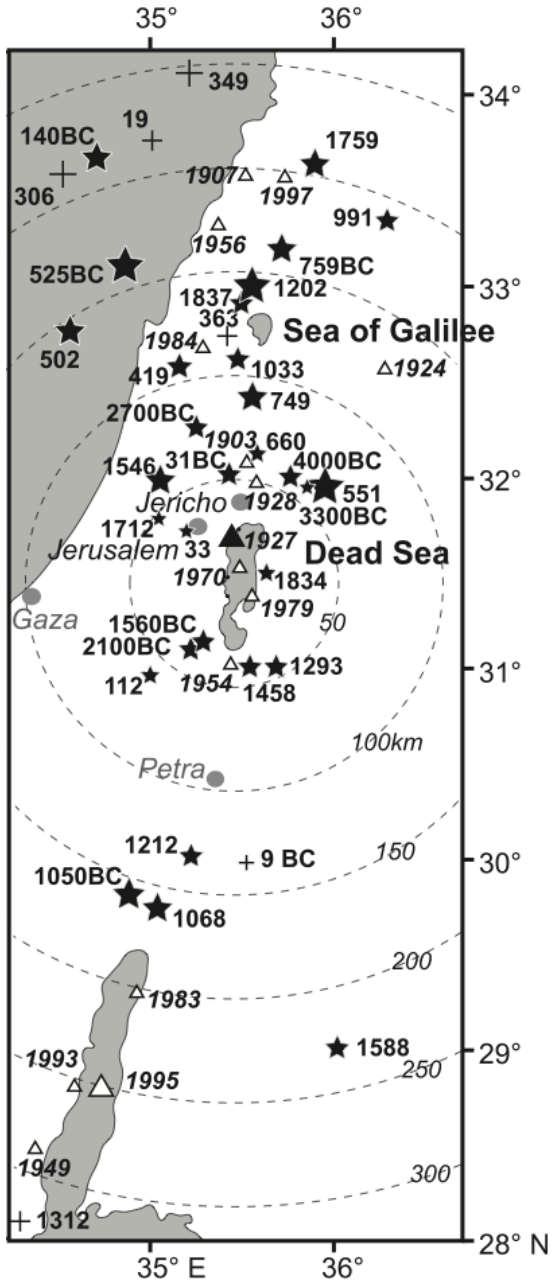
trainee supervised the construction of up to three buildings. Visiting the project nine years later provided some interesting results. "No further adobe structures had been reinforced or built with reinforcement after the project and many adobe structures built after the project showed several errors such as oversized blocks, adobe mixtures containing incorrect proportions of sand and clay, excessively wide mortar layers, positioning of houses on steep inclines etc."[43] So, even though villagers were trained in the proper building technique they did not see it as a priority to continue to retrofit structures and there were a number of errors in the construction of the structures. In sum, while wealthy families show signs of employing the technologies taught, poorer families did not do so. This disparity between the rich and the poor seen in cross-cultural studies of the Himalayan region of Nepal and the Peruvian high Andes calls to mind the language of Amos who is well known for his criticism of the wealthy and elite (Amos 2:6–7; 3:15; 4:1; 5:11; 6:4–6; 8:4–6).

4. Use of 1759 and 1837 CE Earthquakes as Paradigms for Felt Seismic Areas

The supposition for the mid-eighth century BCE earthquake is that its epicenter was located north of the Sea of Galilee. This is based on advances in paleoseismic studies of laminated sedimentary cores, or intraclast breccias, which have shown a close agreement between historical earthquakes and disturbed sedimentary structures (seismites). In addition to identifying historic quakes, paleoseismologists also believe they can approximate epicenter location. In the words of Migowski et al., "Between 1000 B.C. and A.D. 1063, and from A.D. 1600 to recent time the epicenters are all located on the northern segment of the DST, whereas prior to 1000 B.C. and between A.D. 1000 and 1600 they appear to scatter along several segments of the Dead Sea

[43] Macabuag, "Dissemination of Seismic Retrofitting," 5.

Transform."[44] Thus, for Amos's earthquake, they locate the epicenter in the north, and more specifically place it about 100 kilometers north of the Sea of Galilee.





Map 4.2 Map of Intensity Distribution for November 25, 1759 Earthquake, Ambraseys and Barazangi, "1759 Earthquake,"

Map 4.3 Map of Severe (M_L>5.5) Earthquakes in the Eastern Mediterranean and the Dead Sea Region, Migowski et al., "Recurrence Pattern,"

As the maps illustrate, [45]earthquakes close to the 759 BCE earthquake include the 1756 and

[44] Migowski et al., "Recurrence Pattern," 301.

[45] For map 4.2 the intensity distribution is based on the Modified Mercalli Scale. Intensity 5.0=Felt inside by most, may not be felt by some outside in non-favorable conditions. Dishes and windows may break and large bells will

1837 CE earthquakes.[46] The location of the 759 BC quake tempers statements such as that by Zev Herzog and Lily Singer-Avitz, "While termination of the Late Iron Age IIA in the south was probably linked to a major earthquake early in the 8th century BCE, no such catastrophe occurred in the northern regions."[47]

The shake area from these three quakes helps to inform a probable shake area for the 759 BCE earthquake. It must be cautioned at the outset that the earth's crust is dynamic and so any type of one to one correlation from two earthquakes and their shake areas will not be exact. This exercise is meant only as one means to give an example of areas that have been struck by earthquakes similar in size and location.

An earthquake struck southern Lebanon and northern Israel on January 1, 1837 CE, around magnitude 7.0. A number of contemporary sources such as traveler reports, unpublished consular correspondence, press reports, and official documents and damage reports all help reconstruct this quake.[48] While the shock was felt within a radius of about 500 km and included anywhere from Cairo to Tarsus, the heavy damage encompassed a narrow area of about 120 km "from the

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ring. Vibrations like large train passing close to house. 6.0= Felt by all; many frightened and run outdoors, walk unsteadily. Windows, dishes, glassware broken; books fall off shelves; some heavy furniture moved or overturned; a few instances of fallen plaster. Damage slight. 7.0= Difficult to stand; furniture broken; damage negligible in building of good design and construction; slight to moderate in well-built ordinary structures; considerable damage in poorly built or badly designed structures; some chimneys broken. Noticed by people driving motor cars. 8.0= Damage slight in specially designed structures; considerable in ordinary substantial buildings with partial collapse. Damage great in poorly built structures. Fall of chimneys, factory stacks, columns, monuments, walls. Heavy furniture moved.

[46] The full references for the maps are: N. N. Ambraseys, and M. Barazangi, "The 1759 Earthquake in the Bekaa Valley: Implications for Earthquake Hazard Assessment in the Eastern Mediterranean Region," *JGR* 94 (1989): 4007-4013; Claudia Migowski, Amotz Agnon, Revital Bookman, Jörg F. W. Negendank, and Mordechai Stein, "Recurrence Pattern of Holocene Earthquakes along the Dead Sea Transform Revealed by Varve-Counting and Radiocarbon Dating of Lacustrine Sediments," *EPSL* 222 (2004): 301–14.

[47] Ze'ev Herzog and Lily Singer-Avitz, "Sub-Dividing the Iron Age IIA in Northern Israel: A Suggested Solution to the Chronological Debate," *TA* 33 (2006): 163–195.

[48] Nicholas N. Ambraseys, "The Earthquake of 1 January 1837 in Southern Lebanon and Northern Israel," *ADG* XL (1997): 923–935.

coastal area of Saida (Sidon) through the inland iklimi (regions) of al-Touffa, Marjuym, Bshara to Lake Tiberias…"[49] Local damage near the epicenter was extensive but varied from place to place over short distances as the typical one-storey, rubble masonry construction house covered with a flat, heavy roof was highly vulnerable to earthquakes. In Damascus very few of the 15,000 adobe houses collapsed though many were badly cracked.[50]

Outside of this area, the earthquake threw merchandise from shelves in Jaffa and in Ramla people could not stand erect but evidence is lacking that it caused damage. Jerusalem had small damage but the earthquake was not very strong.[51] Aftershocks continued to be felt for almost four months with three aftershocks of greater concern. It is difficult to estimate the loss of life though it is probably several thousand or more. An epidemic struck shortly after the quake and caused additional loss of life while "Safet, Tiberias, and villages in the region of Bshara were plundered by Druses and Mtwalis. The combined effects of the earthquake, plague, and unrest had considerable social implications: because of a rise in the price of labour, before long merchants began to find it difficult to transact their business and commerce was paralyzed for a number of years."[52]

In sum, evidence from the 1837 CE earthquake demonstrates that it was felt throughout the Levant while the actual damage that affected building structures was more tightly clustered around its epicentral location in the north. In addition aftershocks continued for several months, while an epidemic and looting exacerbated an already difficult situation in which the social implications of the earthquakes lasted for several years.

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[49] Ambraseys, "The Earthquake of 1 January 1837," 924.

[50] Sbeinati et al, "The Historical Earthquakes of Syria," 403.

[51] Ambraseys, "The Earthquake of 1 January 1837," 934-935.

[52] Ambraseys, "The Earthquake of 1 January 1837," 935.

The intensity map from the 1759 CE earthquake helps to contextualize the entire felt shake area.[53] The map shown in figure 5.1 used the Modified Mercalli Scale that measures the intensity of earthquakes. The following can be associated with the different intensities:

5.0=Felt inside by most, may not be felt by some outside in non-favorable conditions. Dishes and windows may break and large bells will ring. Vibrations like large train passing close to house.
6.0= Felt by all; many frightened and run outdoors, walk unsteadily. Windows, dishes, glassware broken; books fall off shelves; some heavy furniture moved or overturned; a few instances of fallen plaster. Damage slight.
7.0= Difficult to stand; furniture broken; damage negligible in building of good design and construction; slight to moderate in well-built ordinary structures; considerable damage in poorly built or badly designed structures; some chimneys broken. Noticed by people driving motor cars.
8.0= Damage slight in specially designed structures; considerable in ordinary substantial buildings with partial collapse. Damage great in poorly built structures. Fall of chimneys, factory stacks, columns, monuments, walls. Heavy furniture moved.

This information helps show that most inhabitants of the northern and southern kingdoms would have felt the quake. Though again, as in the 1837 CE earthquake, damages from the quake would have been more localized around a smaller epicentral area and the effects of the earthquake would not cause widespread destruction in an area just because its inhabitants felt the quake.

Comparative evidence from the 1837 and 1756 CE earthquakes whose epicenters were close in proximity to the 759 BCE earthquake shed new light on the probable shake and damage area of the mid eighth century earthquake. While most inhabitants throughout the Levant would have felt the quake, the area where structures were destroyed or severely damage is more limited. The inhabitants in the northern kingdom would have suffered the brunt of the quake. This raises a number of intriguing questions about how the quake would have been perceived by the northern and southern kingdoms. In sum, it would have been clear that to the inhabitants YHWH largely spared the south while he decimated and punished the north. At the same time, the larger

[53] See, N. N. Ambraseys and M. Barazangi, "The 1759 earthquake in the Bekaa Valley: implications for earthquake hazard assessment in the Eastern Mediterranean region," *JGR* 94 (1989): 4007-4013.

felt area of the quake would have reminded all inhabitants of YHWH's control over nature and caused fear and trembling at the hands of their maker.

5. Archaeoseismic Evaluation of Suggested Mid–Eighth Century Seismic Damage

Recent paleoseismic research suggests there may have been at least two mid-eighth century earthquakes. This chapter will focus on an overall evaluation of archaeoseismic evidence but also proceed with the view that at least one strong mid-eighth century quake was located in the north, above Dan. Further research will hopefully make our understanding of seismicity in the eighth century clearer.[54]

6. Dan

Recent excavations at the newly opened Area L in the center of the site have excavators believing that they have discovered earthquake damage in the eighth century. An ox was found crushed and buried—even with a mudbrick on its head—beneath collapsed mudbrick. Since there was no scavenging of the carcass, this led excavators to believe that collapse was not due to military incursion or poor building technique, which would have resulted in the animal being moved or reburied.[55] Quoting from their 2012 goals, "We will continue digging in the new area in the center of the site, Area L, in the 8th cent. BCE levels destroyed in an earthquake. What does a town look, one minute before disaster strikes? Is the earthquake mentioned in the book of Amos (Chapter 1)?"[56] Given Dan's close proximity to the presumed location of the epicenter, it certainly should have evidence of earthquake damage and hopefully the 2012 season will shed new light on this exciting find.

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[54] See, Elisa Kagan, Mordechai Stein, Amotz Agnon, and Frank Neumann, "Intrabasin Paleoearthquake and Quiescence Correlation of the late Holocene Dead Sea," *JGR* 116 (2011): 1–27.

[55] Personal communication Jonathan Greer.

[56] n.p. [cited 18 March 2012]. Online: http://ngsba.org/en/dig-with-us.

7. Hazor

Hazor, well known for its imposing mound in northern Israel has stood as the unquestioned paradigm of archaeoseismic evidence ever since Yadin's publications in the late 1950s and early 1960s.[57] Yadin believed he found evidence of earthquake damage within Stratum VI throughout Area A located just west of the well-known six chamber gate. In building 2a, a building with a large court and series of rooms on its northern and western sides with a roof supported on the eastern side by six square stone pillars, all the walls and pillars leaned south.[58] Yadin also found "huge blocks" of ceiling plaster sealed off by the floors of Stratum V that were built 1.5 meters above the Stratum VI floors. In Yadin's view, since the walls of the Stratum VI house were so tilted, only their tops could be used, and this accounted for the 1.5 meter rise in flooring between strata. Building 14a, located just east of 2a and nicknamed "The House of Makhbiram" because of the inscription found inside was excavated with collapsed walls. Also, the building termed "Ya'el's House" was found with objects of daily use beneath the collapsed ceiling as well as southward-leaning walls that were common near the house.[59]

Decades after Yadin's excavations from the late 1950's Amnon Ben-Tor would also follow

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[57] Amnon Ben-Tor, "Hazor," *NEAHL* 2: 594-606, simply notes that there are "clear signs that this city was destroyed by the earthquake in the days of Jeroboam II, which is mentioned by Amos." But he also mentions that, "Indications of the destruction of stratum VI by earthquake, noted by Yadin, were not identified," Amnon Ben-Tor, "Hazor," *NEAHL* 5:1769-1776.

[58] Yadin, *Hazor: the Head*, 179-181.

[59] In sum, Yadin, *Hazor II*, 24, lists damage as most striking in the following rooms:

> Room 78 – The *N*. wall was leaning to the *S*., and was partly supported by the debris that blocked the *W*. entrance to the room. Next to the wall was a sloping pile of debris made up of courses of stones; buried beneath it were several vessels. The earthquake wrought most havoc in this room, and it was the wreckage here that first gave us the clue to the disaster.
> Room 14a – The *W*. wall leans sharply to the *E*., the *E*. wall less so.
> Room 113 – The *W*. wall is cracked down the middle and leans eastwards. The *N*. wall leans southwards very markedly.
> Room 21a – The *E*. wall slants eastwards, and fallen courses of stones covered the street to the *E*. of the room (28a).

Yadin's interpretation.[60] In *Hazor III-IV*, Ben-Tor writes,

> Due to the excellent construction of building 2a, we can trace in it the effects of the earthquake which destroyed Stratum VI better than anywhere else in the excavation area. Its strongly-built walls remained standing to a considerable height, but the earthquake is evidenced by their tilt-southwards, particularly that of the three pillars (Pl. XXV, 2). In all the rooms and in the northern part of the courtyard, we came upon great quantities of debris comprising lumps of plaster form the collapsed ceilings (Pl. XXVII, 1, 4), resembling those that we found in storeroom 148 in 1956 (*Hazor I*, p. 23).[61]

In the renewed excavations led by Amnon Ben-Tor, he also has argued for evidence of seismic destruction. William Dever, through personal observation and communication with Ben-Tor noted, "…in a street and drain in Area A that seemed simply to have split down the centre – difficult to explain by *any* other hypothesis."[62]

Given Hazor's location near where the presumed epicenter of the quake struck, one would expect more evidence of earthquake damage. At the same time some of the diagnostics used by Yadin must be balanced by our knowledge of the site as well as more advanced archaeoseismic diagnostics. For example, currently, all the evidence that Yadin identified as seismic damage is found in Area A. The area slopes towards the east or southeast, the downward slope of the tel.[63] Thus, the well-known pillars that are slanted, slant towards the downward slope of the tel. This does not undercut his assertion that an earthquake caused the slanting but the topography must be accounted for in labeling damage as due to an earthquake. In sum, earthquake evidence at Hazor is expected but it is not as clear or widespread as we would like.

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[60] Shulamit Geva, *Hazor, Israel: An Urban Community of the 8th Century B.C.E.* (BARIS 543; Oxford: BAR, 1989), lists items buried in several rooms and strongly supports the earthquake theory championed by Yadin.

[61] Amnon Ben-Tor, *Hazor III-IV. An Account of the Third and Fourth Seasons of Excavation 1957-1958* (Jerusalem: Magnes Press, 1989), 41-44.

[62] Dever, "A Case-Study," 28*.

[63] This can be seen in picture 2, plate I and on the topographic map, Plate CXCVIII. The entire upper city has an elevation of about 30 feet that runs from the high side on the west and then downward toward the east side.

8. 'En Gev

'En Gev is located on a narrow plain of the eastern shore of the Sea of Galilee, though the site appears to have been chosen for location over protection as the mound is only a few meters high.[64] In 1961, the Hebrew University made exploratory soundings over eleven days and then the site was more fully explored by a number of Japanese Universities in ten seasons between 1990 and 2004.[65] After a five-year lapse, three years of excavations again commenced beginning in 2009 under the direction of Keio University, Japan.

Nicolas Ambraseys lists 'En Gev as a possible site with earthquake damage but only refers the reader to William Dever's article on the earthquake.[66] Dever, in an endnote, mentions that an unpublished paper by Gordon Franz adds 'En Gev II as a site with earthquake damage, which Dever calls "very speculative."[67] 'En Gev is listed as a site with earthquake damage related to Amos's quake on the map produced by Austin et al. in their 2000 *IGR* article but there is no discussion of what damage from 'En Gev they see as caused by an earthquake. Pending any further details, currently there is nothing that links 'En Gev to an eighth century earthquake but its location in the north makes it a likely candidate to preserve earthquake damage.

9. Samaria

The genesis of this attribution lies in Yadin's article on Judean weights in which his second to last footnote has carried significant weight of its own.[68] Yadin equated stratum VI of Hazor with Stratum IV of Samaria and saw both sites as destroyed by earthquakes. He did not provide any

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[64] Moshe Kochavi, "'En Gev," *NEAHL* 2:409–412.

[65] David T. Sugimoto, "Tel 'En Gev Preliminary Report," n.p. [Cited 21 March 2012]. Online: http://www.hadashot-esi.org.il/report_detail_eng.asp?id=1382&mag_id=117.

[66] Ambraseys, *Earthquakes in the Mediterranean*, 77.

[67] Dever, "A Case-Study in Biblical Archaeology," 34, n. 10.

[68] Yadin, "Ancient Judaean Weights," 24.

evidence for earthquake damage at Samaria but yet in the last few years, two articles have cited Samaria as having earthquake damage. Though Dever did not mention Samaria in his article, both Austin et al. and Ambraseys mention the site in their articles but in very loose ways. First, Austin et al. state that "according to Yadin et al. (1960, p. 36), traces of the middle-eighth-century earthquake were found at Samaria." Yadin, however, does not make this statement in the *Hazor II* volume. Yadin, in *Hazor II*, refers the reader to his *Scripta Hierosolymitana* article which itself also does not provide any type of evidence. The only other evidence adduced by Austin et al. comes from the biblical text itself where they note that according to Amos 3:11; 4:3; and 6:11, Samaria received severe damage to palace-fortresses, walls, and houses, though Amos never links these texts with earthquake damage.

In Ambraseys's attempt to compile purported evidence of eighth century earthquakes he uses work from G. Ernest Wright's *Biblical Archaeologist* article on Iron Age Chronology and Samaria where Wright argues that since the end of Shechem 9b correlates to Samaria Building Period 2 and Shechem 9b had been destroyed in an earthquake, so had Samaria Building Period 2.[69] In Ron Tappy's reevaluation of Samaria, he suggests that one might extend the latter part of Period III "at least as far as the earthquake of ca. 765 BCE" suggesting that the periodization given by Wright is not correct.[70] In sum, there is no compelling evidence, at present, to declare evidence of eighth century earthquake damage at Samaria.

10. Deir 'Alla

Located near the confluence of the Jabbok River and the Jordan, Deir 'Alla is well known for the

[69] G. Ernest Wright, "Israelite Samaria and Iron Age Chronology," *BASOR* 155 (1959): 13–29. Ambraseys, Earthquakes in the Mediterranean, 75, will also site evidence from Ivan T. Kaufman, "The Samaria Ostraca: An Early Witness to Hebrew Writing," *BA* 45 (1982): 229–239 and from a blog of someone named Vern Crisler which is no longer active, which bases its chronology on the work of a dentist, D. A. Courville, *The Exodus Problem and Its Ramifications* (2 vols.; Loma Linda: Challenge Books, 1971).

[70] Tappy, *Archaeology of Israelite Samaria*, 235.

Balaam inscription discovered in 1967 but its close proximity to the Dead Sea Transform suggests it is susceptible to earthquakes. Further, since most of the building material was mud bricks on a foundation of Quaternary alluvium, buildings were even more susceptible to earthquake damage. Excavations in Area B located near the summit found that an earthquake destroyed Phase IX (=M) as well as evidence of fire resulting in contents of rooms left in situ.[71] Franken stated, "These earthquakes and tremors caused vertical cracks which in the excavated area run mostly in east-west direction. When tracing the frequency of these cracks along a north-south line we find at least one every twenty cms."[72] While these cracks help demonstrate the high seismicity of the area which Deir 'Alla sits, cracked foundations and fallen walls constitute the bulk of earthquake damage found in phase IX.

What is as interesting or even more interesting than the clear evidence of seismic damage at Deir 'Alla is the detail provided by the excavators on the aftermath of the quake. Hence, in their view they believe they have identified a second shock in the archaeological record following the first earthquake. In the words of Franken, "We have recorded cracks and shifts of material that run through the ruined buildings but stop at the point where erosion began to level off the debris. These were caused by a second shock which followed the first one after the buildings collapsed and the fire caused by the earthquake had burned itself out."[73] Of interest to many scholars is Franken's assertion that it is after the second shock that he believes the Balaam

[71] G. Van Der Kooij, "Deir 'Alla, Tell," *NEAHL* 1: 338-342.

[72] H. J. Franken, "Archaeological Evidence relating to the Interpretation of the Text," in *Aramaic Texts from Deir 'Alla*, (ed. J. Hoftijzer and G. van der Kooij; Leiden: Brill, 1976), 3–16. For Deir 'Alla, see also, M. Ibrahim and Gerrit van der Kooij, "Two Seasons of Excavations at Tell Deir 'Alla, 1976–1978," *ADAJ* 22 (1977–1978): 56–79; H. J. Franken, "Texts from the Persian Period from Tell Deir 'Alla," *VT* 17 (1967): 480– 481; M. Ibrahim and Gerrit van der Kooij, "Excavations at Tell Deir 'Alla, Season 1979," *ADAJ* 23 (1979): 41–50; M. Ibrahim and Gerrit van der Kooij, "The Archaeology of Deir 'Alla Phase IX" in *The Balaam Text from Deir 'Alla Re-Evaluated, Proceedings of the International Symposium, Leiden, 21–24 August 1989* (ed. J. Hoftijzer and G. van der Kooij; Leiden: Brill, 1991), 16–29.

[73] Franken, "Archaeological Evidence relating to the Interpretation of the Text," 7-8.

inscription fell down. Also, Franken notes how in contrast to evidence of earlier quakes at Deir ʻAlla where they found human victims, they did not find any human victims in this stratum. This discovery—or lack thereof—sheds light on the weight given to different archaeoseismic methodologies that are viable for investigating Iron Age sites. Regarding fire, Franken notes, "Somewhere there was a fire burning in a breadoven or otherwise, because the first shock was followed by a conflagration, wooden objects burned away like the looms, of which we found the clay weights in several rooms, and charred beams which may also partly have belonged to other wooden furniture. But what was left, the less perishable objects, was found and reconstructed as far as possible."[74]

The preservation of earthquake damage at Deir ʻAlla is among the best for the mid eighth century quake and invites new questions about the quake that few other sites can offer. Indeed, William Dever notes that the evidence found at Deir ʻAlla is stronger than most sites.[75] Further, it represents, in my view, the best example of an Iron II Levantine site that preserves damage of the quake. In this way, there is much to learn from Deir ʻAlla regarding how its remains can inform an archaeoseismic methodology for earlier time periods in which many of the traditional markers of seismic damage cannot be found. There is no evidence of human remains even though other phases have evidence of human remains, there was a record of fire though fire did not completely overwhelm the excavated area, and some walls were physically dislocated at the floor level.[76] The dating of Deir ʻAlla phase IX (phase M) is a rare example of how the date of a historical event can inform dating by radiocarbon and ceramic evidence. Carbon date analysis of

[74] Franken, "Archaeological Evidence," 12.

[75] Dever, "A Test Case,"35*. Dever notes that Lachish IV is "perhaps the strongest," but as shown below, this assertion is extremely doubtful.

[76] The wall dislocation may be tempered by the foundation of Quanternary alluvium beneath the walls.

grain and leaf material calibrated to around 800 ± 50 BCE and ceramic study has placed pottery around the same period.[77] Based on the chronological pegs for the earthquake of which a date around 760 or 750 BCE is most likely, the calibration range of the C-14 dates demonstrates how these dates are at the very end of its range.

In sum, Deir ʻAlla provides the best evidence to date of seismic damage related to a mid-eighth century earthquake. In the meantime, the excavated finds offer much to reflect on existing models of archaeoseismic methodology and how this can help provide more nuanced methods of study.

11. Tel Rehov

Tel Rehov's location along the Dead Sea Transform, a few miles south of Beth-Shean already presents itself as a strong candidate for earthquake damage. While the initial excavations in the late 1970s carried out by Fanny Vitto were most well known for the excavated synagogue, the renewed excavations led by Amihai Mazar began in 1997 and thereafter, Mazar tentatively identified eighth century earthquake damage. In Area C, located in the uppermost part of the lower tell and near the northwestern corner, several structures of Stratum VI were exposed and according to the excavators, "A thick mudbrick collapse, with many whole bricks, was found above the floor, although there was no evidence of fire. This severe collapse may be evidence of an earthquake. Another hint of seismic activity is a split or seam in the northern wall of the hall, suggesting that the wall was torn into two."[78] They also stated, "Stratum VI; the western wall

[77] Van Der Kooij, "Deir ʻAlla, Tell," *NEAHL* 1: 341. Given that over thirty years have elapsed since the dating of the grain and leaf material, if material remains, retesting will help confirm this dating.

[78] Amihai Mazar, "The 1997-1998 Excavations at Tel Rehov: Preliminary Report," *IEJ* 49 (1999): 1-42. In stratum C-1, Mazar, 21-22, suggested that charred timber could be the remains of seismic retrofitting, "A common feature of these rooms is the use of wooden logs or beams as a foundation for the walls and floors. The wood was sometimes found to have been laid in several superimposed and interspersed layers. Such wood was also found in the southern compartment room described above. All the beams were carbonised, and in the southern part of the area they were found tilted at a sharp angle down to the east (Fig. 10). The trees used for this construction were identified by Dr. U.

was constructed above a wall of Stratum VII. The poor preservation of the walls, showing signs of brick slippage and cracks, indicate that the building might have been damaged by an earthquake."[79] The site is also known for its Iron Age buildings, without stone foundations, and instead often employ wood foundations and walls which are a common feature, especially in stratum V.[80] Mazar is well known for his careful and well respected excavations and further study and excavation should clarify the damage that appears to be caused by an earthquake. A better understanding of the patterning of the brick fall and the types of cracks in the walls should help clarify the damage.[81]

12. Bethel

Our knowledge of Bethel is, unfortunately, limited due to just four seasons of excavations (1934, 1954, 1957, 1960) that took place over fifty years ago.[82] Austin et al. list Bethel as a site that suffered earthquake damage since, in their view, "Amos indicated severe damage to altars,

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Baruch (Israel Antiquities Authority) as belonging to various species, such as elm, olive, acacia, Judas tree, Syrian ash and mulberry. This type of wooden construction serving as a foundation for both mudbrick walls and clay and plaster floors is unusual, and unparalleled elsewhere in the Levant. It may have been intended to protect the building against earthquakes, which present a hazard in the Jordan Valley, or it could be the roof of a basement, still unexcavated." See also, the summary of the earthquake damage listed on the Tel Rehov project website, "No evidence for violent destruction of this city was found, yet thick mud-brick debris, intact fallen bricks and cracks in the walls allude to destruction or severe damage caused by an earthquake." Amihai Mazar, "Tel Revho Summary," n.p. [Cited 18 March 2012]. Online: http://www.rehov.org/Rehov/Results.htm#Iron%20Age%20IIA. Herzog and Singer-Avitz, "Sub-dividing the Iron Age IIA," 177.

[79] Amihai Mazar, H. J. Bruins, N. Panitz-Cohen, and J. van der Plicht, "Ladder of Time at Tel Rehov: Stratigraphy, Archaeological Context, Pottery and Radiocarbon Dates," in *The Bible and Radiocarbon Dating*: *Archaeology, Text and Science* (eds. T. E. Levy and T. Higham; London: Equinox, 2005), 193-255, esp. 218; Amihai Mazar, "Reḥov, Tel" *NEAHL* 5:2013-2018.

[80] Mazar, "Reḥov, Tel" *NEAHL* 5:2014.

[81] Nimrod Marom, Noa Raban-Gerstel, Amihai Mazar, and Guy Bar-Oz, "Backbone of Society: Evidence for Social and Economic Status of the Iron Age Population of Tel Rehov, Beth Shean Valley, Israel," *BASOR* 354 (2009): 1-21, suggests there is more than just Iron IIA earthquake damage at Reḥov: "Several episodes of rebuilding can be attributed to destruction caused by earthquakes and human activity."

[82] For summaries of the excavations see William Albright and James L. Kelso, *The Excavation of Bethel (1934–1960),* (Cambridge: American Schools of Oriental Research, 1968), 4-9. Austin et al., "Amos's Earthquake," 660, note, "and they provide only a general description of damage" though it is unclear if Austin et al. are implying that this is earthquake damage.

houses, and the temple *(*Amos 3:14,15; 9:1)"[83] though they admit that the excavations did not locate Bethel's temple or provide anything more than a general description of damage.[84] Austin et al. fail to mention that Albright and Kelso saw only one catastrophe during the Iron II period, which Albright and Kelso linked to Assyrian destruction, but, more interesting, Albright and Kelso did note, "The ravages of earthquakes were noted at several points."[85] In this regard, in the volume's section of plates, a picture of a wall collapse from the LB II phase I is found on plate 14:a; Albright and Kelso see this as evidence of seismic destruction. To our great detriment, Albright and Kelso did not expand beyond the example from the LB II phase I on the evidence that constituted the "ravages of earthquakes." However, they listed this statement in their summary of the Iron II period potentially suggesting there might have been earthquake damage in the Iron II period.

Though a number of recent studies have focused on Bethel during the biblical period, only Israel Finkelstein and Lily Singer-Avitz have reevaluated the archaeology of Bethel.[86] For the Iron II, Albright and Kelso suggest that the pottery they identify with the Iron IIB-C compared

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[83] Austin et al., "Amos's Earthquake," 659-660.

[84] Albright and Kelso, *The Excavation of Bethel*, 37, note that searching for Jeroboam's temple was a "major reason" for their work at Bethel, suggesting that its location is above the two major springs and under the modern town or else on the hill east of Bethel. Their suggestion of the eastside hill is curious as during the 1957 season they searched the hill for Iron II sherds and found none. See Albright and Kelso, *The Excavation of Bethel*, 8. Much earlier, Aag Schmidt, who excavated at Shiloh, found only Byzantine and Islamic sherds at Burj Beitin. See, W. F. Albright, "A Trial Excavation in the Mound of Bethel," *BASOR* 29 (1928): 9–11.

[85] Albright and Kelso, *The Excavation of Bethel*, 52. Israel Finkelstein and Lily Singer-Avitz, "Reevaluating Bethel," *ZDPV* 125 (2009): 33- 48, also comment on the state of Iron II destruction, though their concern is after the eighth century: "There is a certain confusion regarding the destruction of the Iron Age II settlement. In one place the excavator noted that there is "only one catastrophe in the life of the town, when it was captured by the Assyrians"; the site seems to have lain in ruins for some time after this event. But then: Bethel "had been spared by Nebuchadnezzar," and was destroyed again "at the shift of world power from the Babylonians to the Persians."" Finkelstein and Singer-Avitz trace the confusion to the dating of the Iron II pottery which was first dated to the latest strata of Tell Bēt Mirsim and Beth-Shemesh but later realized that the dating must be after the end of habitation at Tell Bēt Mirsim.

[86] For a list of recent studies, see, Finkelstein and Singer-Avitz, "Reevaluating Bethel," 33, fns. 2 and 3.

mainly to Tell Bēt Mirsim Stratum A and 6th century B.C.E. They made this comparision because it seemed later than the pottery of Tell Bēt Mirsim Stratum A, which at the time they believed to have been destroyed in 597 B.C.E.[87] Finkelstein and Singer-Avitz, however, based upon examining the pottery plates and pottery held at Pittsburgh Theological Seminary and the Albright Institute, conclude that the two phases are much closer, and both date to the eighth century.[88] They see evidence of strong activity throughout the eighth century and only note that Bethel declined in the late eighth century or early seventh century. Without any more information about Bethel it remains entirely unclear what type of destruction may have occurred in the eight century and if any of this damage can be due to an earthquake.

13. Gezer

Gezer's strategic location at the northern end of the Judean foothills, well known boundary stone inscriptions and large standing stones outside the city have all led it to be subject to a number of excavations in the last 100 years. During the 1990 excavation season, in an attempt to clarify the date and character of the Iron Age defenses, excavators found what they consider to be earthquake damage. Field XI, found along the northern perimeter of the site and 35-55 meters east of Field V contained a portion of the "outer wall," a feature that Macalister as well as Dever saw as secondary Iron Age additions. Since the inner face, however, had a backfilled foundation trench, Dever had difficulty dating the area. As he did isolate a destruction layer about halfway up the outer face it appeared to be clear evidence of Assyrian destruction. Thus, he argued that the date of the wall (an offset/inset) could only be found by extrapolation but must be dated earlier than the Assyrian destruction (733 BCE). In two areas of the outer wall section there

[87] Albright and Kelso, *The Excavation of Bethel*, 68, Finkelstein and Singer-Avitz, "Reevaluating Bethel," 39.

[88] Finkelstein and Singer-Avitz, "Reevaluating Bethel," 39-40, see parallels to Lachish Level III, Tell es-Seba' Strata III–II, Arad Strata X–VIII and Tell Bēt Mirsim Stratum A.

appeared to be evidence of earthquake damage based on two pieces of evidence. Three courses of well-drafted ashlars were cracked through from top to bottom and the stones of each higher course were displaced an increasing amount northward (up to 40 cm northward).

Understanding Dever's process in ascribing this evidence as earthquake damage is illuminating. He noted that he resisted ("for some time") suggestions by various staff members that this was due to an earthquake.[89] Several members from California had just seen earthquake damage —presumably after the 1989 Loma Prieta quake (also known as the "World Series" earthquake because it struck during game three of the world series) —and according to Dever, "even to the fact that random areas of the wall had been affected, and this seemed to provided the confirmation that we needed."[90] Though this outer wall was set into a deep, backfilled trench, with a large section of wall bowed out, where only the superstructure of the wall was visible, and that the bedrock had dipped downward at the very point where the "earthquake damage" was found, they still arrived at earthquake damage as the most likely result.[91]

In addition, further scrutiny from engineering is needed to provide adequate study of the damage in question. While it is well known that stone cracks when subjected to earthquakes due to the repeated vibrations, other causes of pressure also can create cracks.[92] Michael Steiger and A. Elena Charola in their chapter on "Structural behavior and durability of stone masonry," in

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[89] Dever, "A Case-Study in Biblical Archaeology," 30*.

[90] Dever, "A Case-Study in Biblical Archaeology," 30*.

[91] Dever, "A Case-Study in Biblical Archaeology," 28*-30*. Randall Younker, "A Preliminary Report of the 1990 Season at Tel Gezer, Excavations of the "Outer Wall" and the "Solomonic" Gateway (July 2 to August 10, 1990)," *AUSS* 29 (1991): 19-60, argued that the inner face of the uppermost courses of the wall fell southward into the city as further evidence for the suddenness of the wall's collapse. See also a similar critique by Fantalkin and Finkelstein, "Sheshonq I," 22.

[92] L. Binda L and A. Anzani, "Structural behavior and durability of stone masonry," in *Saving our Architectural Heritage: The Conservation of Historic Stone Structures* (ed. N. S. Baer and R. Snethlage; New York: John Wiley & Sons, 1997), 113–150. More recently, the Washington Monument suffered a number of cracks following the Virginia earthquake on August 23, 2011. The monument is made up of marble, granite, and bluestone gneiss.

Saving our Architectural Heritage, note that mechanical damage in stone results when stone is subjected to a load or a stress that is above the mechanical resistance it has. Relevant to Gezer's damage, they state, "Other times, differential soil settlement may be the cause of the cracks in structures, while catastrophic events such as earthquakes are responsible for heavy damages in buildings."[93] Thus, soil compaction could stand as the culprit behind the stone's cracking and movement, especially as the substructure was not excavated and fill pressure is likely behind the wall.

Dever used Gezer's location relative to Ramla/Lydda as an additional level of support for the quake by listing a number of quakes that struck Ramla/Lydda, located 15 km from Gezer. His approach is admirable but it only demonstrates that earthquakes, based on the location of their epicenter in relation to Gezer (such as the 1927 earthquake where he lists 45 houses collapsed at Ramla), could have shook Gezer, and not that Gezer was shook in an eighth century quake. This is seen even more clearly when paleoseismic work is incorporated into the discussion. Based upon their study of the core sediment from the Dead Sea, Migowski et al. have been able to suggest locations of epicenters of Levantine quakes over the last 4000 years.[94] This is relevant to Dever's work as he lists quakes that have destroyed or damaged nearby Ramla. The three quakes that rattled Ramla the most—1033/34 CE, 1068 CE, 1546 CE—all have epicenters that are far from the 760 BCE epicenter near the Sea of Galilee which paleoseismologists believe is where Amos's quake occurred.[95] In sum then, while Ramla incurred earthquake damage, the location of

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[93] Michael Steiger and A. Elena Charola, "Weathering and Deterioration," in *Stone in Architecture: Properties, Durability* (4 ed; ed. Siegfried Siegesmund and Rolf Snethlage), 227-316.

[94] Migowski et al., "Recurrence Pattern," 311, "Data of epicentral distance to farthest liquefaction versus seismic moment have been complied for over a hundred modern shallow focus earthquakes."

[95] Migowski et al., "Recurrence Pattern," 311, lists the epicenter of the 1033/34 CE quake south of the sea of Galilee (one-third of Ramla destroyed), the 1068 CE quake just north of the Gulf of Eilat (Ramla destroyed), and the 1546 CE quake (which Dever lists Ramla as severely damaged), struck very close to Ramla.

the epicenters of these quakes were far from the epicenter of the 760 BCE quake and so this piece of evidence is muted. To achieve further insight into the Gezer evidence a study by engineers of the area and type of stone cracks is a better avenue to clarify the damage that Dever found among the "outer wall."[96] In the meantime, Gezer's evidence is unconvincing.

14. Jerusalem

Notions of the earthquake striking Jerusalem center around Josephus's statement that the earthquake cracked the Temple and caused a large landslide. From the *Antiquities*: "...a great tremor shook the earth, and as the Temple was riven, a brilliant shaft of sunlight gleamed through it and fell on the king's face..." which initiated a 730-meter-long landslide *(Antiquities* IX:225).[97] To date there is no evidence for an earthquake in Jerusalem in the mid eighth century BCE and the evidence rests largely on Josephus's account.

This is not to say that there have been no attempts to find earthquake damage in Jerusalem, but most approaches have focused on evidence of historic landslides on the Mount of Olives. In 1984, Daniel Wachs and Dov Levitte, members of the Geological Survey of Israel studied how the encroaching development of the Mount of Olives would portend a large disaster

[96] Dever, "A Case-Study in Biblical Archaeology," 31*, attempts to situate Gezer in its geotechtonic environment by listing a number of quakes that struck Ramla/Lydda, located 15 km from Gezer. His approach is admirable but it only demonstrates that quakes, based on the location of their epicenter in relation to Gezer (such as the 1927 earthquake where he lists 45 houses collapsed at Ramla), could have shook Gezer, and not that Gezer was shook in an eighth century quake.

[97] Louis Ginzberg, *The Legends of the Jews* (4 vols.; Philadelphia, Jewish Publication Society, 1936), 4: 262, "Two years after Amos ceased to prophesy, Isaiah was favored with his first Divine communication. It was the day on which King Uzziah, blinded by success and prosperity, arrogated to himself the privileges of the priesthood. He tried to offer sacrifices upon the altar, and when the high priest Azariah ventured to restrain him, he threatened to slay him and any priest sympathizing with him unless they kept silent. Suddenly the earth quaked so violently that a great breach was torn in the Temple, through which a brilliant ray of sunlight pierced, falling upon the forehead of the king and causing leprosy to break forth upon him. Nor was that all the damage done by the earthquake. On the west side of Jerusalem, half of the mountain was split off and hurled to the east, into a road, at a distance of four stadia. And not heaven and earth alone were outraged by Uzziah's atrocity and sought to annihilate him; even the angels of fire, the seraphim, were on the point of descending and consuming him, when a voice from on high proclaimed, that the punishment appointed for Uzziah was unlike that meted out to Korah and his company despite the similarity of their crimes."

when an earthquake would strike.[98] Based on fieldwork and aerial photographs, they found evidence of several past landslides on the Mount of Olives. That landslides occur here can be traced to the Mount's composition of chalk that is more susceptible to landslides while Jerusalem sits on limestone and dolomite.[99] Damage to Jerusalem while formerly considered minor has been questioned in light of further research.[100] Regarding the 1927 earthquake, according to R. Avni et al.:

> Almost all the religious quarters of Jerusalem sustained heavy damage, but without many casualties: few people were killed and less than a few dozen were injured. The area of Mount of Olives and Mount Scopus suffered, in particular the Government House in Augusta Victoria, the buildings of the Hebrew University and also churches in the old city. In most of the villages around Jerusalem houses were destroyed, causing casualties and injuries.[101]

Nicolas Ambraseys uses the eighth century earthquake and studies on modern faulting around Jerusalem to conclude, "A relatively large slide can be recognised on the Mount of Olives which is located on the slope which faces west towards the Old City, the scarp of which can be seen halfway up the Mount of Olives, but which, according to the Geological Survey of Israel, is

[98] Daniel Wachs and Dov Levitte, "Earthquake Risk and Slope Stability in Jerusalem," *EGWS* 6 (1984): 183–186.

[99] Daniel Wachs and Dov Levitte, "Earthquakes in Jerusalem and the Mount of Olives Landslide," *ILN* 3 (1984): 118–21.

[100] More recent, advanced studies of hypothetical earthquake damage to Jerusalem paints a much grimmer picture as the Old City sits on centuries of fill and debris which will amplify the seismic waves and create much worse damage. Online: http://www.msnbc.msn.com/id/3980139/ns/technology_and_science-science/t/jerusalems-old-city-risk-earthquake/.

[101] The epicenter of this quake, traditionally placed 25 km north of the Dead Sea near the present-day Damya Bridge, has recently been challenged. R. Avni, D. Bowman, A. Shapira, and A. Nur, "Erroneous interpretation of historical documents related to the epicenter of the 1927 Jericho earthquake in the Holy Land," *JS* 6 (2002): 469-476, place the epicenter near Kibbutz Mizpe Shalem, southeast of Jerusalem. See also, the earlier dissertation by Avni, R. Avni, "The 1927 Jericho Earthquake – Comprehensive Macroseismic Analysis Based on Contemporary Sources" (Ph.D diss., Ben-Gurion University of the Negev, 1999), (Hebrew). For an early perspective on the quake, see Bailey Willis, "Earthquakes in the Holy Land," *BSSA* 18 (1928): 72–103; Sam Frydman, "Geotechnical problems in the Holyland – then and now," *EJGE* 2 (1997): 1–28.

probably much more ancient than the Biblical times."[102] He further states that he cannot find any direct or indirect evidence that Jerusalem was damaged. While Austin et al. state that of the three ancient landslides recognized on the western slope of the Mount of Olives the southernmost of these three landslides may be the one referred to by Josephus. This landslide has yet to be dated, and in light of the above discussion on landslides on the Mount of Olives, dating a slide to the time of Amos begs the evidence.[103] Currently, there is no evidence that can be associated with the earthquake and it is unclear how much damage Jerusalem would have suffered in a quake.

15. Tel es-Safi

Based upon work during the 2009 season, excavators at Tel es-Safi suggested they found eighth century seismic damage which excavation during the 2010 season further explored.[104] In sum, five to six meters in length of collapsed mud bricks in Area F have been uncovered that slid north off their foundation about one meter before collapsing. While the area is located near the summit of the tel, according to the excavators, there is no evidence of fill pressure or foundation failure. The 5-6 meter east to west length of the damage and the possible imbricate arrangement of the mud bricks are consistent with seismic damage rather than a disorganized pattern of fallen mud bricks that would indicate slow deformation.[105] These results are also important since field evaluation came not just from archaeologists, but from seismologists from Hebrew University and engineers from The Technion–Israel Institute of Technology. While the Safi evidence is not

[102] Nicolas Ambraseys, "Historical Earthquakes in Jerusalem – A Methodological Discussion," *JS* 9 (2005): 329-340.

[103] Austin et al., "Amos's Earthquake," 660. See also the comments in Amos Nur and Haggai Ron, "And the Walls Came Tumbling Down," 75– 85.

[104] Jeff Chadwick, "The Earthquake of Amos and the Establishment of Judean Gath in the Eighth Century B.C.E." (paper presented at the annual meeting of the American Schools of Oriental Research, New Orleans, LA., 20 November 2009).

[105] On imbricate pattern of mud bricks see Marco, "Recognition of Earthquake," 151.

conclusive, the collaborative effort provides a good step forward. More evidence from areas away from the summit of the tel, thereby eliminating any type of fill pressure, will help provide further support to their work

16. Tell Judeideh

Tell Judeideh, traditionally identified with Moresheth-Gath, birthplace of the prophet Micah, is located about eight km northeast of Lachish and just north of Beth Gurvin. The excavations were carried out from 1899-1900 by F. J. Bliss and R. A. S. Macalister who pioneered one of the first stratigraphic excavations in Palestine; though most finds belong to the Roman Period, they also distinguished two other phases: Pre-Israelite (Bronze Age) and Jewish (Iron Age II). [106] The Iron IIB period shows evidence of two phases that Shimon Gibson helped to clarify in his re-appraisal of the site.[107] While the upper phase of the Iron IIB contained *lmlk* seals of all types the lower phase did not contain any *lmlk* seals but its pottery compares to that of Lachish IV. The structures in the lower phase were destroyed, which Gibson notes "(in an earthquake?)" and then the upper phase was rebuilt on almost the same lines as the lower phase.[108] Austin et al. list Tell Judeideh as a site with earthquake damage related to Amos's

[106] Magen Broshi, "Judeideh, Tell," *NEAHL* 2:837–838. For the original reports, see F. J. Bliss and R. A. S. Macalister, *Excavations in Palestine during the years 1898-1900* (London: Committee of the Palestine Exploration Fund, 1902). Two preliminary reports were published before the final report: F. J. Bliss, "First Report on the Excavations at Tell ej-Judeideh," *PEFQSt* (1900): 87–101 and F. J. Bliss, "Second Report on the Excavations at Tell ej-Judeideh," *PEFQSt* (1900): 199–222.

[107] Shimon Gibson, "The Tell Ej-Judeideh (Tel Goded) Excavations: A Re-Appraisal Based on Archival Records in the Palestine Exploration Fund," *TA* 21 (1994): 194–234.

[108] Austin et al. mischaracterize Gibson's statement about Iron IIB destruction at Tell Judeideh. They write, "Therefore, Gibson (1994, p. 230) concluded that an earthquake in approximately 760 B.C destroyed Tell Judeideh's "lower-phase" buildings." Gibson does not say this; rather, he states only that there was destruction and leaves unresolved whether an earthquake caused the destruction. In his chart on the stratigraphy of the site (231), he puts question marks both by destruction at 760 BCE and the cause as an earthquake. Quoting Gibson, "The structures from the lower phase were apparently destroyed (in an earthquake?) and then, in the upper phase, were rebuilt roughly along the same lines." They also state (660) that Gibson, "… agreed with Ussishkin and Dever that earthquake destruction debris marks the top of Lachish Level IV." I am unable to find any such statement in Gibson's article, only that he has cf. Lachish IV and III in his stratigraphic chart. Dever is mentioned only once in Gibson's article, regarding his comments on Macalister's poor plans at Gezer (197).

quake but the evidence is circumstantial and at present, can only state that the evidence is inconclusive at best.[109]

17. Tel 'Erani

Tel 'Erani sits in the eastern part of the Coastal Plain and has been identified alternately as Libnah (Conder) or Gath (Guthe/Albright) before Shmuel Yeivin demonstrated that the site is not connected with Gath.[110] Shmuel Yeivin lead six seasons of excavations from 1956-1961 and three further seasons of excavations led by Aaron Kempinksi and I. Gilead in 1985, 1987, and 1988, focused on the southern edge of the high terrace. Austin et al. state that Yeivin indicated evidence of a mid-eighth- century earthquake in Stratum VI of the acropolis, but Stratum VI is identified in Areas A and G on the northern side of the acropolis by Yeivin as Iron Age III (early seventh century).[111] Stratum VIII, however, dates to the eight century and shows evidence of two building phases, especially the courtyard of the northwestern building. Unfortunately, a final report has not been published and to date there is no evidence of earthquake damage.

18. Lachish

Lachish, first identified with Tell el-Ḥesi (Condor) but later connected by W. F. Albright with Tell ed-Duweir sat upon a route between the Coastal Plain and the Hebron Hills attesting to its many layers of occupation. Level V, dating to the Iron IIA and likely destroyed at the hands of Shishak around 925 BCE gave way to a large fortified city though the exact beginning of this

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[109] Ambraseys, *Earthquakes in the Mediterranean*, 68-78, does not list this site.

[110] See Shmuel Yeivin, "'Erani, Tel," *NEAHL* 2:417-422 (Tell esh-Sheikh Aḥmed el-'Areini). Yohanan Aharoni, *The Land of the Bible: A Historical Geography* (rev. and enlarged; trans. By Anson F. Rainey; Philadelphia: Westminster Press, 1979), 271, mentions "Tell el- 'Areini" with the debate about the location of Gath but does not provide any more comments on its identification.

[111] Austin et al., "Amos's Earthquake," 660, point to Yeivin's article, Shmuel Yeivin, "The divided kingdom: Rehoboam-Ahaz/ Jeroboam-Pekah," in *The World History of the Jewish People, The Age of the Monarchies, Political History* (ed. A. Malamat; Jerusalem: Massada, 1979), 161-72, esp. 168.

building period (Level IV) is unclear, Ussishkin argues that it should be linked to an early Judean king (Rehoboam, Asa, or Jeohoshapat).[112] Level IV consists of an outer reventment wall with a glacis, imposing gate and palace-fort and according to the excavators, except for the house in Area S (the area extends between the city wall and the palace-fort) and the city walls, all the monumental structures were destroyed at the end of Level IV, though it is unclear when the destruction dates. This uncertainty is reflected in how Lachish IV became associated with earthquake damage, quoting Ussishkin:

> Level IV apparently came to a sudden end, but it seems clear that this was not caused by fire. On the other hand, the lower house of Level III and the rebuilt enclosure wall followed the lines of the Level IV structures, while the Level IV city wall and gate continued to function in Level III; these facts point towards the continuation of life without a break. Considering that the fortifications remained intact, we can hardly identify this level with the city which was stormed and completely destroyed in the fierce Assyrian attack. Here we may mention M. Kochavi's suggestion (made during a visit to the excavation in 1976 and quoted here with his kind permission) that the end of the Level IV structures may have been caused by an earthquake. A natural catastrophe of this sort would, perhaps, be compatible with the above findings. Of interest in this connection is the earthquake mentioned in Amos 1: 1 and Zech. 14:5, which occurred around 760 B.C.E. during the reign of Uzziah, king of Judah.[113]

Thus, Moshe Kochavi, who had begun digging at Hazor with Yadin in 1955, and was no doubt influenced by the earthquake damage he saw at Hazor, provided the suggestion to Usshiskin, a suggestion that was based more on a process of elimination (not caused by fire, outer walls still standing so no military incursion), than by diagnostics associated with earthquake damage. To Usshiskin's credit he has remained neutral regarding the ambiguous

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[112] David Ussishkin, "Lachish," *NEAHL* 3: 897-911.

[113] David Ussishkin, "The Destruction of Lachish by Sennecherib and the Dating of the Royal Judean Storage Jars," *TA* 4 (1977): 28-60. See also Ussishkin's statement concerning Area S, Level IV (43), "Many of the floors of the main building were covered with relatively large quantities of pottery, including both intact and broken vessels - an indication of sudden destruction. On the other hand, there is only a very small amount of ash remains, lying either on the floors or above them. The layer of debris accumulated above the floors and separating them from the Level III floors was relatively thin, usually less than 50 cm.; in some cases pottery vessels lying on the earlier floors could be discerned while still cleaning the later floors."

evidence both in the preliminary reports as well as his article twenty years later in *The New Encyclopedia of Archaeological Excavations in the Holy Land*.[114] The conclusion reached by William Dever in 1992, however, would argue that Hazor and Lachish were two of the few sites that have put forward "concrete" evidence of earthquake damage and in his view the evidence at Lachish is "perhaps the strongest."[115] Dever does not elaborate on what he sees as evidence of seismic damage. Since that time the final reports from the 1973-1994 excavations at Lachish have been published but there is nothing to change the state of Ussishkin's conclusions. He writes:

> Pottery was found upon the floors of the Level IVa buildings, but there was no evidence for destruction by fire. It is quite possible that this phase was destroyed by an earthquake rather than intentionally destroyed by human attackers, though no unequivocal proof of this is available. Further support, however, may be seen in the fact that the builders of Level III attempted to restore the destroyed city, behaviour which might be considered as an indication that the builders of Level III were no new, intrusive population.[116]

While the evidence remains up for debate the evidence in the archaeological and historical record, as well as the excavators's comments on the destruction, may point to internal reasons for the destruction. 2 Kings 14 recounts the flight of Amaziah, son of Joash from Jerusalem to Lachish (14:19/2 Chron 25:27) where he was captured and subsequently killed. The text lists the conspirators in the plural וישלחו אחריו לכישה וימתהו שם "But they sent after him to Lachish and they killed him there." Amaziah's life, as depicted by the Deuteronomist, was filled with challenge and misfortune that is characterized by frequent confrontation and political

[114] In Ussishkin, "The Destruction of Lachish," 51, he wrote, "The transition from Level IV to Level III is characterized by both continuation and some clear-cut changes and rebuildings." In his encyclopedia article, he simply notes that, "M. Kochavi has suggested that the destruction was caused by an earthquake."

[115] Dever, "The Earthquake," 28*, 35*.

[116] Gabriel Barkey and David Ussishkin, "Area S: The Iron Age Strata," in *The Renewed Archaeological Excavations at Lachish (1973-1994)* (5 vols.; Tel Aviv: Tel Aviv University, 2004), 2:447.

scheming.[117] To my knowledge, little attention has been given to exploring the implications of Amaziah fleeing to Lachish.[118] When Amaziah fled he would have taken a close cohort of trusted advisors and bodyguards with him to Lachish where he appears to have barricaded himself in the city. The conspirators were likely organized by Azariah, as Anson Rainey notes, "it (the conspiracy) could hardly have been done without the knowledge and even the consent of Azariah."[119] Further, the local population who were against the high places that Amaziah kept also aided in his overthrow. In sum, when Amaziah fled the capital city for Lachish he was not met by trusted loyalists in his kingdom but by conspirators from Azariah as well as locals against his rule.

With this historical reconstruction in mind, we can return to the archaeology of Lachish and suggest an alternate interpretation that factors in the apparent destruction, but lack of military incursion, and quick rebuilding between levels IV and III. One interpretation of the evidence could be a smaller attack focused on dislodging Amaziah from Lachish and ending his reign that would not result in evidence of a large scale military incursion. Following his disposal, as the monumental buildings were destroyed but not the fortifications, it appears to be a conscious choice by the attackers who were focused on removing monarchial influence while retaining administrative strength. At the same time, as Usshishkin explains, "by the time of Level III the entire area between the palace-fort and the brick city wall south of the enclosure wall had

[117] J. Maxwell Miller and John H. Hayes, *A History of Ancient Israel and Judah* (2d ed.; Louisville: John Knox, 2006), 352, simply mention that Amaziah was apparently, "involved in some political scheme, fled to Lachish, and there was put to death."

[118] M. Haran, "Observations on the Historical Background of Amos 1:2-2:6," *IEJ* 18 (1968): 201-12, focuses on the effects of Amaziah's victory over the Edomites and the dating of sections in Amos that mention Edom. Anson Rainey, "The Biblical Shephelah of Judah," *BASOR* 251 (1983): 1-22, "If Amaziah had hoped to gain the support of a local governor at Lachish (perhaps a member of the royal family), he was sadly mistaken."

[119] Rainey, "The Biblical Shephelah," 14, 16.

become densely populated, being occupied by relatively poor houses."[120] In this way, the monarchial air that Amaziah filled was soon burst by the reversal of fortunes as housing was now placed where he formally held his last stand. This would account for the rather quick restoration that Barkai and Ussishkin asserted "were no new, intrusive population."

One other piece of evidence strengthens this explanation. Amihai Mazar and Nava Panitz-Cohen suggest the transition between Lachish IV and III is earlier than normally thought, based on their excavations at Timnah.[121] The large assemblage of pottery from Timnah Stratum III includes a number of pottery types that are found at Kuntillet 'Ajrud, which dates to c. 800 BCE.[122] Also, a number of Stratum III types are found at Tel 'Eton, dated to 850-750 BCE. At the same time, large numbers of *LMLK* jars found in Stratum III led Mazar and Panitz-Cohen to identify a main Stratum III as well as a later Stratum IIIB. This distinction is important as Orna Zimhoni argued that Tel Batash Stratum III is a transitional phase between Lachish Levels IV and III.[123] However, based on the typology above, it makes better sense to fit the transition from Tel Batash Stratum IV-III to around the time of transition in rule from Amaziah to Uzziah. This would coincide with the transition from Lachish IV to III. Hence, if there is an ideological reason for destroying government buildings because they represent the king, this event may stand behind the pottery changes at Lachish between Levels IV and III. In short, a massive overhaul in the material culture could be due to the political struggle. Also, modern ethnographic studies

[120] Ussishkin, "The Destruction of Lachish," 44.

[121] I would like to thank Kyle Keimer for strengthening my argument about the transition between Lachish IV and III by pointing me to the evidence at Timnah.

[122] Amihai Mazar and Nava Panitz-Cohen, "" in *Timnah (Tel Batash) II: the Finds from the First Millennium BCE* (2 vols.; Jerusalem: Hebrew University, 2001), 156–160.

[123] Orna Zimhoni, *Studies in the Iron Age Pottery of Israel: Typological, Archaeological and Chronological Aspects* (OP 2; Tel Aviv: Tel Aviv University, 1997), 141–156.

have demonstrated that residents often attack authority centers following a *coup d'état*.[124] This scenario, then, provides an alternate perspective on a reevaluation of the historical and archaeological evidence at Lachish that takes into account destruction without fire or clear military incursion as well as the quick rebuilding that attempted to restore the damaged city.

19. Beersheba

Beersheba, identified by most scholars as the mound east of the modern city, underwent eight seasons of excavations from 1969 to 1975 as part of the Beersheba Valley Regional Research Project that first began at Arad. Yohanan Aharoni, the excavator, pioneered a regional approach to archaeology as he excavated not only Arad and Beersheba but also excavated or initiated digs at Tel Malhata and Tel Masos.[125] At Beersheba he posited possible earthquake damage. The Iron II period shows evidence of destruction four times, which stratum II represents the best-preserved damage and dates to the late eighth century, likely due to Sennacherib.[126] In Beersheba volume I, Aharoni suggested that an earthquake may stand behind the destruction of Stratum III. Aharoni found it difficult to distinguish between stratum III and II, writing: "Only a few intact vessels have so far been recovered from Stratum III, since in most places approximately the same floor level was re-used in Stratum II. The pottery is actually indistinguishable from that of Stratum II and cannot, therefore, be of a much earlier age."[127] While Stratum II was destroyed in

[124] See, for example, the numerous accounts of governmental overthrow and the destruction of government buildings in Jonathan Kandall, "Iraq's Unruly Century," Smithsonian Magazine 34 (May 2003): 44–52. Cited 30 March, 2012. Online: http://www.smithsonianmag.com/people-places/unruly.html.

[125] See the brief comments on Aharoni's approach in Ze'ev Herzog, Miriam Aharoni, Anson F. Rainey, Shmuel Moshkovitz, "The Israelite Fortress at Arad," *BASOR* 254 (1984): 1–34.

[126] Ze'ev Herzog, "Beersheba," *NEAHL* 1: 167–173.

[127] Yohann Aharoni, ed., *Beer-Sheba I, excavations at Tel Beer-Sheba, 1969-1971 seasons*, (Tel Aviv, Tel Aviv University, 1973), 5. He also states (107), "Strata III and II are actually two phases of the same city. Virtually all excavated buildings continued to exist during both strata with only structural changes evident in many of them. In most instances the people of Stratum II re-sued the floors of Stratum III so far, only a few well-stratified vessels of Stratum II are available." He also states on the same page that he "cannot exclude the possibility that Stratum III is

a "huge conflagration" effectively ending the city, there has been debate about how the strata may date in relation to Lachish III and whether the destruction may be tied to Sargon or Sennecherib. Thus, Aharoni's difficulty with strata III and II bled into his conclusion about the end of stratum III. He states, "It would seem that Stratum III suffered some destruction at a given date around the middle of the eighth century but was immediately rebuilt by its inhabitants. On the other hand, the massive public structures, such as the casemate wall and the storehouses, suffered only partial damage; this may be indicative of an earthquake."[128] Aharoni did not include any evidence for this view and quickly followed this suggestion by noting that while he could provide a firm date to the destruction dates of Strata V and II his dates for the end of Strata IV and III were tentative. William Dever's comment regarding Aharoni's evidence is not surprising: "Beersheva depends largely upon the opinion of Aharoni, thus far unsupported by an adequate publication."[129]

Ze'ev Herzog is cautious in his statement about the possibility of earthquake damage at Beersheba but yet he raises the possibility.[130] Quoting Herzog:

> Once we subscribe to the 'low chronology', these changes may not be attributed to Shishak's raid or to the division of the alleged United Monarchy. If so, what generated such a cultural shift? Since typological modification runs parallel to drastic changes in the design of settlements, as observed at Tel Beersheba and Lachish, they should be related to significant events. Tentatively this development might be associated with a severe earthquake dated to ca. 760 BCE, based on biblical references (Dever 1992). A strong earthquake in the southern part of the Judean Kingdom might explain the total destruction of the upper parts of the fortification systems at Tel Arad XI and Beersheba IV and the

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actually not a true stratum (terminating at a given date), but merely includes different phases of remodeling which took place in various buildings during this long period."

[128] Aharoni, *Beer-Sheba I*, 107.

[129] Dever, "A Case-Study in Biblical Archaeology," 35*.

[130] Though there are numerous studies on the low chronology, see the comprehensive work by Thomas Levy and Thomas Higham, editors, *Radiocarbon Dating and the Iron Age of the Southern Levant. Archaeology, text and science. Proceedings of a conference at Yarnton Manor, Oxford* (London: Equinox, 2005).

need to rebuild them in Strata X and III, respectively.[131]

While Herzog admits that his suggestion is tentative it is based on a chronological shift rather than a shift based on evidence. As Finkelstein and Singer-Avitz note, "Indeed, the fact that the earthquake in the days of Uzziah and Jeroboam II is mentioned only by a prophet who was active in the north, with no reference to it in any Judahite source, seems to indicate that Judah was not affected, or at least did not suffer significant damage. The theory that an earthquake was responsible for a major stratigraphic and architectural transition in Judah rests on very shaky ground and should be eliminated from consideration."[132] The lack of any clear evidence offered by Aharoni demands that no earthquake destruction be attributed to Beersheba.

20. Arad

Consisting of a tell along with a Canaanite city, Arad sits about 30 km north-east of Beersheba and is well known for its cultic site with evidence of standing stones and incense altars. Arad is a site that provides excellent stratigraphy for the Iron II period as four strata have been identified for the Iron IIB. Under the old chronology of Miriam Aharoni, since the fortress in stratum XI is connected to Shishak's destruction, Stratum X is linked to the ninth century and stratum IX runs into the eighth. The destruction in the eighth century for stratum IX has been attributed to an Edomite raid (2 Kgs 16:5; 2 Chr. 28:5) with stratum VIII's destruction attributed to Sennecharib in 701 BCE.[133] As at Beersheva where he shifted stratum to fit the low chronology, Ze'ev Herzog moved Arad stratum IX, traditionally identified as early to mid eighth century to the end of the eighth century. In this regard, Herzog's attribution of Stratum X-VIII as eighth century is

[131] Ze'ev Herzog, "The Fortress Mound at Beersheba An Interim Report," *TA* 29 (2002): 3-109, esp. 96-97.

[132] Finkelstein and Singer-Avitz, "The Sheshonq I Campaign," 23.

[133] Miriam Aharoni, "Arad," *NEAHL* 1:82-87; Herzog et al., "The Israelite Fortress at Arad," *BASOR* 254 (1984): 1–34, mention a counterattack from Judah's enemies during the reign of Ahaz but do not provide any detail on the nature of the destruction.

correct as the pottery of Arad X is almost identical to that of Lachish III. In his words regarding the eighth century sequence at the Arad Fortress:

> The time span of the three strata was apparently fairly short. Attributing the destruction of the fortress of Stratum XI to the earthquake of ca. 760 BCE, the construction of the Stratum X fortress may be dated to 750 BCE. The circumstances of the destruction of the Stratum X fortress and its reconstruction in Stratum IX are unclear. If the termination of the use of the temple is associated with the cultic reform attributed to Hezekiah, this event may be dated to ca. 715 BCE. The destruction of Stratum IX may have occurred shortly after this date. [134]

Thus, Herzog's proposal for shifting the chronology for strata X-VIII is helpful, though his link between Stratum XI and the earthquake forces him to leave unanswered the circumstances around stratum XI's destruction and the reconstruction of X. Hence, Arad lacks convincing evidence of earthquake damage.

21. En 'Haseva

'En Haseva (Tamar) stood as a massive 100m x 100m Iron Age fortress (or fortified city) on the southern border of ancient Judah about 35 km south of the Dead Sea. While excavation began in the early 1970's, it was only in 1987 that the excavations, directed by Rudolph Cohen and Yigal Yisrael, uncovered an Iron Age fortress.[135] In Cohen's 1993 article that updated the discovery of the Iron Age fortress, he also noted that the end of strata 2, the Late Roman Period (third-fourth century CE) could have been due to the earthquake of 363 CE though he did not supply any evidence for his suggestion.[136] While early on, there was very little pottery to help date the Iron Age strata, more discoveries helped excavators conclude that Stratum 5 was built in the ninth-eighth century rather than a century later as they previously thought. The fortress consists of four

[134] Herzog, "The Fortress Mound," 98.

[135] Rudolph Cohen and Yigal Yisrael, "The Iron Age Fortresses at ʿEn Ḥaṣeva," 58 *BA* (1995): 223–235.

[136] Rudolph Cohen, "The Fortress at ʿEn Ḥaṣeva," *BA* 57 (1994): 203-214. On the 363 CE earthquake, see Kenneth W. Russell, "The Earthquake of May 19, A.D. 363," *BASOR* 238 (1980): 47–64; Kenneth W. Russell, "The Earthquake Chronology of Palestine and Northwest Arabia from the 2nd Through the Mid-9th Century A.D.," *BASOR* 260 (1985): 37–59.

towers at the corners and an offset-inset casemate wall built of dressed stones. These walls surround a large courtyard with a four-room gate near the northeastern corner of the fortress with some storehouses and granaries near an inner courtyard surrounded by casemate walls. An interesting feature of the site is the absence of floors. In both the storehouses and in the casemate walls floors are absent and complete vessels were found in only two of the casemate rooms near the gate and in the granaries.

Regarding the end of Stratum V, the excavators suggest an earthquake, "Based on the destruction debris and its configuration, we believe that the quake mentioned in Amos and Zechariah was responsible for the destruction of…the gate complex…"[137] They do not list reasons other than the foundation failure associated with the uneven compaction of the substrate.

There is little to evaluate Cohen and Yisrael's view publication was limited to small reports and Cohen's untimely death inhibited a full publication of the results though some reevaluation has taken place. For example, Nadav Na'aman has argued that the builders of Stratum V were not Judean kings, but Assyrians in the late eighth century.[138] Na'aman sees three Assyrian forts in the Negev, at ʿEn Ḥaṣeva, in Wadi ʿAravah near the copper mines, and on the road to the Gulf of Eilat in addition to those at Kadesh Barnea and Tell el-Kheleifeh. Na'aman's suggestion of a later genesis in the building of ʿEn Ḥaṣeva's fortress would certainly dismiss its fate at the hands of an earthquake though Na'aman does not explain how the Stratum V would have ended.[139] David Ussishkin approaches stratum 5 from a different perspective, arguing that

[137] Cohen and Yisrael, "The Iron Age Fortreses," 231. Austin et al., "Amos's Earthquake," 661-662, list 'En Haseva as one of the sites that corroborates evidence of earthquake damage.

[138] Nadav Na'aman, "Notes on the Excavation of ʿEin Haṣeva," *Qadmoniot* 30 (1997): 60 (Hebrew); Nadav Na'aman, "An Assyrian Residence at Ramat Raḥel?," *TA* 28 (2001): 260-280.

[139] To be fair, stratum 4 dates to the seventh-sixth centuries so a tight sequence is not needed to explain the end of stratum 5 before stratum 4 began.

the casemate wall of the fortress and its monumental gate form the substructure of the complex and not the superstructure.[140] He notes, more surprising, that this conclusion was reached with the excavators during a tour of the site during excavations of the stratum 5 gate. In sum, a superstructure of mostly mudbrick would sit on top of the stone substructure. Usshiskin sees evidence of a similar type of construction at other Iron II locations such as a courtyard gate at Megiddo dating to the VA-IVB Southern Palace as well as the inner gatehouse at Lachish from Level IV-III.[141] Ussishkin raises some interesting points about the role of the stone walls and how this could affect earthquake interpretations. The parallel fortresses he provides would argue against Na'aman's proposal of an Assyrian fortress as well as the date of its construction. All this to say, the fortress remains inconclusive for earthquake damage.

22. Other Sites in Scholarly Literature with Dubious Evidence

Several sites should be mentioned as they have been mentioned in scholarly literature at some point regarding earthquake damage in the eighth century but several of the attributions are dubious. Much of this stems from Ambraseys monograph where he included these sites under the section on Amos's earthquake. It is not all together clear why he has done this. To be thorough, several are listed here.

Ambraseys includes Tel Qasile and notes that it is included in the "list of sites damaged by the earthquake of 760 BC" though he does not provide any reference that makes this claim. Ambraseys states that the damage should date to 1100-1050 BCE—which would fit

[140] David Ussishkin, "ʿEn Ḥaṣeva: On the Gate of the Iron Age II Fortress," *TA* 37 (2010): 246-253.

[141] David Ussishkin, "The City-Gate Complex: A Synopsis of the Stratigraphy and Architecture," in *The Renewed Archaeological Excavations at Lachish (1973–1994)* (Monograph Series of the Institute of Archaeology of Tel Aviv University 22). Tel Aviv: Tel Aviv University, 2004), 504–524.

chronologically with earlier Levantine quakes—but I am unclear of other scholars who have listed Tel Qasile as tied to Amos's quake.[142]

Ambraseys includes Tell Abu Hawam as well and notes that it belongs to the same list as Tel Qasile, though he again does not enumerate what list he refers. The site has undergone a number of salvage operations and has had a number of reassessments of its stratigraphy that has resulted in a complex burden of interpretation. The damage that Ambraseys refers to, appears to be evidence of a thick burn layer between Iron I strata in an area of difficulty stratigraphy; thus, the damage dates to the Iron I period.[143] Based on Maria Herrera's subphasing of stratum III, IIIA should date to the second half of the eighth century, and with the strong continuation between stratum III and IV there appears to be a clear continuation of occupation from the start of the Iron II through the eighth century.[144] In sum, there is no evidence of eighth century earthquake damage.

Timnah (Tel Batash), is listed by Ambraseys in his comprehensive work but there is, unfortunately, a serious blunder in his research. He means Timnaʿ (in the Sinai) but since he lists the site as Timnah (Tel Batash) he erroneously juxtaposes Hazor and Tel Batash as the most extreme northern and southern evidence for the quake.[145] The damage that Ambraseys refers to is

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[142] Ambraseys, *Earthquakes in the Mediterranean*, 70, cites Amihai Mazar 1993, 298, (presumably Mazar's *IEJ* article on Beth-Shean in the Iron Age) though none of the references in Ambraseys's bibliography fall into that page range. He also cites the *NEAHL* entry on Tell Qasile, with its two separate sections, one authored by Mazar and the other authored by Trude Dothan and Imanuel Dunayevsky, though it is again unclear what Ambraseys means. See, Amihai Mazar, "Qasile, Tell," *NEAHL* 4:1207-1212 and Trude Dothan and Imanuel Dunayevsky "Qasile, Tell," *NEAHL* 3: 1204-1207.

[143] Ambraseys, *Earthquakes in the Mediterranean*, 70, lists the estimated period of occurrence of the earthquake from 1126–1050 BC, based on a report from Peter Warren and Vronwy Hankey, *Aegean Bronze Age Chronology* (Bristol: Gerald Duckworth, 1989) and also cites the dissertation of Jacqueline Balensi, "Les Fouilles de R. W. Hamilton à Tell Abu Hawam: niveaux IV et V" (Ph.D. diss., University of Strasbourg, 1980); Peter Warren and Vronwy Hankey, *Aegean Bronze Age Chronology* (Bristol: Gerald Duckworth, 1989), 161, "Stratum IVA (dates) from c. 1125 to c. 1050 B.C. The city was violently destroyed, possibly by earthquake."

[144] Jacqueline Balensi, Maria D. Herrera, and Michal Artzy, "Abu Hawam, Tell" *NEAHL* 1: 7-14.

listed by Beno Rothenberg (confirming that Ambraseys means Timnaʿ) and is in the southeast and southwest areas of Area D-K.[146] Area D-K, dating to the Late Bronze/Iron I, consists of a large building complex (c. 400 sq. meters) that Rothenberg saw as partially destroyed by an earthquake and then rebuilt.[147] According to Migowski et al. a 1050 BCE earthquake struck just north of the Gulf of Eilat and so Rothenberg's belief in earthquake damage is strongly corroborated for the Iron I period.[148] Thomas Levy (private communication) has found no evidence of earthquake damage in the Iron IIA period.

Several other sites listed by Ambraseys are confusing as to why they are mentioned. Ambraseys cites a 1993 publication by Amihai Mazar but the references in Ambraseys' bibliography does not match the page numbers in Mazar's study. Further, no evidence is supplied for who or why gave a suggestion that the sites preserved eighth century earthquake damage. These sites include: Iraq al Amir, Tel Michal, Tell el Ḥammah, Tell al Saiidiyeh, and Tel Mevorakh.

Table 4.3: List of Iron IIB Sites Linked to Earthquake Damage

List of Iron IIB Sites Linked to Earthquake Damage and Amos's Earthquake			
Site	Stratum/Area	Earthquake Damage	Comments
Dan	Area L	Likely	Evidence likely recently found
Hazor	Stratum VI Area A	Likely	More work is needed
'En Gev	II	Expected	Lack of publication inhibits analysis
Tell Abu Hawam	----	Wrong Dating	----
Rehov	VI	Likely	Continued

[145] Ambraseys, *Earthquakes in the Mediterranean*, 70. This error leads to the distance between Hazor and Timnah as 350 km rather than 150 km.

[146] Beno Rothenberg, *Timna: Valley of the Biblical Copper Mines* (NAA; London: Thames & Hudson, 1972), 128, 149-50.

[147] Beno Rothenberg, "Timnaʿ," *NEAHL* 4: 1475-1486. Rothenberg also argued that Structure I at site 2 also was destroyed by an earthquake, abandoned, and then covered by wind-blown sand (1479).

[148] Migowski et al., "Recurrence Pattern," 311.

			excavations and study should make the evidence more clear
Samaria	III	Expected	----
Deir ʿAlla	Phase IX	Likely	Best evidence for Iron IIA quake
Tell Qasile	----	Wrong Dating	----
Bethel		Expected	----
Jerusalem	----	Possible	----
Gezer	Stratum VI Field XI Area 20		Assessment of stone walls needed by engineers
Tel es-Safi	Stratum F9/F8 Area F	Possible	Need more excavation
Tell Judeideh	----	----	----
Tel ʻErani	Stratum VIII	Unlikely	No evidence
Lachish	Level IV	Unlikely	----
Arad	IX	Unlikely	Low chronology, no evidence
Beersheba	Sratum III	Unlikely	Lack of evidence
ʻEn Haseva	Stratum V	Unlikely	----
Timnaʿ	Area D-K	Wrong Dating	Strong evidence of seismic damage from earlier quake

23. Summary

The need for archaeoseismic methodology that is fully applicable and useable for Iron Age sites—and even earlier—is clear. As seen in the discussion above a number of diagnostics used for archaeoseismology fit much better in later time periods where monumental architectural features are more common. Other diagnostics such as the presence of human skeletons, wide spread destruction, or evidence of fire are desirable but are more the exception than the rule. A better approach then is decisions that are both nuanced and demonstrate a clear thought process that can eliminate mitigating factors. These can include factors such as fill pressure, erosion over time, poor building technique, foundation failure, leaning of super and substructure, and locations near slopes. In sum, an archaeologist should try and disapprove earthquake evidence than seek earthquake evidence.

Based on a critical evaluation of the current evidence identified with earthquake damage, in my view, only Deir ʻAlla and Rehov (and Dan upon further excavation) contain clear evidence of seismic damage. This is not to say that other sites such as Hazor may contain damage, but it is not as telling as the evidence at Deir ʻAlla and Rehov. At the same time, neither Deir ʻAlla nor Rehov has widespread damage in their mid eighth century strata. The evidence is based on only what is left, largely where residents built over the existing damage. Thus future excavations, especially those north of the Carmel Ridge must be attuned to finding small sections of seismic damage in their mid eighth century strata. Sites such as Abel-Beth-Maacah, Tel Kinrot,[149] Tell Keisan (stratum 6), Bethsaida, Jezreel (if more Iron II remains can be excavated), and Beth-Shean (if more Iron II remains can be excavated) should all be sites that suffered measureable seismic damage. Other sites such as Yoqneam, Tell Qiri, Taanach, Tel Amal, Dothan, Tirzah, Tell es-Saidiyeh, Shechem, and Tell el-Mazar are all sites that may have shook strongly but did not suffer as much damage.

[149] See the preliminary comments about possible earthquake damage in Juha Pakkala, Katri Saarelainen, Kirsi Valkama, Stefan Münger, and Jürgen Zangenberg, "Kinneretin kaivaukset vuonna 2007," *TA* 3 (2008): 195–208. Martti Nissinen and Stefan Münger, "Down the River…A Shrine Model from Tel Kinrot in its Context," in *A Timeless Vale. Archaeological and related essays on the Jordan Valley in honour of Gerrit van der Kooij on the occasion of his sixty-fifth birthday* (ASLU 19; ed. E. Kaptijn and L. P. Petit; Leiden: Leiden University Press, 2009), 129-144, regarding Iron IB evidence, "Tilted or distorted walls with, in some cases cracked boulders and skewed or overthrown mudbrick architecture clearly indicate that this settlement phase fell victim to a massive earthquake. As a secondary effect, parts of the dwellings went up in flames."

Chapter Five: The Context of Amos's Earthquake Imagery

1. Introduction: Newer Approaches to Identifying Earthquake Imagery in Amos

This chapter will examine how insights from comparative Ancient Near Eastern texts and from natural disaster research on earthquakes shed light on identifying earthquake imagery in Amos. This approach will provide a different method of inquiry from most scholars who have attempted to identify earthquake imagery in the book through more conventional methods. To cite a few examples, scholars have focused on various literary approaches; for example, finding verbal roots that are associated with shaking, such as רגז (8:8), רעש (9:1), or נוע (9:9) or connecting images within Amos with earthquake imagery, such as YHWH's promise to destroy Bethel and the royal palaces (3:13–15), YHWH smashing Israel's houses (6:11), or the vision of the destruction of the altar (Amos 9:1–6). At the same time, the chapter will avoid adjudicating whether scholarly identification of earthquake imagery, whether in the past or present, is in fact correct. The goal rather, is to help isolate imagery in the book through comparative Ancient Near Eastern texts as well as help clarify how understanding natural disaster research can enlighten our understanding of the book of Amos.

2. Roaring of a Lion and Earthquake Imagery

Leonine imagery is found throughout the Hebrew Bible, often used in metaphorical descriptions of YHWH's power. Amos 1:2a יהוה מציון ישאג ומירושלם יתן קולו "YHWH roars from Zion and he gives his voice from Jerusalem" is one such text that provides a metaphorical description of YHWH. The verse concludes, "the pastures of the shepherds mourn, and the top of Carmel withers" suggesting judgment is behind YHWH's roaring though the type of judgment and reason for judgment are unclear. This verse, then, has stirred considerable debate about the meaning of YHWH "roaring like a lion." Most scholars have focused on a thunderstorm couched

in theophany imagery because of the formulaic language נתן קול, literally, "he gives voice," which is found in texts such as Exod 9:23; 1 Sam 12:17–18, Psa 18:7–15 (Heb. 18:8–16)/2 Sam 22:14, Psa 46:7, and Psa 68:34 arguing that the formulaic language employed by Amos is part of a long tradition of storm-god imagery.[1] While some of these texts make clear connections between roaring and a thunderstorm, Amos 1:2 does not make this explicit link. The imagery of YHWH roaring, however, in Amos 1:2 is better understood as referring to an earthquake due to parallel imagery in a Neo-Assyrian earthquake omen, a later allusion to this verse in Joel 3:16 (Eng. 4:16), and evidence from earthquake survivors' descriptions of earthquakes.

Connecting "roaring like a lion" in Amos 1:2a with an earthquake has had a long but uneven history of supporters. Two early proponents of this view come from early Jewish interpreters; Eliezer of Beaugency, a Medieval Jewish commentator and grandson of Rashi first advocated this position in the thirteenth century and Zvi Hirsch Chajes, a Talmudic scholar from the nineteenth century also understood "roar" in this manner.[2] Interestingly, Chajes argued elsewhere that the roar was from a thunderstorm not from an earthquake perhaps foreshadowing twentieth century debate on this text. The unevenness expressed by Chajes is also found in Artur Weiser's 1929 work, where he first suggested a catastrophic earthquake.[3] Weiser, however, in his later commentary on the twelve Minor Prophets wrote about "the sound of thunder."[4] The strongest advocate of connecting an earthquake with the imagery of Amos 1:2 is Julius Morgenstern, as part of his four part extensive study on Amos published in *Hebrew Union*

[1] For a list of scholars who have advocated this position, see Karl Möller, *A Prophet in Debate: The Rhetoric of Persuasion in the Book of Amos* (JSOTSup 372; Sheffield: Sheffield Academic Press, 2003), 160, fn. 22–23.

[2] Meir Weiss, *The Bible From Within: The Method of Total Interpretation* (Jerusalem: Magnes Press, 1984), 196–197.

[3] Artur Weiser, *Die Profetie des Amos* (BZAW 53; Giessen: Töpelmann, 1929), 84.

[4] Artur Weiser, *Das Buch der zwölf kleinen Propheten* (Göttingen: Vandenhoeck & Ruprecht, 1956).

College Annual. In Morgenstern's words, "Furthermore, whatever Yahweh's roaring, as implied in the verb ישאג, may have originally connoted, thunder perhaps, or even the roaring of the lion, in this passage, as the continuation of the v. indicates, it depicts the deep, roaring, rumbling noise of the earthquake."[5]

Outside of these proponents, over the last decades few scholars have argued for an earthquake, as they have focused on a narrow demarcation of storm-god imagery tied to thunder. For example, in Brent Strawn's work, *What is Stronger than a Lion*?, he notes that Amos 1:2 has connections to the "theophanic tradition of the thunderstorm" constraining "roaring" to thunder rather than broader notions of celestial or terrestrial phenomena.[6] Part of the reason behind the shift to a theophanic thunderstorm is due to scholarships' shift associating nature's trembling solely with thunder rather than seeing earthquakes as equal or more plausible imagery. In fact, in Frank Moore Cross's seminal work, *Canaanite Myth and Hebrew Epic*, he notes that the "explicit language of the storm has been largely eschewed" and uses Amos 1:2 as an example.[7] In addition to Frank Moore Cross, the work of Samuel Loewenstamm is instructive as he demonstrates there is a long history of nature trembling in Akkadian and Canaanite literature.[8] Loewenstamm did not slavishly link nature's trembling to thunder but saw it as a much larger phenomena. This motif led Loewenstamm to conclude that the model of nature-shaking

[5] Julius Morgenstern, "Amos Studies I," *HUCA* 11 (1936): 19–140, esp. 137 n. 144. Morgenstern will further link Amos 1:2 with the Day of Yahweh, noting, "In this respect the picture here agrees completely with that of the Day of Yahweh in Zech. 14, with its earthquake likened to the terrible earthquake in the days of Uzziah. Here the picture goes even beyond, and far beyond, that of Zech. 14; here the earthquake will even affect both heaven and earth. It is indeed the utmost extreme in the depicting of an earthquake."

[6] Brent Strawn, *What is Stronger than a Lion? Leonine Image and Metaphor in the Hebrew Bible and the Ancient Near East*, (OBO 212; Göttingen: Vandenhocke and Ruprecht, 2005), 59–62; 265–266.

[7] Frank Moore Cross, *Canaanite Myth and Hebrew Epic* (Cambridge: Harvard University Press, 1972), 156–177.

[8] Samuel E. Loewenstamm, "The Trembling of Nature during the Theophany," in *Comparative Studies in Biblical and Ancient Oriental Literatures* (AOAT 204; Kevelaer: Bercker & Butzon; Neukirchen-Vluyn: Neukirchener, 1984), 173–89.

theophany came to Israel under Canaanite influence, which borrowed it from Akkadian literature. These distinctions are more than banal discussion in terminology and will be clearer when examining neo-Assyrian evidence that relates to Amos 1:2.

Outside of these interpreters, it is important to draw attention to Moshe Weiss, who in a number of studies, has focused his attention on the use of the metaphor in Amos 1:2.[9] Weiss divides interpretive opinion into two categories: the tenor is a natural acoustic phenomenon, such as thunder, an earthquake, an east wind, or all three together, or the tenor is a theophany.[10] Weiss provides an extensive survey of scholarly views through most of the twentieth century before arriving at his interpretive decision. In Weiss's view, "roaring" awakens the "complex of associations aroused in the hearer's mind by the roar of the lion."[11] In sum, Weiss argues that the tenor of verse 2a is that it refers to the appearance of God where his action is active, but the action of the existence is passive, thus the Lord is not seen, he is only heard. Weiss's survey of scholarship is instructive, but it highlights that scholarship has favored demarcating theophany image into thunder rather than seeing theophany language more broadly as all types of weather phenomena.

A Neo-Assyrian earthquake oracle from the seventh century provides new light to read Amos 1:2 in light of an earthquake. Experts in divination, especially celestial divination, compiled lists and studied observable celestial phenomena, which were seen as divine communication. In the words of Francesca Rochberg, "Every phenomenon in heaven or on earth, every experience, every symptom of a disease, every birth and human physical attribute, were

[9] Meir Weiss, "On the Traces of a Biblical Metaphor," *Tarbiz* 34 (1964–1965): 107–28, 211–23, 303–18 (Heb); *idem*, "Methodologisches über die Behandlung der Metapher dargelegt an Am. 1,2" *TZ* 23 (1967): 1–25; *idem*, *The Bible from Within*, 196–207.

[10] Weiss, *The Bible from Within*, 196–197.

[11] Weiss, *The Bible from Within*, 206.

potential conveyors of divine messages, and so forecasts or correlations to social, political, or economic events were obtainable from all these phenomena."[12] The origins of Mesopotamian scholarly and literary divination come from the Old Babylonian Period and reach their zenith in the seventh-century library of Aššurbanipal at Nineveh.[13]

An overwhelming majority of tablets found at Nineveh were written during the reigns of Esarhaddon (679 BCE to 668 BCE) and Aššurbanipal (667 to 626 BCE). Even more specific, most tablets were written between 670 to 665 BCE due to dating scribal colophons at the end of the tablet. As mentioned above, the origins of this divination can be traced to the Old Babylonian Period and earthquake omen texts are first known from Nuzi, best known in biblical scholarship for parallels drawn between Nuzi tablets and the patriarchal period.[14]

The oracle studied here, however, does not have any parallels to other omen texts but was composed by a well-known Neo-Assyrian scribe, Issar-šumu-ereš, who wrote thirty-eight other omens found at Nineveh. The omen concerns what to do if an earthquake strikes during *šabaṭu*, the eleventh month of the Assyrian calendar. Overall, the omen is in good condition with most damage occurring at the right side of the tablet. The tablet is thirty lines in total, fifteen lines each on the obverse and reverse, with the relevant portion consisting of lines eight through ten on the obverse. The excerpted portion reads:

8. 1 AN-*ú is-su-ma* KI.TIM *ir*-[*tu-ub*]	If the sky shouts and the earth qu[akes]:
9. *me-reš* KUR *i-ma-aṭ-ṭi šu du bu*$^{?}$ *uk*$^{?}$ *x*[*xxx*]	the cultivated fields will diminish…[]…

[12] Francesca Rochberg, *The Heavenly Writing: Divination, Horoscopy, and Astronomy in Mesopotamian Culture* (Cambridge: Cambridge University Press, 2004), 47.

[13] Rochberg, *The Heavenly Writing*, 63–65. Omens continued to be transmitted into the Persian and Seleucid periods, but the building of Aššurbanipal's library enabled the bulk of exemplars to be found there.

[14] The Nuzi omens were first published by E. R. Lacheman, "An Omen Text from Nuzi," *RA* 34 (1937): 1–8. See also, the discussion in Hermann Hunger and David Pingree, *Astral Sciences in Mesopotamia* (Leiden: Brill, 1999), 11.

10. 1 ^{d}*e-ri-iš-ki-gal ik-kil-la-šá* GIM UR.[MAH ŠUB-*d*]*i*	If Ereškigal [utter]s her roar like a li[on]: the earth will throw the land into ruins.[15]

As mentioned above, the omen focuses on what to do if there is an earthquake during the eleventh month. The word "earthquake" is found in lines one, six, eight, twelve, fourteen, and on the reverse in lines one and eleven. Beyond this phrase, the refrain "if the sky shouts" is found five times in the omen. The omen does not provide a subject for the sky "shouting" but other omens in this same corpus refer to Adad, the storm-god, shouting and thundering.[16] In these omens, however, the earth never shakes so it remains unclear if shouting and/or thundering causes an earthquake. At the same time, the structure of the omens is formulated in conditionals: if *a* occurs, then *b* will occur, a common Near Eastern form of a protasis and apodosis. Grammatically, scholarship has seen the relationship not as a causal but a correlation; thus, if *a*, expect *b*.[17] With this background in mind, the omen is best read, if Ereškigal roars like a lion, then expect the earth will turn the land into ruins. It is important to note that the wording of the apodosis appears cumbersome. It is not "expect the land to turn into ruins" but "expect that the earth will turn the land into ruins."[18] The terrestrial focus of this line is made even clearer when

[15] Hermann Hunger, *Astrological Reports to Assyrian Kings* (SAA 8; Helsinki: Helsinki University Press, 1992), 19–20, omen 36. Another Assyrian parallel is often deduced for Amos 1:2. The Middle Assyrian, "Fable of the Fox" describes the dog's strength as: "My strength is overpowering, I am the claw of the Zû-bird, a very lion… At my terrible bellow the mountains and the rivers dry up [*e-ta-na-ab-ba-la-a*]." See W. G. Lambert, *Babylonian Wisdom Literature* (Oxford: Clarendon Press, 1960), 192–193.

[16] Hunger, *Astrological Reports*, "shouting" in omens 1, 31, 32; Hunger, *Astrological Reports*, "thundering" in omens 1, 31, 32, 33. Omen 36 later states, "either Adad will thun[der], or a storm will come, or […], or there will be an earth[quake]."

[17] See the explanation in Rochberg, *The Heavenly Writing*, 58.

[18] The addition of this subject in the apodosis, not only supplies a grammatical subject, but also suggests that at least in a rudimentary way, the Assyrians saw the ground as the reason behind the earthquake. Lest this statement sound elementary, the modern theory of plate tectonics was only suggested in the 1950's.

Ereškigal's religious history is understood: Ereškigal, translated as "Queen of the Great Below" was the goddess of the underworld.[19] Thus, Ereškigal's roaring from the underworld caused the earth to turn the land into ruins. In other words, it is the roaring that causes the earthquake.

The imagery in this omen until this point has not been connected with Amos 1:2 but suggests a number of intriguing parallels. As Samuel Loewenstamm has argued, it is clear that storm-god imagery has a long history in Akkadian and Canaanite literature. This is not to say that Amos 1:2 borrowed from a Neo-Assyrian omen but to suggest that a contextual reading of a lion roaring outside the Hebrew Bible and close in date to Amos is understood as an earthquake. In addition, as noted above, theophany imagery should not be narrowly confined to just thunderstorms. In the Neo-Assyrian omen, the sky shouting is found alongside the earth quaking raising the likelihood that the ancients had a broader understanding of terrestrial phenomena.

3. Finding a Lost Omen

The scholarly history behind this omen is fascinating as it illustrates how it has remained in obscurity. In 1900, R. C. Thompson published a two volume collection of texts, entitled, *The Reports of the Magicians and Astrologers of Nineveh and Babylon*, where he noted in his preface both the early fascination with Assyrian astrology as well as its great difficulty.[20] Campbell Thompson ordered his publication by topic, thus he grouped together eight omens regarding

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[19] Ereškigal, known in Akkadian as Allatu, has a long religious history. She appears in "Inanna's Descent to the Underworld" when Inanna is led by Neti through the seven gates of the netherworld to enter the underworld where, upon crouching and stripping bare in front of Ereškigal, Inanna tries to dethrone her sister. Enki will trick Ereškigal by sending two mourning specialists to free Inanna from the netherworld. A later myth, "Nergal and Ereškigal" is found in part in an Amarna tablet as well as in the first half of the first millennium. Here, Nergal almost kills Ereškigal before finding love with Nergal, who previously went to the underworld to cut off her head. See, Thorkild Jacobsen, *The Treasures of Darkness: A History of Mesopotamian Religion* (New Haven, London, 1976), 56–59, 229–230; Jeremy Black and Anthony Green, *Gods, Demons and Symbols of Ancient Mesopotamia* (Austin: University of Texas, 2006), 77.

[20] R. Campbell Thompson, *The Reports of the Magicians and Astrologers of Nineveh and Babylon I-II* (London: Luzac and Company, 1900). For the cuneiform, see volume one, plate seventy–six, for Thompson's abbreviated translation, see volume two, lxxiii–lxxxiv.

earthquakes. For this omen, he translated lines twelve through fifteen of the obverse which contain "if, then" statements regarding earthquakes during the eleventh month of the calendar year.[21] Outside of those lines, he transliterated a portion of line eight and all of lines ten and eleven, which were quoted above. Thompson briefly commented on the character of Ereškigal (Thompson wrote this as Iriškigal) but did not include the word "lion" as only the first half of the logogram was clear.[22] Thus, whether this omission was Thompson's oversight or a reflection of the state of Assyriology in which unknown words, phrases, and logograms, were left untranslated, Thompson did not provide the rest of the simile (like a lion) to explain Ereškigal's roaring.[23]

After the initial publication of the texts no updates were made to Thompson's rudimentary edition for over ninety years. A. Leo Oppenheim wrote a study of the astrological reports in a 1969 *Centarus* volume where he focused on the scribes behind the reports and planned to produce another edition of the volumes but his untimely death prevented an updated edition.[24] The work fell to Hermann Hunger, who published an updated and expanded volume in

[21] Thompson, *The Reports*, lxxxi–lxxxiv. In his work they are labeled 263, 264, 265, 265a, 265c, 266, 267, 267a. It is unclear why 267a is included as there are no references or allusions to earthquakes.

[22] Akkadian lion, *nēšu*, is written logographically either as UR.MAḪ or UR.A. Hunger, *Astrological Reports*, 19, transcribes the end of line ten UR.[MAH ŠUB-*d*]*i* while Thompson, *The Reports of the Magicians*, 97 (No. 267), transcribes *kima ur…tak.*

[23] See the comments in the preface to Thompson's second volume where he notes (viii), "…owing to breaks or the occurrence of words unknown to me, I have made no attempt to render them in English." Henrietta McCall, *The Life of Max Mallowan* (London: British Museum Press, 2001), 81, records how Mallowan saw Campbell Brown (R.C.), "C.T. was an epigraphist, and not really an archaeologist. He had no clear plan of campaign: 'the mound of Kuyunjik was not a tidy one.' Work had been done in a rather disorganized way, taking each day as it came. Consequently plotting the site had been more or less impossible and in many ways excavating with C. T. had been more of a 'glorified tablet-hunt.' C. T. was more interested in recovering tablets than buildings, and his methods were frequently haphazard."

[24] A. Leo. Oppenheim, "Divination and Celestial Observation in the Last Assyrian Empire," *Centaurus* 14 (1969): 97–135.

the State Archives of Assyria series in 1992, and who based his edition on a sign by sign comparison with the originals.[25] Hunger's edition, then, provided a much needed update to Thompson's turn of the century *editio princeps*, elucidating among other things, the rest of the simile preserved in line eleven: "If Ereškigal utters her roar like a lion." Thus, tracing the history of publication behind these omens illustrates why even though the omen tablet was first published in 1900, it has never been connected to Amos. Thompson, in his original publication, for whatever reason, did not translate the crucial line about Ereškigal roaring and causing an earthquake, and Oppenheim, while producing an important study of the omens died before he could complete an updated edition. It was only in the 1990's that Hermann Hunger published a new edition of the oracles, based upon a sign by sign comparison with the original tablets, that included the rest of the phrase about Ereškigal.

The date of the earthquake omen in the mid seventh century raises a question about the dating of Amos 1:2. As is well known, Amos has been subject to a dizzying array of suggestions regarding the dating of its composition and redaction. Amos 1:2 has been central to this discussion as it is seen as the motto of the book, but debate has focused on whether it is a continuation of verse 1 and if it is continued by verse 3 and following.[26] The authenticity of 1:2 has been challenged due to the reference to Zion and Jerusalem with most scholars connecting 1:2 to a Judean or Deuteronomic redactor.

[25] See the brief account on the history of publishing these texts in Hunger, *Astrological Reports*, ix.

[26] On Amos 1:2 as the motto of the book, see Shalom Paul, *Amos* (Minneapolis: Fortress Press, 1991), 36, fn. 39; Weiss, "On the Traces,"107–128, 211–223, 303–318 (Heb); *idem*, "Methodologisches über die Behandlung," 1–25; *idem*, *The Bible from Within*, 196–207.

Several reasons, however, point to 1:2 as authentic to Amos and make more sense to see Amos 1:1-2 as a unit.[27] As Shalom Paul illustrates, the vocabulary and theme in 1:2 is characteristic of other undisputed passages in Amos, especially Amos 3:4-8 which contain further leonine imagery. Amos 3:4 states, "Does a lion roar in the forest, when he has no prey? Does a young lion cry out from his den, if he has captured nothing?" while Amos 3:8 states, "The lion has roared; who will not fear? The Lord GOD has spoken; who can but prophesy?" The verb שאג "roar" found in Amos 1:2 is also present in both verses in chapter three and as Paul notes, "the indication that the effects of the 'roaring' of God reach from Jerusalem as far north as the Carmel (mentioned again in 9:3) is an extremely fitting prelude to the prophetic message of one who was sent from Judah to northern Israel to announce the Lord's sovereignty over the entire nation."[28]

In addition, the verse follows the superscription, which ends שנתים לפני הרעש "two years before the earthquake." As the Neo-Assyrian parallel above illustrates, if earthquake imagery is behind Amos 1:2, it makes more sense to connect the verses, where verse one ties Amos's prophecy with an earthquake, and verse two emphasizes the earthquake as part of the motto of the book. As Amos's oracles announce judgment (1:2–2:16), one of the clearest ways judgment is pronounced in Amos is through earthquake imagery. As David Noel Freedman and Andrew Welch write, "What matters is that for the editor of Amos's oracles, the earthquake confirms Amos's message. The earthquake shows that Amos was a true prophet, because his message of

[27] The imagery in 1:2b, "the pastures of the shepherds mourn, and the top of Carmel withers" has caused some scholars to suggest the verse originally contained two independent elements. As Weiss, *The Bible from Within*, 202, illustrates, one need not expect a logical connection between the two halves. What is clear is that YHWH's roar will have a powerful impact and that the "pastures of the shepherds" and "summit of Carmel" constitute a merism. In the Neo-Assyrian omen, a connection between agricultural failings and an earthquake is clear: (line 8, "the cultivated fields will diminish," line 12, "the furrow will reduce its yield"). The distance from Jerusalem to the top of the Carmel, suggests a totality of judgment against the north, reaching its greatest height.

[28] Paul, *Amos*, 37. Paul, footnote 42, compiles a long list of scholars dating as far back as Bernhard Duhm who see this verse as original.

Yahweh's judgment is followed by Yahweh's definitive action."[29] While the dating of Amos 1:2 is not central to the argument, in my view, Amos 1:2 originates close to the time of the prophet Amos, and texts from around this period have similar language that point to an earthquake behind YHWH's roaring.[30]

Outside of Amos, Joel 4:16 (Eng. 3:16) provides another line of support to interpret the roaring in Amos 1:2 as an earthquake.[31] The words of Amos 1:2a are repeated word for word in Joel 4:16 (3:16 Eng.), with the following phrase added ורעשׁו שׁמים וארץ "and the heavens and the earth shake."[32] John Strazicich, in his magisterial volume on Joel's use of Scripture notes that Joel retains the theophany motif in Amos's motto, but has now transferred it to the Day of the Lord motif in Joel. Strazicich further writes, "Amos's motto has been adapted so that the theophanic feature of Yahweh is directed cosmically instead of terrestrially."[33] In this way, Joel's allusion points to an early understanding, if not interpretation of Amos 1:2 as roaring that results in the heavens and earth shaking: in other words, earthquake imagery. While some scholars have tried to suggest that Joel's use of Amos 1:2 comes from editorial activity of the Book of the Twelve, Strazicich demonstrates that the same textual reading underlies both the LXX and the MT. Thus, scribal activity on the part of the editors is mitigated. In sum, Joel 3:16 stands as the

[29] David Noel Freedman and Andrew Welch, "Amos's Earthquake and Israelite Prophecy," in *Scripture and Other Artifacts* (ed. M. D. Coogan, J. C. Exum, and L. E. Stager; Louisville: Westminster John Knox, 1994), 188–198.

[31] There is also a relationship between Amos 1:2 and Jer 25:30, יהוה ממרום ישׁאג (YHWH will roar from on high) another text frequently cited as a variant formulation of Amos 1:2. In sum, Jeremiah echoes Amos 1:2 whereas Joel alludes to it. The closer relation between Joel and Amos is seen in the Day of the Lord theme first inaugurated in Amos 5: 18–20. Whereas Jeremiah uses some of the imagery of Amos 1:2 but without the word for word copying found in Joel. Scholars are divided on whether YHWH's roar from on high refers to heaven or if YHWH is still in Jerusalem.

[32] The language of Joel 2:10b "The earth quakes before them, the heavens tremble. The sun and the moon are darkened, and the stars withdraw their shining," is inverted in 4:15 "The sun and the moon are darkened, and the stars withdraw their shining," and in 16a "and the heavens and the earth shake."

[33] John Strazicich, *Joel's Use of Scripture and the Scripture's Use of Joel: Appropriation and Resignification in Second Temple Judaism and Early Christianity* (BIS 82; Leiden: Brill, 2007), 238–240.

earliest interpreter of Amos 1:2, and makes explicit here—earthquake imagery—what was implicit in Amos.

In sum, several lines of evidence point to an earthquake behind the image of YHWH roaring like a lion in Amos 1:2. First, as illustrated in chapter two, an overly narrow definition of theophany language has focused on thunder and thunderstorms at the expense of a broader vocabulary of theophanies. While some theophany texts in the Hebrew Bible make a close comparison between YHWH giving his voice and thunder, this reading is not found in Amos 1:2. A contextual reading of texts from around the time of Amos suggest that roaring like a lion was understood in the context of earthquake imagery, seen most clearly in a Neo-Assyrian omen from the seventh century. In addition, Joel 4:16 stands as an early interpreter of Amos 1:2, alluding to or borrowing the language from Amos while adding "and the heavens and the earth quake." This addition makes earthquake imagery explicit for YHWH's roaring in Joel and highlights an early interpretation of Amos. At the same time, for Amos, an earthquake is essential to his validity as a prophet, and the book begins by placing Amos's prophetic work in relation to an earthquake (Amos 1:1) before demonstrating that YHWH is acting through an earthquake (Amos 1:2). Descriptive accounts by earthquake survivors, as seen in chapter two, point to the fluidity by which survivors describe earthquakes. Storm imagery is intermixed with earthquake imagery demonstrating that hard and fast lines cannot be drawn between the two. This is also seen clearly in a neo-Assyrian omen, which contains both storm and earthquake imagery but connects the roaring of a goddess with an earthquake. Seen through these lines of evidence, when YHWH roars from Zion, earthquake imagery stands behind this pronouncement, calling certain judgment on the land and fear and trembling on the inhabitants.

4. Religious Revival and Responses to Natural Disasters

A second approach to understanding earthquake imagery in Amos comes from how understanding how natural disasters cause religious revival. The notion of a direct relationship between a natural disaster and a supernatural cause has a long history that continues even into today. Following the devastating 2011 Japanese earthquake and tsunami, Shintaro Ishihara, Tokyo's mayor remarked "Japanese politics is tainted with egoism and populism. We need to use the tsunami to wipe out egoism, which has attached itself like rust to the mentality of the Japanese people over a long period of time." He further described the disaster as "tembatsu" - divine punishment.[34] Ishihara would later apologize but his statement, coming from a technically advanced culture, demonstrates that even today there still is seen a strong connection between disasters and supernatural causes. Another recent example of the interlinking of disaster and the divine comes from the 7.0 magnitude 2010 Haitian earthquake, a quake that struck along a fault line that had been silent for over 200 years. Following the quake, Catholics as well as voodoo practitioners both jumped to supernatural explanations to paint the quake as judgment on their country. Voodoo practitioners, interestingly, placed blame on political corruption for allowing light skinned elite to benefit at the expense of the dark majority, while other Catholics viewed the earthquake as calling people back to God.[35]

Beyond these examples from disasters within the last few years, there are almost a limitless number of historic examples that connect natural disasters with religious revival and further these examples span cultures, religious beliefs, and time periods. For example, circumstances from fourteenth century England provide evidence that is eerily similar to the

[34] Justin McCurry, "Tokyo governor apologises for calling tsunami 'divine punishment," n.p. [cited 5 September 2011]. Online: http://www.guardian.co.uk/world/2011/mar/15/tokyo-governor-tsunami-punishment.

[35] "Religious Haitians Say Earthquake was God Asking for Change," n.p. [cited 5 September 2011]. Online: http://www.foxnews.com/story/0,2933,583236,00.html.

theme of the "Day of the Lord" first found in Amos 5:18-20. During this period, England was beset by a number of unfortunate circumstances: a plague later known as the Black Death, combined with bad weather and bad harvests culminated in a Great Famine from 1315 to 1322. Further, the conflict that would later be known as the Hundred Years War began in 1337. These experiences created Visions of the Apocalypse convincing many of England's inhabitants that the end was near so much so that the 1380's inaugurated an especially downtrodden period. John Aberth summarizes the period as follows, "During the 1380s especially, many Englishmen were so dismayed by a series of disasters—including recurring pestilence, declining fortunes in war, a Peasant's Revolt in 1381, and an earthquake in 1382—that they predicted the year of reckoning to be not far off."[36] An anonymous poet of the period stated that the earthquake was one of three reasons why vengeance and retribution "*that schulde falle for synnes sake*" (that should fall on us for our sins) while the preacher Thomas Wimbledon linked signs of the Apocalypse (wars, pestilence, and "erthe schakynges") with apocalyptic language from the end of Matthew. Regarding the Black Death of 1348–1349, one of the most common explanations given for this horrendous period was that the plague was "God's scourge, his righteous retribution raining down like arrows from the sky upon man in terrible judgment of his abundant wickedness and sin."[37] Beyond the common answer that God's anger caused the plague, an authority among scholars at the University of Paris responded to King Philip VI of France that the plague had been caused by the alignment of Saturn, Jupiter and Mars. In addition to his conjecture, which has echoes of Neo-Assyrian celestial divination, the don of scholars also provided an

[36] John Aberth, *From the Brink of the Apocalypse: Confronting Famine, War, Plague, and Death in the Later Middle Ages*, (New York: Routledge, 2001), 4.

[37] Aberth, *From the Brink of the Apocalypse,* 114. Andrew Cunningham and Ole Peter Grell, *The Four Horsemen of the Apocalypse: Religion, War, Famine and Death in Reformation Europe* (Cambridge: Cambridge University Press, 2000), 304, note that doctors were trained in astrology in their university courses and so epidemics were attributed to a change in the air caused by a change in the heavens.

environmental reason for the plague that partially entailed earthquakes: "'particular and near' causes of the vile, plague-producing vapors, such as earthquakes and exhalations from swamps and rotting corpses."[38] Not only did popular opinion, seen through comments by local preachers and anonymous poets, hold to such views but even scholarly advisors to the king built their "learned" answers around rationale this today is seen as clearly wrong.

These insights from fourteenth century England demonstrate the extent to which divine causes were seen as the cause of natural disasters. Beyond linking the divine with natural disasters, the most advanced science of the day, practiced by the academic elites saw earthquakes as one reason behind the plagues. Perhaps the only difference between the Tokyo mayor's explanation of the tsunami and earthquake as divine retribution with fourteenth century English understanding of earthquakes behind plagues and God behind earthquakes is that today modern discourse does not tolerate such equivocation even if one still believes it.

While it may be suggested that fourteenth century British thinking represented pre-enlightenment, pre-Scientific Revolution and that these epochs inaugurated a paradigm shift that privileged naturalism over epistemological theism, this is not the case. Amos Nur, a Stanford geophysicist whose work, *Apocalypse: Earthquakes, Archaeology, and the Wrath of God*, is a popular level book aimed at a multidisciplinary study of earthquakes, archaeology, and mythology devotes one of his chapters to the political and religious effects of earthquakes.[39] Nur points out how two small earthquakes in 1750 London prompted a prophecy that resulted in a great sensation.[40] In short, because the second earthquake struck London four weeks after the

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[38] Aberth, *From the Brink of the Apocalypse,* 115.

[39] Amos Nur, *Apocalypse: Earthquakes, Archaeology, and the Wrath of God* (Princeton: Princeton University Press, 2008), 246–271.

[40] Prior to this quake, an earthquake struck New England in 1727 and caused a series of religious revivals. See, Kenneth Minkema, "The Lynn End 'Earthquake' Relations of 1727," *NEQ* 69 (1996): 473–499; Thomas S. Kidd,

first, a prophecy began circulating that London would be destroyed by a third quake, four weeks from the date of the second earthquake. The resulting clamor caused an evacuation of up to one third of the city—most of whom had the means to evacuate—which other clergy and administrators were not able to calm. When the quake did not strike, the citizens returned, though some still waited a full month rather than four weeks, and there was a general sense of sheepishness across the city.[41]

Five years later on November 1st 1755, a massive quake struck Lisbon Spain influencing scientific theory and the development of Western thought. Charles Richter suggested the quake "could scarcely have been less than 8 ½ and may have approached 8 ¾" with shaking affecting most of Europe and even parts of North Africa."[42] An estimated 50,000 to 60,000 people died, a very large number due to the quake striking at 9:30 A.M. during All Saint's Day. High ceilings along with unreinforced masonry arches and vaults caused parish churches and cathedrals to collapse and exacerbated the number of deaths along with hundreds of fires that spread throughout the city. Since so many people died in churches, a common view was that the earthquake was a punishment by God. For those who survived the quake caused theological reflection as people asked themselves how God could be loving in the midst of so much suffering. The quake also virtually annihilated the philosophical view of Optimism, a view the held that everything in the world worked toward the general good. Instead, intellectuals like

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The Great Awakening: The Roots of Evangelical Christianity in Colonial America (New Haven: Yale University Press, 2007), 10–12. The quake was used to promote religious awakenings, with many leading pastors in New England leveraging the quake with calls for repentance. Scholars have termed this period "Earthquake Revival" due to the spread of repentance following the quake. Harry S. Stout, *The New England Soul: Preaching and Religious Culture in Colonial New England* (Oxford: Oxford University Press, 1988), 177–178, noted how since the 1670s ministers had been predicting a great day of trouble, which when it struck, fasts occurred and if the people reformed, earthquakes would stop.

[41] Nur, *Apocalypse*, 246–247.

[42] Nur, *Apocalypse*, 249. J. T. Kozak and C. D. James, Historical Depictions of the 1755 Lisbon Earthquake," n.p. [cited 6 September 2011]. Online: http:nisee.berkeley.edu/Lisbon/ suggest the quake approached 9.0.

Voltaire went on the offensive, using the earthquake as intellectual leverage to contest the idea of an all-loving God.[43]

Stepping outside of examples of religious revival and natural disasters from Judeo-Christian civilizations, Greek history preserves the memory of an earthquake or series of earthquakes that struck Sparta from 469–464 BCE and was understood as lengthening war due to the anger of a god.[44] Diodorus Siculus, historian from the first century BCE, wrote in his *Bibliotheca historica* (XI: lxiii):

> During this year a great and incredible catastrophe befell the Lacedaemonians; for great earthquakes occurred in Sparta, and as a result the houses collapsed from their foundations and more than twenty thousand Lacedaemonians perished. And since the tumbling down of the city and the falling in of the houses continued uninterruptedly over a long period, many persons were caught and crushed in the collapse of the walls and no little household property was ruined by the quake. And although they suffered this disaster because some god, as it were, was wreaking his anger upon them, it so happened that other dangers befell them at the hands of men for the following reasons. The Helots and Messenians, although enemies of the Lacedaemonians, had remained quiet up to this time, since they stood in fear of the eminent position and power of Sparta; but when they observed that the larger part of them had perished because of the earthquake, they held in contempt the survivors, who were few. Consequently they came to an agreement with each other and joined together in the war against the Lacedaemonians.

Diodorus's quote addresses two issues surrounding the effect of an earthquake on historical events. First, the earthquake was due to some god venting his anger against the Spartans. There is no shortage of Greek and Roman writers who proposed a view of what caused earthquakes from Aristotle's view in his *Meteorologica*, that exhalations of moist and dry air cause earthquakes in the fourth century BCE to 800 years later in the fourth century CE Roman

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[43] Voltiare, "Poeme sur le desastre de Lisbonne," in *Selected Works of Voltaire* (ed. J. McCabe; London: Watts, 1911).

[44] A number of Greek writers such as Diodorus, Plutarch, Thucydides, and Pausanias mention this quake but the date is unclear as it is unknown if there were a series of quakes and the chronology cannot be reconciled. On the quakes see, Nur, *Apocalypse*, 259–261; Ambraseys, *Earthquakes in the Mediterranean*, 81–82; J. Ducat, "Le Tremblement de Terre de 464 et l'histoire de Sparte," Colloque, Tremblements de Terre, historie et Archaéologie (Antibes), 73–85; Paolo Autino, *I terremoti nella Grecia classica* (MIL 38; Milan: Istituto Lombardo di Scienze e Lettere, 1987), 355–446; G. Panessa, *Fonti greche e latine per la storia dell'ambiente e del clima nel mondo Greco* (2 vols.; Pisa: Scuola normale superiore, 1991).

historian Ammianus Marcellinus (325/330–391 CE) who provided a much more in depth description of particular earthquakes.[45] For the Greeks, a religious reflection on their view of earthquakes can be seen through Poseidon, the earthquake god who stood behind the quakes, as formulaic titles as early as the Iliad attest to Poseidon as the "earth-holder," "Lord Earthshaker," and "Mighty Earthshaker."[46]

Beyond the narrow survey of Aristotle, Ammianus Marcellinu, and Poseidon, Gerhard Waldherr has produced a recent monograph that studies treatments of earthquakes in Classical sources from the fourth century BCE to the fourth century CE.[47] Among Waldherr's contributions is that he shows that classical writers were not concerned with giving an objective account of an earthquake but were interested in earthquakes as divine signs or how a quake would affect issues such as warfare, politics, or society. As is well known, the genesis of science is attributed to the Greek Civilization; though Egypt and Mesopotamia advanced mathematics in areas such as geometry and more complex areas of arithmetic, these advances centered on

[45] On theories about seismic phenomena, see Guidoboni and Ebel, *Earthquakes and Tsunamis in the Past*, 147–153.

[46] Judith Maitland, "Poseidon, Walls, and Narrative Complexity in the Homeric Iliad, " *The Classical Quarterly* 49 (1999): 1-13. On the early history of Poseidon, see the classic work by Fritz Schachermeyr, *Poseidon und die Entstehung des grieschischen Götterglabuen* (Bern: A. Francke, 1950); Fritz Schachermeyr, *Die Levante im Zeitalter der Wanderrungen vom 13. Buz zum 11. Jahrhundert v. Chrt.* (VKMF 9; Vienna: Verlag der Österreichische Akademie der Wissenschaften, 1982), 98–99. Interestingly, as in Mesopotamia, Poseidon also possesses powers related to storm and winds, where as god of the sea, he can also blow sailors off course with storm winds.

[47] Gerhard. H. Waldherr, *Erdbeben: Das asusergewöhnliche Normale. Zur Rezeption seismischer Aktivitäten in literarischen Quellen vom 4. Jahrhundert v. Chr. bis zum 4. Jahrhundert n. Chr.* (GH 9; Stuttgart: Franz Steiner: 1997). For a quick reference of English translations on Greek sources that deal with earthquakes see the unpublished manuscript of Christopher L. Liner, *Greek Seismology: Being an Annotated Sourcebook of Earthquake Theories and Concepts in Classical Antiquity 1997*. n.p. [cited 21 September 2011]. Online: http://samizdat.mines.edu/liner/. Though most scholars turn to Aristotle's *Meteoroligica*, pre-Socratic literature has several references to earthquakes. The *Iliad* and the *Odyssey*, while not containing any references to earthquakes, refer to Poseidon as the "earth-shaker" or the "earth-enfolder." Herodotus in book 6 sect. 98 and book 7 sect. 129 refers to two different earthquakes.

practical applications such as commerce, construction and agriculture.[48] As Stephen Bertman argues, "Ancient Greek thinkers, however, were more fascinated by the abstract beauty and mystery of numbers and shapes rather than their practical application."[49] Thus, even as the Greeks began to probe nature for its secrets more so than its applications, there still existed a clear connection between natural disasters and non-scientific significance such as divine signs and how a quake would affect warfare, politics, or society.[50]

The well known view that natural science came about because of the Greeks raises the question about how and why an earthquake's societal impact has not been fully appreciated in the Levant in such a life altering light, in view of so many of the above examples.[51] I see two overarching reasons. First, as biblical scholarship advanced in the twentieth century it never stopped to reexamine the common view espoused throughout scholarly literature that earthquakes were extremely common in ancient Israel and the quake in Amos must have been larger than the rest. This thinking, though, is counterintuitive for even if earthquakes were common, and even if Amos's quake was much larger than other quakes, no one thought how this

[48] For a convenient overview see, Stephen Bertman, *The Genesis of Science: The Story of Greek Imagination* (Amherst: Prometheus, 2010) who divides his study into the world outside and the world inside and also contextualizes science before and after the Greeks. Bertman's treatment of science within the Hebrew Bible, though, is extremely narrow and polemical. For a more technical discussion that traces the study of nature in the early history of Greek thought, see Daryn Lehoux, *Natural Knowledge in the Classical World* (ed. P. Harrison, R. Numbers, and M. Shank; Chicago: University of Chicago Press, 2011), 37–58; Lucio Russo, *The Forgotten Revolution: How Science was Born in 300 BC and Why It Had to be Reborn* (Berlin: Springer-Verlag, 2004), argues that there was a birth and fall of Hellenistic science and technology in the second century B.C. when the scientific studies declined rapidly. The most serious collapse of scientific activity, according to Russo is due to the wars between Rome and the Hellenistic states, from the plunder of Syracuse and the killing of Archimedes in 212 BCE to 146 BCE when Carthage and Corinth were razed.

[49] Bertman, *The Genesis of Science*, 45.

[50] See also the essays in L. Piccardi and W. B. Masse, *Myth and Geology* (GSSP 273; London: Geological Society, 2007).

[51] On the natural sciences and the Greeks, see Olaf Pederson, *Early Physics and Astronomy: a Historical Introduction* (rev.; Cambridge: University of Cambridge, 1993), 1–10. On the topic of the history of science more generally, see *The Philosophy of Science: an Historical Anthology* (ed. T. McGrew, M. Alspector-Kelly and F. Allhoff; Maiden: Wiley-Blackwell, 2009).

would have impacted the society around Amos. With the benefit of paleoseismic study of the Dead Sea Transform, it has only been in the last fifteen years that this new scholarly field has demonstrated that earthquakes are far less common than previously thought. In light of this, any future research into Amos's quake now should focus reconstructing its effect on the socioeconomic, political, and religious moorings of the day. Further, as the examples from fourteenth century England, the Lisbon earthquake, and Greek perspectives on the role of earthquakes, in addition to social scientific study, have all demonstrated how dramatic natural disasters affect society. This further underscores the need for a critical reassessment of and appreciation for Amos's earthquake.

Second, an overall scholarly reticence to take seriously ancient Israel's pre-Enlightenment understanding of their physical world and how this would influence their conception of the cause and effects of earthquakes.[52] Case in point, since Israel saw God as the creator of the universe, the creator behind all natural phenomena who intervened in nature through signs and wonders such as revealing himself through a burning bush, parting a sea or river, or causing the sun to stand still, this equaled a God who would intervene in nature and cause earthquakes.[53] Admittedly, there is a need to sift carefully through the biblical text in order

[52] See, for example, the work of Peter Harrison, *'Religion' and the Religions in the English Enlightenment* (Cambridge: Cambridge University Press, 1990); *idem*, *The Bible, Protestantism, and the Rise of Natural Science* (Cambridge: Cambridge University Press, 1998); *idem*, "The Bible and the Emergence of Modern Science," *S & CB* 18 (2006): 115–132. See also, Jamie Rae Bluestone, "Why the Earth Shakes: Pre-Modern Understandings and Modern Earthquake Science" (Ph.D. diss., University of Minnesota, 2010).

[53] This point is further underscored when we consider when the term "natural disaster" first was introduced into our lexicon. It appears to first be used following the events of the 1755 Lisbon earthquake; thus, prior to that time it is difficult to conceive of a disaster caused by anything other than the metaphysical. See the postscript in Norman Habel, review of Terence E. Fretheim, *Creation Untamed: The Bible, God, and Natural Disasters RBL* 03/2012.

to devise the Israelites' view of the physical world, a task made far easier in an Ancient Near Eastern conceptualization of the world in which there are a number of texts to examine.[54]

5. Cosmic Geography and Cosmic Seismology

In this regard, Wayne Horowitz's monograph, *Mesopotamian Cosmic Geography*, has supplied an impressive amount of data as well as a painstaking effort to synthesize it.[55] Horowitz's collection of Sumerian and Akkadian texts, however, calls into question important ideas such as whether some of these descriptions are meant to be understood as physical or metaphysical. Horowitz provides a view of the Mesopotamian universe of, "a region of heaven above the sky where the gods of heaven dwelled, the starry sky, the earth's surface, the subterranean waters of the Apsu, and finally the underworld of the dead."[56] An Israelite conception of the universe, in contrast is simpler: a tripartite world of heaven, earth, and the subterrestrial ocean or underworld. Important to this discussion, however, is one key difference between a Mesopotamian and Judahite worldview that has bearing on an Israelite understanding of what caused an earthquake; the area under the disk shaped earth and the role of pillars in supporting the earth.

One of the few scholars to pursue the connection between earthquakes and the conception of the world is Luis Stadelmann's study, *The Hebrew Conception of the World: a Philological*

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[54] Ronald A. Simkins, *Creator and Creation: Nature in the Worldview of Ancient Israel* (Peabody: Hendrickson, 1994), uses social scientific research to construct ancient Israel's worldview towards nature. For the book of Amos, Simkins argues that Amos 9:13-15 demonstrates that creation will not end in catastrophe, even with the day of the Lord imagery found throughout the book. Terence E. Fretheim, *Creation Untamed: The Bible, God, and Natural Disasters* (Grand Rapids: Baker, 2010), approaches the topic theologically and builds his premise around the created world in Genesis 1–2 as being good but less than perfect. Thus, nature is far more complex as God may allow a disaster even while not directly causing the disaster. See also, Baruch Halpern, "The Assyrian Astronomy of Genesis 1 and the Birth of Milesian Philosophy," *EI* 27 (Fs. Hayim and Miriam Tadmor) (2003): 74*–83*, who provides the first study of Israelite astronomy based on Gen 1.

[55] Wayne Horowitz, *Mesopotamian Cosmic Geography* (Winona Lake: Eisenbrauns, 1998).

[56] Horowitz, *Cosmic Geography*, xii.

and Literary Study.[57] In his section on geophysical phenomena, Stadelmann first examined texts that he thought contained evidence of landslides (Job 14:19; Judg 5:4-5; Job 14:18; Mic 1:3-4; Psa 97:5; Nah 1:5), before turning his attention to earthquakes. He noted with surprise that biblical authors were not more precise in their allusions to earthquakes as they did not define the nature and effect of earthquakes. Stadelmann next surveyed a number of texts with earthquake imagery (Job 9:5; Psa 18:8; Psa 60:4) and suggested that verbs used to describe seismic disturbance were caused either by faulting of the rocks or by volcanic shocks.[58] Stadelmann notes that the pillars of the earth are said to shudder but only in a figurative sense, but the topic of the pillars of the earth deserves further attention.

In the Mesopotamian view, there were two levels under the earth: the Apsu or Middle Earth, located between the earth's surface, and the underworld.[59] In contrast to the Mesopotamian cosmological view, biblical scholarship is divided on whether there is evidence of pillars of the earth that sit underneath the earth. Izak Cornelius provided a helpful conception of both the passages and visual representations of surveyed Ancient Near Eastern visual representations of the world.[60] As part of his study on the visual representation of the world in the Hebrew Bible he compiled a number of texts related to the pillars of the earth (1 Sam 2:8b;

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[57] Luis I. J. Stadelmann, *The Hebrew Conception of the World: a Philological and Literary Study* (Rome: Pontifical Biblical Institute, 1970), 141–146.

[58] Stadelmann, *Hebrew Conception*, 143, again follows an older view of more frequent earthquakes, quoting Kathleen Kenyon. Kathleen M. Kenyon, *Archaeology in the Holy Land* (New York: F. A. Praeger, 1960), 105, "the whole of the Jordan valley is an area of seismic disturbance, and major earthquakes happen on an average four times a century."

[59] Horowitz, *Mesopotamian Cosmic Geography*, 334–347.

[60] Izak Cornelius, "The Visual Representation of the World in the Ancient Near East and the Hebrew Bible," *JNSL* 20 (1994): 193–218. For the most significant references to Israelite cosmology, see footnote one in John Walton, *Ancient Near Eastern Thought and the Old Testament* (Grand Rapids: Baker, 2006), 166.

Ps 18:8 (Heb), 16 (Heb); 75:4 (Heb); 82:5b; 104:5a; Job 9:5 (*sic*);[61] Isa 24:18; Jer 31:37)[62] that informed his drawing of the biblical world. As part of his conception, he saw the disk-shaped earth supported by pillars of the earth akin to pylons that support a pier or deck, and surrounded by the sub terrestrial ocean.[63] The pillars of earth have not been accepted by all scholars in their view of the Israelite world; for example, in Paul Seely's reconstruction of the earth and seas, he argues that "the earth is a single continent in the shape of a flat circular disk floating in the middle of a circular sea, which sea was thought to be the source of water for earthly springs, wells and rivers."[64] Similarly, Larry Stager suggests that the earth is a floating island on the cosmic waters, and John Walton is unclear if ancient Israel believed that pillars supported the earth.[65]

The number of verses and texts in which the pillars of the earth exist suggest that pillars were broadly considered as part of creation, and more so than just as figurative symbols. For example, Job 38, most likely a later biblical text and well known for its elaboration on creation,

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[61] Job 9:5 should be 9:6.

[62] See also, Isa 51:13, 16; Psa 96:10; 102:25; 104:5; Prov 8:29; Job 38:4, 6; 1 Chr 16:30.

[63] Cornelius builds on the work of his mentor, Othmaar Keel, who himself drew a conceptualization of the biblical world in, Othmaar Keel, *The Symbolism of the Biblical World: Ancient Near Eastern Iconography and the Book of Psalms* (New York: Seabury, 1978). In Keel's drawing, the pillars of the earth extend from the disk shaped earth but rest on the wisdom of YHWH.

[64] Paul H. Seely, "The Geographical Meaning of 'Earth' and 'Seas' in Genesis 1:10," *WTJ* 59 (1997): 231–255, esp. 255. Seely, 251, based on Psa 24:2, argues that God founded the earth continent on the sea. Seely reads the text too literally while not engaging the number of texts that speak of pillars of the earth. As Peter Craigie, *Psalms 1–50* (WBC 19; Waco: Word Books, 1983), 212, illustrates, the language is more profound that a simple cosmology and reflects the subjugation of chaotic forces. Horowitz, *Cosmic Geography,* also does not discuss any concept of pillars of the earth in a Mesopotamian worldview. A *kudurru* from the 12th century BCE now in the Louvre appears to represent a pillar providing support, see Cornelius, "Visual Representation," 198, 214.

[65] Lawrence E. Stager, "Jerusalem as Eden," *BAR* 26 (2000): 36–47, 66; Walton, *Ancient Near Eastern Thought*, 176, notes, "Finally, the earth was believed to be undergirded by pillars, but also supported by the roots of mountains that reached down into the netherworld. These images must be combined with the idea that the earth floated on the underground waters." In 2011, Walton (private communication) said the Hebrew Bible does not make clear if ancient Israel believed in pillars of the earth. Avraham Faust, "Doorway Orientation, Settlement Planning and Cosmology in Ancient Israel During the Iron Age II," *OJA* 20 (2001): 129–55, argues that the Israelites tended to orient their houses and settlements towards the east. This orientation, however, should be seen as part of Israelite cosmology but not religion, in Faust's view.

points to pillars in verses 4 and 6. The first half of 38:4 reads איפה היית ביסדי־ארץ "Where were you when I laid the foundations of the earth" while 38:6 reads: על־מה אדניה הטבעו או מי־ירה אבן פנתה "On what where its bases sunk, or who laid its cornerstone?" This text may refer to the building of a temple by laying the foundation seen in texts such as Psa 24:2-3 and Psa 78:69, but it also diminishes Job in light of YHWH's creation.[66] Perhaps a less figurative text is Job 9:6, which connects an earthquake with pillars trembling: המרגיז ארץ ממקומה ועמודיה יתפלצון "who shakes the earth out of its place, and its pillars tremble."[67] In this text, enumerates YHWH's total control over creation, where He can overthrow mountains, keep the sun from rising, and subdue the water.

In sum, a number of texts that refer to the shaking of the pillars of the earth suggest there is more to study in this regard. Some of the texts also connect the notion of the pillars of the earth with mountains in which John Walton's comments are important to highlight, "Finally, the earth was believed to be undergirded by pillars, but also supported by the roots of mountains that reached down into the netherworld. These images must be combined with the idea that the earth floated on the underground waters."[68] Walton's observation underscores how often mountains shake in descriptions of earthquakes. Of course, this is seen primarily in theophanic texts where YHWH descends on a mountain such as at Sinai or at Carmel to Elijah. In this way, the earth's connection between pillars below and mountains below as two means of support for the

[66] On this passage referring to a temple, see William P. Brown, *Character in Crisis* (Grand Rapids: Eerdmans, 1996), 92–93. Kathryn Schifferdecker, *Out of the Whirlwind: Creation Theology in the Book of Job* (HTS 61; Cambridge: Harvard University Press, 2008), focuses on divine speeches but does not offer any new insights into the Job passages. The Akkadian *ramû shubtu* and *nadû uššê*, literally "throw a dwelling" also convey a sense of building. See, Robert Gordis, *The Book of Job: Commentary, New Translation, and Special Studies* (New York: Jewish Theological Seminary, 1978), 443.

[67] See also, Psa 104:5 יסד־ארץ על־מכוניה בל־תמוט עולם ועד׃ "You set the earth on its foundations, so that it can never be shaken" and 1 Sam 2:8b כי ליהוה מצקי ארץ וישת עליהם תבל׃ "For the pillars of the earth are YHWH's, and on them he has set his the world."

[68] Walton, *Ancient Near Eastern Thought*, 176.

firmament brings together one insight into how ancient Israel may have understood the mechanics behind earthquakes.

6. Post-Disaster Housing Following Earthquakes and Remnants in Amos

Another approach to identify earthquake imagery is through insights from natural disaster research. E. L. Quarantelli has proposed a four-fold taxonomy for post-disaster sheltering and housing that is helpful in reconstructing the aftermath of Amos's earthquake. The four stages of post-disaster sheltering are emergency sheltering, temporary sheltering, temporary housing, and permanent housing. Emergency sheltering refers to sheltering outside of the house and only for a few hours or overnight, while temporary sheltering refers to "peoples' displacement into other quarters, with an expected short or temporary stay."[69] Temporary housing, on the other hand, is not just occupying some form of housing temporarily, but also reestablishing normal household routines, responsibilities, and activities to the extent possible. Permanent housing refers to returning to a rebuilt home or new quarters permanently. Quarantelli's taxonomy centers on modern disasters; thus, while helpful it does not consider scenarios that may have been different in ancient disasters. In applying his model, therefore, attention will be given to how it may be adapted to fit an ancient Levantine disaster.

Understanding Iron II domestic architecture is a needed starting point for its role in a disaster. The ground plans from sites such as Tell Beersheba, Tell Beit Mirsim, Tell en-Nasbeh, and Tell el-Farah (North), show that a typical Iron II house consisted of three parallel

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[69] E. L. Quarantelli, *Sheltering and Housing after Major Community Disasters: Case Studies and General Conclusions* (Columbus: Ohio State, 1982). Emergency sheltering "refers to actual or potential disaster victims seeking quarters outside their own permanent homes for short periods: hours in many cases, overnight at most." Temporary shelter refers to "peoples' displacement into other quarters, with an expected short or temporary stay." Permanent housing "involves disaster victims returning either to their rebuilt homes or moving into new quarters . . . occupying permanent, residential facilities." Walter Gillis Peacock, Nicole Dash, and Yang Zhang, "Sheltering and Housing Recovery Following Disaster" in *Handbook of Disaster Research* (ed. E. Quarantelli and R. Dynes; New York: Springer, 2006), 258–74, critique Quarantelli's classification as "dated" primarily due to hurricane housing in which pre-impact sheltering does not fit into Quarantelli's classification.

longitudinal spaces with a broad-room across the back.[70] Once viewed as a predominately one building structure, there is an increasing tendency to interpret the four-room house as two stories with the main living area on the second floor used for dining, entertaining, and sleeping.[71] The actual construction of a typical two-story Iron II house is as follows: on top of a few levels of stone foundation the roughly two meter high walls were made of mud brick that was sealed and plastered.[72] Usually two rows of stone pillars would help divide the area into rooms for animals, supplies, and food processing. Stone stairs or a ladder would enable access to the upper floor and the roof would consist of timber laid across the open area and straw or brushwood placed on the rafters.[73]

The family structure within these four-room houses has drawn considerable attention by Avraham Faust. Faust argues that there is a difference in size between rural and urban four-room houses in which the larger, rural houses held extended families of at least three generations (parents, married sons and their children, unmarried daughters, unmarried aunts, additional relatives, and possible also servants), while the smaller urban houses held nuclear families (two parents and a couple of unmarried children).[74] Faust draws a connection between the larger, extended families and the biblical *bet av*, where the organizing framework goes beyond the

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[70] Avraham Faust and Shlomo Bunimovitz, "The Four Room House: Embodying Iron Age Israelite Society," *NEA* 66 (2003): 22–31; Phillip J. King and Lawrence Stager, *Life in Biblical Israel* (Westminster John Knox: Louisville, 2001), 21–35.

[71] See, Faust and Bunimovitz, "The Four Room House," 23.

[72] See the descriptions by Faust and Bunimovitz, "The Four Room House," 22–31; King and Stager, *Life in Biblical Israel*, 28–30; Ehud Netzer, "Domestic Architecture in the Iron Age" in *The Architecture of Ancient Israel: From the Prehistoric to the Persian Periods* (ed. A. Kempinski and R. Reich; Jerusalem: Israel Exploration Society, 1992), 193–201; G. R. H. Wright, *Ancient Building in South Syria and Palestine* (2 vols.; Leiden: Brill, 1985), 294–296.

[73] Wright, *Ancient Building*, 1:461, suggests that the earth or mud plaster spread over the matting to surface the roof, "obviously is a heavy load, anything up to 10kg/m^2."

[74] Avraham Faust, "The Rural Community in Ancient Israel during Iron Age II," *BASOR* 317 (2000): 17–39.

extended family to a larger framework of the *mishpahah*, or the lineage.[75] Above the *mishpahah*, Faust suggests that the elders of the *mishpahah* made decisions for all the members of the community seen in a number of biblical texts (Deut 21:1–9; Judg 11:5; 1 Sam 2:3; 2 Kgs 10:1–6).[76]

Combining Iron II domestic architecture with studies on earthquake injuries enables a cautious reconstruction of the earthquake. David Alexander's paper, "The Health Effects of Earthquakes in the Mid-1990s," examined the global pattern of earthquakes over a 30-month period and concluded that a disproportionate number of earthquake casualties occurred during the first six hours of the day and in earthquakes with magnitudes between 6.5 and 7.4.[77] Interestingly, as stated previously, recent paleoseismic research suggests the size of Amos's earthquake was around or just above 7.0 on the Richter Scale.[78] Based on Alexander's study, if the earthquake struck during the first six hours of the day, when domestic structures were most full, this timing would have inflicted the greatest number of injuries—and deaths—on the population. Keeping in mind that most Iron II inhabitants lived on the upper floor with timber, matting, and mud plaster thick enough for waterproofing above their heads suggests a high rate of injury or worse.[79] For those who escaped death, common injuries included head and back

[75] Faust, "The Rural Community," 30. On the broader implications of a patrimonial system, see, J. David Schloen, *The House of the Father as Fact and Symbol: Patrimonialism in Ugarit and the Ancient Near East* (SAHL 2; Winona Lake: Eisenbrauns, 2001).

[76] See Hanoch Reviv, *The Elders in Ancient Israel: A Study of a Biblical Institution* (Jerusalem: Magnes, 1989).

[77] David Alexander, "The Health Effects of Earthquakes in the Mid-1990s," *Disasters* 20 (1996): 231–47.

[78] Migowski et al., "Recurrence Pattern," 307; Agnon et al., "Intraclast Breccias," 207.

[79] Larry G. Herr and Douglas R. Clark, "Excavating the Tribe of Reuben," *BAR* 27 (2001): 36–47, 64, 66, reconstructed part of a typical Iron I, four-room house and suggested that the total weight of a four-room house was 470 tons. 27 tons of lumber to support the second story of the house, for beams spanning walls and for branches to give additional support to the first-floor ceiling and roof, 280 tons of stones in the walls, 14 tons of mortar and plaster, 14 tons for the ceiling and roof, and 124 tons of mud brick walls for the second story. See the discussion of flat-roof construction in Gus W. Van Beek with Ora Van Beek, *Glorious Mud! Ancient and Contemporary Earthen*

injuries, leg fractures, broken ribs, multiple fractures of limbs, clavicle fractures, spinal damage, paraplegia, cuts, bruises, lacerations, burns, and crush injuries.[80]

Analyzing those injured in an earthquake demonstrates that specific age groups are more vulnerable to injury and death. For example, Roger Glass et al.'s study, "Earthquake Injuries Related to Housing in a Guatemalan Village," found that the elderly and young children were most susceptible to death, and specifically the penultimate child, as the youngest usually slept with the mother.[81] Glass studied the village of Santa Maria Cauque in which most of the villagers lived in one-room shelters made of adobe brick or cornstalk, roofed with thatch, tile, or corrugated tin. They found that the 7.5 earthquake on the Richter Scale which struck at 3:05 a.m. killed five percent of the people and destroyed all buildings except those made of reinforced concrete. When nurses and health workers interviewed the villagers, they found that all the deaths and serious injuries were inflicted on those who lived in mud brick homes.[82] While there certainly are differences between Guatemalan domestic structures and Israelite four-room houses—namely, one story, one-room houses versus two-story four room houses—the similarity of mud brick structures and insight into care of the young suggests Glass's study is relevant to reconstructing the effects of earthquake damage on family structure.[83]

Design and Construction in North Africa, Western Europe, the Near East, and Southwest Asia (Washington D.C.: Smithsonian, 2008), 288–98.

[80] Earthquake epidemiology is a young but growing field. See Alexander, "The Health Effects of Earthquakes in the Mid-1990s," 237 for discussion on the types of earthquake injuries. See the helpful chart of comparative earthquake mortalities from 1985 to 2003 in Marizen Ramirez and Corinne Peek-Asa, "Epidemiology of Traumatic Injuries from Earthquakes" *ER* 27 (2005): 47–55.

[81] Roger I. Glass, Juan J. Urrutia, Simon Sibony, Harry Smith, Bertha Garcia, and Luis Rizzo, "Earthquake Injuries Related to Housing in a Guatemalan Village," *Science* 197 (1977): 638–43.

[82] Glass et al., "Earthquake Injuries," 640.

[83] Mud bricks structures are extremely susceptible to seismic motion. For a discussion of possible methods to strengthen mud brick structures in the ancient Levant, see Van Beek, *Glorious Mud*, 482–500. The domestic architecture of a mud brick house is in contrast to the administrative structures in the north that were constructed

An understanding of Iron II domestic architecture and family structure enables the following reconstruction. Immediately following the earthquake, affected people would have moved outside as a number of their structures—whether domestic, administrative or otherwise—would have been destroyed or severely damaged. At the same time, the continual shaking caused by aftershocks would have kept the population outside for fear of further collapsed buildings. As survivors accounted for their nuclear and extended family members, they would have maddeningly scrambled to remove rubble and search for those still trapped. The aftermath of the Bam, Iran earthquake where more than 25,000 people died is instructive because collapsed mud brick houses led to suffocation of those trapped due to dust and lack of oxygen. In small countryside villages where an entire extended family or *mishpahah* would have resided, severe destruction could have killed entire family or lineage networks.

In the initial hours after the quake, the population would have worked together irrespective of any socioeconomic divide, as immediate survivors remain the most immediate and best means of emergency relief. In fact, in the immediate aftermath of a natural disaster, countless studies have demonstrated that panic and social disorder are uncommon.[84] Social connections not only remain in place but also are often strengthened during catastrophe while racial and class distinctions are overlooked. The calm focus is tied to the work of the survivors themselves accomplishing initial search and rescue activity, casualty care, and restoration of

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using ashlar masonry. This is not to say that ashlar masonry would be able to withstand an earthquake; in fact, while the stones were dressed at the point of construction and fitted precisely, it was done without mortar. Yet, the interiors of the walls were constructed of large stones that in the view of Nahman Avigad, "Samaria (City)," *NEAHL*, 4:1303, would have "considerably increased the stability of the structures."

[84] See E. L. Quarantelli and R. R. Dynes, "When Disaster Strikes (it isn't much like what you've heard and read about)," *PT* 5 (1972): 66–70; Lee Clarke, "Panic: Myth of Reality?" *Contexts* 1 (2002): 21–6, notes that E. L. Quarantelli, the foremost scholar of disaster research stated, "I no longer believe the term 'panic' should be treated as a social science concept. It is a label taken from popular discourse… During the whole history of [our] research involving nearly 700 different field studies, I would be hard pressed to cite…but a very few marginal instances of anything that could be called panic behavior."

services.[85] This tendency of disaster to bring about immediate cooperation in society is known by terms such as post–disaster utopia, stage of euphoria, or therapeutic or altruistic community.[86] This stage in recovery, however, will quickly dissipate as the scope of the disaster overwhelms the situation and post–disaster utopia turns into post-disaster reality.

A more nuanced understanding of the aftermath of a devastating earthquake sheds new light on the death and destruction found in Amos 6:8-11. This passage, as with most of Amos has been subject to a dizzying array of suggestions regarding the dating of its composition and redaction.[87] Rather than be buried under further scholarly conjecture, the importance of the text lies in its description of the effects of an earthquake whether it was an oracle recorded soon after its pronouncement or passed down orally for a longer period a time. This approach avoids needless speculation on a small subset of verses and since paleoseismic research has found evidence of Levantine earthquakes around 700 BCE and 525 BCE, in addition to 760 BCE, there are several instances when this oracle—whether in oral or literary form—would have been understood as referring to an earthquake.[88]

The oracle of judgment follows verses 1–7 which describe luxurious living through images such as lying on beds of ivory (v. 4), eating lambs and calves (v. 4), drinking wine in bowls (v.6), and anointing with the finest oils (v. 6). Hans Joseph Wolff summarizes the first part of chapter six as follows, "The oppressed are made to suffer, while the oppressors loll about,

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[85] D. E. Wenger, T. F. James, and C. E. Faupel. *Disaster Belief and Emergency Planning* (New York: Irvington, 1985), 36.

[86] See the helpful chart of Krzysztof Kaniastry and Fran H. Norris, "Social Support in the Aftermath of Disasters, Catastrophes, and Acts of Terrorism: Altruistic, Overwhelmed, Uncertain, Antagonistic, and Patriotic Communities," in *Bioterrorism: Psychological and Public Health Interventions* (eds. R. J. Ursano, A. E. Norwood & C. S. Fullerton. Cambridge: Cambridge University Press, 2004), 200–29.

[87] Overall, two popular approaches to understanding Amos 6:8–14 are either as a collection of oracles or fragments of oracles, or as a series of redactional *Fortschreibungen*. See the collection of references in Tchavdar S. Hadjiev, *The Composition and Redaction of the Book of Amos* (BZAW 393; Berlin: Walter de Gruyter, 2009), 175–78.

[88] Migowski et al., "Recurrence Pattern," 307; Agnon et al., "Intraclast Breccias," 207.

indulging their appetites for food, wine, and frivolity."[89] The text, in sum, takes aim at the monarchy and administrative and military leaders who take advantage of the oppressed in the midst of extravagant living. This sets the stage for the oracle of judgment beginning with an oath against pride and concluding with an illustration of destruction.

Scholars traditionally interpret these verses as the result of a plague, siege, or earthquake, as God decrees that he will destroy the city and buildings but he does not reveal how he will do this. Specifically, the imagery of ten people huddled in one house (v. 9) suggests three options: huddling as part of siege survival, warning against staying together due to a contagious disease, or sharing housing since all others homes were destroyed in an earthquake. Shalom Paul suggests the cause is pestilence because, "it is not an enemy to whom they are handed over"[90] while others in the past have pointed to the number ten as signifying the *minyan* of Jewish worship,[91] or the smallest fighting unit that would remain from the prior population.[92]

Central to this debate is why ten survivors are in one house and why death is promised if they remain. One scenario, based on post-disaster housing, is that survivors have moved into temporary housing, specifically, any house that remained standing. Temporary housing in the ancient world, as opposed to the infamous FEMA trailers following Hurricane Katrina or even prefabricated units or tents following the Bam Iran Earthquake, would have been limited to

[89] Hans Walter Wolff, *Joel and Amos*, (Philadelphia: Fortress, 1977), 275. Micah 6:15, "You shall sow, but not reap; you shall tread olives, but not anoint yourselves with oil; you shall tread grapes, but not drink wine" suggests that oil and wine would not be used in time of mourning and sadness.

[90] Paul, *Amos*, 282.

[91] See, H. A. Brongers, "Die Zehnzahl in der Bibel und in ihrer Umwelt," in *Studia Biblica et Semitica: Festschrift Th. C. Vriezen* (Wageningen: H. Veenman, 1966), 30–45.

[92] Douglas Stuart, *Hosea-Jonah*, (WBC 31; Waco: Word Books, 1987), 364. See the earlier mention of ten in Amos 5:3.

existing structures.[93] In addition, survivors faced several post earthquake hazards including aftershocks, flooding, landslides, and post earthquake soil liquefaction. A closer reading of the start of Amos 6:9, עשׂרה אנשׁים והיה אם־יותרו "And if ten people remain," points to the oath being conditioned on future destruction; if (אם) ten remain in a house when destruction comes, then they will die. Following Amos's quake, where decimated mud brick houses and severely damaged or destroyed administrative structures dotted the landscape, this imagery would have resonated with survivors fearful of their temporary housing. Indeed, a first hand account from a non-governmental organization eyewitness documenting the aftermath of a 2001 El Salvador earthquake demonstrates this point: "People in El Salvador are really traumatized by the earthquakes and continuing aftershocks. They are sleeping in the streets either because their homes have been destroyed, or because they are afraid to return to their homes for fear they will collapse in another quake or an aftershock. And parents don't want to send their kids to school because they are afraid the structures are unsafe."[94] This eyewitness account came more than a month after the earthquake had struck. These realities illustrate why ten people remaining in a house after an earthquake would lead to a stern warning of future death.

Verse ten moves from the threat of judgment to its aftermath as the dead must now be removed and the house searched for survivors. There are a number of interpretive difficulties surrounding the beginning of verse ten (מן־הבית ונשׂאו דודו ומסרפו להוציא עצמים "And when his kinsman and the one who burns him carries out the remains from the house") that make it

[93] For pictures of temporary housing following the Bam earthquake, see Alireza Falahi, "Lessons learned from the housing reconstruction following the Bam Earthquake in Iran," *AJEM* 22 (2007): 26–35. One of the difficulties in applying modern theories of post–disaster housing to the ancient world is that governments and non-governmental organizations (NGO) can respond quicker than ever—even if not more efficiently—to disaster and provide supplies. Thus, even for the Bam Iran earthquake, villages had access to pre-fabricated housing and tents. On historical disaster research see the state of the question in, Gerrit Jasper Schenk, "Historical Disaster Research. State of Research, Concepts, Methods and Case Studies," *HSR* 32 (2007): 9–31.

[94] Rafael Callejas, "Earthquakes in El Salvador," n.p. [cited 1 September 2011]. Online: http://www.care.org/newsroom/specialreports/elsalvadoreq/.

difficult to link it to verse nine or what follows in verse ten.[95] The lack of antecedent for the verbal suffix ונשׂאו "and someone shall carry him," the *hapax legomenon* ומסרפו "the one who burns him," and if the דוד and מסרף are the same person, prevent a clear understanding of this verse. In any case, it is clear that the house is being searched for any remaining bodies with one person in the front of the house and another in the rear. The layout of a four-room house suggests that the person searching for survivors is in the broad room that runs across the rear of the house.[96] This search, though, is in vain as the preceding verse indicated that none remain. The question עמך העוד "Are there any more with you?" then, is a picture of rummaging through building debris in the back of the house. The person at the front of the house must call to his companion because of all the debris and rubble preventing a clear line of communication.

The last part of verse ten supplies an additional piece of evidence that links Amos 6:8–11 to an earthquake. The one who first asked if anyone remained in the rear of the house, upon hearing the response "no" now says הס "silence." הס is a seldom used word, found only seven times in the Hebrew Bible, and denotes a sacred silence. Shalom Paul's comments on this word deserve attention as he states that this form "is associated in some passages with the fear and trembling accompanying a theophany, for example, Hab 2:20; Zeph 1:7; Zech 2:17. Here, too, it is employed as a warning to avoid any and all possible dread consequences that may be brought on by the presence of the Deity if the dialogue continues."[97] Following the implications of Paul's insights, why then, would הס be employed as a warning against further consequences brought on

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[95] Paul, *Amos*, 280, "And when <someone> lifts up his relative and is <constrained> to take the corpses out of the house" while Francis I. Anderson and David Noel Freedman, *Amos*, (AB 24A; New York: Doubleday, 1989), 569, translate, "Then the nearest relative and his *msrp* will arrive to remove the corpse from the house."

[96] בירכתי literally, "in the rear of." In 1 Kings 6:15–16, Solomon first lines the walls of the temple with cedar board (v.15) before lining the rear (מירכותי הבית).

[97] Paul, *Amos*, 216.

by God? One could suggest, as Paul does, that if one invoked the name of the Lord, that they also would be struck by pestilence. Or, Anderson and Freedman link the saying to a lack of normal burial rites being observed.[98] But more likely, the strong linkage between theophanies and earthquakes points to the use of הם as a warning against further consequences brought on by God

Earthquakes have long been part of theophanies in the Hebrew Bible. Samuel Lowenstam authored an important article on the connection between the trembling of nature and theophanies, not only in the Hebrew Bible, but also in East and West Semitic texts.[99] For Loewenstamm, God as a powerful warring force created trembling for the world as seen in biblical texts. This motif, which is also common in Akkadian literature, led Loewenstamm to conclude that the model of nature-shaking theophany came to Israel under Canaanite influence that borrowed it from Akkadian literature. Within the Hebrew Bible a number of texts link earthquake imagery and theophanies. For example, Judges 5:4–5 states, "YHWH, when you went out from Seir, when you marched from the region of Edom, the earth trembled and the heavens dropped, yes, the clouds dropped water. The mountains quaked before the Lord, even Sinai before the Lord, the God of Israel." Psalm 18:7–8 (Eng. 6-7) with a parallel passage in 2 Sam 22:7-8 declares, "In my distress I called upon the Lord; to my God I cried for help. From his temple he heard my voice, and my cry to him reached his ears. Then the earth reeled and rocked; the foundations also of the mountains trembled and quaked, because he was angry." Other examples like these abound, in texts such as Exodus 19 (Sinai), Psalm 29 (Ascribing glory to YHWH), and 1 Kings 19:11–12 (Elijah on Mt. Carmel).

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[98] Anderson and Freedman, *Amos*, 573.

[99] Samuel E. Loewenstamm, "The Trembling of Nature during the Theophany," in *Comparative Studies in Biblical and Ancient Oriental Literatures* (AOAT 204; Kevelaer: Bercker & Butzon; Neukirchen-Vluyn: Neukirchener, 1984), 173–89.

In sum, earthquakes are one of the key elements found during a theophany and the threat of God appearing, via another earthquake would spell further destruction. Thus, הס underscores the severity of the situation. More than a simple reply to an answer, it illustrates that the one crying for silence does not wish to call upon himself another earthquake, as YHWH had already appeared and caused this one. Further, a number of commentators have suggested some connection to magic or magical undertones since naming YHWH's name כי לא להזכיר בשם יהוה "For we must not mention the name of YHWH" would call YHWH.[100] Thus, as earthquakes were seen as divine acts of God, not mentioning his name was a deliberate and careful act that could avoid another divine act.

Verse 11 concludes this episode by offering certainty of God's judgment. It connects to verse 10 via the phrase כי־הנה "For behold" tying the oracle together by explaining what will happen to the remaining houses large and small. YHWH will give the command and houses large and small will be struck down with the result that the great house will be רסיסים "smashed to bits" and the smaller house will be בקעים "to splinters."[101] The totality of the destruction and YHWH as the agent behind the destruction both point towards an earthquake as the cause. It is difficult to reconcile a view of pestilence with a reason to utterly decimate houses and it is hard to imagine that demolition by enemy forces would take the painstaking time to smash houses to bits and in splinters. In fact, Neo-Assyrian chronicles and reliefs do not depict their armies doing this, and it would be waste manpower, resources, and time to do such a thing. Rather, houses

[100] Wolf, *Joel and Amos*, 283; Paul, *Amos*, 216.

[101] See the discussion in Freedman and Anderson, *Amos*, 576. רסיסים is another *hapax legomenon* but has a homonym *rss* in Ezek 46:14 while בקעים is also found in Isa 22:9. בקע is also found in Zech 14:4-5 and Micah 1:4 "the valleys will be burst open" as two other examples of theophanies.

smashed to bits are found in earthquakes, such as Bam Iran where the earthquake razed more than eighty percent of the cities' mud brick houses.

In sum, Amos 6:8-11 is an example of a text that has had a number of interpretive suggestions placed on it, though often without insight into how the particular disaster—whether war, disease, or an earthquake—would have affected society. While the reason for fear of death in a house is not spelled out, several clues from the aftermath of an earthquake suggests earthquake imagery is behind the oracle. In specific, the guarantee of staying in a house leading to further death points to post-earthquake hazards (most notably aftershocks) while those looking for survivors by relying on familial and communal support dug through rubble in the back part of a typical four-room house. The belief that YHWH caused earthquakes created a reverent fear so that no one else would be subject to such trauma, but the reality of a quake seen in the complete destruction of houses both large and small demonstrated how natural disasters impact all levels of society.

7. Summary

Using insights from comparative Ancient Near Eastern evidence, understanding how natural disasters can invite religious revival, and applying disaster research to the book of Amos are all methods that can sharpen our understanding of earthquake imagery within this prophetic book. Neo-Assyrian omen texts demonstrate the "roaring" has a close connection to earthquakes and that once again, hard and fast lines cannot be drawn between thunderstorms and earthquakes. Their semantic and conceptual domains overlap in Mesopotamian and Israelite literature. This insight applied more directly to Amos suggests that roaring like a lion, found in Amos 1:2, can be understood as referring to an earthquake and helps link the superscription more organically with the following motto.

A connection between religious revival and earthquakes has a long and secure history that can be identified over time and throughout culture. Historically, there is an almost universal connection between natural disasters causing religious revival. Part of this stems from the nascent emergence of the term "natural disaster." If we are to reflect a more accurate understanding of disaster and ancient cultures, a term such as divine disaster or divine action, may be a more precise term to describe phenomena like earthquakes, floods, tsunamis and other events that today we label natural disasters.

Constructing an Israelite worldview for how they viewed the causes of an earthquake, whether by mountains shaking which were connected to the pillars of the earth, whether by pillars of the earth that rocked the disc shaped land above it, or whether they believed in pillars of the earth at all remains out of reach. This is not to say, however, we cannot at least raise some tantalizing suggestions based on a number of texts. In fact, in my view, one may create some plausible scenarios, which I lean towards an understanding that ancient Israel conceptualized mountains shaking which were connected to the pillars of the earth. From Ereškigal's role in neo-Assyrian omen texts, it appears that the Assyrians linked earthquakes as coming from under the earth.

Utilizing disaster research illustrates the variety of ways to study and reconstruct earthquakes. Careful methodological justification is paramount for applying models of disaster research to the Ancient Near East and in this case it is difficult to distinguish between emergency and temporary sheltering as pre-modern societies would not have had the benefit of pre-fabricated housing or even governmental or NGO issued tents. For ancient Israel, rather, families and social networks were dependent on each other for survival both in the initial aftermath and subsequent rebuilding. This dependence on family networks was likely greater in the countryside

far from the capital city or hubs of influence. In the face of such a large disaster, where Amos or later compilers would have seen pre-existing social networks magnified in post-disaster recovery, the condemnation of the gapping disparity between rich and poor and call for social justice would have been magnified through the effects of a massive earthquake. Thus, a verse like Amos 2:7a, "they who trample the head of the poor into the dust of the earth, and push the afflicted out of the way," can be read in an entirely different light based on the ramifications of post-disaster recovery where the poor and marginalized suffered at the hands of the elite. It is texts like these that deserve a fresh reading in light of newer approaches and methodologies.

CHAPTER SIX: READING AN EARTHQUAKE IN AMOS

1. Introduction

Advances in paleoseismic research have enabled new perspectives for the study of Amos. Though scholars throughout the twentieth century have sifted the book for earthquake imagery, this endeavor was based on a limited understanding of the frequency of earthquakes in Israel. Namely, the traditional view of earthquakes in the Levant argued that they were extremely common and that Amos's quake must have been particularly large to be remembered. This view should be modified. Rather, following an earthquake around 1050 BCE, there is no evidence of another meaningful seismic event until the mid-eighth century earthquake struck the Levant.[1] The picture is more complicated within the eighth century. The most recent studies now suggest that two earthquakes occurred during this period.[2] It is difficult to date specifically when these events occurred but the most probable view is within a few decades of each other.[3] In all likelihood one or both of these mid-eighth century quakes stand behind the earthquake imagery in Amos.

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[1] Migowski et al., "Recurrence Pattern," 307, suggest a quake also struck the Levant around 1100 BCE though the evidence cannot be corroborated. Freedman and Welch, "Amos's Earthquake," 195, writing before paleoseismic research has changing our understanding of the frequency of Levantine earthquakes, represent a common, but now outdated view. "Living along so many fault lines, including one of the major fault lines of the world, people experienced earthquakes with some frequency; anyone could predict an earthquake in the relatively near future (ten to fifteen years) with confidence."

[2] See, Elisa Kagan, Mordechai Stein, Amotz Agnon, and Frank Neumann, "Intrabasin Paleoearthquake and Quiescence Correlation of the late Holocene Dead Sea," *JGR* 116 (2011): 1–27.

[3] Kagan et al., "Intrabasin Paleoearthquake," 23–25, give mixed information about these quakes. On the one hand, the evidence from three different seismite records shows two different seismites, in other words, two different quakes. Based on the distance separating the seismites, Kagan et al., state it is "comparable to a few decades." On the other hand, Kagan et al., point to work completed at Megiddo (Macro et al., "Megiddo Earthquakes") that shows two deformation events: one after 800 BCE and another after 700 BCE. They further raise a study by E. Zilberman, R. Amit, I. Bruner, and Y. Nahmias, "Neotectonic and paleoseismic study: Bet She'an Valley," *GSI* 15 (2004): 1–37, who found evidence of two seismic events, one each in the 7th and 6th centuries. The dating of Kagan et al. is less specific than Migowski et al., "Recurrence Pattern," who suggested a quake struck around 700 BCE. The uncertainty about specific information for this quake is magnified by Migowski et al., as they do not plot the epicenter on their map.

Another earthquake struck the Levant around 525 BCE but it did not influence the earthquake in Amos.[4] This is because the epicenter of the 525 BCE quake struck offshore, roughly 25 to 50 km northwest of modern day Haifa.[5] For comparison, the epicenter of the 502 CE earthquake struck in a similar location and heavily damaged Ptolemias (Acre, Akko) as well as half of the towns of Tyre and Sidon. Yet, the lack of evidence for damage in the hinterland points to an offshore epicenter.[6] Since the presumed epicenter of the 525 BCE earthquake is located even further north than the 502 CE earthquake, the location impacted by the earthquake would likely have been limited to the area around Acre, Beirut, Tyre and Sidon. This appears to explain why there is no reference in the Hebrew Bible to this earthquake.

This knowledge provides, in my view, a compelling argument to place a large portion of the composition of Amos to the eighth century. It may be plausible, based on the host of later texts that also employ earthquake imagery (Haggai 2:6–7; Jeremiah 4:23–26; Ezekiel 38:17–20; Nahum 1:5; Joel 3:16 (Eng. 4:16); Zechariah 14:5), to decouple Amos from the mid-eighth century earthquakes but it is unlikely. In specific, this view underestimates, among other things, the intimate connection between religious revival and natural disasters. For Amos, the editorial activity of the book, seen through the superscription, prompts the reader to make the connection between disaster and revival. In the view of the book's editors, Amos predicted the earthquake. Further, earthquake imagery is littered throughout the book, from the superscription to the fifth vision concerning the altar at Bethel. This allowed for the application and reapplication of

[4] Agnon et al., "Intraclast Breccias," 207, suggest a quake struck around 227 BCE though they are unable to correlate the quake with other evidence. Migowski et al., "Recurrence Pattern," do not list this quake in their findings. After the 525 quake they suggest two quakes struck around 148 and 140 BCE.

[5] See, map 4.3, 158 in chapter four and comments in Kagan et al., "Intrabasin Paleoearthquakes," 20.

[6] See the summary in Ambraseys, *Earthquakes in the Mediterranean*, 179.

visions and oracles that are laden with earthquake imagery.[7] Other prophetic texts such as Isa 5:25 and Joel 3:16 (Eng. 4:16) allude to, if not quote, earthquake imagery from Amos lending more support to an eighth century time period for its primary composition.[8] In addition, in the view of Walter Houston, two primary modes of judgment exist in Amos: earthquake (Amos 3:14–15 (?); 4:11; 8:8; 9:1–6) and "the sword" and deportation (Amos 2:14–15; 3:11; 5:3, 5; 6:7, 14; 7:9, 11, 17; 9:1, 4, 10).[9] Thus, while later books will add earthquake imagery to their arsenal of prophetic pronouncement, the book of Amos is built around the idea of earthquake as judgment.

In light of the composition of large portions of Amos close to the time of the mid-eighth century earthquakes, this chapter will examine how passages in Amos can be read in light of an earthquake. The operating principle behind this is to utilize evidence from natural disasters and how it can shed new light on Amos's ancient text. In specific, this chapter will examine the link between natural disasters and religious revival seen through the early compositional history and

[7] Though scholars have also connected the fifth vision with Jerusalem or to a cultic site on Mt. Carmel, most scholars agree that Bethel is implied in the text.

[8] Freedman and Welch, "Amos's Earthquake," 196; Strazicich, *Joel's Use of Scripture*, 238–240. Joseph Blenkinsopp, *Isaiah 1-39: A New Translation with Introduction and Commentary* (AB 19; New York: Doubleday, 2000), 217–18, has suggested a number of parallels between Amos and Isaiah. In his interpretive framework, Isa 9:7-20 [8-21] + 5:25 are five stanzas around the refrain "yet his anger did not abate/still was his arm outstretched." Blenkinsopp sees Isa 5:25 as providing the clearest allusion to an earthquake and thus it summarizes the entire refrain before being moved to its current location in chapter five. Due to his redactional reading of 5:25 as the conclusion of 9:7-20, Blenkinsopp suggests a number of parallels throughout 9:7-20 + 5:25. Besides the last vision of Amos in 9:1-4 which has an earthquake and an invading army similar to Isa 9:7-20, he also points to 5:25 paralleling the five reproaches listing five "visitations" in Amos 4:6-11. Further, he notes the shared use of the term ragaz (5:25 and Amos 8:8) noted above, corpses awaiting burial or cremation (5:25, Amos 6:9-10; 8:3), buildings collapsing (9:9, Amos 3:15, 6:11), the whole land on fire (9:18, Amos 4:11), and the key Isaianic refrain of "his anger did not return" recalling Amos's oracles against foreign nations ("I will not cause it to return" 1:3, 6, 9, 11, 13; 2:1, 4, 6) as well as the reproach ("you did not return it to me" Amos 4:6, 8, 9, 10, 11). In sum, Blenkinsopp sees 9:7-20 as a message to the Northern Kingdom stating that though they survived one disaster, it will not be the last one.

[9] Walter J. Houston, *Contending for Justice: Ideologies and Theologies of Social Justice in the Old Testament* (rev ed.; Great Britain: T & T Clark, 2008), 60.

interpretation of Amos. It will first turn to social justice texts in Amos and how these texts would have been interpreted and reinterpreted by its listeners in light of natural disasters.
Next, it will examine how texts within Amos argue that Amos correctly foresaw the earthquake as judgment.

2. Scholarship and Expanding the Causes and Effects of Social Justice

Scholarship on social justice in the ancient world has focused almost exclusively on an economic or political approach to social justice. Thus, studies approach social justice in its relation to the poor through economic abuse by the wealthy or by its reflection of monarchical values of protecting the widows and poor. There certainly is preservation of social justice texts built around these ideals, but the contextual ambiguity in Amos also lends itself to understanding how they can reflect the aftermath of an earthquake. My approach to social justice in the eighth century prophets, and Amos specifically, will come from a different perspective. It will examine how the results of a large natural disaster can create a different reading of social justice texts in Amos. Specifically, in the aftermath and rebuilding following an earthquake, the already existing chasm between the rich and the poor would be magnified even more.

The large number of studies on social justice prevents an exhaustive survey but the central works will be noted here.[10] Léon Epsztein's, *Social Justice in the Ancient Near East and the People of the Bible*, first offered an overview of social justice in Mesopotamia and Egypt before focusing on how these backgrounds can be used to help understand justice in the Hebrew Bible. Epsztein's work is useful for its extensive interaction with secondary sources as well as its overall contribution in the second half of the book to examining prophecy and social laws in the Pentateuch in relation to social justice. Epsztein concludes that the collective responsibility for

[10] See the summaries in Léon Epsztein, *Social Justice in the Ancient Near East and the People of the Bible* (London: SCM Press, 1986), 45-82, 149-173 and for a summary of studies geared more towards ethics, see Christopher J. H. Wright, *Old Testament Ethics for the People of God* (Great Britain: Intervarsity Press, 2004), 415-440.

justice as articulated through the covenant demands in the Torah ensured that the quest for social justice, as opposed to its halt in Mesopotamia or its long eclipse in Egypt, is pursued by people of the Bible to this day.

Another work that situates social justice in the Ancient Near East before approaching the biblical material is Moshe Weinfeld's, *Social Justice in Ancient Israel*.[11] Weinfeld focuses on clarifying the two terms: משפט וצדקה "justice and righteousness" and עשות משפט וצדקה "doing justice and righteousness." In Weinfeld's view, maintaining social justice in society so that equality and freedom prevail, is behind the concept of justice and righteousness. Further, there was a heavy religious significance in Israel as God first established justice at creation, then gave justice (=law) at Sinai. And, in the future, God will reveal himself to judge the nations with "justice and righteousness." Weinfeld focuses on the social-political realm and how social legislation initiated by the kings and ruling circles ensured justice for the poor and less fortunate classes.

The edited volume, *Social Justice in the Ancient*, by K. D. Irani and Morris Silver, Raymond Westbrook and Benjamin Foster contains essays that focus on Ancient Near Eastern conceptions of social justice.[12] Silver, building on his earlier work on the political economy of ancient Israel argued that due to urging by classical prophets, the kings of Israel and Judah implemented altruistic social reforms. In this way, it was not a conflict between the wealthy and royalty but the wealthy, royal, and non-royal, seeking the guidance of the prophets.

Enrique Nardoni, has written a comprehensive study of justice in the biblical world, first tracing its roots in Mesopotamia and Egypt before following justice thematically through the

[11] Moshe Weinfeld, *Social Justice in Ancient Israel and in the Ancient Near East* (Jerusalem/Minneapolis: Magness Press/Fortress Press, 1995).

[12] Eds, K. D. Irani and Morris Silver, *Social Justice in the Ancient World* (CPS 354; Westport, Connecticut: Greenwood Press, 1995), 149-164; 165-178; 179-198.

Hebrew Bible, apocalyptic writings, and through the New Testament.[13] Nardoni devotes a few pages to Amos and draws a contrast between those well off in the city and the poor dwelling around cities and in small towns. Specifically, Amos criticizes the leaders of society (king, priests, and judges) as well as upper-class and influential people (rich landowners, prosperous traders, and businessmen) for their gap between "their religious piety and their relationship to their neighbors."[14]

Walter Houston's work, *Contending for Justice*, originally published in 2006, was subsequently revised in 2008 in light of his study of Avi Faust's insights on the archaeological picture of cities and villages in the Iron II period.[15] Houston relies on Faust's research on family structure and urban dwellings and their differences between city and rural during the Iron II period.[16] In Faust's reconstruction, there was a sharp distinction between cities and villages; cities had a larger population and a higher density of settlement and also showed economic specialization and social stratification, but nuclear families were more prevalent. This is in contrast to villages that are built around agriculture, have extended families that are more prevalent, and do not appear to show evidence of any social differences. Thus, a village in the heartland of Israel or Judah consisted, on average, of a few dozen substantial houses with 6-8

[13] Enrique Nardoni, *Rise Up, O Judge: A Study of Justice in the Biblical World* (Transl. Seán Charles Martin; Peabody: Hendrickson, 2004).

[14] Nardoni, *Rise Up, O Judge*, 101. For other studies on Amos and social justice, see, Herbert B. Huffmon, "The Social Role of Amos's Message," in *The Quest for the Kingdom of God: Studies in Honor of George E. Mendenhall* (ed. Herbert B. Huffmon et al.; Winona Lake: Eisenbrauns, 1983), 109-116; Merlene Fendler, "Zur Sozialkritick des Amos," *EvT* 33 (1973): 32-53.

[15] Walter J. Houston, *Contending for Justice: Ideologies and Theologies of Social Justice in the Old Testament* (rev ed.; Great Britain: T & T Clark, 2008).

[16] Avi Faust, "Socioeconomic Stratification in an Israelite City: Hazor VI as a Test Case," *Levant* XXXI (1999): 179-190; Avi Faust, "Differences in Family Structure Between Cities and Villages in Iron Age II," *TA* 26 (1999): 233-252; Avi Faust, "The Rural Community in Ancient Israel during the Iron Age II," *BASOR* 317 (2000): 17-39; Avi Faust, *The Israelite Society in the Period of the Monarchy: an Archaeological Perspective* (Jerusalem: Yad Ben-Zvi Press, 2005), (Hebrew).

rooms for more options for separation and privacy.[17] Further, the evidence of agricultural installations such as oil presses, grain silos, threshing floors indicate a level of autonomy and ability to manage resources. An interesting feature of Faust's work is his concern for the rural landscape. He suggests that villages were far more developed in Israel than in Judah, and that Israel had a number of farmsteads.[18]

As a result of Fausts's insights, Houston applied them to interpreting social justice texts in Amos. In his view, there is little to learn from the positive expression for "justice and righteousness," but more can be gleaned from the negative passages of judgment (2:6-16; 3:9-15; 4:1-3; 5:10-12; 8:4-7). Houston analyzes these passages under the headings of victims, oppressors, and the moral characterization of acts of oppression. The prevalent view is that the victims are peasants in the countryside but based on Faust's work that argues that villages were largely self-sufficient, Houston argues that the urban context is more likely.[19] Houston's work has much to commend as it is anchored in a quest to understand Israelite society on its own terms and enables a more nuanced understanding of social justice texts.

3. Disaster and Vulnerability

To understand social justice texts in light of disaster, it is important to understand the changing conception of disaster in scholarship. The study of disaster began about sixty years ago where

[17] Faust, "Differences in Family Structure," 246.

[18] Avraham Faust, "The Farmstead in the Highlands of Iron Age II Israel," in *The Rural Landscape of Ancient Israel* (ed. S. Dar, A. M. Maeir and Z. Safrai; Oxford: Oxford University Press, 2003), 91–104.

[19] See, for example, the view articulated in Bernhard Lang, "The Social Organization of Peasant Poverty in Biblical Israel," in *Anthropological Approaches to the Old Testament* (IRT 8; London: SPCK/Fortress, 1985), 83-99. Reprinted from *Monotheism and the Prophetic Minority* (SWBAS, 1; Sheffield: Almond Press, 1983), 85. See also, Amos 3:9 וראו מהומת רבות בתוכה "see what tumult is *within* Samaria."

disasters were first seen as deviations from the norm.[20] In this regard, the words of Greg Bankoff are important:

> The preoccupation with physical damages and statistics of all descriptions, both as assessments of loss and as measurements of recovery, probably owes its origins to these beginnings. The identification of disasters as purely physical occurrences (typhoons, floods, earthquakes and initially also bombings and explosions) that affect people who have the misfortune to be simply in the wrong place at the wrong time gave rise to a preoccupation with technological solutions for the protection of infrastructure and exposed populations.[21]

As researchers began to turn their attention to third world countries in the 1970s, this turned the conception of disaster away from seeing vulnerability from a passive standpoint. In this model, the impact of anthropology studies in third-world countries shifted the conversation to a political-economic perspective as disaster proneness was often tied to chronic malnutrition, low income, and famine potential.[22] Thus, greater attention was placed on social vulnerability. In this model, issues such as increasing poverty culminated in an understanding that disaster was tied to hazard as well as vulnerability.[23] This had led researchers to stress the mutuality of hazard and vulnerability while diminishing the notion of environmental determinism. Seen through this light, disaster must be understood in light of its ability to touch all facets of life. Thus, disasters impact human life, environment, social, economic, political, and biological conditions.[24] In other words, disasters are physical and social events. Disasters are physical in that the environment

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[20] Christof Mauch, "Introduction" in *Natural Disasters, Cultural Responses: Case Studies toward a Global Environmental History* (eds. C. Mauch and C. Pfister; New York: Lexington Books, 2009). 1–16.

[21] Greg Bankoff, "Time is of the Essence: Disasters, Vulnerability and History," *IJMED* 22 (2004): 23–42.

[22] Anthony Oliver-Smith, "Theorizing Disasters: Nature, Power, and Culture," in *Catastrophe and Culture: The Anthropology of Disaster* (eds. S. M. Hoffman and A. Oliver-Smith; Santa Fe: School of American Research, 2002), 23–47.

[23] Dorothea Hilhorst, "Complexity and Diversity: Unlocking Social Domains of Disaster Response," in Mapping Vulnerability: Disasters, Development and People (eds. G. Bankoff, G. Frerks, and D. Hilhorst; London: Earthscan, 2004), 52–66.

[24] Oliver-Smith, "Theorizing Disasters, 27.

itself can cause a catastrophe (such as sitting near an earthquake fault, being susceptible to a tsunami because of a coastal location) and social in how society responds to circumstances presented by a disaster. An example of the social side of disaster is the well-known picture of hundreds of flooded school buses in New Orleans following the 2005 Hurricane Katrina. Though these buses could have been used to move thousands of residents outside the city, the lack of planning highlighted the social aspect of disaster.

More recently, historical disaster research has focused on pre-modern, pre-industrial societies. Scholars have built theories for working in pre-modern societies that in the words of Jürg Helbling, "allows studying the relative weight of factors such as natural hazards, inefficient prevention and mitigation strategies by peasants and state failure, in causing a disaster, a model which does not pre-empt the definition of the phenomenon that should be the object of an empirical analysis."[25] This approach, then, builds on the earlier recognition that disasters are not natural per say, but are social phenomena. It is how society deals with events that may turn them into a disaster. Part of the difficulty in working in the historical study of disaster is the lack of studies or methodology to date.[26] In this regard, the comments of Monica Juneja and Franz Mauelshagen are appropriate:

> The historical study of disasters continues to occupy a marginal position within the discipline of history, though this has changed somewhat in the recent years. Till 1990 there existed but a handful of studies focusing on single outstanding disasters such as the Lisbon earthquake of 1755 or London's Great Fire of 1666. Most historians assigned (natural) disasters to the domain of fate, as exceptional incidents within the course of human history—something destructive that might interrupt social normalcy and which could not be grasped through recourse to socio-cultural concepts of historical change.[27]

[25] Jürg Helbling, "Coping with 'Natural' Disasters in Pre-industrial Societies: Some Comments," *MHJ* 10 (2007): 429–446.

[26] See most recently, Andrea Janku, Gerrit Jasper Schenk, and Franz Mauelshagen, eds., *Historical Disasters in Context: Science, Religion, and Politics* (New York: Routledge, 2011).

[27] Monica Juneja and Franz Mauelshagen, "Disasters and Pre-industrial Societies: Historiographic Trends and Comparative Perspectives," *MHJ* 10 (2007): 1–31.

As Juneja and Mauelshagen illustrate, the historical study of disaster is in its infancy. Attention to social justice will focus on the "social" aspect of disaster and how this may aid in the understanding of historical disaster.

4. The Archaeological Picture at the Time of Disaster

Returning to Avi Faust's construction of the Iron II landscape supplies us with a better sense of the socioeconomic picture in which an earthquake struck. Faust's argument for a size difference between rural and urban four-room houses was first explored in the previous chapter. In sum, larger, rural houses held extended families of at least three generations (parents, married sons and their children, unmarried daughters, unmarried aunts, additional relatives, and possibly servants), while the smaller urban houses held nuclear families (two parents and a couple of unmarried children).[28] Faust draws a connection between the larger, extended families and the biblical *bet av*, where the organizing framework goes beyond the extended family to a larger framework of the *mishpahah*, or the lineage.[29] Above the *mishpahah*, Faust suggests that the elders of the *mishpahah* made decisions for all the members of the community.

Beyond the difference between the extended families in the rural sectors and nuclear families in the urban, the organization of labor also differed. Based on the number and size of agricultural installations in the countryside along with the estimated production leads to the suggestion that the produce enabled not only local sustenance but also was intended to be sold.[30] Evidence for storage installations is found in both the rural (Khirbet Jemein, Khirbet Kla, Beit Aryeh, Khirbet Deir Daqla, Khirbet Hamad) and urban environments (Megiddo, Bet Shemesh,

[28] Faust, "The Rural Community" 17–39.

[29] Faust, "The Rural Community," 30.

[30] Faust, "The Rural Community,"23, citing David Eitam, "Olive Oil Production during the Biblical Period," in *Olive Oil in Antiquity* (eds. M. Helter and D. Eitam; Haifa: Haifa University, 1987), 16–43.

Tell en-Nasbeh), though the urban installations stand out for their higher quality construction. The lack of socioeconomic stratification in the villages lends support to the notion that Amos was not criticizing injustice among villagers.

Faust outlines three types of villages based on studies from archaeology, ethnographic records, and texts from Alalakh VII archives. The three types of villages are those owned by the palace or a member of the elite ("absentee landlord"), a privately owned village (large house, many smaller houses), and communal villages that were cooperative. Since Iron II villages has large installations, boundary fences, and well built stone homes, Faust argues that this is evidence of a standard of living higher than subsistence. Further, it testifies to an abundance of production.[31]

Turning to the urban sector, Avi Faust has surveyed a number of Iron II cities and has concluded that the evidence is not as programmatic as other studies on the city.[32] Faust specifically challenges the conclusions of Gideon Sjoberg's influential, *The Preindustrial City*, where the upper class and most prominent religious and governmental buildings are located in the central area while the poorest live towards the periphery.[33] Based on the archaeological finds, while sites like Beersheba hew closely to Sjoberg's model, a number of sites do exactly the opposite (Tell al-Nasbah, Tell Bet Mirsim, Shiqmona, Hazor). In Faust's estimation, cities that did not adhere to a center/periphery divide all grew in size and the expansion allowed for its wealthier inhabitants to move to newer and more spacious locations. As a city grew and

[31] Another aspect relating to rural settlements is the preliminary work on the study of farmsteads. Farmsteads, or small farms, are attested predominantly in the Iron II in the Hebron Mountains, near Jerusalem, and on the western slopes of Samaria. See, Avraham Faust, "The Farmstead in the Highlands of Iron Age II Israel," in *The Rural Landscape of Ancient Israel* (eds. S. Dar, A. M. Maeir, and Z. Safrai, Oxford: Oxford University Press, 2003), 91–104. A majority of these farmsteads date to the Late Iron Age but there are still several cases that date to the eighth century.

[32] Avraham Faust, "Residential Patterns in the Ancient Israelite City," *Levant* 35 (2003): 123–138.

[33] Gideo Sjoberg, *The Preindustrial City, Past and Present* (New York: Free Press, 1960).

administrative structures needed a new location for its structures, the rich would follow the administration to a new area within the city walls.

5. The Socioeconomic Disparity Following Earthquakes

Socioeconomic disparity following disaster is a well-known and frequently studied area. After the initial time period of searching for victims ends, shock wears off and survivors are forced to begin to come to grips with the sad reality in front of them.[34] Since disasters are as much "acts of people" as they are "acts of God," women, elderly, minorities, often suffer disproportionately from disaster.[35] The rich, who have access to more resources, are able through their wealth, mobility, and access to the political administration, to more quickly rebuild and move on with their lives while the poor struggle.

A number of social justice texts in Amos can be read in light of understanding this rich/poor divide following disaster. In this way, the message of Amos remained timeless. In Amos 2:6b-7a (7b will be discussed below), the judgment against Israel is one text whose timelessness can be understood by early listeners and readers through an earthquake. The text reads: על־מכרם בכסף צדיק ואביון בעבור נעלים׃ השאפים על־עפר־ארץ בראש דלים ודרך ענוים יטו

"Because they have sold for silver, those whose cause was just, and the needy for a pair of sandals (hidden gain). The ones who trample the heads of the poor into the dust of the earth, and

[34] On the initial social support that is felt after disasters, see, Krzysztof Kaniasty and Fran H. Norris, "Social Support in the Aftermath of Disasters, Catastrophes, and Acts of Terrorism: Altruistic, Overwhelmed, Uncertain, Antagonistic, and Patriotic Communities," in *Bioterrorism: Psychological and Public Health Interventions* (ed. R. J. Ursano, A. E. Norwood, and C. S. Fullerton; Cambridge: Cambridge University Press, 2004), 200–229.

[35] Gary A. Kreps, *Facing Hazards and Disasters: Understanding Human Dimensions* (Washington D.C.; National Academies Press, 2006), 64–66, and studies listed therein. See also, Alice Fothergill, Enrique G. M. Maestas, and JoAnne DeRouen Darlington, "Race, Ethnicity and Disasters in the United States: A Review of the Literature," *Disasters* 23 (1999): 156–173; Alice Fothergill, "The Stigma of Charity: Gender, Class, and Disaster Assistance," *SQ* 44 (2003): 659–680. Avraham Faust, "Ethnic Complexity in Northern Israel During Iron Age II," *PEQ* 132 (2000): 1–27, argues that differences in finds at villages in the Northern Valleys and the villages in other regions of the county demonstrate that the Northern Valley population were Canaanite-Phoenician. A number of these supposed Canaanite-Phoenician villages would have been subject to strong shaking—and damage—following the earthquake. Applying our understanding of the vulnerability of ethnic minorities following disasters suggests that these villages would have been subject to slower recovery without much help from the central administration.

divert the humble off the road." The two accusations focus on maltreatment of the poor, applied in different ways.[36] Regarding the second accusation, Shalom Paul understands it to mean, "They step upon the heads of the poor as though they were stepping upon the ground beneath them, that is, they treat the underprivileged with contempt and abuse."[37] Paul, however, does not try and explain in what ways the wealthy would treat the unprivileged with contempt and abuse.

Given the relative autonomy of extended families in the countryside seen through features such as large installations, boundary fences, and well built stone homes suggests the focus of the accusation is not on the countryside. This is reinforced by the lack of socioeconomic stratification seen in villages. Rather, the focus on the accusation is in the cities where the rich/poor divide is more easily seen through the movement of the elite following the building of administrative structures throughout. One scenario is that the judgment against Israel might have addressed some type of economic oppression, perhaps by forced evictions from housing to make way for the elite.[38] Another scenario is that because most of the peasants would have lived in the city they were exploited by the elite through debt slavery. In this scenario, because of their lack of access to resources, they would have been indebted for basic resources.

After an earthquake, the maltreatment of the poor in the cities would have been highlighted even more. The building materials and overall construction quality of their housing would have been inferior to the elite. This suggests that their housing would have been more at

[36] There are a number of interpretive difficulties in this section. In specific, the first accusation is linked either to bribery of judges from debt slavery or creditors selling debtors into slavery. Further, interpreters have suggested a number of suggestions for the meaning of נעלים "sandals." While Anderson and Freedman, *Amos*, 310–314, raise a number of suggestions but focus on bribes changing hands while Paul, *Amos*, 77–79, argues that the present vocalization is a misunderstanding of its original meaning. In his view, based on similar usage in Samuel, the word for sandals signifies a type of gift payment.

[37] Paul, *Amos*, 80.

[38] A similar idea may stand behind the "Broad Wall" in Jerusalem (Isa 22:9–11). Though it cut through several houses, its clear defensive purpose suggests its residents may have been more understanding with losing their homes.

risk for collapse and in areas where there was not whole-scale destruction, the houses of the poor would have been more susceptible to damage. In a study of housing in the Andean and Himalayan regions, a high proportion of earthquake-vulnerable adobe construction was found among the poorer communities.[39] The rations given to the poor at grain silos or other state controlled food storage areas in cities such as Bethel, Samaria, Megiddo, and Dan following the quake, would have come after provisions were made for the administration, military, and elites.

The woe oracle in Amos 6:3–6 is given new meaning in this light. It reads:

> "O you who put far away the day of disaster, and bring near the seat of violence. Woe to those who lie on beds of ivory and stretch themselves out on their couches, and eat lambs from the flock and on calves from the feeding stall. Who sing idle songs to the sound of the harp and like David they invent for themselves instruments of music, who drink wine in bowls and anoint themselves with the best oils, but are not grieved over the ruin of Joseph!"[40]

Amos 6:3 indicates that the rich were able to המנדים "put off" the יום רע "day of disaster." Following an earthquake, this would indicate that they were able to quickly move on with their lives, as though the disaster barely impacted them. At the same time, the verse next states that by these actions, the rich actually brought near even more destruction. One way to understand this reference is that the destruction and exile of the northern kingdom achieved what the earthquake could not: the day of disaster. Next, Amos 6:4–6a demonstrates how well off the elite lived through eating, drinking, and living out the pleasures of life. Amos 6:6b demonstrates the problem with this lifestyle. Shalom Paul writes, "While devoting themselves to all their creature comforts of personal pleasures and delights–banqueting and imbibing, music making and cosmetic ointments–they nevertheless remain totally indifferent, apathetic, and oblivious to the

[39] Macabuag, "Dissemination of Seismic Retrofitting," 3, see chapter four for more details.

[40] Jonathan S. Greer, "A *Marzeaḥ* and a *Mizraq*: A Prophet's Mêlée with Religious Diversity in Amos 6. 4–7," *JSOT* 32 (2007): 243–262, suggests, "Thus, this Yahwistic purist's root cause of 'woe' was the offense of syncretism, rather than simply the symptomatic neglect of the poor. According to Amos, it was such 'religious diversity' that angered Yahweh and sent these mizraq-sippers of Samaria into exile a few decades later."

perilous situation in Israel…"[41] Hence, while many in Israel (the ruin of Joseph) suffered in their struggle to rebuild and return to a normal life, the rich already had resumed their sumptuous, indulgent, and insolent lifestyles. Another aspect of being indifferent to the "ruin of Joseph" concerns search and rescue efforts and their concentration on cities rather than the villages. In this way, the attention given by the administrative elite to those in the city at the expense of the countryside would also stand behind the indifference to the "ruin of Joseph."

6. Exploitation of Women Following Natural Disasters

The study of gender in disaster is now a research priority. One outcome of this burgeoning area of study is that it has demonstrated the struggle women face in disaster. In fact, prior to the mid 1990s, little attention had been placed on gender and disaster. Alice Fothergill's 1996 literature review helped synthesize over 100 studies that involved some type of gender study.[42] As part of her synthesis, she demonstrated the inequality women faced after a disaster, though she also illustrated that this inequality was not well understood. Building off of Fothergill's work, the edited volume, *The Gendered Terrain of Disaster: Through Women's Eyes*, offers a number of studies on gender and disaster.[43] As a starting point, women are more vulnerable to disaster because they have a greater exposure to risk. This vulnerability is tied to their relative lack of power and statues as well as their role in being a caregiver and how they must protect, as well as assist and protect following a disaster.[44] One area in specific that relates

[41] Paul, *Amos*, 209.

[42] See the important study by Alice Fothergill, "Gender, Risk, and Disaster," *IJMED* 14 (1996): 33–56.

[43] See especially, Jennifer Wilson, Brenda D. Phillips, and David M. Neal, *The Gendered Terrain of Disaster: Through Women's Eyes* (eds. E. Enarson and B. H. Morrow; London: Praeger, 1998), 115–122.

[44] Fothergill, "The Neglect of Gender in Disaster Work: An Overview of the Literature," 11–25. Fothergill's essay represents an updated an revised version of her 1996 article in the *International Journal of Mass Emergencies and Disasters*. Though not focused on reconstructing a social understanding of women in the Iron Age, see the helpful

to Amos is the sad reality of domestic and sexual abuse that often accompanies social breakdown following disaster.[45]

It is difficult to track statistics on domestic and sexual abuse following disaster, as many events are not reported. In addition, there is a greater concern for basic needs, feelings of powerlessness due to bereavement weaken resolve, social networks are destroyed, and law enforcement is overwhelmed with rescue and chaos. Even worse, law enforcement can be completely overwhelmed and broken-down following a disaster.[46] Even with the difficulty in tracking domestic and sexual abuse, a number of studies have demonstrated that violence against women, especially spousal abuse, may increase in times of disaster.[47] A large reason for the spike in this type of abuse is due to, in the view of the World Health Organization, stress and the disruption disaster causes.[48] The World Health Organization has documented instances of women and children coerced into sex in exchange for food or shelter. They also note, "In cultures with traditions of early marriage and dowry, adolescent girls' may face an increased risk of early and forced marriage because of poverty. Forced marriage can also be a consequence of disclosing sexual abuse."[49]

With this background in mind, it presents another perspective on Amos's oracles against Israel in Amos 2:7b: וְאִישׁ וְאָבִיו יֵלְכוּ אֶל־הַנַּעֲרָה לְמַעַן חַלֵּל אֶת־שֵׁם קָדְשִׁי׃ "And a man and his father

study of texts regarding women in the Hebrew Bible, Joseph Blenkinsopp, "The Family in First Temple Israel," in *Families in Ancient Israel* (eds. L. G. Perdue et al.; Louisville: Westminster John Knox Press, 1997), 48–103.

[45] Fothergill, "Neglect of Gender," 17–18.

[46] Lin Chew and Kavita N. Ramdas, "Caught in the Storm: The Impact of Natural Disasters on Women," *The Global Fund for Women* (2005): 1–5. To give a recent example of the difficulty compiling statistics, during Hurricane Katrina, the storm closed the local rape centers impacting the level of confirmation and counting.

[47] Fothergill, "Neglect of Gender," 18, cites eight different studies on this point.

[48] Chew and Ramdas, "Caught in the Storm," 2.

[49] World Health Organization, "Violence and Disasters," n.p. [cited 18 May 2012]. Online: www.who.int/violence injury_prevention/.

go to the same girl, And thereby profane My holy name." Since the word for female is נערה "young woman" and does not convey any cultic context like the term קדשה "cultic prostitute" Shalom Paul is correct in noting that "…Amos is not denouncing cultic rites and wrongs but rather the lack of basic moral conduct."[50] Capturing the intent of the sexual encounter in Amos is difficult. Several different verbs are used to label rape including עלל (Judg 19:25), ענה (Judg 20:5; 2 Sam 13:22, 32; Lam 5:11), and שגל (Zech 14:2). The overall lack of force in the idiomatic expression הלך אל suggests that the lack of moral conduct is at the heart of Amos's critique, though it is still seen as a crime. Indeed, at the heart of the matter is a father, already married, who joins with his son in having sex with a young woman. Though Amos 2:7b does not describe specifically what is behind the accusation, the critique addresses a failing in moral conduct. In this manner, the original critique of Amos becomes more potent in light of what was experienced following the earthquake.

7. Earthquake as Theological Judgment and Vindication

As first explored in chapter five, there is a strong link between natural disaster and religious revival. This was seen clearly in modern examples from the Tokyo and Haiti earthquakes as well as earlier disasters such as the 1755 Lisbon earthquake, Earthquake Revivals in Colonial America, the late 1300 and early 1400's in England, and Diodorus Siculus, a first century Greek historian. In addition to these historic examples, anthropological work also has provided a strong link between natural disasters and their religious interpretation. In an edited volume based on studies of various disasters in Indonesia, Pakistan, the Solomon Islands, Kenya, and Myanmar, the editors conclude, "Religion also provided strength and a sense of purpose to individuals and

[50] Paul, *Amos*, 81. See, pp. 82–83 for an extended discussion on the idiomatic use of ילכו "to have sexual intercourse."

groups. People said that churches and mosques were full after the natural disaster as people looked to God for wisdom and vigor."[51]

Beyond these examples, we may also turn to another example from Indonesia. Judith Schlele, in a recent work, "Anthropology of Religion: Disasters and the Representations of Tradition and Modernity" examined the tension between explanations of an earthquake on the island of Java, Indonesia in 2006.[52] Schlele concluded that, "The most widespread accounts of the earthquake referred to local myths connected to the landscape. The spirits are said to have sent the disaster in order to remind the Javanese – and most importantly the Sultan and other people in power – of their traditions. Several rituals were invented to prevent more misery, and certain experts thereby gained considerable importance."[53] Schlele, in her work to understand the local beliefs notes that the Javanese are no more "superstitious" than people elsewhere and through her work helps to again underscore that disasters are as much religious events as they are physical. From those Javeanese who held to Islamic beliefs to those who followed more local gods, all saw the earthquake as a sign or a warning or a punishment from their deity/ies.

Returning to Amos, paleoseismic evidence has located an eighth century quake in the far north, even north of Dan. This location would suggest that Israel suffered damage far worse than Judah. In fact, based upon comparative evidence from the 1837 and 1759 CE earthquakes—both of which had epicenters close to the presumed epicenter of the 760 BCE earthquake—most of

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[51] Anouk Ride and Diane Bretherton, "Conclusion: Community Resilience in Natural Disasters," in *Community Resilience in Natural Disasters* (eds. A. Ride and D. Bretherton; New York: Palgrave Macmillian, 2011), 169–193.

[52] Judith Schlele, "Anthropology of Religion: Disasters and the Representations of Tradition and Modernity," *Religion* 40 (2010): 112–120.

[53] Schlele, "Anthropology of Religion," 112. There remains the question of whether disaster causes cultural change in the long run following a disaster. See Susanna M. Hoffman and Anthony Oliver-Smith, "Anthropology and the Angry Earth: an Overview," in *The Angry Earth: Disasters in Anthropological Perspective* (eds. S. M. Hoffman and A. Oliver-Smith; Routledge: New York, 1999), 1–16; Susanna M. Hoffman and Anthony Oliver-Smith, eds. *Catastrophe and Culture: the Anthropology of Disaster* (Santa Fe: School of American Research Press, 2002).

Judah would have felt vibrations akin to a large train passing close to a house.[54] Certainly some structures would have been damaged or even collapsed but the damaged was worst and most severe throughout Israel, especially north of the Carmel Ridge. This has strong bearing on how the quake would have been perceived not only as a theological judgment, but even stronger, as a theological judgment on Israel, which God decimated while largely sparing Judah. Understanding this point, in my view, helps shed light on why a herdsman from Tekoa without any official link to the temple or palace would become associated with a prophetic book that bears his name. It also furnishes a reason why he would become known as first prophet in the eighth century, in light of other prophetic activity that was ongoing. In a curious twist of irony, while Judah stood in the shadows of its more sophisticated neighbor to the north, Israel effectively sat on a ticking seismic time bomb, that when it ruptured, venerated a prophet and decimated a kingdom.[55]

8. Religious Revival, Earthquakes, and Prophecy

John Holladay has produced what is still considered to be the standard view of the emergence of prophets in Israel in his article, "Assyrian Statecraft and the Prophets of Israel."[56] Holladay first argued that from at least the eleventh century through the first part of the sixth century BCE, the function of a prophet was as a representative of the heavenly court. For Holladay, the difference between tenth and ninth century prophets and eighth and seventh century prophets is a "dramatic shift of the primary object of the prophetic address *away* from the ruling houses of the twin

[54] This is based on an intensity of five on the Modified Mercalli Scale.

[55] Migowski et al., "Recurrence Pattern," 312, Between 1050 B.C. and A.D. 1000, and from A.D. 1600 to recent time the epicenters are all located along the northern segment of the DST, whereas prior to 1050 B.C. and between A.D. 1000 and 1600 they appear to scatter along several earthquake rupture segments of the DST." In other words, in the course of history most earthquakes have been centered in the northern part of Israel. This is not to diminish that disasters are as much "social," as they are "natural."

[56] John S. Holladay Jr., "Assyrian Statecraft and the Prophets of Israel," *HTR* 63 (1970): 29–51.

kingdoms and *to* the people of Israel as a whole."[57] To account for what would cause this shift, Holladay turns to the Assyrian methods of statecraft whereby royal heralds addressed not only the ruling houses but also the nation. In this way, as Assyria moved from direct interaction with just the vassal king and instead held entire populations accountable through penalties for rebellion, this shift in imperial rule, for Holladay, stands as the causative factor in the change in prophetic address. This explanation answers Holladay's question: what is the watershed between classical prophets of the eighth century and their lesser-known forebears?[58]

Holladay's approach has much to commend for its use of Assyrian texts and imperial policy as a means to address the shift in prophetic address that begins in the eighth century. His approach, however, still does not answer the question: what is the watershed in the emergence of the "writing" prophets. Rather, he answers why there was a shift in how prophets acted. Holladay's approach in viewing the shift in prophetic address due to Assyrian influence, coupled with the implicit notion that Assyrian influence prompted Israel's eighth century prophets into action relies on compressing the events and composition of prophetic texts in the eighth century.

While Holladay discusses the imperial government of Assyria, which Israel was exposed to in the later ninth century, and part of the eighth century, his evidence comes from mid eighth century exemplars. For example, Holladay notes that the earliest application of the democratization of responsibility is the treaty of Shamshi-Adad V with Marduk-zakir-shum I of Babylon.[59] He then notes that by the rise of popular prophecy in Israel around 750 BCE the practice is "a well-established practice in the Syro-Palestinian corridor" and cites the various

[57] Holladay, "Assyrian Statecraft," 35.

[58] Holladay, "Assyrian Statecraft," 33.

[59] Holladay, "Assyrian Statecraft," 49-50. The earliest evidence that Holladay finds in the Hebrew Bible to support his view is based on an example from 701 BCE, the well known speech of the Rabshakeh (2 Kings 18:17). Holladay, 44, notes this is the first time in recorded Israelite history where the "new" form of messenger-speech is used.

treaties of Matiel, king of Arpad. It is unclear though, to what extent these treaties would have been transmitted to the governments of Israel and Judah. There is no evidence that Shamshi-Adad V (823-811 BCE) had interaction with the West and though Adad-nirari III (810-783 BCE) campaigned in the West he did not penetrate further than Damascus.[60] Following Adad-nirari III's reign, the following kings (Shalmaneser IV 782-773, Ashur-Dan III) were concerned with the growing Urartu threat.[61] Thus, it remains unclear how the democratization of responsibility would have found its way to the calling and mission of Amos.[62]

9. Prophetic Validity

The idea that the earthquake is linked to the fulfillment of Amos's prophecies has been advanced by a number of scholars.[63] David Noel Freedman and Andrew Welch suggest that the reference to the earthquake in Amos 1:1 is more than just chronology and actually a sign of

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[60] The well-known anti-Assyrian coalition dissolved after fighting Shalmaneser III (858-824 BCE). On this point, see the classic work by Wayne T. Pitard, *Ancient Damascus: A Historical Study of the Syrian City-State from Earliest Times until its Fall to the Assyrians in 732 B.C.E* (Winona Lake: Eisenbrauns, 1987), 145.

[61] Damascus still factors into geopolitical decisions as the Eponym Chronicle states that the Assyrian fought Damascus in 773-772. Shamshi-ilu, an Assyrian field marshal (*turtanu*), who maintained control over much of Syria through his post at Til Barsip also attests to his activity against Damascus. The reason for this activity certainly centers around an anti-Assyrian coalition seen in texts such as the Zakkur inscription.

[62] It is easier to explain how the knowledge of Assyrian practice and influence made its way into the composition of Amos. A final composition during the Hezekian period would have allowed for Assyrian influence through Assyrian movement into Judah throughout the later half of the eighth century. In this, I follow the view of Schniedewind, *How the Bible*, 87. He suggests that Amos received its final form in the Hezekian period. He notes that it could not have received its final form earlier than that due to the disappearance of Philistine Gath in 712 BCE. He argues that Amos was preserved in the south because the prophet correctly foresaw the exile of Samaria and this was interpreted as further legitimizing the Davidic dynasty (Amos 9:11-15). To this I would add, Amos was seen as also correctly foreseeing at least one earthquake. While Schniedewind argues that the royal court is a favorable setting for the final editing of Amos, based on projecting royal power, the temple, perhaps, provides a better link for the editing of Amos. Richard C. Steiner, *Stockman from Tekoa, Sycomores from Sheba: A Study of Amos' Occupations* (CBQMS 36; Washington D.C.: Catholic Biblical Association of America, 2003), 121, has marshalled a strong argument that many of the animals raised by the herdsman of Tekoa were destined for the temple altar, or at least for private sacrifice. In Mesopotamia, *nāqidu*'s were hired by the temple to manage animals, though the *nāqidu* were not cultic personnel. Further, the reference to his צֹאן "sheep" in Amos 7:15, which is similar to Nathan's oracle, helps tie Amos to David, outside of the "booth of David" epilogue. These factors suggest that Amos knew temple personnel and provides a natural link between his prophetic work and its composition.

[63] Benjamin Edidin Scolnic, *If the Egyptians Drowned in the Red Sea Where are Pharoah's Chariots? Exploring the Historical Dimension of the Bible* (SJ; Lanham: University Press of America, 2005), 145–154, provides a simplistic view for linking prophetic validity and an earthquake.

prophetic validation. In their words, "The implicit claim of 1:1, then, is that a direct connection exists between Amos's prophecy (particularly 9:1) and a devastating earthquake two years later. In short, Amos predicted the earthquake."[64] Freedman and Welch further argue that what was important was that the earthquake confirmed Amos's message. Their view is consistent with Shalom Paul's observation that, "The occurrence of this earthquake, which was interpreted as a fulfillment of some of his prophetic oracles, most probably authenticated his being accepted as a true prophet and thus was cited in the introduction to his book."[65] While Hans Wolff does not make as strong a connection between the earthquake and prophetic fulfillment, he notes, "Here there is still a sense of nearness to the recently experienced event."[66] Joseph Blenkinsopp writes:

> We are not told that Amos had disciples, but he must have had a support group of some kind in which his sayings and some account of his activities were preserved. The initial impetus to their preservation may have been the great earthquake (1:1) that Amos was perhaps thought to have predicted, to judge by frequent allusions in the book as well as the chronological indication (two years before the earthquake) in the title.[67]

In addition to these views another layer of support is found in composition of the superscription. Though scholars often have argued for redactional elements in the superscription—most notably in the dual monarchial references—there is near unanimity that the reference to the earthquake was part of the original superscription.

Two conclusions flow from the connection between the reference to an earthquake in the superscription and its use as a means to authenticate the prophet Amos. First, the earthquake could have caused the spread of Amos's oracles or have been a catalyst for recording some or many of Amos's oracles. Freedman and Welch argue that oral tradition was not enough; a

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[64] Freedman and Welch, "Amos's Earthquake," 190.

[65] Paul, *Amos*, 36.

[66] Wolff, *Joel and Amos*, 117.

[67] Joseph Blenkinsopp, *A History of Prophecy in Israel* (rev. and enl. ed.; Louisville: Westminster John Knox, 1996), 78.

written record, confirmed by witnesses was needed to pass a threshold of evidence to distinguish true prophets from false. They turn to Isaiah 8:16 as one example of the importance of writing for prophetic validation: צור תעודה חתום תורה בלמדי "Bind up the testimony, seal the instruction among my disciples." Thus, Freedman and Welch understand this verse to link prophetic authority and validity with the act of writing. Other scholars connect the binding and sealing with a later publication of the prophecies which would validate the prophet.[68] Either way, writing would serve as a vehicle to disseminate the prophet's message and provide greater credibility to his message. Second, by contextualizing Amos's prophetic activity within the history of Israelite prophecy, Freedman and Welch contrast the earliest, existing model of the wonder-working committed by Elijah and Elisha with the newer model practied by Amos. While Elijah and Elisha would directly transmit the prophetic mantle to a group of prophets or to a successor, Amos, however, denies being a בן־נביא "son of a prophet" (7:14). There is no instant wonder connected to him. His authenticity is not seen for two years. Further, he is a peripheral prophet with no support from or access to the monarchy.

Robert Wilson in his review of Amos's prophetic activity classifies Amos as a peripheral prophet in the north whereby he tried to reform the social and religious systems along Judahite lines.[69] Wilson believes Amos was a member of the Judean establishment due to the enigmatic term נקד "shepherd" which in his view, placed Amos as a government employee with a large herd of sheep or an independent sheep owner with a large herd.[70] In addition, because the

[68] See the summary in John N. Oswalt, *The Book of Isaiah: Chapters 1–39* (Grand Rapids: Eerdmans, 1986), 235. In the context of Isaiah, Isaiah's withdrawing had to do with events from the Syro-Ephraimite crisis. Schniedewind, *How the Bible*, 10, suggests that the text indicates that Isaiah's disciples collected his teachings.

[69] Wilson, *Prophecy and Society*, 270.

[70] Amos's solitary lifestyle and view that he was a government employee is challenged by Steiner, *Stockman from Tekoa, Sycomores from Sheba: A Study of Amos' Occupations*. Steiner suggests that Amos is both a scratcher of figs

oracles against the nations in Amos 1 and 2 deal with treaty violations by nations which were part of the Davidic empire, Amos saw these as still in effect and held to a Judahite view. One other line of evidence that Wilson advances for his view of peripheral prohecy is Amos's encounter with Amaziah at the royal sanctuary in Bethel (Amos 7:10-15). For Wilson, the use of the technical terms חזה "seer" and נביא "prophet" provide further insight into Amos's prophetic position.[71] Specifically, there are two possibilities why Amaziah and Amos employ different terms for prophecy. Either Amos rejected the northern designation for an intermediary (חזה) and their understanding of prophecy, or that he does not recognize a distinction between visionary and prophet but rejects the permanent social role implied by the terms. In sum, Wilson sees Amos as a member of the Judean establishment but unlikely that he was a member of the central cult in Jerusalem. Wilson's insights lend support to Amos's status as a peripheral prophet as the authenticity of message took time to gain support: at least two years later, after the earthquake. Amos's place as a peripheral prophet who was rejected by the north deserves closer examination and how his prophetic activity as well as ultimate rejection and vindication are recorded in the final form of the book. As part of this study, illustrating how wordplay is used in the composition of Amos will help situate Amos's role as a prophet.

10. Mantic Prophecy, "Word play" and Prophecy

Isolating wordplay is more than simply finding examples or, as Wilfred G. E. Watson summarizes wordplay: "to amuse and sustain interest and to make the poem cohesive."[72] More than amusement, and especially within prophetic books, wordplay is significant because of the

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as well as a stockman who was part of a collective group to further trade. There is no evidence to suggest that he was a government employee. It is much more likely that he had a connection to the temple, through sacrifice.

[71] Wilson, *Prophecy and Society*, 269.

[72] Wilfred G. E. Watson, *Classical Hebrew Poetry: A Guide to its Techniques* (JSOTS 26; Sheffield: JSOT Press, 1984), 245.

inherent power with which ancient Israel saw in words. Scott Noegel outlines the importance of words as follows:

> The Israelites used a consonantal script. Though the Hebrew script evolved from pictographic signs, by the time of the Israelites it had lost its pictographic associations. Consequently, its associative dimension was limited largely to sound devices like paronomasia and polysemous homonyms. See, for example, a vision of the prophet Amos in which Yahweh shows Amos a basket of "summer fruits" (קַיִץ, *qayiṣ),* objects that are interpreted as signaling the "end" (קֵץ, *qēṣ)* of Israel (Amos 8:1–2).[73]

Noegel's reference to Amos 8:1-2 supplies us with one of the quintessential examples of "word play" in the Hebrew Bible.[74] In this example, which we will return to below, wordplay is key to the interpretive solution to the vision.

Though the term "word play" conveys words as the underlying catalyst to wordplay, Scott Noegel argues this term is problematic:

> This is because in Near Eastern languages, the word does not constitute the basic linguistic unit upon which puns are based. In Akkadian and Egyptian, for example, it is the sign that constitutes the fundamental element. In Hebrew and other consonantal scripts, it is arguably the syllable that serves as the basic linguistic unit for punning. Moreover, there is little that is "playful" about punning in the ancient Near East. On the contrary, it appears to have been a rhetorically serious device of some performative power.[75]

Thus, in examining wordplay it is imperative to think of "word play" as far more than the sophisticated use of language.

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[73] Scott B. Noegel, "'Sign, Sign, Everywhere a Sign'": Script, Power, and Interpretation in the Ancient Near East," in *Divination and Interpretation of Signs in the Ancient World* (OIS 6; ed. A. Annus; Chicago: Oriental Institute of the University of Chicago, 2010), 143-162.

[74] I prefer to use the term wordplay throughout this section as it overlaps with a number of other terms such as pun or paronomasia, but is more generic than these terms. In Amos 8:1–2, the wordplay on the root *qof/tsade* is technically paranomasia as the term most often refers to words close together that differ slightly in form but have different meaning. The use of "word play" is not without its difficulties. See, Scott B. Noegel, "'Word Play in Qoheleth,'" *JHS* 7 (2007): 1–28. On the discussion of definition, see Anthony J. Petrotta, *Lexis Ludens: Wordplay and the Book of Micah* (AUS 7; New York: Peter Lang, 1991), 6–8. Modern study of word play in the Hebrew Bible is indebted to the groundbreaking work of Immanuel M. Casanowicz, *Paronomasia in the Old Testament* (Boston: Cushing, 1894). Casanowicz provides a number of examples from Amos (1:5, 14; 4:9; 5:5, 8, 26; 6:7; 7:10, 14; 8:1, 2). The fourth vision has been called a "word-play vision" by Wolff, *Joel and Amos*, 318.

[75] Scott B. Noegel, "'Word Play' in Qoheleth," 3.

Rather, I am more interested in the rhetorical, performative, and numinous power that lies in wordplay. William Schniedewind helps balance Noegel's attention to the performative aspects of words through his focus on the numinous power of writing. Schniedewind brings together examples from Egyptian texts and the Hebrew Bible to suggest: "Writing was not mundane; rather, writing was used to communicate with the divine realm by ritual actions or formulaic recitations in order to affect the course of present or future actions."[76] Wordplay, then, as a linguistic anomaly, is at its most basic level, "a menace to the textual coherence of the 'grammatical' text (the "main" text) on the one hand, but may generate a new text on the other."[77] Adding to the emphasis provided by Noegel and Schniedwind above, Isaac Rabinowitz writes,

> …while words indeed did constitute the medium of interpersonal communication and expression, the words were not perceived and thought of as exchangeable *symbols* or *representations* of their sensible referents, but rather as *those referents themselves*—the palpable object, the "real" and perceptible actions and events, the sensible relationships and interactions—in the *concentrated form* of words.[78]

Rabinowitz helps to reorder our thinking against a modern understanding of words as simply symbols through which people speak. In this way, Rabiniwitz argues that for ancient Israel words were far more than symbols but objects that conveyed the essence of the actual or imagined reality.

Once the power of words, in their rhetorical, performative, and numinous power is understood, their role in prophetic literature is made clearer. Within prophetic literature, since

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[76] Schniedewind, *How the Bible*, 24.

[77] Stefan Schorch, "Between Science and Magic: The Function and Roots of Paronomasia in the Prophetic Books of the Hebrew Bible," in *Puns and Pundits: Word Play in the Hebrew Bible and Ancient Near Eastern Literature* (ed. S. B. Noegel; Bethesda: CDL Press, 2000), 205–22.

[78] Isaac Rabinowitz, *A Witness Forever: Ancient Israel's Perception of Literature and the Resultant Hebrew Bible* (Bethseda: CDL Press, 1993), 3, italics his.

prophets were speakers and actors, far more than readers or writers, wordplay gives insight into the compositional and editorial activity of the prophetic books.[79] In Michael Fishbane's groundbreaking work on innerbiblical exegesis, he examines the role of word play in mantological exegesis. In his words, "…*paranomastic* associations and elaborations often provide the key to many other interpretations of dramas, visions, and oracles."[80] Among the examples he cites is same vision first explored above in Amos 8:1–2. Fishbane argues that the Israelite exegetical tradition for dreams and visions is found in the visions shown to Amos in 7:1–9 and 8:1–3.[81] The episodes are first introduced with כה הראני אדני יהוה והנה "Thus my Lord YHWH showed me," and after each vision, YHWH will then say to the prophet מה־אתה ראה "What do you see (Amos 7:8; 8:2)?" In Fishbane's view, elements in the visions of Amos (and Jeremiah) distinguish them from post-exilic prophets. In his words, "The first of these is that none of the pre-exilic texts has a trance or dreamlike quality; the second is that none of these interpretations is communicated by an angelic being."[82] Bringing Fishbane's understanding of mantological exegesis together, the dreamlike quality of the vision as well as its communication from an angelic being provide even more support to Amos's oracles as pre-exilic. Further, the key to these visions is found in the paranomastic interpretation.

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[79] Schniedewind, *How the Bible*, 86.

[80] Michael Fishbane, *Biblical Interpretation in Ancient Israel* (Oxford: Clarendon Press, 1988), 451. Two other clear examples of paronomasia in Amos which are not found in visions are Amos 5:5 and 6:13. Amos 5:5 provides an example of paronomasia הגלגל גלה יגלה "for Gilgal will surely go into exile." Paul, *Amos*, 162–63, also suggests that the use of אל is intentional in Amos 5:5 (rather than the use of לא in the next two stiches) in order to create a paronomasia on the place name Bethel ואל־תדרשו בית־אל. Another use of paronomasia is found in Amos 6:13 הַשְּׂמֵחִים לִלֹא דָבָר "You who rejoice over Lo-dabar." The intentional vocalization, found only in Amos, points to the use of paronomasia.

[81] See Fishbane, *Biblical Interpretation*, 449. Fishbane also examines similar passages in Jer 1:11–14 and 24:1–10.

[82] Fishbane, *Biblical Interpretation*, 449.

In sum, all of these factors should alert the reader to identify wordplay in Amos, and when found, to describe the rhetorical, interpretive, and prophetic purpose of such wordplay. As Michael Fishbane has explained, mantological exegesis is seen through paronomastic associations. One other aspect of wordplay should be raised as it may be linked, in specific, with prophecy: connecting punning with the ecstatic roots of prophecy.[83] For example, Stefan Schorch assembles an impressive number of examples from the prophets and suggests that the connection between prophetic ecstasy and particular manners of speaking "seems likely in the light of the parallel use of *n-b-ʾ* (niphal) 'in prophetic ecstasy' and *n-ṭ-p* (hiphil) 'drip (words).'"[84] This is seen in examples from Ezek 21:2 and 21:7 as well as Amos 7:16: ועתה שמע דבר־יהוה אתה אמר לא תנבא על־ישראל ולא תטיף על־בית יצחק "And now, listen to the word of the Lord. You say, 'Do not prophesy (נבא) against Israel, and do not drip words/prophesy (נטף) against the house of Isaac.'"[85] While the extent to which there is a strong connection between prophecy and a particular manner of speaking can be debated, Schorch's suggestion provides another aspect to consider when studying the intentional use of words and wordplay in the prophets.

Taken together, then, word play is well rooted in rhetorical, performative, and numinous power. Additionally, this is seen clearly through a number of studies that have linked the abundance of wordplay with prophetic texts, further suggesting that wordplay is far more than idle amusement but carries great significance.[86] This will be seen clearly below through

[83] See Rudolf Meyer, "Propheten, II. A," *Religion in Geschichte und Gegenwar* (Tübingen: J. C. B. Mohr [Paul Siebeck] 3: V.), 613-18 and Helmer Ringgren, "Ecstasy," *ABD* 2:280-81.

[84] Schorch, "Between Science and Magic," 211.

[85] On the connection of the roots to punning see also, Scott B. Noegel, *Janus Parallelism in the Book of Job* (JSOTS 223; Sheffield Academic Press, 1996), 100-101.

[86] See Robert B. Chisholm, "Word Play in the Eighth-Century Prophets," *BSac* 144 (1987): 44–52; Baruch Halpern and Richard Elliot Friedman, "Composition and Paronomasia in the Book of Jonah," *HAR* 4 (1980): 79–92; D. F. Payne, "Characteristic Word-Play in 'Second Isaiah'. A Reappraisal," *JSS* 12 (1967): 207–229; Stefan Schorch,

examples from the third and fourth visions of Amos (7:7–9; 8:1–3) as well as the section in between the visions, the narrative of Amos and Amaziah (7:10–17).

11. The Power of the Word in Amos 7

Amos 7 begins a series of five visions of judgments that will continue to the end of the book. The first pair of visions (7:1–3, 4–6) involves a threat of locusts that would attack crops and the threat of a consuming fire, potentially ruining the entire year's worth of harvest. In both instances, Amos pleads for YHWH's intervention in which YHWH then relents. However, the following three visions (7:7–9; 8:1–3; 9:1–6) emphasize judgment in which YHWH will not relent. Subsequent to the first three visions is the famous interaction between Amos and Amaziah in Amos 7:10–17. Traditionally, the narrative has been seen as interrupting the series of visions. A closer examination of the narrative itself, as well as the visions before and after it, suggests that the narrative is centrally linked to the authenticity of Amos's prophecy that had now come true. The narrative's placement demonstrates a number of clear connections to the passages around it (see below), in which it is clear that the narrative should be read in concert with the five visions.

Prior to the interaction between Amos and Amaziah, Amos's vision in 7:7–9 stands out in contrast to the first two oracles in Amos 7 as it consists of a number of wordplays, repetition of sound, and an absence of prophetic intercession. The text reads:

כה הראני והנה אדני נצב על־חומת אנך ובידו אנך׃
ויאמר יהוה אלי מה־אתה ראה עמוס ואמר אנך ויאמר אדני
הנני שׂם אנך בקרב עמי ישׂראל לא־אוסיף עוד עבור לו׃
ונשׁמו במות ישׂחק ומקדשׁי ישׂראל יחרבו וקמתי על־בית ירבעם בחרב׃

"Thus, this is what he showed me: Behold, my Lord was standing by a wall of *anak*, with *anak* in his hand. And YHWH said to me, "What do you see Amos?" And I said, "*anak*." Then my Lord said, "Behold, I am setting *anak* in the midst of my people Israel I will pardon not pardon them

"Between Science and Magic: The Function and Roots of Paronomasia in the Prophetic Books of the Hebrew Bible," in *Puns and Pundits: Word Play in the Hebrew Bible and Ancient Near Eastern Literature* (ed. S. B. Noegel; Bethesda: CDL Press, 2000), 205-22; Noegel, *Nocturnal Ciphers*, 123–128, provides a number of examples from Jeremiah.

again. The high places of Isaac will become desolate, the sanctuaries of Israel shall be ruined. And I will rise against the house of Jeroboam with the sword.""

The passage is well known for its interpretive difficulties surrounding the meaning of אנך. In the past, commentators translated the term, "plumb bob" but lexical work by Benno Landsberger has made a strong case that אנך is a loanword from Akkadian *annaku*, "tin."[87] Thus, rather than the imagery implying an instrument that is placed against the wall to measure its straightness, the use of אנך is used to describe Israel as being extremely weak and on the verge of collapse. Further, the use of אנך as a *hapax legomonen*, found four times in the Hebrew Bible and only in Amos 7:7–9, suggests the use of אנך functions as more than just as a rare lexical choice. The rare lexical choice represents, in the words of Baruch Margalit, *alliterationis causa*.[88]

In Amos 7:7–9 the use of אנך "tin" accomplishes the rhetorical means of demonstrating how weak and malleable Israel was to God's judgment. The employment though, of a word found only in these verses draws the reader—and listener—to its use as an emphatic pun. The use of an emphatic pun functions, in this context, at the level of emphasis by use of alliteration.[89] Amos 7:8 provides the interpretive key to this vision and the emphasis on YHWH's coming destructive acts—in light of His relenting in the previous two visions—is highlighted through the

[87] Benno Landsberger, "Tin and Lead-The Adventures of Two Vocables," *JNES* 24 (1965): 285-96. See also, the discussion in Paul, *Amos*, 233-235, who favors Landsberger's view. For a nuanced argument on retaining "plumb bob" see H. G. M. Williamson, "The Prophet and the Plumb-Line: A Redaction-Critical Study of Amos 7," in *"The Place is Too Small for Us": The Israelite Prophets in Recent Scholarship* (SBTS 5; ed. R. P. Gordon; Winona Lake: Eisenbrauns, 1995), 453–477. See also the discussion in Hayim ben Yosef Tawil, *Akkadian Lexicon Companion for Biblical Hebrew: Etymological, Semantic and Idiomatic Equivalents with Supplement on Biblical Aramaic* (Jersey City: KTAV Publishing, 2009), 26, and Peter Mankowski, *Akkadian Loanwords in Biblical Hebrew* (Winona Lake: Eisenbrauns, 2000), 35-36. Peter R. S. Moorey, *Ancient Mesopotamian Materials and Industries: the Archaeological Evidence* (Oxford: Clarendon, 1994), 195 and following, has found evidence in Middle Assyrian legal texts that *anaku* may point to lead in some instances.

[88] Baruch Margalit, "Alliteration in Ugaritic Poetry: Its Role in Composition and Analysis [I]," *UF* 11 (1979): 537–57; idem, "Alliteration in Ugaritic Poetry: Its Role in Composition and Analysis [II]," *JNSL* 8 (1979): 57–80. For another example of alliteration in prophetic writing, see Lawrence Boadt, "Intentional Alliteration in Second Isaiah," *CBQ* 45 (1983) 353–63.

[89] Schorch, "Between Science and Magic," 211, provides a helpful hierarchy of puns dividing their uses into emphatic and exegetical functions.

alliterative punning. The use of the *aleph* as well as the long "o" sound provide a visual and auditory pun וַיֹּאמֶר יְהוָה אֵלַי מָה־אַתָּה רֹאֶה עָמוֹס וָאֹמַר אֶנָךְ וַיֹּאמֶר אֲדֹנָי הִנְנִי שָׂם אֶנָךְ בְּקֶרֶב עַמִּי יִשְׂרָאֵל לֹא־אוֹסִיף עוֹד עֲבוֹר לוֹ׃ "And YHWH said to me, "What do you see Amos?" And I said, "*anak*." Then my Lord said, "Behold, I am setting *anak* in the midst of my people Israel I will pardon not pardon them again." The use of אֲדֹנָי "my Lord" in the phrase וָאֹמַר אֶנָךְ וַיֹּאמֶר אֲדֹנָי rather than יְהוָה helps to emphasize the alliterative and auditory punning while the rare word אנך helps to draw the reader's attention to the use of punning in this section.[90] In sum, then, the interchange between Amos and YHWH, which stands as the first vision in which Amos does not call for intervention and YHWH does not relent, signals the reader to this important development. YHWH's resulting judgment will focus on Israel's religious and political structures. Further, it is Amos alone who is able to foresee (ראה Amos 7:8) and make sense of YHWH's forthcoming judgment. This is conveyed to the reader through the detailed wordplay, which continues into 7:9.

The odd spelling of יִשְׂחָק "Isaac" in this section of Amos can also be understood through wordplay. It is found only in Amos 7:9, 16; Jeremiah 33:9 and Psalm 105:9. The first part of Amos 7:9 reads: ונשמו במות ישׂחק ומקדשׁי ישׂראל יחרבו "the high places of Isaac shall be made desolate, and the sanctuaries of Israel shall be laid waste." The spelling of יִשְׂחָק, rather than יִצְחָק, will allow for wordplay on the root for Isaac (שׂחק) as well as maintain the focus on the שׂ/שׁ phoneme.[91] While the verse contains alliteration in the sibilants, it is better to understand this

[90] Casanowicz, *Paronomasia in the Old Testament*, 8, same paronomasia and alliteration as different phenomenon. He writes, "Alliteration is the simplest, most frequent, and probably the oldest form of paronomasia."

[91] One of the most common examples of the repetition of sound is found in Isa 5:6 שׁמיר ושׁית "thorns and briars." For a discussion of the repetition of sounds see, Luis Alonso Schökel, *A Manual of Hebrew Poetics* (SB 11; Roma: Editrice Pontificio Istituto Biblioc, 1988), 20-33. Stanley Rosenbaum, *Amos of Israel. A New Interpretation* (Macon: Mercer University, 1990), 88–95, suggests there is evidence through spelling, foreign words, and peculiar forms to support his argument that Amos was a northerner. Rosenbaum suggests that the spelling יִשְׂחָק is evidence of a

sequence as a wordplay, as the sibilant in ומקדשי is not found in the beginning of the word and even if the alternate spelling were used, צ is itself a sibilant.[92] The initial verb in 7:9 employs the word ונשמו and its root שׁמם to draw attention to the impending destruction and desolation that will occur to the high places of Isaac and the sanctuaries of Israel.[93]

In the same way, understanding why the much rarer reference (and spelling) to the sanctuary of Isaac is used here, also is best understood in the context of the prophetic announcement of judgment. Previous interpreters have suggested that "Isaac" refers to a limited geographic area such as the vicinity of Peneul-Mahanaim or parts of the Transjordan. Hans Wolff has suggested that "Isaac" refers to those on pilgrimage to Beer-sheba from the northern kingdom but in light of our understanding of the location of the earthquake it would make no sense for an area that would have been spared any earthquake damage, to be linked to destruction.[94] William Harper helps draw attention to the root שׂחק "mockery" to describe the worship conducted at Bethel.[95] In this way, the prudence of careful reading is again highlighted as wordplay helps unlock the rich meaning of this prophetic oracle and helps orient the reader to

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variant dialect akin to Northern parentage as he views Amos, Jeremiah, and Psalm 105 all to be northern (to be more specific, Rosenbaum suggests the dialect in Amos is Ephramite). This view is problematic as Jeremiah may preserve a "Benjaminite" dialect but is not truly northern. See Colin Smith, "'With an Iron Pen and a Diamond Tip': Linguistic Peculiarities in the Book of Jeremiah" (Ph.D. diss., Cornell University); Gary A. Rendsburg and William M. Schniedewind, "The Siloam Tunnel Inscription: Historical and Linguistic Perspectives," *IEJ* 60 (2010): 188–203. Further, Psalm 105 is not viewed as containing northern or "Israelian Hebrew" by Gary Rendsburg, *Linguistic Evidence for the Northern Origin of Selected Psalms* (SBLMS 43; Atlanta: Scholars Press, 1990). Rosenbuam, Amos of Israel, 91, also suggests that the use of the word אנך "tin" argues against the view that Amos was a "rustic, Judean or otherwise" but this statement is now outdated in light of Steiner, *Stockman from Tekoa*, 95–119, who argues persuasively that Amos, in fact, was part of a collective and financially well to do.

[92] Originally שׁ and שׂ were not represented by a diacritical marker until the time of the Masoretes. This is not to say that there was no distinction in pronunciation between *sheen* and *sin* as the well-known *shibboleth*/*sibboleth* example from Judges 12 indicates. See, Gary A. Rendsburg, "Ancient Hebrew Phonology," in *Phonologies of Asia and Africa (Including the Caucasus)*, (ed. A. S. Kaye; Winona Lake: Eisenbrauns, 1997), 65–83.

[93] Paul, *Amos*, 236–237, argues for a chiastic structures in the first two stiches based on the use of *sheen*/*sin* as well as the repetition of the *mem*.

[94] Wolff, *Joel and Amos*, 302.

[95] Harper, *Amos and Hosea*, 166.

the pivotal scene between Amos and Amaziah. Using the rare form יִשְׂחק rather than יִצְחק enables the writer(s) of this passage to highlight the extent by which Amos can interpret signs through the subtle wordplay. Further, the wordplay on (שׂחק)י also mocks the fragile structures of the northern kingdom in light of the impending destruction by YHWH.[96] Paying attention to the wordplay and its purpose in Amos 7:7–9 helps inform us of its rhetorical and prophetic purpose as well as help link this section into the following passage.

12. Amos, Amaziah, and Editorial Activity

In the midst of the series of visions is the narration between Amaziah and Amos. Since it interrupts the visions and is told in the third person almost all commentators view the section as a secondary insertion. Without getting lost in redactional details, the point of the narration is meant to further authenticate Amos by framing the accusations against Amos as real events, through the use of dialogue. The rhetorical benefit of this approach invites the listeners and readers to observe firsthand, the exchange as it actually happened, through the use of dialogue. Thus, the narrative presents itself as an eyewitness account free of any tampering by Amos. In addition, the narrative mocks Amaziah by highlighting how he unwittingly prophesizes to Jeroboam the coming destruction of Israel by an earthquake.

The message from Amaziah to Jeroboam in Amos 7:10 reads לא־תוכל הארץ להכיל את־כל־דבריו "The land is not able to bear all his words." It traditionally is interpreted as a reference that Amos has reached the limits of what was tolerable for his speaking and that any more speech would threaten the royal and religious administration. For example, Hans Wolff sees the use of the verb כול "to contain" as a reference to the country and how it can only hold a

[96] At the risk of reading too far into the wordplay, Amos 7:9 also feature a parallel structure of the *shin*/*sin*, which though not apparent in the original writing, would have been apparent in its reading: ונשמו ישׂחק, ומקדשׁי ישׂראל.

limited measure.[97] To support his interpretation, Wolff turns to 1 Kings 7:26, 38 as these texts describe the capacity of temple vessels. Or, Marvin Sweeney views Amaziah's statement that, "suggests that conditions in Israel were ripe for the overthrow of the king…"[98] In the view of Shalom Paul, the limits of tolerance has passed and the country is pictured as one grand receptacle which can no longer contain Amos's prophecies.[99]

The statement about containing Amos's prophecies, however, is more than a statement about the level of verbal criticism that Amos has leveled. The phrase, placed in the words of Amaziah and spoken to Jeroboam, king of Israel, is a subtle allusion meant to further mock the religious position of Amaziah. The mocking, first began in 7:9 through employing the rare spelling יִשְׂחָק, will now intensify as the words placed in Amaziah's mouth indicates that he predicted the destructive earthquake to the king himself (though Amaziah does not realize it).[100] This conclusion is seen clearly by examining other contexts in the Hebrew Bible where לְהָכִיל "to bear, contain" is used. In Koehler and Baumgartner's lexicon, they group Jeremiah 6:11; 10:10, Joel 2:11, and Amos 7:10 together as verses that use the hiphil of כול as well as use the verb in the lexical context of "to endure or bear."[101] The contexts of these verses deserve further study to help clarify the meaning of this seemingly innocuous statement.

Jeremiah 10 and Joel 2:11 provide strong comparative evidence that Amaziah's statement in Amos 7:10 refers to an earthquake. Jeremiah 10 addresses idolatry by contrasting the stilted material of idols against Judah's true God. YHWH is shown to be living through the

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[97] Wolff, *Joel and Amos*, 310.

[98] Marvin A. Sweeney, *The Twelve Prophets* (Vol. 1; Collegeville: Liturgical Press, 2000), 257.

[99] Paul, *Amos*, 240.

[100] Stuart, *Hosea-Jonah*, 375, compares the phrase as, "it portrays Amos's verbal attacks as coming like a flood."

[101] Ludwig Koehler and Walter Baumgartner, *The Hebrew and Aramaic Lexicon of the Old Testament* (2 vols.; Leiden: Brill, 2001), 1:464.

consequences of his wrath in 10:10: מקצפו תרעשׁ הארץ ולא־יכלו גוים זעמו "At his wrath the earth quakes, and the nations cannot endure his indignation." Here, the consequences of YHWH's actions are clear as he causes an earthquake that the nations cannot endure. Thus, use of כול (in the hiphil) is used clearly in Jeremiah to describe an earthquake. Likewise, in Joel 2:11, earthquake imagery is tied to the Day of the Lord through the same use of the verbal construction. Joel 2:10–11 concludes his description of the Day of the Lord first begun in 2:1 with a description of an earthquake in 2:10 and then the crucial use of כול in 2:11. After YHWH utters his voice and his army goes forth, the second half of the verse reads: כי-גדול יום-יהוה ונורא מאד ומי יכילנו "For the Day of the Lord is great and exceedingly fearful; who can endure it?" Again, in this context the verb כול (in the hiphil) is connected to an earthquake that no one can endure.

Returning to Amaziah's message to Jeroboam, comparative examples of the same verbal construction in other prophetic books suggests that the underlying message in Amos is that the land cannot bear an earthquake. Beyond the examples from Jeremiah and Joel, the use of הארץ in Amos 7:10 is best understood as referring to the physical land rather than people. In this way, the narration quotes a northern cultic figure speaking to the king himself about a destructive event that will soon occur. Though Amaziah's warning to the king sounds simple enough, a careful reading of the dialogue demonstrates that it is meant to mock Amaziah. In short, Amaziah is able to prophesize an impending disaster on the northern kingdom, though he does not realize it. In this way, this example illustrates another editorial attempt in the book to connect the earthquake with prophetic validation.

In addition to this point, the careful reader is rewarded again as the use of alliteration and paronomasia is seen once more. Shalom Paul astutely notes the alliteration of the *lamed* at the

end of 7:10: לא־תוכל הארץ להכיל את־כל as well as paronomasia in תוכל (יכל) and להכיל (כול). In this way, the verbal paronomasia helps to once again alert the reader to the significance of Amaziah's words and points the reader to a deeper meaning.

13. Paronomasia and a Probable Portent of an Earthquake

Following the narrative of Amos against Amaziah, Amos 8:1–3 contains the fourth vision in the book. It reads as follows:

כֹּה הֶרְאַנִי אֲדֹנָי יְהוִה וְהִנֵּה כְּלוּב קָיִץ׃
וַיֹּאמֶר מָה־אַתָּה רֹאֶה עָמוֹס וָאֹמַר כְּלוּב קָיִץ וַיֹּאמֶר יְהוָה אֵלַי בָּא הַקֵּץ
אֶל־עַמִּי יִשְׂרָאֵל לֹא־אוֹסִיף עוֹד עֲבוֹר לוֹ׃
וְהֵילִילוּ שִׁירוֹת הֵיכָל בַּיּוֹם הַהוּא נְאֻם אֲדֹנָי יְהוִה רַב הַפֶּגֶר בְּכָל־מָקוֹם הִשְׁלִיךְ הָס׃

"This is what my Lord God showed me—a basket of summer fruits.
He said, "Amos, what do you see?" And I said, "A basket of summer fruits." Then YHWH said to me, "The end has come upon my people Israel; I will pass them by again. And the wailing women of the palace will wail on that day," says the Lord God; "the corpses shall be many, thrown everywhere. Be silent!""

In this vision, YHWH shows Amos a basket of summer fruit, which Amos identifies correctly. To Amos, a basket of summer fruit is innocuous. This thinking is soon turned on its head as YHWH illustrates that the basket of summer fruit is actually symbolic of impending doom.[102] The close resemblance in orthography and pronunciation of "summer fruits" (קיץ, *qayiṣ*) and the "end" (קץ, *qēṣ*) stand as the crux to understand the vision. While Amos identifies the "summer fruits," it is in the words of YHWH that provides the paronomasia on the homonyms (קיץ, *qayiṣ*) and (קץ, *qēṣ*). More than simple wordplay, the key to interpreting the vision comes from understanding the paronomasia and how it takes an innocent object and turns it into impending doom.

[102] On the use of symbolic visions see the classic work by Susan Niditch, *The Symbolic Vision in Biblical Tradition* (HSM 30; Chico, Scholars Press, 1980), and the recent work by Kelvin G. Friebel, *Jeremiah's and Ezekiel's Sign-Acts* (JSOTSup 283; Sheffield: Sheffield Academic Press, 1999).

The end result of the vision, in Amos 8:3, is a description of the punishment in store. The punishment will include the wailing of professional mourners due to the number of corpses that have been strewn all around. Explaining the cause of so many bodies that are thrown around everywhere (הפגר בכל־מקום השליך) is enigmatic. Amos does not posit what would cause such a scene though most interpreters suggest disease, the work of some enemy, or a symbol of complete defeat. These suggestions, in my view, are shortsighted as they fail to grasp what types of activity cause bodies to be strewn about. In specific, the link between corpses and being thrown is found only in Amos. While Isaiah 14:19, 34:3, and Jeremiah 41:9 all contain פגר "corpse" and שלך "to throw," none of the texts connect corpses with being thrown around.[103] Thus, the words of Amos contain flexibility in how they would have been understood. The euphemism of "throwing a body" certainly indicates death, but in the context of such devastation, Amos's words also would have carried extra weight following an earthquake.

A number of earthquake accounts bear out this information. For example, following the 2010 earthquake in Haiti, the Associated Press summarized the devastation this way, "Bodies were everywhere in Port-au-Prince: those of tiny children adjacent to schools; women in the rubble-strewn streets with stunned expressions frozen on their faces; men hidden beneath plastic tarps and cotton sheets."[104] A survivor of the Christchurch earthquake in New Zealand described her ordeal this way, ""The streets were just churning up in waves and the air was full of shouting and crying and the terrible noise of the earthquake booming and ripping everything apart. There

[103] There is a much stronger link between throwing and the more common word for corpse or carcass of a human (נבלה). For example, in Josh 8:29, after hanging the king of Ai, Israel takes the king's body and throws it at the entrance of the city gate. In 1 Kings 13:11–34, a text that coincidentally, deals with a prophet at Bethel, the body of a prophet is thrown in the street. In both these texts, the body is singular and the cause of the throwing is easily explained.

[104] "Homes Toppled, Bodies Piled in Streets After Devastating Haiti Quake," n.p. [cited 16 May 2012]. Online: http://www.foxnews.com/world/2010/01/13/homes-toppled-bodies-piled-streets-devastating-haiti-quake/#ixzz1vNhOwanU.

were dead bodies strewn across the streets. It was heartbreaking.""[105] In interviews with Indian children and their caretakers following earthquakes they stated, "Children narrated stories of how human bodies appeared to be strewn all around them."[106] In sum, a number of eyewitness accounts from earthquakes link bodies strewn about with an earthquake.

14. Neo-Assyrian Warfare and the Piling up of Bodies

Beyond these accounts, understanding Neo-Assyrian warfare tactics presents a mixed picture on whether dead bodies can be strewn about because of military defeat. On the one hand, there is clear evidence starting with Ashurnasirpal II (883–859 BCE) of, in the words of Fabrice De Backer, "the cutting of the throat of the enemies, by drawing on the hair, with the scraping-knife, the decapitation of the enemies with the scraping-knife, the bodies of enemies, scattered but whole or scattered but decapitated."[107] This pattern—with different nuances and "advances" in cruelty—will be followed by a number of Neo-Assyrian kings including Shalmaneser III, Tiglath-pileser III, Sargon II, Sennacherib, Esarhaddon, and Assurbanipal. In addition, the importance of severed heads is well known in Neo-Assyrian texts and reliefs, where kings record the number of heads and reliefs depict the piling of heads and bodies before city gates.[108]

On the other hand, the actual Neo-Assyrian practices as played out in Israel and Judah argues against widespread evidence for the stacking of bodies. In the Neo-Assyrian period, Ashurnasirpal II inaugurated no less than fourteen campaigns as he expanded his empire, though

[105] "New Zealand Earthquake: Brit Crawls from Rubble," n.p. [cited 16 May 2012]. Online: http://swns.com/new-zealand-earthquake-brit-crawls-from-rubble-251410.html.

[106] Manasi Kumar, "A Journey into the Bleeding City: Following the Footprints of the Rubble of Riot and Violence of Earthquake in Gujarat, India," *PDS* 19 (2007): 1–36.

[107] Fabrice De Backer, "Cruelty and Military Refinements," *RA* 6 (2009): 13–50.

[108] See Dominik Bonatz, "Ashurbanipal's Headhunt: An Anthropological Perspective," *Iraq* 66 (2004): 93–101.

he reached only as far as the northern Levant.[109] Shalmaneser III (858–824 BCE), following in his father's stead, worked hard to stabilize and consolidate the gains of his father that resulted in the well-known confrontation with the southern states. The Kurkh monolith, dating soon after the Battle of Qarqar (853 BCE), records Shalmaneser III's account of his battle against the southern coalition. Though the monolith suggests he won, he returned in three subsequent campaigns (849, 848, 845 BCE), underscoring the likelihood that at best, he captured Qarqar. After four campaigns, Shalmaneser III appeared to have greater success against the coalition as reflected in the Black Obelisk or Jehu Stele. While Jehu is pictured and described as giving tribute, there is no reference to Israel's soldiers being slain. Shalmaneser III's reign ended, according to the *limmu*-chronicle, with numerous revolts within Assyria. This precipitated a decline in Assyrian influence from 823–745 BCE, though their territorial gains held until Tiglath-Pileser III (744–727 BCE) again expanded the empire.[110]

During Tiglath-Pileser III's reign, Israel and Judah served as client states and only suffered the brunt of Tiglath-Pileser III's power during the Syro-Ephramite War. Though Ahaz paid tribute to Tiglath-Pileser III for his help, there is no mention in Tiglath-Pileser III's summary inscriptions of brutal killing.[111] In fact, this is in contrast to Tiglath-Pileser III's account of his defeat of Rezin of Damascus where the "chief ministers, alive I impaled, and had

[109] For a study of his reliefs, see the recent publication by Ada Cohen and Steven E. Kangas, eds., *Assyrian Reliefs from the Palace of Ashurnasirpal II: A Cultural Biography* (Hanover: Hood Museum of Art/University Press of New England, 2010).

[110] Kuhrt, *The Ancient Near East*, 2: 492–496.

[111] Mordechai Cogan, *The Raging Torrent: Historical Inscriptions from Assyria and Babylonia Relating to Ancient Israel* (Jerusalem: Carta, 2008), 72–73, notes a picture of a relief from Layard's notebook, now lost, which depicts an assault on Gezer. Tiglath-Pileser III also mentions in another Summary Inscription that in his former campaign he had leveled all cities, which may include the Galilee and the Gilead. 2 Kings 15:20 also records Menahem giving tribute to Tiglath-Pileser III.

(the people of) his land behold them."[112] Also, in his conquest of the Galilee, the fragmentary remains only supply a record of exile. In the palace of Sargon II at Dur-Sharrukin, his account of the fall of Samaria in both his annals and on a prism notes that after capturing Samaria he took as spoil 27, 290 people.[113] Again, there is no record of mass killings or bodies being thrown about. Further, Sargon records that he only killed Yaubidi, the Hamathite since he caused a number of other cities to rebel.[114] Or, in the account of the rebellion against Sargon, the Azekah inscription only mentions Sargon carrying away spoil. It is only in the siege of Lachish that there is clear evidence of Judeans being tortured and killed, and this appears to be restricted to high officials and some foreigners. The depiction of two people naked, and presumably flayed, is only a small part of a large procession of people among vines, figs, and orchards.[115] In fact, the Lachish reliefs depict families taking possessions with them into exile. In all, Sennacherib states the he deported 200, 150 as a result of his campaign.

The results of this survey of Neo-Assyrian military encounters with Israel and Judah suggest the following. In the 100 years prior to the period of Amos's prophetic work, no Assyrian battles in the Southern Levant resulted in the mass disposal of bodies. Following the reappearance of Assyria in the Levant with the advent of Tiglath-Pileser III, Israel still did not have firsthand experience with these brutal Assyrian techniques. It is only at the siege of Lachish that we find clear evidence of anyone from Israel or Judah experiencing these brutal practices.

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[112] Cogan, *The Raging Torrent*, 74–76.

[113] Since the number (or its variant 27, 280) is so large, the number likely includes people from the entire district of Samaria. 2 Kgs 17:5b-6a also mentions exile, in this case "he exiled Israel to Assyria."

[114] The text reads, "I burned Qarqar. Him I flayed. I killed the rebels in the midst of those cities." "The Great 'Summary' Inscription," translated by K. Lawson Younger Jr. (*COS* 2.118E: 296–97).

[115] See Julian Reade, *Assyrian Sculpture* (2d ed.; London: British Museum, 1998), 65–69; Paul Collins, *Assyrian Palace Sculptures* (London: British Museum, 2008), 92–94. There is also a depiction of some leaders impaled on stakes with heads hung suggesting they were already killed. See, Erika Belibtreu, "Grisly Assyrian Record of Torture and Death," *BAR* 17 (1991): 17–24.

This is not to say that these practices could have been witnessed from afar and then written into the book of Amos. But, in light of the evidence to the contrary, the picture of so many dead bodies being attributed strictly to a military defeat does not fit with the historical evidence. Another, and perhaps more likely view, is that an earthquake is envisioned by this reference. It accounts for what people saw and experienced firsthand and would help to further legitimate the prophet by connecting what people witnessed firsthand with what is attributed to the prophet in his book.[116] At the same time, the multivalent nature of Amos's vision allowed it to be interpreted as military defeat following decimations at places like Lachish.

15. Conclusion

Earthquake imagery is found throughout Amos; identifying it, however, is a more difficult task. Advances from paleoseismology help us understand why an earthquake in the mid-eighth century was so important. Rather than just being a larger than normal quake, the quake shattered a long period of seismic quiescence. This would be reflected in the composition of Amos, as his validity as a prophet became linked with the quake. The earthquake could have caused the spread of Amos's oracles or have been a catalyst for recording some or many of Amos's oracles. In addition, it helped Amos distinguish himself as a prophet who ultimately would have his oracles and visions recorded as sacred literature.

Mantic prophecy and wordplay helped vindicate Amos's prophetic work. The editors of Amos took great pains to illustrate through words and sounds, how Amos was able to divine the message of God. This is seen in the "plumb-bob" and "summer fruits" visions as well as in the narrative between Amos and Amaziah. A careful reading of these texts suggests they are laden

[116] One other piece of evidence is important. The use of הס "Be Silent!" is also found in Amos 6:11. As outlined earlier, Amos 6:8–11 is better understood as the result of an earthquake as the Assyrians would not have expended such energy on destroying structures large and small following a siege. Their inscriptions show evidence of looting but not wholesale destruction of cities.

with imagery that illustrates the devastating effects of an earthquake. Perhaps the scribes behind Amos did this in part to give more validity to a man who was a wealthy stockman but without an official religious position.

The heavy preponderance of social justice texts illustrates the thriving economy in Israel as well as its rampant abuse of the poor. A number of the critiques leveled at the rich would radiate in the aftermath of the quake as the gap between rich and poor would become even clearer. In this way, even if the elite ignored the social critique of Amos, following an earthquake, his critique would again be undeniable. The overlapping language to describe the consequences of war as well as earthquakes gives elasticity to Amos's words. Whereby, even if they were written in light of a specific event, it is difficult for modern scholars to identify such an event. At the same time, the elasticity allowed Amos's words to be applied and reapplied throughout the tumult of the later eighth century and following.

Chapter Seven: Conclusion

The relationship between tectonic environment and human activity has a long history that intimately involves the Ancient Near East and Levant. Indeed, texts from the third millennium onward attest to earthquake imagery whether reflected as faint echoes, in some cases merged with storm imagery, or in other cases stood on its own. Identifying earthquake imagery in ancient texts, however, deserves greater scrutiny. At the same time, the geographic locations and their close relation to, or lack thereof, of earthquake imagery within their respective texts, suggests that along with environmental constraints such as rainfall versus irrigation, seismic geography also can be tracked through textual archives and locations.

Records of actual earthquakes cluster in two periods in the Middle and Neo-Assyrian periods. Genre helps define, for better or worse, what historical information can be gleaned from these texts. To date, Middle Assyrian texts attest to two earthquakes, which were recorded on wall pegs meant to commemorate the rebuilding or repairing of a building. In the Neo-Assyrian period, a detailed record of an earthquake during the end of the reign of Esarhaddon sheds light on how an ancient administration began to deal with its aftermath. Scribal concern focused on the defensive fortifications of the city, both in its city walls, garrisons, and towers. At the same time, and as expected, the scribe also details how religious buildings as well as the king's gods survived the quake. Last, a number of earthquake omens attest to the growing importance of celestial divination over extispicy in the Neo-Assyrian period. Earthquakes cause greater injuries and fatalities at night rather than the day, and earthquakes can level an uneven playing field for enemies or discriminated masses. This suggests, as should be expected, that these omens reflect common sense concerns of earthquakes. Since earthquakes are equal opportunity events affecting all types of structures and peoples, a prompt response by the ruling administration in the

aftermath of a quake can determine how quickly society can rebuild and move forward. In the absence of prompt attention, resources, or willpower, earthquakes can devastate the political fabric of a society.

Turning to the Levant, the need for archaeoseismic methodology that is fully applicable and useable for Iron Age sites—and even earlier—is lacking. This is because the current diagnostics used for archaeoseismology fit much better in later time periods where monumental architectural features are more common. Other diagnostics such as the presence of human skeletons, wide spread destruction, or evidence of fire are desirable but are more the exception than the rule. Based on a critical evaluation of the current evidence identified with earthquake damage, Deir ʻAlla and Rehov (and Dan upon further excavation) contain clear evidence of seismic damage within the eighth century. This is not to say that other sites such as Hazor (or Safi) may contain damage, but it is not as telling as the evidence at Deir ʻAlla and Rehov. At the same time, neither Deir ʻAlla nor Rehov has widespread damage in their mid eighth century strata. The evidence is based on only what is left, largely where residents built over the existing damage. Thus future excavations, especially those north of the Carmel Ridge must be attuned to finding small sections of seismic damage in their mid eighth century strata.

Using insights from comparative Ancient Near Eastern evidence, understanding how natural disasters can invite religious revival, and applying disaster research to the book of Amos are all methods that can sharpen our understanding of earthquake imagery within this prophetic book. Neo-Assyrian omen texts demonstrate that "roaring" has a close connection to earthquakes and this insight suggests that "roaring like a lion," found in Amos 1:2, can be understood as referring to an earthquake and helps link the superscription more organically with the following motto of the book.

A connection between religious revival and earthquakes has a long history that can be identified over time and throughout culture. Historically, there is an almost universal connection between natural disasters causing religious revival. Part of this stems from the nascent emergence of the term "natural disaster" whereas in ancient times, disasters were understood through religious thought. This religious conception helps ground the composition of Amos through the connection between an earthquake and his validity as a prophet. The earthquake could have caused the spread of Amos's oracles or have been a catalyst for recording some or many of Amos's oracles. In addition, it helped Amos distinguish himself as a prophet who ultimately would have his oracles recorded as sacred literature. One of the ways Amos became validated as a prophet was through mantic prophecy and wordplay. The editors of Amos took great pains to illustrate through words and sounds, how Amos divined the message of God. The "plumb-bob" and "summer fruits" visions as well as in the narrative between Amos and Amaziah all serve as examples of Amos's validity as a prophet. A careful reading of these texts suggests they are laden with imagery that illustrates the devastating effects of an earthquake.

Utilizing disaster research illustrates the variety of ways to study and reconstruct earthquakes. For ancient Israel, families and social networks were dependent on each other for survival both in the initial aftermath and subsequent rebuilding. This dependence on family networks was likely greater in the countryside far from the capital city or hubs of influence. In the face of such a large disaster, where Amos or later compilers would have seen pre-existing social networks magnified in post-disaster recovery, the condemnation of the gapping disparity between rich and poor and call for social justice would have been magnified through the effects of a massive earthquake.

The large number of social justice texts in Amos points to ancient Israel's thriving economy as well as its abuse of the poor. A number of the critiques leveled at the rich would radiate in the aftermath of the quake as the gap between rich and poor would be magnified. In this way, even if the elite ignored the social critique of Amos, following an earthquake, his critique again would be undeniable. Once his words were codified, the elasticity in his message allowed it to be applied and reapplied throughout the tumult of the later eighth century and following.

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