

SUSANNE LEIKAM

Framing Spaces in Motion

Tracing Visualizations of Earthquakes
into Twentieth-Century San Francisco

American Studies ★ A Monograph Series

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ALFRED HORNUNG
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“Happy tourists pass by the Fairmont Hotel,
which still stands, but is destroyed inside from the fires.”
Photograph from Shawn Clover’s
1906 + 2010: Earthquake Blend (Part 1).
Courtesy of Shawn Clover.

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“There is no agony like bearing an untold story inside you.”
Zora Neale Hurston, Their Eyes Were Watching God (1937)

To all
whose stories remain untold
on account of earthquakes and fires ...

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Susanne Leikam

Prologue: How the Pictures Became the Frames

While it is impossible to put a definite starting point to my enthrallment with earthquakes, a four-week road trip I embarked on with two fellow graduate students after finishing the last class of my study abroad year at the University of Colorado at Boulder in 2004 might be a good beginning. After three weeks of hiking in a number of national parks in the American West, we finally arrived in San Francisco, where an acquaintance of mine, a German engineer working on the seismic retrofit of the Bay Bridge, had been so kind as to open his home to us. On our second day in the city, he took us to the site of the \$6.4-billion reconstruction project and explained, among many other details, how the 1989 Loma Prieta Earthquake had impaired the Bay Bridge and which precautions would be taken to secure the new bridge against future earthquakes.

At the time, I was well-acquainted with the basic principles and workings of ‘natural’ disasters on account of a genuine interest in natural sciences reaching back to my early childhood days as well as my second major in geography. My two earth science classes at CU Boulder, “Mountain Geography” and “Natural Catastrophes and Geologic Hazards,” both included elaborate sections on seismic hazards. In our textbooks and readings, California’s fault systems—including the infamous St. Andreas Fault—constituted the paradigmatic example of earthquake-prone areas in the United States, and recent predictions of the United States Geological Survey (USGS) accompanied many a publication. At the time, the probability of a major earthquake (defined as magnitude 6.7 or greater) taking place before the year 2036 was estimated to be around 63 percent. Yet, what I saw in San Francisco was quite different from a matter-of-fact engagement with future seismic risks.

Walking along Pier 39, I noticed a souvenir shop bearing the name “After the Quake” and, on the same stroll, spotted an old advertisement for San Francisco’s annual literary festival called “Litquake.” Inside the souvenir shop, mugs and T-shirts with the slogan “Extreme sports are

nothing, try living next to the San Andreas Fault” were on sale and, a little further down the road at Ghirardelli’s, tourists could literally order an “Earthquake,” which consisted of eight scoops of ice cream and eight different toppings. When I talked to a long-time resident at Caffè Trieste in North Beach about earthquakes, she told me that the ‘real’ dangers lay somewhere else. Her daughter, she related, had just moved to Texas, where tornados and hurricanes—in her opinion—were much more dangerous than earthquakes in the Bay Area. While seismic threats undeniably constitute a risk to San Francisco, more often than not, earthquakes (past and future) seemed to initiate a reaction different from concern, at times bordering on pride. Later, whenever my American Studies classes brought me across concepts of ‘a usable past,’ I was reminded of these glimpses into San Francisco’s framings of its earthquake and fires.

Besides these first tentative encounters with the ways in which San Franciscans embedded their earthquakes in larger webs of meaning, the center piece of the project was laid when I met with my advisor Udo Hebel to talk about a doctoral thesis. After having exhausted quite a substantial variety of scenarios for a dissertation topic, he advised me to simply go with my passions. When I told him that this advice would lead to the combination of my ardor for visual culture studies with my interest in ‘natural’ disasters, he liked the idea right away. Half an hour later, I left with a mind map that has been hanging on the wall over my desk since the very beginning of this research project. While the map’s content has certainly been revised, expanded, and particularized, it now serves as a dear reminder of the commencement of my dissertation.

The merging of disaster studies with visual culture studies had twofold implications for the use of the term ‘frame’ in this research project. Firstly, it is applied in accordance with frame analysis in a transmedial manner to refer to *all* key concepts guiding the interpretation of disasters—be they written, visual, performed, or sound-based. Secondly, special attention is given to ‘frames’ in their conceptualization as ‘picture frames,’ i.e. with particular attention to the role that visualizations of calamities take on in interpretative processes. Consequently, this ‘double-take’ on frames explores the processes of embedding the disruptive experiences of disasters in larger coherent and meaningful narratives across media boundaries but, on the other hand, it also addresses the visual in its idiosyncratic characteristics leaving space

for what W.J.T. Mitchell calls the images' "silences, their reticence, their wildness and nonsensical obduracy" (*What Do Pictures Want?* 10).

Research stays at various archives and libraries in the Bay Area constituted integral aspects of my work and have considerably influenced the course of the project. Even though a substantial amount of materials has been digitized and is now available online, on-site access with its potential for unbounded browsing of materials box by box, the possibility to assess the resources in their entirety (e.g. including the written messages on the back sides of postcards), and the unmediated perception of the items' properties (such as size, color, material) turned out to be indispensable for my project. On top of these benefits, archival research gave me the chance to talk to scholars who were familiar with the collections and their arrangements, which led to a more efficient handling of resources and, in occasional cases, also to the discovery of scholarly gems.

The time spent in the different research facilities in the Bay Area did not only give me valuable insights into the nature of the materials but it also fostered an even greater fascination with the way San Franciscans framed their calamities and, in direct connection to this, how they put pictures of disaster to use. Among the personal highlights of my examination of the archives' resources were the findings of two photographic postcards showing utterly ruined stretches of San Francisco after the 1906 Earthquake and Fire. One card announced the birth of the family's baby daughter and the other was sent to England to convey birthday wishes. Both cases display utilizations one would not necessarily expect in the context of death and destruction, and one can hardly imagine a similar handling with different disaster images such as from Hurricane Katrina, which points to crucial differences in the framings of the calamities. Findings such as these and the lack of scholarly publications engaging in critical analyses of visualizations of earthquakes and fires in San Francisco encouraged me to delve deeper into the research of this subject matter.

Since the inception of my doctoral thesis project during the meeting with Udo Hebel years back, the initial mind map has evolved into a full-fledged book. In spite of this extent, some research questions about the framing of earthquakes (and fires) in San Francisco from the late nineteenth to the early twentieth century in words and pictures remain unaddressed. A dissertation, just like a poem, is never finished, but at

some point merely abandoned. Far from providing an all-encompassing assessment of San Franciscans' interpretations of earthquakes (and fires), this doctoral thesis constitutes a study investigating the role of visual representations in the dominant framing(s) of earthquakes and fires in San Francisco and exploring the potential of inter pictorial readings of late-nineteenth- and early-twentieth-century visualizations of earthquakes in San Francisco. Both aspects could be—and hopefully will be—expanded by other scholars at some point in the future. After years of dedicated work, my project is finally completed and the only thing left is to hope that the readers will find pleasure in exploring *Framing Spaces in Motion*.

1. Introduction: ‘Framing Spaces in Motion’

[T]he deep and peculiar impression left on the mind by the first earthquake which we experience [...] is rather due to the sudden revelation of the delusive nature of the inherent faith by which we had clung to a belief in the immobility of the solid parts of the earth. [...] A moment destroys the illusion of a whole life; our deceptive faith in the repose of nature vanishes, and we feel transported, as it were, into a realm of unknown destructive forces.

—From Alexander von Humboldt, *Cosmos* (1845)

In his first volume of the *Cosmos* (1845), Alexander von Humboldt described the first-time encounter with an earthquake as the “sudden revelation of the delusive nature of the inherent faith by which we had clung to a belief in the immobility of the solid parts of the earth,” which transported man into “a realm of unknown destructive forces” and conveyed the “idea of some universal and unlimited danger” (216). Due to their unpredictability (cf. K. Hewitt 22-24) and “invisibility” (Jackson 409), earthquakes attained an enigmatic connotation early in human history, which challenged their interpretation and their incorporation into different worldviews. Despite their invisible nature, earthquakes—along with lightning and floods—became one of the most popular motifs of the first mass-produced illustrated publications such as Sebastian Münster’s *Cosmographia* (1544) and later of similar works like Increase Mather’s *A Discourse Concerning Earthquakes* (1706), Alexander von Humboldt’s *Cosmos* (1845), and also California’s *Report of the State Earthquake Commission* (Lawson et al.; 1908)—all of which set out to make sense of a hitherto inexplicable phenomenon by providing a coherent and conclusive reading.

The visualization of an ‘invisible’ event, rather to be felt and heard than seen, constitutes a creative challenge but also provides freedom to take up agency and to assume ‘ownership’ of a particular disaster

narrative. All pictures,¹ as Marita Sturken and Lisa Cartwright point out, are produced “within dynamics of social power and ideology” (22). As a result, the visual representations of earthquakes are implicated in a multitude of discourses and contexts, which negotiate interpretations of the unexpected experience of the shaking of the earth and the disruption of what had been perceived as a stable ‘normality’ (K. Hewitt 9-12). Throughout the world, the “vast majority of deaths and injuries from earthquakes result from building collapse” (Wisner et al. 64), which is why cities with their concentration of (tall) buildings and high population density are especially vulnerable to earthquakes. This, in turn, enhances the need for urbanites living in areas of seismic risk to embed actual earthquakes in a meaningful narrative and to frame the persisting threat of recurrences in a way that neither their psychological well-being nor the city’s cultural and economic prosperity are acutely endangered (Erikson, *Everything* 240).

In this context, ‘framing’ refers to the interpretative processes which involve a selection of “focusing device[s]” (MacLachlan and Reid 20), the so-called frames, which guide and structure the production and reception of cultural artifacts (Bateson; Goffman; MacLachlan and Reid; Wolf, “Introduction”). In regard to disasters, this means that certain aspects of the calamity (e.g. the silver linings of a specific disaster) are emphasized over others (e.g. the threat of recurrences) so that particular readings are consequently encouraged, while different ones recede to the margins. Various framings often compete for the privilege of rendering disastrous events in their specific view in order to appropriate the catastrophe for their own ends.

Due to San Francisco’s relatively short urban history, an examination of the city’s perception of natural hazards during the first decades of the second half of the nineteenth century offers the chance to get a thorough insight into how the framings of calamities and persisting threats developed. In its early stages of urbanization, San Francisco, which lies right on top of the San Andreas Fault system, was not only prone to

¹ In this study, the terms ‘visual representation,’ ‘visual,’ and ‘visualization’ are used as synonyms to denote the concept of the ‘picture’ as delineated by Mitchell in “The Surplus Value of Images.” The designation ‘illustration’ is also used for physically embodied images, yet, it particularly refers to non-photographic material.

earthquakes but also to fires.² Within two years, six large conflagrations considerably harmed the city in the early 1850s and jeopardized its economic flourishing (Tobriner 20-33; cf. also Soulé, Gihon, and Nisbet). These initial experiences with disasters lastingly influenced not only the interpretation of later urban fires but also of the first earthquakes that threatened to impair the city's rise to a crucial urban center in the 1860s. Due to the high financial stakes, the framings of the first major earthquakes in 1865, 1868, and finally in 1906 were particularly important for the rapidly growing metropolis of the Pacific coast.

With the advances in print technologies and the burgeoning of mass-produced visual representations such as photographs, stereo views, and postcards toward the end of the nineteenth century, visual artifacts were increasingly taking part in the framing processes of earthquakes and fires in San Francisco. While the earthquakes in 1865 and 1868 were still visualized quite sparsely, the 1906 San Francisco Earthquake and Fire was regarded by contemporaries as the most photographed event since the invention of the camera (Cohen 183). Far from emerging as independent formats, these cultural artifacts were closely entangled in previously productive American and European pictorial repertoires and practices (cf., e.g., Birt 8-11; Reilly xiii-xxx). Despite the local focus on San Francisco, the visualizations of earthquakes and fires are thus implicated in a variety of translocal and transnational contexts as well as inter pictorial relationships, which also played into the interpretations of calamitous events in the city. The reference to "framing" in the title of this analysis is thus twofold: It does not only pertain to the potential of artifacts of all media to function as meta-messages indicating how to encode or receive a particular text but also to the focus on the agency of visual representations—either enclosed in a literal picture frame or implicitly 'framed' by material borders—within the negotiations of how to incorporate disasters into a coherent narrative.

² Originating in the contact zones of the Pacific and the North American Plate, the San Andreas Fault stretches from its northernmost point, the Mendocino Triple Junction, over approximately 800 miles (1,200 km) to Baja California. In the Bay Area, the fault is composed of various smaller subsystems such as the Hayward Fault, the Calaveras Fault, and the San Gregorio Fault (cf. Frisch and Meschede 135-37; Press and Siever 500; Wallace, esp. "General Features").

Particularly in San Francisco, a plethora of questions arises in regard to the framings of earthquakes: How does a city reconcile its economic aspirations with the threat of recurring earthquakes, which are inherently tied to the city's geophysical environment? What kind of relationship is constructed between nature/the non-human and culture/the human, the "basic pillars of any ideological system" (Oliver-Smith 30)? Through which types of distinct framings are the destructive seismic phenomena incorporated into the self-understanding of the city praising its flux, disorder, and ephemerality as well as glorifying the pioneer spirit of the American West? How are the cultural constructs of race, class, gender, and place tied into the line of reasoning of these disaster narratives? To what extent do visual representations play a role in the framing of the earthquakes? Do they reverberate with the verbal discourses or do they add their own narratives? How does the comprehensive network of transnational flows influence the production/distribution, the repertoire, and the reception of visual representations of earthquakes? Are the earthquake pictures perpetuating earlier (European and American) repertoires and stock elements or are they rather innovative? How is the invisibility of earthquakes affected through the 'invisibility' of the photograph, "the message *without a code*" (Barthes, "Photographic" 19)? In which manner are discourses of urban vulnerability and of the controllability of technology complicated through the camera, which is but a machine itself?

Yet, before these and other questions arising in connection with the framings of 'spaces in motion' can be discussed in detail, a broad array of theoretical inquiries and reflections will have to be addressed: Among others, what exactly is it that renders an event a 'disaster'? In which ways do earthquakes differ from other 'natural' disasters? How can pictures be 'read'? To what extent are the emerging sets of visual practices and the pictorial repertoire implicated in transnational flows and exchanges? Which potential semantic surplus emerges from an inter pictorial reading of the pictures? In which ways can we master the challenge of keeping "one eye on the ways in which 'nature' is always in some ways culturally constructed, and the other on the fact that nature really exists, both the object and, albeit distantly, also the origin of our discourse" (Garrard 10)? Finally, how does this project reverberate with core concerns and the conceptual, theoretical, and methodological trajectories of American Studies?

After the theoretical and conceptual framework for the analysis has been laid out in detail, the first chapter will turn to the early modern European earthquake broadsheets and examine how the first mass-produced Western illustrations of seismic temblors established a first tentative pictorial repertoire. It will also investigate the development of the framings and visualizations of earthquakes from early modern to eighteenth-century Europe and follow their transnational entanglements into colonial North America to analyze the (dis)continuations of the earlier European conventions in words and pictures. From there, the first chapter will trace the framings of earthquakes into the nineteenth-century United States in order to open up possible interrelations and correspondences to the visualizations of earthquakes in late-nineteenth- and early-twentieth-century San Francisco.

Taking the city's reputation for disorder and change into close consideration, the second chapter will analyze how the repeated challenges of fires and earthquakes in San Francisco's early past shaped distinct patterns of disaster framings. Since the 1906 San Francisco Earthquake was followed by three days of fire, the city's history of framing fires will receive special consideration. Starting with the 'six great conflagrations' in the early 1850s, the investigation will explore the development of San Francisco's repertoire of incorporating natural hazards into its self-understanding as the successful 'Metropolis of the Pacific' from the great earthquakes of 1865 and 1868 to the turn of the century, while paying special attention to the cultural functions of the visualizations of these calamities.

The third and last chapter is dedicated to a detailed analysis of the 1906 San Francisco Earthquake and Fire, which constituted one of the most destructive urban catastrophes and also one of the most visualized events of its time in the United States. Before the distinct patterns of framings of the 1906 calamity 'in and beyond picture frames' are assessed, its particular visual culture will be scrutinized. The third chapter will then proceed with an inter pictorial reading of the visuals of this disaster investigating relationships to earlier visual representations and popular types of framings. Finally, a section will be devoted to an exploration of the silences, gaps, and absences in the 1906 visuals, which will expose narratives that resisted the dominant framings, before the conclusion wraps up the analysis of *Framing Spaces in Motion*.

2. Introducing the Conceptual Scaffolding

2.1 Emplacing 'Framing Spaces in Motion' in American Studies

The scholarly exploration and contextualization of pictures visualizing San Franciscan earthquakes are firmly embedded in the core concerns of American Studies. If we define American Studies with Winfried Fluck as “an attempt to understand how the American system, American culture, and the idea of ‘America’ work” (“Inside” 30),³ the analysis of the cultural patterns and tropes of San Franciscan earthquake narratives—which weave the unexpected, destructive event into a coherent and meaningful worldview and thereby expose the influences of nineteenth-century (American) ideologies as well as of the regional self-understanding of the city—helps to partly implement this endeavor. Since this study conceptualizes place not merely as a physical backdrop for life but as a “space that is bounded and marked as humanly meaningful through place attachment, social relations, and physiographic distinctiveness” (Buell, *Future* 145), the project participates in the realization of the ‘spatial turn’ in American Studies (cf. Benesch and Schmidt; Orvell and Meikle). The analysis of visuals depicting (‘natural’) disasters accordingly interrogates the embeddedness of the lived experience in real and imagined places, the social and ideological underpinnings of the cultural constructions of place, and the calamities’ impact on topophilia and place attachment.

³ Richard Horwitz commented on the plurality of meanings of “the ‘America’ that American Studies scholars aim to understand” and identified it as “an elusive target” (cf. also Radway). As fluid and amorphous as these terms are, this project understands the term United States of America as a political designation determined predominantly by geographical and legal definitions. In accordance with scholars such as Amy Kaplan and Benedict Anderson, ‘America’ then points to the “ideological, discursive, or mythic construct, an ‘imagined community’ that excludes as well as includes, that has hierarchical and imperial as well as egalitarian and democratic dimensions” (Kaplan, “Call” 143).

Moreover, crucial research interests such as the particular cultural construction of 'nature,' its presumed relationship to the 'human'/'culture,' the ability to control natural processes, and an optimistic belief postulating progress through (an increase in) technology emerge as central inquiries in the quest to better comprehend the self-proclaimed 'Nature's Nation.' The focus on visualizations similarly places the project at the center of American Studies since the study of images "is not just a simple, illustrative peripheral to the more serious work of American Studies, but is essential to our understanding of the way in which American culture operates" (Cutrer 909; cf. also Reynolds 19). The focus on San Francisco notwithstanding, the project also partakes in recent calls for the internationalization of the discipline, which was so paradigmatically voiced by Shelley Fisher Fishkin in her 2004 ASA Presidential Address titled "Crossroads of Cultures: The Transnational Turn in American Studies." While the analysis with its spotlight on San Francisco focuses on what Winfried Fluck termed the "inside" ("Inside" 28) of the United States in his programmatic *American Quarterly* article, it does so with an awareness of the "mobility of 'things and ideas American'" (Hebel, Preface 1). Particularly the early American repertoire of earthquake visualizations (just as most other pictures of the same period) is "best understood as part of a transatlantic culture expressive of the multiple strands of a transnational perspective" (Lacey 20). San Franciscan earthquake framings are similarly embedded in multiple translocal, transnational, and global networks and, more often than not, deliberately employ multiple European tropes and pictorial conventions.

Despite the project's rootedness in American Studies, it nonetheless emerges at an inter- and transdisciplinary crossroads with a variety of further academic fields such as environmental criticism, disaster studies, visual culture studies, memory studies, and (art) history, to name but a few. Since one of the stable foundational pillars of American Studies has been the field's propensity to venture across disciplinary boundaries to engage in productive collaborations with other research domains in the quest to "gain systematic knowledge about American society and culture in order to understand the historical and present-day meaning and significance of the United States" (Fluck and Claviez ix), its interdisciplinary scope embeds the project at hand even more profoundly in the trajectories of American Studies. Among the fields of research most closely related to the study of 'framing spaces in motion,' environmental

criticism and disaster research come forward as academic liaisons whose expertise—one with the conceptualization and theorization of nature, the other with disasters—lends itself to a profitable alliance with American Studies in this analysis.

2.2 ‘Nature’ and ‘Disasters’ in Their (Inter-)Disciplinary Contexts

Environmentally-oriented cultural and literary studies provide a productive conceptual lens for the analysis of the particular character, structure, and ideological contexts ascribed to non-human nature in particular worldviews. Within these frameworks, ‘natural’ disasters⁴ are commonly understood as unexpected violations of life’s ‘normality’ that are perceived to have been caused at least partly by natural forces. In the face of destruction and disruption, the affected people—on an individual as well as on a collective level—need to make sense of ‘natural’ disasters and interpret the events in such a manner that they can be integrated into larger coherent narratives (Rozario, “Making Progress” 28). As Gregory Bateson’s (1955) and Erving Goffman’s (1974) influential studies in frame analysis have shown, every act of interpretation is guided by “culturally formed metaconcepts,” so-called ‘frames,’ which function as “basic orientational aids” (Wolf, “Introduction” 5), guiding and structuring the framing, i.e. the interpretative processes on the levels of perception, experience, and comprehension. Jerome S. Bruner explains the basic tenets of frame analysis as follows:

⁴ Despite slight differences in connotation, the terms disaster, calamity, and catastrophe are used interchangeably in this study. Taking its origin in the practice of reading the stars as omen, the word ‘disaster’ initially referred to “an unfavorable aspect of a star or planet” but today comes forward as one of the most prolific terms denominating “a sudden or great misfortune” (“Disaster”; cf. also D. Alexander 20-22). Calamity “once referred primarily to the state of an individual afflicted by misfortunes” (Rozario, *Culture* 11), but is today more often used as a synonym for collective disaster (“Calamity”). Catastrophe, which in its simplest conception denotes “an event producing a subversion of the order or system of things,” has its etymological roots not only in Greek drama but also in eighteenth-century geology (“Catastrophe”). For more information on these terms, see D. Alexander 20-22; Groh, Kempe, and Maelshagen 16-19; Rozario, *Culture* 11-12.

Framing provides a means of ‘constructing’ a world, of characterizing its flow, of segmenting events within that world, and so on. If we were not able to do such framing, we would be lost in a murk of chaotic experience and probably would not have survived as a species in any case. Framing pursues experience into memory, where [...] it is systematically altered to conform to our canonical representations of the social world, or if it cannot be altered, it is either forgotten or highlighted in its exceptionality. (56)

Consequently, framing refers to the selection of “some aspects of a perceived reality” and to the processes of making “them more salient in a communicating text, in such a way as to promote a particular problem definition, causal interpretation, moral evaluation, and/or treatment recommendation” (Entman 52). In so doing, frames—which can be physical objects such as a facial expression, a picture frame, or the title of a novel or intangible concepts such as mental images, genre conventions, or cultural stereotypes—narrow down the multitude of readings. Similar to the presence of a picture frame directing the attention to what is prominently delineated as the object worth beholding inside, they focus the readers’ attention on specific aspects of the texts and contexts (cf. MacLachlan and Reid 1-6).

Framing initially emanated from cognitive psychology, however, other social sciences such as sociology, political communication research, and media studies have since then also embraced frame analysis (cf., e.g., D’Angelo and Kuypers; Scheufele; Snow and Benford). Recently, Werner Wolf and Walter Bernhart brought the concept to new prominence in literary and cultural studies with their edited volume *Framing Borders in Literature and Other Media* (2006). The diversity of applications and disciplinary distinctions brings with it a plethora of conceptualizations in the field, which is the reason why the use of some of the concepts will be laid out in detail in the following.

In accordance with Werner Wolf, this project sees framing as “a general term which refers to discursive exchanges as in the production and reception of literature and other media” (“Introduction” 2). The frames involved are to be understood as signs that have the potential to function as “meta-messages” indicating which aspects in and around a text to accentuate and which ones to exclude (MacLachlan and Reid 39). As cultural constructs, frames usually display a relative stability over

time but are subject to historical and cultural changes (Wolf, "Introduction" 4-5). Besides, frames are considered to be transmedial phenomena that appear in various media but are generally, if the specificity of the medium itself does not influence the frame's function, not separated according to their materiality (Wolf, "Introduction"; MacLachlan and Reid).⁵ While some disciplines, for instance media studies, resort to quantitative approaches in frame analysis (counting individual frame references), the following study rather aims to point to productive framings and highlight their cultural functions.

Frames are the result of framing processes, which "demarcate" phenomena in a double-edged way that is simultaneously inclusive and exclusive" (MacLachlan and Reid 16). Whereas scholars do not have direct access to (past and present) cognitive framing processes, Werner Wolf elaborates, the frames are accessible in the cultural artifacts/texts and their contexts:

[A] practical consideration may induce one to bracket framing activities to a certain extent, namely the fact that one cannot easily observe the cognitive framing taking place in recipients' minds (let alone that of recipients from past epochs), whereas cultural 'frames of reference' as givens are readily available to research. ("Introduction" 5)

Hence, whenever a particular 'framing' of a calamity is investigated in this study, the term does not refer to the cognitive processes but the interpretations as derived from the 'cultural frames of reference.'

Since frame analysis subsumes the interpretation of the elements 'within' a text and the (inextricably linked) reading of the circumtextual framework in one critical category, contexts—whether implied in the presuppositions one brings to components of the text or generated through the historical and cultural embeddedness of producers, text, and recipients—are of crucial importance to this research project. The application of frame analysis consequently underscores the notion that cultural artifacts are not 'finished products' but that their meanings are continually (re)produced through contextualizing processes which

⁵ For typologies classifying frames according to numerous criteria such as salience, location, and agency, see, e.g., MacLachlan and Reid 3-6; Wolf, "Introduction" 12-21.

necessarily involve agents (MacLachlan and Reid 1-18; Wolf, "Introduction" 17). In this manner, the focus on frames emphasizes agency (who?), processes (how?), and functions (what? to which ends?) and thus suits the interpretations of 'tales of disasters' very well. The scrutiny of frames involved in the shaping of narratives of disaster provides a comprehensive glimpse into the ways a society constructs its realities, negotiates its vulnerabilities, and proposes solutions for the future. Especially the inquiry of how the intricate entwinements of the human, nature, religion, and technology are constructed grants a keen insight into the cultural fabric of a community. Recently, the humanities have notably reinforced their engagement with conceptualizations of 'nature' (Slovic 7-8).

The recognition that "forces of cultural construction play a much greater role in forming our understanding of nature than has been admitted" (Lease 7) has permeated academic works since the turn of the twentieth into the twenty-first century. Currently, one of the research branches most prolifically engaging in the analysis of how nature is imagined and constructed in various historical, cultural, and political contexts is ecocriticism (Slovic). Since disaster research has developed out of the social and geophysical sciences, it has tended to heavily rely on quantitative methods in its inquiries. Therefore, the collaboration with a cultural studies-oriented environmental criticism, which promotes the awareness of the constructedness of conceptions of nature and applies interpretative semiotic models of analysis, turns out to be of great avail for an analysis of visual representations located in the field of American Studies. Ecocriticism's profound expertise with theoretical conceptualizations of non-human nature and the attentiveness to the contingency of constructions of the relationship between 'culture' and 'nature' provide a solid base for the analysis of the framings of nature in pictures of earthquakes.

Ranging from ecocriticism, environmental criticism, and green cultural studies to literary ecology or ecopoetics (Heise, "Hitchhiker's Guide" 506; Glotfelty xx), the plethora of labels employed to refer to the study of the relationship between cultural representations and the non-human environment points to the growing pluriformity and multi-vocality of this field of research. According to Lawrence Buell, one of the "most theory-minded and most prolific writer[s] on ecocritical themes" (Benesch 437), scholars have to be increasingly "aware of

speaking from some position within or around the movement rather than ‘for’ it” (*Future* viii).

Due to the field’s productivity in the United States and its proximity to English departments, the American environmental imagination has long constituted a core research area. Even before the institutionalization of ecocriticism in the early 1990s, nature writing, conceptualizations of the relationship between the non-human and the human, and scholarly analyses of particular real and imagined versions of ‘nature’ had often been connected to the United States and also showed a high productivity in the field of American Studies.⁶ Since the environmental turn in literary studies in the late 1980s and the early 1990s, these bonds have even intensified and expanded far beyond the borders of the nation (Buell, *Future* 1-28; Garrard 1-17; Heise, “Hitchhiker’s Guide” 512-14).⁷

Beginning with the early inception of the discipline, an “explosion of articles and books in the field” (Heise, “Hitchhiker’s Guide” 505) has further opened up “the study of the relationship between literature and the physical environment” (Glotfelty xviii) in a variety of aspects. Most importantly for the following analysis, ecocriticism has moved from a literature-centered approach to include a wide array of cultural artifacts as analytical corpus material (Slovic 5; Bergthaller). Responding to both inside and outside criticism concerning the narrow focus on nature writing, the privileging of realistic modes of representation, and the

⁶ Numerous of the canonical (primary as well as secondary) texts of first-wave ecocriticism emanated in a U.S.-American context; this development also found its equivalent in the institutional structures of the field (see Glotfelty xvii-xviii). As a result, the principal professional association and publication—the Association for the Study of Literature and the Environment (ASLE) with its journal *Interdisciplinary Studies in Literature and Environment (ISLE)*—are located in the United States. For a detailed treatment of the history of ecocriticism/environmental criticism, see Garrard; Slovic; Starre.

⁷ The institutional framework of environmental criticism correspondingly increased and solidified. In addition to a variety of local ASLE branches in, e.g., Australia, Taiwan, or India, the European Association for the Study of Literature, Culture, and the Environment (EASLCE) was founded in 2004. Additionally, projects such as the World Ecoculture Organization, founded in 2009 as a cooperation between Peking University and Johannes Gutenberg University of Mainz, also enrich the scholarly field.

exclusion of spaces thoroughly modified by human actions, the analyses engaged more profoundly with (sub)urban or toxified environments, environmental justice, transnational perspectives, ethnicity, and non-human animality (Slovic 7-8). Furthermore, ecocriticism has become “more globally networked” and even “more interdisciplinary” (Buell, *Future* viii). The inclusion of environmental criticism into several canonical works of literary and cultural theory (cf., e.g., Peter Barry’s *Beginning Theory* and Ann B. Dobie’s *Theory into Practice*) and its institutional proliferation are but two symbolic markers that point to a “promising” future (Dobie 241).

While the range of individual conceptualizations of ‘the human’ and ‘nature’ has always been diverse in Western cultures, the binary opposition of the two entities has been a shared trait of most worldviews (Knobloch). “In its commonest and most fundamental sense,” Kate Soper asserts, “the term ‘nature’ refers to everything which is not human and distinguished from the work of humanity” (15). Based on Cartesian dualism, modern thought—most prominently visible in many of the natural sciences—proposed a consideration of ‘nature’ as an extra-discursive entity existing independent of humanity. According to this understanding, man is able to access this materiality through the application of reason and the pursuit of ‘scientific’ methods. The knowledge derived, finally, empowers man to interfere with ‘nature’ and to employ it in a way that any benefits are increased and potential negative outcomes avoided. The rise of poststructural thought and the Foucauldian emphasis on power, knowledge, and discourse has complicated this understanding and has resulted in a general emphasis on the fact that “[t]heory in general tends to see our external world as socially and linguistically constructed, as ‘always already’ textualised into ‘discourse’” (Barry 252; cf. also Dingler 29-42; Grewe-Volpp 72-73)—perpetuating a centuries-old binary dualism between ‘nature’ and ‘the human’ on a conceptual level.⁸

Born out of discontent with a theoretical conceptualization of nature that assumes a closed system in which an extradiscursive materiality

⁸ The efforts to expose and replace binary oppositions between nature and culture are one of the central concerns of environmental criticism. Concepts such as “nature-culture”/“natureculture” (cf. Latour; Haraway) aim to highlight the impossibility of separating nature and culture into two distinct and opposing categories.

does exist but cannot be accessed epistemologically, scholars such as Kate Soper, Donna Haraway, and N. Katharine Hayles set out to realize Cheryll Glotfelty's call for an assessment of "the interconnections between the material world and human culture" (qtd. in Grewe-Volpp 71) by developing mediating positions. The crucial communality of these approaches—whether following Donna Haraway's model of "co-construction" ("Promises"; *Simians*), Bruno Latour's "Actor-Network-Theory" (cf., e.g., *Reassembling the Social*), or N. Katherine Hayles's paradigm of "constrained constructivism" (cf. "Searching"; "Simulated Nature")—arises from the postulation of a dynamic system in which nature and culture cannot be separated and depend on each other. While in these conceptualizations nature still constitutes a social construct, it is moved from the position of the passive, instrumentalized Other to an agent simultaneously shaping and being shaped by power discourses.⁹ "The challenge for ecocritics," as Greg Garrard rightly recapitulates, "is to keep one eye on the ways in which 'nature' is always in some ways culturally constructed, and the other on the fact that nature really exists, both as the object and, albeit distantly, the origin of our discourse" (6). Most importantly, however, positions acknowledging nature "as an agent in its own right" leave space for nature's unforeseeable reactions and responses to human interferences (Clark 202).

Referring to the signifying potential of an autonomous nature, Christa Grewe-Volpp correspondingly states that nature "cannot be contained and manipulated forever, it will reemerge in surprising and often unpleasant ways, as for example in the polluted food chain or in natural catastrophes [...] both the result of human actions" (78). While promoting an understanding of nature as an actant, this focus on the intricate interconnections between material world and human culture, however, does not propagate a lessened emphasis on nature as a cultural construct. In accordance with scholars such as Catrin Gersdorf and Sylvia Mayer, this research project thus sees the great potential of ecocritical scholarship, *inter alia*, in the (re)examination of

⁹ Lawrence Buell makes clear, however, that this 'mutual constructionism' is highly complex and not to be taken as symmetrical. He describes the interrelation with the vague phrase "in some measure" (*Writing* 6), thereby indicating that nature's influence on its cultural constructions, while being crucial, is not to be equated with the impact of the cultural constructions of nature (*Writing* 6; cf. also Buell, "Green Disputes").

the history of ideologically, aesthetically, and ethically motivated conceptualizations of nature, of the function of its constructions and metaphorisations in literary and other cultural practices, and of the potential effects these discursive, imaginative constructions have on our bodies as well as our natural and cultural environments. ("Nature" 10)

Therefore, as Ursula Heise postulates, the "most promising theoretical ground" for analyses pertaining to the relationship between the natural environment and its textual representations are "weak constructivist [perspectives] that analyze cultural constructions of nature with a view towards the constraints that the real environment imposes on them" ("Hitchhiker's Guide" 512).

In the concluding panel discussion "Transnational American Studies Whereto?" at the 2011 Annual Meeting of the German Association for American Studies in Regensburg, Alfred Hornung emphasized that growing ecological concern about planet earth has resulted in the planetary consciousness "gaining ground over and above all national agendas" (Benesch et al. 627). Just as all other environmental and ecological calamities, earthquakes do not stay confined to national and cultural boundaries and as such demand a more differentiated approach when assessing their impact on space and place. The concept of the 'bioregion' is just one of many examples of how to "integrate ecological and cultural affiliations within the framework of a place-based sensibility" (Thomashow qtd. in Buell, *Future* 83). The focus on natural processes and their cultural trajectories raises an awareness for the artificiality of national boundaries and heightens the productivity of translocal and transnational perspectives (Buell, "Green Disputes" 49-50). Despite its initial "emphasis on localism as a foundation of environmental thought" (Heise, "Ecocriticism" 384), recent third-wave ecocriticism has not only embraced a "post-national persuasion" and exhibited "skepticism toward mythographies of [the] national landscape" (Buell, *Future* 81) but has also explored "global concepts of place" (cf., e.g., Ursula Heise's 2008 *Sense of Place and Sense of Planet*) and increasingly incorporated "cross-cultural comparative impulses" (Slovic 7, 8).

This development to open up analytical categories goes along with claims of the transnational turn, which has "effected the most significant

reimagining of the field of American studies since its inception” (Pease 1) and has been “increasingly embraced as the dominant paradigm of studying the United States (and beyond)” (Benesch et al. 615). As advocated and practiced by Emory Elliott, Shelley Fisher Fishkin, Winfried Fluck, Alfred Hornung, Heinz Ickstadt, Amy Kaplan, Donald E. Pease, and John Carlos Rowe, to name but a few of the leading American Studies scholars, the translational turn, *inter alia*, highlights the “complex ways in which human beings are wrapped up in multiple, often conflicting discourses, practices, and institutions” (Ickstadt 551). This necessity to look beyond the politically or legally defined borders of the nation state—without disregarding it and its affective impact (cf. esp. Fluck, “Inside”; Ickstadt)—also reverberates with Shelley Fisher Fishkin’s seminal 2004 ASA Presidential Address “Crossroads of Cultures: The Transnational Turn in American Studies,” in which Fishkin also points out the need to redirect the lens, among others, to the environment and to questions about environmental justice from a global or transnational perspective.

But the transnational turn also changed the conceptual grasp of the research areas within the national limits of the United States by highlighting the “double move” to the “inside, to core constituents of a given nation, and to an outside, [to] whatever forces introduce a new configuration” (Pease 5-6). In her introduction to *The Anarchy of Empire in the Making of U.S. Culture* (2002), Amy Kaplan further argues that cultural “phenomena we think of as domestic [...] are forged in a crucible of foreign relations” (1) and that entanglements with imperial actions and global economic power abroad equally influence representations of American national identity in the domestic spaces of the United States. Following this scholarly paradigm, the study at hand will engage with an analysis positioned on the ‘inside’ of the nation state but “with a transnational consciousness” (Ickstadt 556).

Within the last decade, ecocriticism has increasingly turned its attention not only to environmental crises such as pollution and threats to biodiversity but also to the study of ‘natural’ disasters.¹⁰ In addition to

¹⁰ As a result, a number of publications from the field of ecocriticism and the environmental humanities have begun to engage in the study of disasters in North America. See, e.g., Christof Mauch and Sylvia Mayer, eds, *American Environments: Climate, Cultures, Catastrophe* (2012); Uwe Lübken, *Die Natur der Gefahr: Überschwemmungen am Ohio River im 19. und 20. Jahrhundert*

ecocriticism's methodological and conceptual expertise, this analysis will extend its scope to also include disaster studies. As a "very small specialty field" (Tierney 516), disaster studies, together with the geographical and geophysical sciences, has the longest institutional history of researching disaster and also constitutes the academic discipline with the highest specialization on the research of disasters. Disaster studies as a systematic academic endeavor has its roots in the early days of the Cold War, when scholars engaged in often interdisciplinary projects to study the effects of 'natural' disasters and war-related extreme events on human behavior (Aragón-Durand 35-70; Perry; Tierney).

Aided by the formation of the Disaster Research Center at the Ohio State University (1963) and the National Hazard Center at the University of Colorado at Boulder (1976), disaster research—mostly conducted by sociologists, geographers, or scholars from closely related disciplines—has meanwhile opened up to a broader array of disaster settings and perspectives. Referring to the current plurality of definitions and approaches to the study of disaster within the field, Enrico L. Quarantelli has argued that "there is no basis and logic and little hope in practice that a single definition can be devised that meets and is universally accepted and useful" (qtd. in Perry 2). A general conceptualization of 'disasters' is further complicated by the emergence of new and hybrid forms of disasters such as biological or nuclear terrorism or Internet-related catastrophes (Fischer 13-15; Quarantelli, Lagadec, and Boin 24-25). Yet, this plurality of approaches and specializations doubtlessly also constitutes the strength of the field.

One of the most seminal contributions from disaster studies in regard to the framing strategies of disasters comes from geographer and environmental studies scholar Kenneth Hewitt, who draws attention to the so-called 'myth of ordinary life.' In the introduction to his edited volume *Interpretations of Calamity from the Viewpoint of Human Ecology* (1983), he exposes the very prevalent and persisting idea that human life, by default, is characterized by stability, predictability, and order. This matters greatly for the framing of disasters since disruptive

(2014); Sylvia Mayer and Alexa Weik von Mossner, eds, *The Anticipation of Catastrophe: Environmental Risk in North American Literature and Culture* (2014).

events, which actually occur on a very regular base and are part of every historical moment, are therefore perceived as ‘unnormal.’ This is of relevance in regard to all disasters as the emergency status generally attested to calamities tends to push them out of the daily routine and also “outside the realm of everyday responsibilities both of society and individual” (K. Hewitt 16). In this context, the specific type of disaster also proves important for the framing strategies.

A long-established, yet meanwhile fervently contested, categorization in disaster studies classifies the primary subject matter into ‘natural’ and ‘technological’ (‘man-made’) disasters. The U.S. Geological Survey (USGS), for example, distinguishes between six different sets of ‘natural’ disaster agents: earthquakes, floods, hurricanes, landslides, tsunamis, volcanoes, and wildfires (USGS, “Natural Hazards”). In this manner, a ‘natural’ disaster is demarcated solely as the consequence of a geophysical extreme event (cf. Aragón-Durand 46-49). Technological disasters, on the contrary, are delineated as “events that are human-made in that they are accidents, failures, or mishaps involving technology and manipulation of the natural environment that we created to enhance our standard of living” (Baum, Fleming, and Davidson 334-35). The distinction between the two categories, as the 2011 Tōhoku Earthquake and Tsunami as well as the consequent Fukushima nuclear disaster of the same year have sadly demonstrated, is nonetheless not always clearly definable. In one way or another, most modern ‘natural’ disasters involve instances of human failure or oversight and are closely related to technologies utilizing the natural environment. Besides, over the course of the last two decades, the differentiations of disaster according to the prevalent type of forces involved (‘natural’ vs ‘technological’) “have come to be seen as less important than the social setting in which they appear” (Quarantelli, Lagadec, and Boin 22) since the human responsibility for—and thus the ‘unnaturality’ of—‘natural’ disasters has come forward much more emphatically in the media as well as in academic scholarship (Perry; Quarantelli, Lagadec, and Boin).

Nonetheless, the division into ‘natural’ and ‘technological’ disasters makes sense since, whenever a natural hazard is prominently involved in a catastrophe, “[t]he initiative in calamity *is seen to be* with nature, which decides where and what social conditions or responses will become significant” (K. Hewitt 5; emphasis added). Particularly in

regard to ‘natural’ disasters such as earthquakes, floods, or hurricanes, this means that regardless of the actual causation of a calamity, the people affected tend to ascribe the resulting damage and distress to the natural phenomenon and not (primarily) to human involvement and fault, which affects the perception and the framing of a disaster sustainably (Aragón-Durand 17-23).¹¹

The increasing scholarly emphasis on the human causation of disasters notwithstanding, the perceived involvement of a natural hazard such as an earthquake makes a strong difference for the affected people in the processes of making sense of a disaster (Aragón-Durand 17-23; Erikson, *A New Species* 19, 226-42). “The ‘natural’ in ‘natural disasters,’” Fernando Aragón-Durand argues, “comprises an essential ingredient for framing disaster” (20). It directs the attention to the geo-physical event and to the need for technology in order to monitor, control, and regulate the hazard rather than to the structural socio-economic processes that are often responsible for exposing populations to risks in the first place. Hence, technocratic views tend to neglect enduring systemic inequalities and human causation and thus often undermine efforts to improve the long-term vulnerability of a culture (Aragón-Durand 20-21; Davis, *Ecology* 6-56; Steinberg xi, xv-xxiii).

Taking the ‘myth of ordinary life’ and the aforementioned idiosyncrasies in the framings of ‘natural’ disasters into account, the term ‘natural calamity’/‘natural disaster’¹² in the following has to be understood—based on Anthony Oliver-Smith and Susanna Hoffman’s conception of disaster (4) in general—as a process combining a potentially destructive force *perceived* to have emanated from the natural environment and a population in a socially and economically produced condition of vulnerability, resulting in a *perceived* disruption of the fulfillment of individual and collective needs for physical

¹¹ Recently, the term ‘environmental disaster’ has been used in scholarship as well as in the media to account for the inextricable links between natural hazards and human causation/technology (cf., e.g., Whyte; Gillis).

¹² So far, single quotation marks have been used with the phrase ‘natural’ disaster(s)/‘natural’ calamity(ies) to indicate that human causation plays a much more crucial role in the origin and extent of a disaster than commonly assumed when using the linguistic marker ‘natural’ (cf., e.g., Steinberg; Aragón-Durand). In the following, single quotation marks will only be added in cases particularly highlighting the ‘un-naturality’ of natural disasters.

survival, social order, and meaning. In accordance with the “current paradigm of disaster research” (Perry 12; Quarantelli 339), this characterization identifies natural disasters as social phenomena rather than as results of natural events. Accordingly, the involved geophysical processes function as triggers of disasters but not as their (sole) causes. An earthquake in an uninhabited area does not constitute a ‘disaster’ unless a (group of) vulnerable people are involved and put at risk. Furthermore, this understanding of natural disasters can also be applied to (urban) conflagrations, which played an important role in the early urban history of San Francisco, since fires have often been perceived as natural hazards.

The awareness that every culture generates particular (im)material conditions that vary according to aspects such as class, ethnicity, gender, age, citizenship, and family status (to name but a few) and that either privilege or discriminate against individuals or groups in the case of a disaster lies at the very heart of most current projects of disaster studies (Perry 12-14). Among the most prominent promoters of this so-called vulnerability research are Ben Wisner, Piers Blaikie, Terry Cannon, and Ian Davis, who characterize vulnerability as

the characteristics of a person or group and their situation that influence their capacity to anticipate, cope with, resist and recover from the impact of a natural hazard (an extreme natural event or process). It involves a combination of factors that determine the degree to which someone’s life, livelihood, property and other assets are put at risk by a discrete and identifiable event (or series or ‘cascade’ of such events) in nature and in society. (11; emphasis in the original)

Hence, the field of vulnerability studies directs its lens on the complex factors and processes producing conditions that put some individuals at risk more so than others. In vulnerable groups, economic, political, and cultural marginalization is either initiated or fostered, and the members are exposed disproportionately to hazardous materials and relegated to live and work in environmentally jeopardized spaces. The analysis of vulnerability and resilience (as the ability to withstand or even utilize the impact of natural disasters came to be known) intersects with environmental justice research and thus taps into core concerns of

cultural studies and also of American Studies (cf. Fishkin, "Crossroads" 23, 31).

One great advantage of approaching natural disasters as outlined in the definition above stems from the emphasis on the disruptive momentum of natural calamities, even if the intrusion is subjectively perceived rather than factually quantifiable (K. Hewitt 3-24). If the concept of culture, following Clifford Geertz's understanding, "is essentially a semiotic one," composed of the "webs of significance" (5), then the disturbance of a web and, even more crucially, the mending of the damaged fabric yield important insights into the structures and patterns of the overall web, the connections between the single strands, and their interdependencies (D. Alexander v; Biel 5). In the course of a natural disaster, a liminal space comes into being for a restricted time in which established structures and practices are suspended, hierarchies are partly reversed, and the continuity of traditions is temporarily at stake. In this heterotopian space (cf. Foucault, "Of Other Spaces"), already existing tensions surface and expose fissures in the social fabric along lines, for example, of class, ethnicity, gender, age, and sexual orientation (Biel 5; Oliver-Smith and Hoffman 6-12;).

What additionally emerges as positive in this conceptualization is the understanding of natural disasters as processes. The move away from a conception of calamity as an event limited in time to the immediate moment of the impact of the geophysical forces highlights the intricate long-term historical and cultural developments building up and perpetuating vulnerability—often over centuries. In this manner, the entire extended period of time—from the onset of the formation of conditions of vulnerability to the last stage of the long-term recovery process—is included as a central part of the disaster. Moreover, a processual understanding of natural disasters also enables us to point the lens at the multidirectional transnational flows that shape and are shaped by natural disasters.

The impact of a distinct natural disaster is indeed hardly ever contained within the borders of a nation, which renders natural calamities paradigmatically transnational phenomena. First of all, natural forces are generally embedded in global atmospheric, hydrological, and geophysical processes, which transcend cultural and political boundaries. More importantly, the representations and reverberations of natural disasters, be they material (such as visual representations or

financial support) or immaterial (such as philosophical reflection, empathy, or knowledge transfer), epitomize the transnational nature of natural disasters by making visible the “multidirectional flows of people, ideas, and goods and the social political, linguistic, cultural, and economic crossroads generated in the process” (Fishkin, “Crossroads” 22). As one of the most destructive and terrifying natural phenomena (Stallings 8-9; Zeilinga de Boer and Sanders 1), earthquakes have emphatically demonstrated their ability to transgress nation states and to incite long-term (im)material cultural interactions. The 1348 Friuli Earthquake, the 1693 Sicily Earthquake, the 1755 Lisbon Earthquake, the 1906 San Francisco Earthquake and Fire, the 1970 Peru Earthquake, and, more recently, the 2011 Tōhoku Earthquake in Japan are but a few of the numerous temblors that had significant global reverberations (cf., e.g., Borst; S. Cameron; Fonseca; Lauer and Unger, “Angesichts”; Zeilinga de Boer and Sanders).

2.3 Earthquake Frames

Earthquakes differ from other natural disasters in their sudden impact, unpredictability, and invisibility. While floods, hurricanes, and to a certain extent even tornadoes tend to have a more apparent genesis, which enables the estimation of the time and place of their impact in advance, “there is currently no reliable way to predict the days or months when an [earthquake] will occur in any specific location” (Prasad 33; cf. Abbott 123; 305-53). Unlike meteorological phenomena such as storms, floods, or droughts, earthquakes do not display a regular periodic recurrence (e.g. ‘hurricane season,’ ‘wet season’), which additionally bestows them with notions of arbitrariness and uncontrollability.

Since it took a comparatively long time to find scientific explanations uniting the disparate seismic phenomena into one coherent and plausible theory, earthquakes carried mythical connotations and were regarded as prophetic signs for a long time. What made earthquakes especially startling was the invisibility of the seismic forces, which caused the environment to tremble as if by the hand of an angry god or by magic. The frequent references to earthquakes in crucial passages of the Bible or in Greek philosophy testify to their power as auguries (cf., e.g., Zeilinga de Boer and Sanders 22-44; Waldherr). Moreover, seismic