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Famine, Fever, Flood, and Conquest:

The Impact of Natural Disasters on the Ninth-Century Rise of the Vikings in the Carolingian Empire According to the Royal Frankish Annals, the Annals of Xanten, the Annals of St Bertin, and The Annals of Fulda

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The University of Edinburgh
2020

Lay Summary

The lay summary is a brief summary intended to facilitate knowledge transfer and enhance accessibility, therefore the language used should be non-technical and suitable for a general audience. Guidance on the lay summary in a thesis. (See the Degree Regulations and Programmes of Study, General Postgraduate Degree Programme Regulations. These regulations are available via: www.drps.ed.ac.uk.)

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Events characterised as “natural disasters” now had an impact on early medieval Europe (c. AD 476-1054), but previous attempts to measure said impact have been hindered by ambiguous terminology. This study reviews the modern mainstream concept of “natural disaster,” defined most broadly by *The Asian Natural Disaster Reduction Center*, and redefines it to fit within a medieval setting. Since the only clearly discernible impact of early medieval natural disasters appears to be exploitative political responses, it emphasises their cultural rather than environmental impact. A brief review of a selection of written sources suggests two particularly high-profile links between disasters and exploitative raids by the Scandinavian raiders now known as Vikings: the first on Lindisfarne, Northumbria, in AD 793 and the second on Dorestad, Frisia, in AD 834. The two disasters, a famine and a flood, would have weakened each populace physically, but would have also weakened their resolve and capacity for defence. Informed by the emphasis of later military strategists, the focus of this study becomes the possible exploitation of disaster-induced weaknesses by these warbands.

A range of medieval written sources is then examined, but because only annals provided by Continental Europe’s contemporary Carolingian Empire provide the necessary extended run of precise data within a clear timeframe, the geographic focus is pinpointed upon the Empire. As the volume and detail of relevant data is at its peak before the Treaty of St. Claire-sur-Epte, when Charles the Simple granted the Viking leader Rollo of Normandy and that expanded to become the

duchy of Normandy, the focus was further refined to the period before AD 911.

By extracting, collating, coding, and then charting annalistic data for disasters and raids, and by using deaths of politically significant individuals and Frankish aggressions as controls, a methodology is devised to investigate the disaster/raid correlation. As the relative severity of these disasters remains unclear, corroboration is sought from non-narrative sources. While dendrochronology, (the science of tree rings), is used to help establish the broad climatic background, it does not allow for precise assessment of disaster severity. The embedded nature of Christian symbolism within Carolingian culture, however, allows for a subjective but more secure interpretation of severity through intertextual comparison of annalistic descriptions of disasters with the language of the Bible.

The charted data is then revisited to find potential links between disasters and attacks, leading to the identification and presentation of four extensive case studies. The geographical, political, and climatic situation are all assessed along with the disaster's likely severity, then the attack is modelled in light of military theory to assess whether the disaster created an exploitable weakness. In all four examples this is found to be the case.

Thus, the thesis confirms that one of the most visible impacts of natural disasters in Early Medieval Europe was their potential for exploitation for political gain. By then investigating the geopolitical significance of these exploited disasters, the study then points to a possible loosely coordinated military strategy against the Carolingian Empire, challenging current theories on the origins of the Viking Age in Continental Europe. Further studies into the exploitation of natural disasters would therefore provide a path into understanding political developments in early medieval Europe and especially the Viking Age.

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Abbreviations

The following sources appear frequently and therefore are referenced by abbreviations in the text as well as in the footnotes after the first citation.

Annals

The Annals of St Bertin AB
The Annals of Fulda AF
The Anglo-Saxon Chronicle ASC
The Annals of Ulster AU
The Annals of St Vaast AV
The Annals of Xanten AX
Regino of Prüm Regino
The Royal Frankish Annals RFA

Scientific Databases

The Oak Tree Chronology OTC
The Old World Drought Atlas OWDA

Introduction

From before the eruption of Thera between 1627-1525 BC—an event that may have contributed to the collapse of Minoan civilization¹—to our recent months with COVID 19, human societies have suffered from and been forced to respond to natural disasters. Today the response to disasters can benefit from modern technology and centralised governments to help ameliorate any potential damage. But what about disasters in less developed times such as the Early Middle Ages (c. AD 476-1054)?²

Using surviving written records, scholars have been able to study the impact on earlier cultures of several *particular* disasters, for example, the AD 79 eruption of Mt. Vesuvius during the reign of Roman Emperor Titus and the AD 1349 Black Death that devastated Europe. Though written records are scarce for the Early Middle Ages, the AD 542 Justinian

¹ Carl Knappett, Ray Rivers, and Tim Evans, “The Thera Eruption and Minoan Palatial Collapse: New Interpretations Gained from Modelling the Maritime Network,” *Antiquity* 85, no. 329 (2011): 1019-1020

² The Early Middle Ages will be defined here as roughly from the deposition of the last Western Roman emperor, Romulus Augustus, in AD 476 to the split between the western Catholic and eastern Orthodox church in 1054. J. Derek Holmes, Bernard Bickers, and J Derek Holmes, *A Short History of the Catholic Church* (London: Bloomsbury Publishing, 2002), 45, 65-66.

plague has been examined thoroughly.³ And recently, a few authors have attempted to examine the impact of a lesser-known volcanic eruption in AD 763-764 on the military campaigns of Carolingian king Pippin the Short.⁴ Natural disasters—famine, floods, and fever, for example—were not rare, however, and the broader question of how natural disasters *in general* might have impacted early medieval society in Europe has not yet been examined in depth.

In addition to regular natural disasters, the Early Middle Ages also saw the beginning of the Viking Age. And coincidentally, *The Anglo-Saxon Chronicle* reports a famine immediately before its report of the first recorded Scandinavian encounter in Western Europe that was clearly a raid, the AD 793 raid on Lindisfarne, Northumbria.⁵ This coincidence raises the question of whether these raiders might have been drawn out or “pulled” by the prospect of exploiting the famine in

³ See, e.g., M.G.L. Baillie, “Dendrochronology Raises Questions about the Nature of the AD 536 Dust-Veil Event,” *The Holocene* 4, no. 2 (1994): 212; David Keys, *Catastrophe: An Investigation into the Origins of Modern Civilization* (New York: Random House, 2000), 18-19.

⁴ Paul Dutton, Paul Mayhewski, and Michael McCormick, “Volcanoes and the Climate Forcing of Carolingian Europe, A.D. 750-950,” *Speculum* 83 (2007).

⁵ Michael Swanton, ed. and trans., *The Anglo-Saxon Chronicle* (London: Phoenix Press, 2000), 55-57.

Northumbria when deciding when and where to attack the Anglo-Saxon kingdoms.⁶

Such a tactic would not have been new. When describing the “General Rules of War”, the classical military scientist Vegetius explicitly mentions the advantages of famine to weaken a people.⁷ Vegetius does not discuss the wider geopolitical significance of warfare but Prussian general Carl von Clausewitz, the father of modern military theory, does. He observes that the aim of warfare is to disarm an enemy through a preferably superior amount of force, and that it is necessary not only to break an army physically but also to break its will.⁸ A famine that weakened not only the malnourished Northumbrian population’s capacity for defence but also its resolve would create an ideal situation for attack. Though a single disaster/raid combination could be just a coincidence, a pattern of similar “coincidences” would suggest a thread of purpose inviting an explanation.

⁶ This study often refers to Scandinavian aggressors as Vikings. Though this word had been used previously, it became prominent only after Adam of Bremen claimed sometime after AD 1069 in *Gesta Hammaburgensis Ecclesiae Pontificum* that these aggressors were called “Viking” by Zealanders. Adam of Bremen, *History of the Archbishops of Hamburg*, trans. Francis J. Tscan (New York: Columbia University Press, 2002), 190.

⁷ Vegetius, *Epitome of Military Science*, trans. N. P. Milner (Liverpool: Liverpool University Press, 2001), 119.

⁸ Carl von Clausewitz, *On War*, eds. and trans. Michael Howard and Peter Paret (Princeton: Princeton University Press, 1984), 77.

Combining these two paths of inquiry thus formed the basis for this study, which initially asked: Is one impact of natural disasters in the Early Middle Ages their exploitation by Scandinavian aggressors in choosing when and where to attack? To undertake this study required two shifts away from what has been the traditional approach to the study both of natural disasters and of the Vikings.

The first shift was to carefully define a natural disaster itself and limit the concept of impact. Impact was constrained in location and time to avoid problems of intervening and attenuated cause. More importantly, a natural disaster was defined from the human perspective in terms of human experience. An event is not a disaster unless human societies experience it as such. The human report of that experience constituted the most comprehensive source material, and that report in the Early Middle Ages appeared in annals. As the Carolingian annals provided the most extensive run of precise data in a clear timeframe, the Carolingian Empire before AD 911 became the geographic and temporal area of study.

Then, unlike in previous studies focusing on a single event, these annals were mined for every report of a natural disaster and Scandinavian aggression as well as local warfare and deaths of politically important individuals to serve as controls. This data was collated, coded, and charted, and

indeed a pattern emerged suggesting that Scandinavian aggressors possibly thought in the same vein as Vegetius and Clausewitz and exploited vulnerabilities cause by natural disasters in deciding when and where to attack.

Two other methodologies offered the potential to broaden and deepen the investigation. The science of dendrochronology seemed an avenue to determine whether the recorded natural disasters were severe enough to invite military exploitation. Intertextual analysis comparing the precise language of the annal entries to biblical language, narratives, and tropes suggested an approach to determine each author's specific understanding of the severity of the events he recorded. While neither of these methodologies proved able to provide a precise assessment of severity, each offered a means to contextualize disasters.

Thus, to move the correlation suggested from the charted data from possible to probable, four reports of varying levels of correlation received extensive study of their geographical, political, and climatic situation as well as the disaster's likely severity. The attack was then modelled in light of military theory to assess whether it created an exploitable weakness. In all four examples, the possible connection between the disaster and the attack proved to be probable.

But what is the significance of this connection, especially in light of the fact that the Vikings attacked some vulnerable populations and not others? To arrive at a deeper understanding required the second shift of perspective. While most current scholarship asks why the Vikings left their homelands, asking instead why they targeted the places they targeted facilitated a new analysis. This analysis showed that the Vikings had clear criteria for their targets. They must be weakened by natural disaster and located on a major river estuary. These criteria highlighted the geopolitical significance of the Vikings' choices and pointed to a possible overarching military strategy against the Carolingian Empire that challenges current theories on the origins of the Viking Age in Carolingian Europe.

Chapter 1. Developing the Question

1.1 Why Natural Disasters and Why the Early Middle Ages?

This study arose from my personal experience of what is popularly considered a natural disaster. As a native of New Orleans, Louisiana, I was eighteen when Hurricane Katrina and the resulting collapse of protective levees nearly destroyed my

city on 29 August 2005.⁹ Katrina took approximately 1,000 Louisianan lives, a number commonly cited as evidence the response was botched.¹⁰ Perhaps so. However, given that the population of Greater New Orleans at the time was 1,338,000, that the city was unprepared, and that the devastation I witnessed first-hand was gigantic, I would posit the rescuers were incredible.¹¹ Over one million refugees were forced to find new homes until we could return, *if* we could return.¹² Wherever we landed, however, we were welcomed compassionately and received any help we needed.¹³

In the aftermath, some questioned the wisdom of rebuilding New Orleans since eighty percent of the real property

⁹ Select Bipartisan Committee to Investigate the Preparation for and Response to Hurricane Katrina, "A Failure of Initiative: Final Report of the Select Bipartisan Committee to Investigate the Preparation for and Response to Hurricane Katrina," H.R. Rep. 109-377, (15 February 2006), 7.

¹⁰ The official investigation reported in 2006 that 1,100 Louisianans died in the storm. Select Bipartisan Committee, "Failure of Initiative," H. R. Rep. 109-377, 74. Others estimate the number at 971. See, J. Brunkard, G. Namulanda, and R. Ratard, "Hurricane Katrina Deaths, Louisiana, 2005," *Disaster Medicine and Public Health Preparedness* 2, no. 4 (2008): 215. For more on the rescue in general, see Select Bipartisan Committee, "Failure of Initiative," 114.

¹¹ Narayan Sastry, "Tracing the Effects of Hurricane Katrina on the Population of New Orleans: The Displaced New Orleans Residents Pilot Study," *Sociological Methods & Research* 38, no. 1 (August 2009): 173.

¹² Institute of Medicine., "Hurricane Katrina: Challenges for the Community." In, "in *Environmental Public Health Impacts of Disasters: Hurricane Katrina: Workshop Summary*, 16-21. Washington, DC: National Academies Press, 2007. <https://doi.org/10.17226/11840>.

¹³ A *Times Picayune* journalist wrote an open thank-you letter for the extensive help. Chris Rose, "A letter to America from Hurricane Katrina-ravaged South Louisianans," *The Times-Picayune*, September 6, 2005, https://www.nola.com/opinions/article_b49979d1-f2c5-5865-85bb-5c36322a96c1.html.

had been damaged or destroyed. House Speaker Dennis Hastert wondered whether parts of the city should simply be razed.¹⁴ When our family returned in November, power was still out in vast areas of the city.¹⁵ Politicians blamed each other, exploiting the disaster for political favour. Nevertheless, Mardi Gras rolled 28 February 2006 and was as fun as always.¹⁶ In fact, when I made this proposal in May 2014, despite dire predictions, New Orleans was thriving again and had been for some years. However intensely I, as a Katrina survivor, remembered the scale of Katrina's destruction and the effect the storm and its aftermath had on me personally, the city of New Orleans was on its feet once more. The horrific event had passed from both political discourse and the public consciousness. I realized a dispassionate mind would be forced to wonder: Exactly what was Katrina's long-term impact on the United States? In fact, what was Katrina's impact on New Orleans, except surviving as a tragic memory?

¹⁴ Jed Horne, *Breach of Faith: Hurricane Katrina and the Near Death of a Great American City* (New York: Random House, 2006), 256. See also, Edward L. Glaeser, "Should the Government Rebuild New Orleans, Or Just Give Residents Checks?" *The Economist's Voice* 2, no. 4 (2005): 1-6.

¹⁵ Allison Plyer, "Facts for Features: Katrina Impact," *The Data Center* (29 August 2016), accessed 15 September 2019, <https://www.datacenterresearch.org/data-resources/katrina/facts-for-impact/?fbclid=IwAR2N20oCsKcxWQumsDI9skGnsKMJAIn0kQiUI8QZUTfH-eA2xpnsqxfztrA>. See also, Times Picayune, *Katrina: The Ruin and Recovery of New Orleans* (New Orleans, LA: Times Picayune, 2006), 134.

¹⁶ My New Orleans. "Eye on Carnival: 10 years since the pivotal post-Katrina Mardi Gras." My New Orleans, April 2, 2016. <https://www.myneworleans.com/eye-on-carnival-10-years-since-the-pivotal-post-katrina-mardi-gras/>.

While I was pondering this issue, I was also earning a Masters in Medieval History, writing a dissertation on the origins of Normandy. As a medieval historian, I was forced to ask another question: while the United States government and our fellow Americans helped us refugees immediately and extensively after this natural disaster, how did societies without the benefit of a centralized government and before the existence of modern technology respond to their natural disasters?

The earliest well-documented natural disaster in the western world is perhaps the AD 79 eruption of Mt. Vesuvius, the recovery from which was facilitated by the overarching and well-organised Roman Empire. From the Late Middle Ages comprehensive records such as rent records, chronicles, letters, and other writings have survived and allowed scholars to investigate the many disasters of this period, including famine and cattle plagues as well as the infamous Black Death. But what about the hundreds of years between the collapse of the Western Roman Empire and the rise of the Late Middle Ages. During these Early Middle Ages, European polities generally became less powerful and more agrarian.¹⁷ Natural disasters surely occurred and produced serious impacts, but many fewer written sources survive, and little scholarship has

¹⁷ Chris Wickham, *Framing the Early Middle Ages: Europe and the Mediterranean, 400—800* (Oxford: Oxford University Press, 2005), 677.

focused on this era. Addressing this gap in scholarship became the goal of this study, which was framed initially by the question: What was impact of natural disasters in the Early Middle Ages?

Such a broad general question, however, cannot be effectively studied. Therefore, the first task was to narrow the topic. That narrowing began by examining two definitional questions embedded in the original historical question. First, what exactly is a “natural disaster”? Is it a hurricane from which a city quickly rebuilds, an earthquake that destroys a country, a fire that ravages an uninhabited forest, or all the above? And second, what constitutes a natural disaster’s “impact”? Is it the fact that Katrina killed 1,000 people or something more? And can impact be measured? Finding these answers led to the first major refinement of the question.

1.2 Developing a Working Definition of “Natural Disaster”

The first term to be defined is the most basic— “natural disaster”. Several preliminary questions are contained in this initial effort: What constitutes a disaster? What makes a disaster “natural?” What is the effect of applying this term to an early medieval situation? And how do the requirements of a

definition fit within this situation? All these concerns were addressed to develop a useful working definition of this term.

1.2.1 Focusing on the Basic Terms

The term “natural disaster” is usually understood to mean a disaster originating from natural causes. Just this basic idea presents two avenues of inquiry. First, exactly what is a disaster, and second, what is meant by “originating from natural causes”?

Indeed, some events are universally acknowledged to be disasters, for example, the 1666 Great Fire of London which consumed a city made of dry wood, thatch, and pitch.¹⁸ The fire had a clear beginning and end, lasted five days, burned down eighty percent of the city of London, and left many destitute Londoners, if few deaths.¹⁹ Afterward, London was a ghost of what it had been, though it eventually grew into a thriving city again.²⁰ Yet not every unfortunate event is so readily categorized as a disaster. The difficulty of establishing

¹⁸ London Fire Brigade, “History and Stories: The Great Fire of London,” (London: London Fire Commissioner, 2019), accessed 27 September 2019, <https://www.london-fire.gov.uk/museum/history-and-stories/the-great-fire-of-london/>.

¹⁹ Magdalena Alagna, *The Great Fire of London of 1666* (New York: Rosen, 2004), 4.

²⁰ Alagna, *Great Fire of London*, 7.

a meaning for this basic term is evident in the variety of attempts at definition.

First, in his 1992 book *Hazard Management and Emergency Planning: Perspectives in Britain*, Professor Dennis Parker of the Flood Hazard Research Centre within the University of Middlesex defined a disaster very specifically as:

[A]n unusual natural or man-made event, including an event caused by failure of technological systems, which temporarily overwhelms the response capacity of human communities, groups of individuals or natural environments, and which causes massive damage, economic loss, disruption, injury, and/or loss of life. This definition encompasses medical accidents and disasters such as those which affect of whooping cough vaccine, Opren and HIV/AIDS haemophinac cases.²¹

Second, the well-known humanitarian relief organisation, *The International Federation of Red Cross and Red Crescent Societies*, currently defines a disaster in a broader, less specific way:

A sudden, calamitous event that seriously disrupts the functioning of a community or society and causes human, material, and economic or environmental losses that exceed the community's or society's ability to cope using its own resources. Though often caused by nature, disasters can have human origins.²²

Thirdly, *The Asian Natural Disaster Reduction Center*, an organisation working to enhance disaster resilience for its

²¹ Dennis Parker, *The Mismanagement of Hazards – Hazard Management and Emergency Planning, Perspective on Britain* (London: James & James, 1992), 6.

²² International Federation of Red Cross and Red Crescent Societies, "What is a Disaster?" accessed 28 February 2018, <http://www.ifrc.org/en/what-we-do/disaster-management/about-disasters/what-is-a-disaster/>.

member countries, defines a disaster in an even broader way: “A serious disruption of the functioning of society, causing widespread human, material or environmental losses which exceed the ability of the affected society to cope using only its own resources.”²³

Finally, recent Disaster Studies scholars have also attempted a definition. In 2011, Michael Lindell, quoting a 1961 definition from disaster studies pioneer C.E. Fritz, says a disaster is an “event concentrated in time and space, in which a society or one of its subdivisions undergoes physical harm and social disruption, such that all or some essential functions of the society or subdivision are impaired”.²⁴ Lindell then argues that the key element is the event’s “concentrat[ion] in time and space”.²⁵ He claims this factor “distinguish[es] between earthquake deaths that might number as few as 50 deaths in a matter of minutes from automobile fatalities that number approximately 40,000 in the US”.²⁶ His example, however, illustrates the ambiguity of this key element. The United States is a specifically delineated and relatively concentrated space,

²³ Ibrahim Mohamed Shaluf, "Disaster types," *Disaster Prevention and Management: An International Journal* 16, no. 5 (2007): 704.

²⁴ C.E. Fritz, “Disaster,” in *Contemporary Social Problems*, eds. R.K. Merton and R.A. Nisbet (New York: Harcourt, Brace and World, 1961), 655.

²⁵ Michael Lindell, “Disaster Studies,” *Sociopedia.isa* (2011): 2, <https://doi.org/10.1177/0011392113484456>.

²⁶ Lindell, “Disaster Studies,” 1-2.

and a year is a relatively concentrated time. By some standards, however, they constitute a large geographical area and a long duration, suggesting that an implicit aspect of this definition is that “concentrated” has a distinct but unspecified meaning for Lindell. Lindell also claims that the concept of “concentrated time” allows the ability to study the pre-impact conditions of a devastated territory such as its preparedness, then the impact on that territory, and finally the post-impact conditions such as the emergency response and recovery.²⁷ In this case, he admits these boundaries are more ambiguous than they appear at first glance.²⁸ How to measure when pre-impact ends or when post-impact begins? New Orleans had time to prepare for a trackable hurricane, but in 2010, Port-au-Prince, Haiti, did not have that same luxury before the earthquake. In the immediate aftermath, New Orleans was a ghost town and remained so for months before it began rebuilding. For Port-au-Prince beginning recovery took even longer. These examples raise the question of whether the ability to precisely model impact is a useful aspect of the definition of the term itself.

These difficulties defining the margins of the term “disaster” continue when the inquiry expands to include the

²⁷ Lindell, 2.

²⁸ Lindell, 2.

concept of “natural”. The first difficulty here is the problem of cause. For example, Magdalena Alagna describes the Great Fire of London as a natural disaster.²⁹ Certainly, the fire was “natural” in that fire is a “natural” *means*. This fire, however, did not originate from a natural *source* such as lightning but from a baker.³⁰ Thus the originating cause of the disaster was not natural and describing it as a natural disaster is inaccurate.

Cause can be complicated in other ways. When Hurricane Katrina struck New Orleans in 2005, the floodwaters themselves originated in a natural cause but the greatest damage resulted from the collapse of manmade protective levees. Had they held, the disaster would not have occurred—at least not nearly to the same extent. Thus the question arises: Was the disaster caused by the storm or by the collapse of manmade protections? Fortunately, neither of these complications arises in the data researched for this study. All the disasters analysed originated from naturally occurring sources and the damage was caused by the disaster itself.

The second issue with defining a “natural” disaster lies in the problem of impact. Do all adverse events arising from naturally occurring sources constitute natural disasters? If an event is a naturally occurring environmental process can it be

²⁹ Alagna, *Great Fire of London*, 7.

³⁰ Alagna, *Great Fire of London*, 4.

considered a disaster beyond the negative effect it may have had on that environment? For example, is a forest fire in an unoccupied wilderness a natural disaster? In fact, is it even disastrous? In some ecosystems, fire is one means of breaking physical dormancy of seeds for germination.³¹ Fire is also used in forest management to burn away underbrush so later fires will be less severe.³² These examples highlight the fact that implicit in the term “disaster” as it is used is the concept of human impact. Thus, a “natural” disaster is usually understood to mean a naturally occurring event originating from natural sources that causes “[a] serious disruption of the functioning of society”,³³ harms “human communities”,³⁴ or “disrupts the functioning of a community or society”³⁵ to the extent that “all or some essential functions of the society or subdivision are impaired.”³⁶ The concept does not extend to a natural event by itself.

³¹ Carol C. Baskin and Jerry M. Baskin, *Seeds: Ecology, Biogeography, and Evolution of Dormancy and Germination 2nd Edition* (New York: Elsevier, 2014), 174-175

³² James K. Agee, “The Fallacy of Passive Management Managing for Firesafe Forest Reserves,” *Conservation in Practice* 3, no. 1 (2006): 18-26.

³³ Shaluf, “Disaster types,” 704.

³⁴ Parker, *Mismanagement of Hazards*, 6.

³⁵ Red Cross and Red Crescent Societies, “What is a Disaster?” accessed 28 February 2018, <http://www.ifrc.org/en/what-we-do/disaster-management/about-disasters/what-is-a-disaster/>.

³⁶ Fritz, “Disaster,” 655.

For example, one natural event that would seem to be a natural disaster is the eruption of Mount St Helens in the United States on 17-18 May 1980.³⁷ The volcanic eruption reached level five on the Volcanic Explosivity Index.³⁸ However, because Mount St Helens is in the middle of a relatively unpopulated area, only fifty-seven people died.³⁹ And although it did cause some immediate damage and the United States government had to invest many resources to recover, the eruption did not seriously disrupt communities and caused little lasting damage to the infrastructure within the United States. Therefore, although it was a frightening event originating from natural sources, it was not a natural disaster.

On the other hand, a natural event that has no immediate death toll and does not directly touch a populated area or economic centre can constitute a natural disaster depending on its effect. If a fire burned down the forest within one clearly defined territory but did not touch a single home or injure even one person, that fire could still cause major human impact if, for example, it disrupted the functioning of that territory's logging industry, causing serious material and

³⁷ Alan Robock, "Volcanoes and Climate," *Reviews of Geophysics* 38, no. 2 (2000): 204.

³⁸ Robock, "Volcanoes and Climate," 201.

³⁹ Robert I. Tilling, "Mount St. Helens 20 Years Later: What We've Learned," *Geotimes* (American Geological Institute, 2000), accessed 26 Sept. 2019, <http://www.geotimes.org/may00/featurestory.html>.

economic losses and leaving many loggers destitute. It could also provide a window of opportunity for loggers in a neighbouring territory to exacerbate the impact by exploiting the disaster to take the customers of the affected loggers. Thus, even though this forest fire killed no one and did not touch a single home, it would still rate as a natural disaster because it seriously disrupted the functioning of the society of loggers who depended on the trees for their livelihood.

An example of a similar medieval event is a cattle plague. Cattle were an essential resource in early medieval society. Often they seem to have been the main unit of currency in pre-monetary economies and a key factor in assessing social status.⁴⁰ Written records in early medieval Ireland describe them as the most valuable livestock.⁴¹ Archaeological remains have confirmed cattle were one of the most significant domestic livestock in the ninth-century, continental Carolingian Empire. Archaeologists excavating the city of Dorestad found 3649 cattle remains as compared to 833

⁴⁰ For a discussion of cattle in Ireland, see, e.g., Fergus Kelly, "Cattle in Ancient Ireland: Early Irish Legal Aspects" in *Cattle in Ancient and Modern Ireland: Farming Practices, Environment and Economy*, eds. Michael O'Connell, Fergus Kelly, and James H. McAdam (Cambridge: Cambridge Scholars Publishing, 2016), 44-40.

⁴¹ A. Kyle, K. Stewart, and A. Tourunen, "Excavating a meal: a multidisciplinary approach to early medieval food economy," in *Dining and Dwelling: Archaeology and the National Roads Authority*, eds. M. Stanley, E. Danaher, and J. Eogan (Dublin: Monograph Series No 6, 2009), 80.

sheep and 680 pigs.⁴² Thus a cattle plague would seriously disrupt the functioning of a medieval society and become a natural disaster, even though the plague itself did not kill humans.

Taken together, the nuances of defining “natural disaster” show that analysing natural disasters and their potential impact in whatever place and time they occur is a relatively subjective process. Nevertheless, a few parameters can be established. Accordingly, for purposes of this study, natural disasters are those naturally originating events that specifically and disastrously impact human populations.

1.2.2 Exploring the Early Medieval Perspectives

Another issue is the fact that the early medieval concept of what today is called a disaster differs from the later concept in several distinct ways beginning with the basic fact that early medieval societies had not abstractly bracketed out a category of events to call “disasters”. The abstract concept of “disaster” is of late medieval origin, emerging by the fourteenth century with the Italian word “*disastro*”.⁴³ According to *The Online*

⁴² Terry O’Connor, “Livestock and deadstock in early medieval Europe from the North Sea to the Baltic,” *Environmental Archaeology* 15, no. 1 (2010): 7.

⁴³ Gerrit Jasper Schenk, “Disastro, Catastrophe, and Divine Judgment: Words, Concepts and Images for ‘Natural’ Threats to Social Order in the Middle Ages and Renaissance,” in *Disaster, Death and the Emotions in the Shadow of the Apocalypse, 1400–1700*, eds. Jennifer Sprinks and Charles Zika (London: Macmillan, 2016), 49-52.

Etymological Dictionary, “*disastro*” combines the Latin prefix “*dis*” and the word “*astrum*”, defined together as “ill-starred”. The word descended into Middle French as “*désastre*” and then into English as “disaster”.⁴⁴

This brief etymology underscores a second issue. In the early medieval period, people did not believe events later termed “natural disasters” necessarily had a natural origin.⁴⁵ Instead, these events were considered consequences of divine wrath and/or unlucky stars.⁴⁶ Though these events might come from natural processes, the original cause was sin.⁴⁷ For example, in surviving letters, Charlemagne ordered fasts and prayers as responses to failed harvests, famines, and other types of natural disasters.⁴⁸ Meanwhile he and his courtiers watched the sky carefully for divine warnings of inauspicious events.⁴⁹ In *The Life of Charlemagne*, Einhard recorded several

⁴⁴ Douglas Harper, *The Online Etymology Dictionary*, s.v. “disaster” (2001-2019), accessed 10 September 2019, https://www.etymonline.com/word/disaster#etymonline_v_11375.

⁴⁵ Schenk, “Disastro,” 55-56.

⁴⁶ Schenk, “Disastro,” 49.

⁴⁷ Schenk, “Disastro,” 48-49.

⁴⁸ Carine van Rhijn, “Charlemagne and the Government of the Frankish Countryside” in *Law and Empire: Ideas, Practices, Actors*, eds. Jeroen Duindam et al. (Leiden, NL: Brill, 2013), 162.

⁴⁹ Paul Dutton, *Charlemagne’s Mustache and Other Cultural Clusters of a Dark Age* (Hampshire, UK: Palgrave Macmillan, 2004), 102-103.

celestial events as portents of Charlemagne's approaching death, including two AD 810 eclipses.⁵⁰

Moreover, while authors writing in Early Medieval Europe regularly record events that today would be considered natural disasters, these writers often do so without comment, indicating they may have considered these disasters to be simply facts of life. For example, *The Annals of Fulda* (AF), which record events in the middle and eastern Carolingian Empire during the ninth century, describe an AD 874 plague that would undoubtedly be considered a horrible disaster today: "*Hoc anno fame et pestilentia per universam Galliam et Germaniam grassantibus pene tertia pars humani generis consumpta est.*"⁵¹ The record of this plague is stark and terrible, but that the author provides no details and uses such mild language suggests he considered this disease no more significant than many events that year.

On the other hand, when medieval authors do describe natural disasters in some detail, they sometimes frame them as judgements from God.⁵² For example, a medieval writer who

⁵⁰ Dutton, *Charlemagne's Mustache*, 102.

⁵¹ Fridericus Kurze, ed., *Annales Fuldenses* (Hannover: MGH, 1891), 83. "[T]hrough the hunger and pestilence which raged through the whole of Gaul and Germany, nearly a third of the population was destroyed." Timothy Reuter, trans, *The Annals of Fulda: Ninth-Century Histories Vol. II* (Manchester: Manchester University Press, 1992), 75.

⁵² See Tim Newfield, "A Great Carolingian Panzootic: The Probable Extent, Diagnosis and Impact of an Early Ninth-Century Cattle Pestilence," *Argos* 46

describes a flood as a *diluvium* is likely connecting that flood to the Great Flood and God's judgment. "*Diluvium*" has descended into English as "deluge". *The Online Etymological Dictionary* states that "deluge" came into English in the late fourteenth century as "an overflowing of water, a great flood, [and] Noah's Flood in Genesis".⁵³ Gerrit Jasper Schenk further explains: "[*D*]iluvium conveys an explicitly religious interpretation of the event and is in evidence from the Early Middle Ages. In the Vulgate this term in the Old Testament stands for the Flood, in the New Testament for the events at the Last Judgment."⁵⁴ Thus an early medieval author who used "*diluvium*" would be suggesting its cause was the divine wrath of God.

Further complicating an understanding of the early medieval perspective is that authors of medieval annals often record and catastrophise events that might not be considered disasters today. For example, the AF record for AD 872, "*Omne tempus aestivum grandinibus variisque tempestatibus*

(2012): 202. Here Newfield discusses the fact that an author considered a cattle mortality in AD 810 to be a just judgement from God. See also, Sally Lamb, "Evidence from Absence: Omission and Inclusion in Early Medieval Annals." *The Medieval Chronicle* 7 (2012): 55. Lamb discusses Hincmar of Rheims' indication in the AB that he believed the successful Scandinavian raids of AD 863 and AD 864 were a just punishment from God on Lothar II for his divorce case.

⁵³ Harper, *Online Etymology Dictionary*, s.v. "deluge," accessed 7 November 2019, https://www.etymonline.com/word/deluge#etymonline_v_5549.

⁵⁴ Schenk, "Disastro," 52.

*pernoxium extitit; nam grando plurima loca frugibus devastavit; (horrida) [horrenda] etiam tonitrua et fulmina pene cotidie mortalibus interitum minabantur.*⁵⁵ A medieval author would likely view a *grandinibus tempestatibus*, hailstorm, as divine wrath because hail was the seventh plague in Egypt, as translated by the *Douay-Rheims*: “And the hail destroyed through all the land of Egypt all things that were in the fields, both man and beast: and the hail smote every herb of the field, and it broke every tree of the country.”⁵⁶ Revelation 16:21 also foretells a hailstorm during the Apocalypse: “And great hail, like a talent, came down from heaven upon men: and men blasphemed God for the plague of the hail: because it was exceeding great.”⁵⁷ Still, hailstorms are not unusual, and today thunder and lightning are considered normal summer weather.

⁵⁵ Kurze, AF, 76. “The whole summer was ruined by hailstorms and other kinds of tempest. The hail destroyed the crops in many places, and terrifying thunder and lightning threatened mortals almost daily with death.” Reuter, AF, 68.

⁵⁶ Exodus 6:25, (Latin Vulgate): “*Et percussit grando in omni terra AEgypti cuncta quae fuerunt in agris, ab homine usque ad jumentum: cunctamque herbam agri percussit grando, et omne lignum regionis confregit.*” All English translations herein are from the Douay-Rheims Bible unless otherwise noted. Though it has undergone various revisions since it was originally produced in the late 15th/early 16th century, the Douay-Rheims was originally based on the Latin Vulgate Bible. All Latin translations herein are from the Latin Vulgate Bible. A discussion of the significance of the Latin Vulgate appears in Chapter 5, section 5.1. Both texts were accessed online at Biblegateway—the particular Douay-Rheims at <https://www.biblegateway.com/versions/Douay-Rheims-1899-American-Edition-DRA-Bible/#booklist>, and the Vulgate at <https://www.biblegateway.com/versions/Biblia-Sacra-Vulgata-VULGATE/#booklist>. To avoid repetition, this online access information appears only in this footnote.

Whether writers of the Early Middle Ages considered an event to be disastrous or merely a fact of life may have arisen in part from their understanding—or lack of understanding—of its cause and methods of prevention. For example, when a plague infected a region, people did not know how it spread or how contagious it was. Relying on the theories of the ancient doctors Hippocrates and Galen, medieval doctors believed diseases were spread not by direct contact but by corrupting poisonous vapours.⁵⁸ Several centuries later during the Black Death, people still did not know that living together facilitated the spread of the disease. Not surprisingly, therefore, William Dene records:

The Bishop of Rochester [Hamo Hethe] lost 4 priests, 5 squires, 10 household servants, 7 young clerks and 6 pages, leaving no one in any office who should have served him. At Malling he appointed two abbesses who promptly died. No one remained alive there except 4 professed nuns and 4 novices.⁵⁹

With no knowledge of the cause of these tragedies, no ability to prevent them, and no option except to endure, the authors simply recorded them.

⁵⁷Revelation 16:21 (Latin Vulgate): “*Et grando magna sicut talentum descendit de caelo in homines: et blasphemaverunt Deum homines propter plagam grandinis: quoniam magna facta est vehementer.*”

⁵⁸ Luke DeMaitre, *Medieval Medicine: The Art of Healing, from Head to Toe* (Santa Barbara, US: Praeger, 2013), 62-63.

⁵⁹ Rosemary Horrox, ed. and trans., *The Black Death* (New York: Manchester University Press, 2004), 71.

Indeed, one of the central issues that arises from medieval descriptions is determining which events were disastrous and which were not. However terrifying frequent hailstorms in AD 872 might be for an author thinking of the hailstorms in Exodus and Revelation, these hailstorms would only constitute a natural disaster if they impacted human communities. In AD 872 the impact is clear because the AF also report the consequences, the ruin of that year's harvest. Yet in AD 837 when the author of another ninth-century Carolingian annal, *The Annals of Xanten (AX)*, reports without elaboration "*ingens turbo*", huge windstorms, then begins to describe a comet, it is difficult to determine whether these windstorms caused sufficient damage to constitute natural disasters or were just frightening tornadoes.⁶⁰

1.2.3 Understanding the Early Medieval Situation

Another concern is the difference between the modern and the early medieval situation. Of the four modern definitions above, none quite fit a medieval situation. The Red Cross and Fritz require that the disaster be a "sudden, calamitous event" or one "concentrated in time and space".⁶¹ This specificity, however,

⁶⁰ Bernhard von Simson, ed., *Annales Xantentes et Annales Vedastini* (Hannover: MGH, 1909), 10.

⁶¹ Red Cross and Red Crescent Societies, "What is a Disaster?" accessed 28 February 2018, <http://www.ifrc.org/en/what-we-do/disaster-management/about-disasters/what-is-a-disaster/>; Fritz, "Disaster," 655.

would not include a medieval disaster that developed over time and was long-lasting. A harvest failure caused by a hot summer is not a sudden event; it develops into a disaster over time. Parker's definition contains the key concept that a disaster "temporarily overwhelms the response" of the affected community.⁶² Implicit in this concept is the assumption that there is a response that can be overwhelmed. But in a medieval situation such as a plague or famine, there would likely be no way to respond, to correct, or to relieve in the first place. The people would simply have to endure—bury the dead and plant again in the spring. The least specific definition, the one developed by *The Asian Natural Disaster Reduction Center*, comes closest to fitting a medieval situation. It requires a "serious disruption of the functioning of society, causing widespread human, material or environmental losses which exceed the ability of the affected society to cope using only its own resources".⁶³ This definition is more fitting because the "serious disruption" does not have to be sudden and there need not be a response. Nonetheless, this definition still fits only a modern natural disaster. The last phrase—"using only its own resources"—does not provide a measure of severity in a

⁶² Parker, *Mismanagement of Hazards*, 6.

⁶³ Shaluf, "Disaster types," 704.

medieval situation. In early medieval Europe, a society would probably have no option except to cope using its own resources regardless of the event. Most of the populace lived in a rural setting, tending their own crops and livestock.⁶⁴ If a famine struck a region, other regions could not intervene to supply food to relieve the suffering. Indeed, they might inadvertently worsen it, since the price of grain was based on the quality of a harvest.⁶⁵ During a famine, instead of being provided to the hungry, scarce grain could become more expensive.⁶⁶

Bridging these differences between the modern and medieval situation required a purely situational definition. It could not limit these examined events to those that are sudden, unusual, or immediately calamitous, but must include both a famine, which usually takes a year to develop as a result of two successive failed harvests, or a quickly spreading plague as contagious and lethal as the Black Death, which lasted roughly six months in each area it affected.⁶⁷ It must also exclude minor events that terrified those who witnessed them but caused no real damage. Finally, it must be adaptable, allowing

⁶⁴ Adriaan Verhulst, *The Carolingian Economy* (Cambridge: Cambridge University Press, 2002), 14-15.

⁶⁵ Verhulst, *Carolingian Economy*, 123-124.

⁶⁶ Verhulst, *Carolingian Economy*, 118. See also, Reuter, AF, 31, about prices in the AD 850 Rhine famine.

⁶⁷ Cormac Ó Gráda, *Famine: A Short History* (Princeton, US: Princeton University Press, 2010), 31-32; Horrox, *Black Death*, 35.

societies to adjust without any outside help. Fortunately, slightly adjusted, the definition set out by *The Asian Natural Disaster Reduction Center* suits this purpose and fits a medieval setting.

Therefore, for this study, an early medieval natural disaster was defined as an “event originating from natural sources that seriously disrupts a society, causes widespread losses, and exceeds the society’s ability to cope immediately.”

1.3 Defining, Measuring, and Limiting “Impact”

The concept of “natural disaster” carries within it the concept of “impact”. There is no disaster if there is no impact. But how, exactly, to measure an “impact”? *The Oxford English Dictionary* defines “impact” as follows: “a. The act of impinging; the striking of one body against another; collision. . . b. Now commonly . . . the effect of such action; influence.”⁶⁸ This definition emphasises that impact includes both a physical and a metaphysical component.

The physical effects of a natural disaster are an obvious measure of its impact. This measure is usually first addressed by counting mortalities, a difficult task in the Early Middle Ages when accurate and reliable records are unlikely to exist. Another measure of physical impact is geographical reach.

⁶⁸ OED Online, s.v. “impact,” (Oxford: Oxford University Press, 2018), accessed 12 March 2018, <http://www.oed.com.ezproxy.is.ed.ac.uk/view/Entry/92036?rskey=KGtHZs&result=1&isAdvanced=false#eid>.

Sometimes the reach is clear, as in the AD 79 eruption of Mt. Vesuvius. But if the disaster is a plague that spread across all Europe leading to the death of only one in 1000 people, to what extent does its physical breadth measure its impact?

Another hypothetical measure is the immediate, intentional human response, whether altruistic or exploitative. In early medieval societies, mustering resources to provide aid would be unlikely when such resources were scarce. Exploitation of another's loss or vulnerability, however, requires few resources, and thus might provide indirect information on impact.

Stepping farther away from the immediate, impact may also be measured in broader evolutions such as shifts in economies, cultural practices, laws, or religion when these can be firmly attributed to the disaster. The analytical danger here, however, is the increasingly murky connection the greater the gap in location and time as other events intervene and possibly even crowd out the disaster's impact.

The intricacies of these issues are illustrated by an examination of three disasters bordering the Early Middle Ages: the AD 79 eruption of Mt. Vesuvius, the AD 1348 Black Death as it affected England generally and Yorkshire specifically, and the hypothetical result of the AD 536 Mediterranean Dust Cloud.

1.3.1 Exploring Issues of Location and Time: The AD 79 Eruption of Vesuvius

Around one p.m. on 24 August AD 79, Pliny the Younger began to witness the eruption of Mount Vesuvius.⁶⁹ In less than twenty-four hours, the eruption's tephra and dust had not only buried the cities of Herculaneum and Pompeii but also destroyed nearby cities such as Stabiae and many surrounding villas and villages.⁷⁰ This eruption clearly had an impact. But what type of impact, where did the impact occur, and how long did this impact last? The immediate physical impact was substantial, likely costing thousands of lives. The refugee crisis strained nearby cities, as evidenced by the naming of a district in Naples after Herculaneum refugees.⁷¹ The geographic reach of the destructive pyroclastic flow and ash-fall was extensive, as shown in Figure 1-1 below, but other areas were also damaged.⁷²

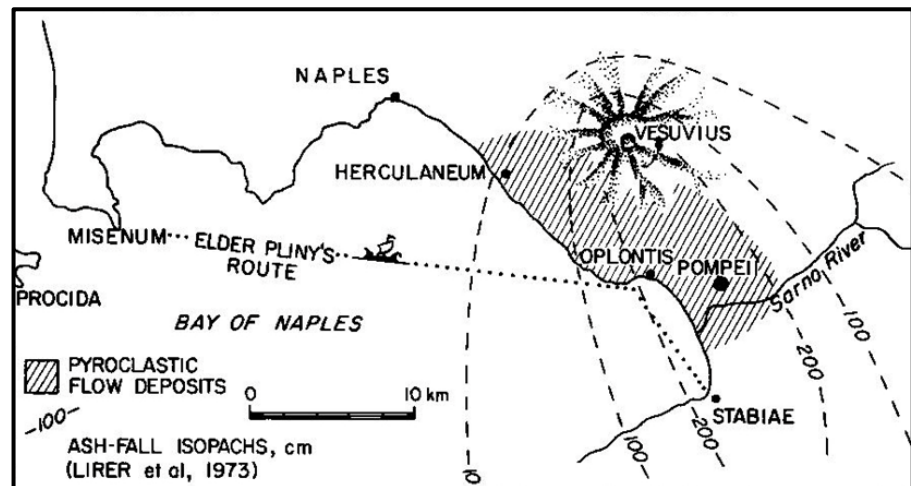
⁶⁹ Lisetta Giacomelli et al., "The eruption of Vesuvius of 79 AD and its impact on human environment in Pompei," *Episodes*, 26, no. 3 (2003): 234.

⁷⁰ Eric Moorman, *Pompeii's Ashes: The Reception of the Cities Buried by Vesuvius in Literature, Music, and Drama* (Boston: Walter de Gruyter, 2015), 7-8.

⁷¹ Roger Ling, *Pompeii: History, Life, and Afterlife* (Stroud, Gloucestershire, UK: Tempus Publishing, 2007), 155.

⁷² Haraldur Sigurdsson, Stanford Cashdollar, and Stephen R. J. Sparks, "The Eruption of Vesuvius in AD 79: Reconstruction from Historic and Volcanological Evidence," *American Journal of Archaeology* 86, no.1 (1982): 40, Illus. 1.

Figure 1-1: Pyroclastic Flow and Ash-Fall Isopachs of Vesuvius in Sigurdsson, Cashdollar and Sparks, 1982, 40.



Thirty kilometres west, in Misenum, Pliny the Younger experienced earthquakes that climaxed shortly after dawn on 25 August when volcanic ash also fell briefly.⁷³

The immediate response was both altruistic and exploitative. Pliny's uncle, the Roman admiral Pliny the Elder, mobilized his fleet in the Bay of Naples to attempt a rescue. His route from Misenum to Stabiae appears in Figure 1-1 above. He reached Stabiae where many had fled before it was also destroyed, but his ships could not escape with the contrary wind, and he died in the attempted rescue.⁷⁴ The Roman Empire also responded with substantial altruistic relief. Emperor Titus immediately appointed ex-consuls to oversee relief, and

⁷³ Pliny, *Letters and Panegyricus, Books 1-7*, trans. Betsy Radice (Cambridge, US: Loeb Classical Library, 1969), 441-447.

⁷⁴ Pliny, *Letters*, 429-433.

he personally visited the sites soon after in AD 80.⁷⁵ Suetonius, publishing in AD 120, reported that these ex-consuls overrode the usual law and assigned to relief instead of to the Roman Empire the property and wealth of families who had died in Pompeii without heirs.⁷⁶ Cassius Dio, writing a century and a half later, stated that Titus gave “general gifts of money”.⁷⁷ In AD 80, Titus minted coins to “commemorate” the people’s attempts to appease the gods’ wrath, and inscriptions in cities such as Naples, Salerno, and Sorrento indicate he and his successors worked to rebuild much that was damaged.⁷⁸

Archaeological excavation at Pompeii also reveals an exploitative response. While Herculaneum was completely covered by twenty to twenty-five meters of ash, Pompeii received only five meters, so higher roofs were exposed.⁷⁹ People seem to have tried to salvage or loot what they could reach, as evidenced by an inscription written on the wall of one buried house reporting the house had been tunnelled.⁸⁰

⁷⁵ Ling, *Pompeii: History*, 155.

⁷⁶ C. Suetonius Tranquillus, *The Lives of the Twelve Caesars*, trans., J.C. Rolfe, vol. 1 (London: Loeb Classical Library, 1913), xii, 333.

⁷⁷ Cassius Dio, *Roman History by Cassius Dio*, trans, Earnest Cary, vol. 8 (Boston: Loeb Classical Library, 1925), 311.

⁷⁸ Allison Cooley and M.G. Cooley, *Pompeii: A Sourcebook* (New York: Routledge, 2004), 40.

⁷⁹ Sigurdsson, Cashdollar, and Sparks, “The Eruption of Vesuvius,” 41.

⁸⁰ Cooley and Cooley, *Pompeii*, 40.

Though it is possible the home's owner was the tunneller so there was no theft involved, one cannot be so optimistic about the bronze statues in the city forum. By the time archaeologists reached the forum, the statues had disappeared.⁸¹

If the impact of the Vesuvius eruption is defined by these measures—the substantial number of casualties, the dislocated people, and the apparent urgency and focus of the Empire to rebuild, then the evidence suggests that the Vesuvius disaster had a significant harmful impact on surrounding communities, even wiping Pompeii off the map. But what if the location of potential impact is enlarged to include the entire Roman Empire?

Rome, a city with no port, was a little over 200 kilometres north of Pompeii and the Bay of Naples. See Figure 1-2 below.⁸²

⁸¹ Ling, *Pompeii: History*, 155.

⁸² Wilhelmina Feemster Jashemski, "Pompeii: Ancient City," in *Encyclopedia Britannica*, accessed 3 March 2018, <https://www.britannica.com/place/Pompeii>. Map available <https://cdn.britannica.com/s:700x450/52/19752-004-F056403C.jpg>.

Figure 1-2: The Relationship of Rome to Pompeii in Jashemski, 2008



Thus, cities such as Pompeii were central to Rome's economy as excellent ports for trade in slavery and foodstuffs.⁸³

Pompeii's destruction would have meant a successful port was lost. Furthermore, much of the Nuceria–Stabiae road that began in Naples was damaged or destroyed so merchants travelling from that region would have more difficulty reaching Rome.⁸⁴ But to what extent did this loss impact the Roman Empire as a whole?

Though some have argued that other markets may have exploited the disaster in their competition with Rome—Arwin Scarth, for example, suggests that in the years immediately

⁸³ Cedric A. Yeo, "The Economics of Roman and American Slavery," *FinanzArchiv / Public Finance Analysis, New Series*, Bd. 13, H. 3, (1951/52): 445.

⁸⁴ Domenico Camardo, "Herculaneum from the AD 79 Eruption to the Medieval Period: Analysis of the Documentary, Iconographic and Archaeological Sources, with New Data on the Beginning of Exploration at the Ancient Town," *Papers of the British School at Rome* 81 (2013): 305.

following, the merchants of Gaul might have exploited the disaster to become more significant and dominating—Peter Temin contends that “the Roman economy of the first and second centuries CE was integrated enough for areas around the transportation network in the Mediterranean Sea to exploit their comparative advantages”, and so Roman merchants adapted.⁸⁵ They were able to shift their focus to other ports so that the resilient Roman economy remained highly competitive in every market, including grain, wine, and slavery. That the state treasury also suffered little is shown by the fact that although Titus provided substantial relief he was still able to complete the famed Coliseum in the next year, AD 80.⁸⁶ Furthermore, an expanded time frame reveals that while Pompeii and Herculaneum were never rebuilt, according to the contemporary poet Statius, Stabiae was fully recovered twenty years later, and by forty years later, the Empire had even rebuilt the road from Campania.⁸⁷ By all these measures, the eruption’s effect on the entire Roman Empire was minimal. Rome did not falter.

⁸⁵ Arwin Scarth, *Vesuvius: A Biography* (Harpendum, UK: Terra, 2009), 85; Peter Temin, “The Economy of the Early Roman Empire,” *Journal of Economic Perspectives* 20, no. 1 (2006): 140.

⁸⁶ Massimo Polidoro, “Myths and Secrets of the Colosseum,” *Skeptical Inquirer* 42, no. 1 (2018): 15.

⁸⁷ Statius, *Silvae: Thebaid I-IV*, trans. J.H. Mosley, vol. 1 (London: Loeb Classical Library, 1928), 201; Camardo, “Herculaneum,” 305.

These competing views of the impact of Vesuvius illustrate the need to constrain the concept of “impact”, especially in terms of geography and time. Without such constraints, the impact of a terrifying volcanic eruption fades to nothing as does the meaning of the word itself.

1.3.2 Untangling the Threads of Cause: The AD 1348 Black Death

While the Vesuvian disaster clearly affected only one region, the Black Death affected almost the whole world. It originated in Central Asia then spread steadily for fifteen years via trade networks through the Middle East before arriving in Europe, which was expecting it.⁸⁸ But what was its impact? Though people died everywhere, as shown by the Vesuvian eruption, studying too expansive a region makes the picture of impact difficult to evaluate. Solid grounding for a useful evaluation, however, is possible by limiting the territorial focus to the Black Death’s effect generally on England and specifically on Yorkshire, the second-last county in England to be hit and a place where the plague lasted especially long, ending in Meaux Abbey in August 1349.⁸⁹

⁸⁸ Horrox, *Black Death*, 9, 45. See also the two influential maps by Carpentier and Buchholtz as presented by David Mengel in “A Plague on Bohemia? Mapping the Black Death,” *Past and Present* 211 (2011): 4, 6.

⁸⁹ Horrox, *Black Death*, 10.

In the summer of 1348, the Black Death arrived in England through Dorset.⁹⁰ It grew into a “pestilence [that] held such sway in England . . . there were hardly enough people left alive to bury the dead.”⁹¹ Thus, the first measure of impact, the death toll, was enormous. A reliable percentage of the overall deaths in England is difficult to determine, but the estimate in 2016 was between forty percent and sixty percent of the English population, or roughly one in two.⁹² These extreme numbers are borne out by more focused evidence from Yorkshire, where it arrived around 26 May 1349 and raged for two months until 25 July 1349.⁹³

While there is no specific record of a mortality rate, the evidence suggests it was immense. In Meaux Abbey in East

⁹⁰ The accounts of monks differ on whether the disease arrived in England in late June or early August. The Benedictine monk Ranulf Higden of St. Werburgh’s monastery records its arrival in late June. Ranulf Higden, *Polychronicon Radulphi Higden Monachi Cestrensis*, 9 vols., eds. C. Babington and J. R. Lumby, Rolls Series, Vol. 8 (1865-86), cited in Horrox, *Black Death*, 62. An unknown monk in Malmsbury Abbey records its arrival in early July. F. S. Haydon, ed., *Eulogium Historiarum sive Temporis*, 3 vols., Rolls Series, Vol. 3 (1858-63), cited in Horrox, *Black Death*, 63. Finally, the Franciscans in Lynn, Norfolk, record the arrival in early August. Antonia Gransden, ed., “A Fourteenth-Century Chronicle from the Grey Friars at Lynn,” *English Historical Review* 72 (1957), cited in Horrox, *Black Death*, 64.

⁹¹ This statement was made by monk Thomas Burton of Meaux Abbey. E. A. Bond, ed., *Chronica Monasterii de Melsa*, 3 vols., Rolls Series, Vol. 3 (1866-68), cited in Horrox, *Black Death*, 69.

⁹² Carenza Lewis, “Disaster recovery: new archaeological evidence for the long-term impact of the ‘calamitous’ fourteenth century,” *Antiquity* 90, no. 351 (2006): 778.

⁹³ E. M. Thompson, ed., *Robertus de Avesbury de Gestis Mirabilibus Regis Edwardi Tertii*, Rolls Series, (1889), cited in Horrox, *Black Death*, 64-65; J. Raine, ed., *Historians of the Church of York*, 3 vols., Rolls Series, Vol. 2, (1879-94), cited in Horrox, *Black Death*, 65.

Riding, Brother, and later Abbot, Thomas Burton records that the abbey originally housed one abbot, forty-two monks, and seven lay brothers before the plague, but only ten monks survived.⁹⁴ With contagious diseases spreading more rapidly in closed environments, the plague probably had a greater death toll on the abbey than in Yorkshire as a whole, but Yorkshire's legal records of property rent and church tithes also provide evidence of a massive death toll. During the plague, rent and tithes declined a third, suggesting a comparable decline in the able adult population.⁹⁵ Children and the elderly, who would have also been greatly affected but did not pay rent or church tithes, are not included in this figure. These two facts combined support a general mortality rate of forty to sixty percent.⁹⁶ Measuring the impact of the Black Death by death toll thus suggests that, indeed, the impact of the Black Death was enormous in England and in Yorkshire. But this measurement technique, while temptingly straightforward, does not provide a full picture of the disaster's economic, political, or social impact. So, how did the Black Death impact Yorkshire and England on these fronts?

⁹⁴ Bond, *Chronica Monasterii de Melsa*, 68, cited in Horrox, *Black Death*, 68.

⁹⁵ Public Record Office, Chancery inquisitions miscellaneous, C 145/164/8., cited in Horrox, *Black Death*, 293.

⁹⁶ Public Record Office, Chancery inquisitions miscellaneous, C 145/164/8., cited in Horrox, *Black Death*, 293.

As with Rome's, England's economy does not seem to have been impacted substantially. Focusing on the city of York is illustrative. York was already the centre of the northern wool trade and seems to have continued as such.⁹⁷ Moreover, the two *York Memorandum* books which record the York City Ordinances between 1376 and 1419 reference the plague only once—in regard to “pynnercraft,” making pins and nails—and the reference is only to earlier ordinances regarding pynners during the Black Death.⁹⁸ Therefore, with the scarcity of evidence, the Black Death's impact on York's economy cannot be considered substantial, making an economic measure of impact contrast sharply with the mortality rate.

Another hypothetical measure of societal impact might be the Black Death's grip on the literary imagination. Geoffrey Chaucer, who lived through the disease, did not catastrophise it in his writings. He refers to it prominently only once in *The Canterbury Tales* within the “Pardoner's Tale”.⁹⁹ The Pardoner specifically sets his tale during the plague, yet his subject is not

⁹⁷ Maud Seller, ed., *York Memorandum Book Part II: 1388-1493* (Ontario, CA: TannerRichie, 2014), ii.

⁹⁸ Maud Seller, ed., *York Memorandum Book Part I: 1379-1419* (Ontario, CA: TannerRichie, 2014), 88.

⁹⁹ David Raybin, “Chaucer as a London Poet: A Review Essay,” *Essays in Medieval Studies* 24 (2007): 25.

the horror of the many deaths but the sinful decadent rioters who survived.¹⁰⁰

In another measure of the Black Death's societal impact, it appears at first to have spurred certain legal or political changes. The loss of approximately half of the population reduced the pool of England's labourers. This gave surviving peasants and serfs a window of opportunity to call for more economic freedom, and indeed, they demanded higher wages. In response, King Edward III issued two decrees attempting to freeze wages: one in 1348 during the spread of the Black Death and another in 1351 immediately after it had passed. Both attempts failed.¹⁰¹ This failure is linked to what has been described as a major social impact of the Black Death in England: a shift in the status of peasants and a loosening of the feudal system.

Indeed, in 1361, ten years after the plague had passed, the king and Parliament were still wrestling with peasant demands and increased the punishment for disobeying wage laws from fines to imprisonment.¹⁰² In 1381, thirty years after

¹⁰⁰ Peter G. Beidler, "The Plague and Chaucer's Pardoner," *Chaucer Review* 16, no. 3 (1982): 257, 259.

¹⁰¹ Albert Beebe White and Wallace Notestein, eds., "Statute of Laborers, 1351" in *Source Problems in English History* (New York: Harper and Brother, 1915), *Internet History Sourcebooks*, accessed 5 February 2018, <https://sourcebooks.fordham.edu/seth/statute-labourers.asp>.

¹⁰² Samuel Cohn, "After the Black Death: Labour Legislation and Attitudes towards Labour in Late-Medieval Western Europe," *Economic History Review* 60, no. 3 (2007): 476.

the first plague had passed, the peasants revolted and again demanded more economic freedom.¹⁰³ They marched to London, and only the intervention of King Richard I stopped and eventually quelled the revolt.¹⁰⁴ More restrictive decrees came in 1388, 1390, and 1408, all harsh on idle able men—beggars and transient workers.¹⁰⁵ These decrees, harsh and restrictive as they were on serfs, were *also* harsh and restrictive on the nobility, putting *them* more firmly under the king and Parliament's control. And, paradoxically, these restrictive laws ultimately granted serfs more freedom. They could flee their lords and chasing them would be so troublesome the lords would compel other fleeing serfs into service. Thus, serfs could begin to choose their lords, furthering the decline of serfdom.¹⁰⁶

A broad definition of impact might reach as far as these changes. But the impact of a disaster must, logically, be caused by it. David Hume pointed out in the eighteenth century that the concept of "causation" is based solely on human experience of the world. To say one distinct event caused another is ultimately an exercise of assumptions made from human

¹⁰³ Judith M. Bennett, "Compulsory Service in Late Medieval England," *Past and Present* 209, no. 1 (2010): 23.

¹⁰⁴ Mark Seen, "English Life and Law in the Time of the Black Death," *Real Property, Probate and Trust Journal* 38, no. 3 (2003): 580-581.

¹⁰⁵ Cohn, "After the Black Death," 476.

¹⁰⁶ Bennett, "Compulsory Service in Late Medieval England," 25-26.

experience and could be incorrect.¹⁰⁷ Therefore, to establish a sound hypothesis that one event caused another requires a strong correlation between the two events. That correlation necessarily weakens when there are many possible causes for the same event. Given the numerous crises in England and York that preceded the Black Death, it is questionable how many of these social changes, new demands, and restrictions can be attributed directly to the Black Death as opposed to other causes.

Before the Black Death arrived, England had already suffered a substantial population decline. From 1314 to 1320, many floods and harvest failures led to the Great Famine in Northern Europe, a famine resulting in an estimated mortality of ten to fifteen percent of the population.¹⁰⁸ From 1319 until 1330, a cattle plague also ravaged England. Between 1319 and 1320 it is estimated to have killed around sixty-two percent of the cattle population, after which it resurfaced in lesser outbreaks until 1330.¹⁰⁹ Although the resultant mortality of people from the

¹⁰⁷ David Hume, *An Enquiry concerning Human Understanding*, ed. Tom L. Beauchamp, The Clarendon Edition of the Works of David Hume (Oxford: Oxford University Press, 2014), 25-27.

¹⁰⁸ Phillip Slavin, "The Crisis of the Fourteenth Century Reassessed: Between Ecology and Institutions Evidence from England (1310-1350)," (Paper, Annual Meeting of the Economic History Association, 2010), 1, <https://pdfs.semanticscholar.org/145a/d268b00c85e429815e85e44f6fb0ac698e1e.pdf>.

¹⁰⁹ Phillip Slavin, "The Great Bovine Pestilence and its economic and environmental consequences in England and Wales, 1318-50," *Economic*

lack of cattle cannot be measured, it must have devastated the population. Gentry could buy grain and cattle during the famine and cattle plague, but peasants and serfs went hungry.¹¹⁰ By the time the Black Death swept through England, therefore, the population had already been living under the stress of flood, famine, and plague for a full generation. The resulting increased demand for the fewer peasants had already given peasants more economic and social power. The even greater mortalities from the plague increased the bargaining power of the surviving peasants, but rather than being the cause of the subsequent developments it may have been merely an accelerant.

Therefore, the question remains: what was the Black Death's impact on England? If "impact" is defined only in physical terms as the mortality rate, the impact was substantial. Furthermore, Edward III's efforts to control wages during the immediate crisis seem to show that peasants exploited the Black Death's mortality rate to demand more economic power and higher wages, suggesting that its immediate social impact was also significant. On the other hand, if "impact" is defined

History Review 65, no. 4 (2012): 1242, 1249. Although the first year of rinderpest was of course the most devastating, Bruce Campbell has calculated that by 1339 the outbreaks had reduced the cattle population by a further 26%. Bruce Campbell, *The Great Transition: Climate, Disease and Society in the Late-Medieval World*, (Cambridge: Cambridge University Press, 2016), 224.

¹¹⁰ Slavin, "Crisis of the Fourteenth Century Reassessed," 2.

more broadly to include the new economic power peasants gained or the fact that serfdom in England had effectively ended by 1400, the impact of the Black Death itself is so tightly interwoven with all the other crises that affected Yorkshire and England earlier in the same century that it becomes indistinguishable—and meaningless—once again illustrating the need for limits on the concept of impact.

1.3.3 Probing the Risk of Over-Speculation: The AD 536 Dust Cloud

The Black Death disaster exemplifies the problem of multiple potential causes for broadly defined impacts even within a relatively constrained location and timespan. The causal connection becomes even more attenuated when the location expands to include a continent and the time increases to include a century or more. The AD 536 Dust Cloud illustrates these associated risks.

Immediately before the Early Middle Ages, a global natural phenomenon occurred. Based on descriptions by Chinese and Byzantine authors, it was a “darkness” or winter caused by dust probably produced by a volcanic eruption or comet.¹¹¹ The Dust Cloud appears to have been experienced

¹¹¹ Antti Arjava, “The Mystery Cloud of 536 CE in the Mediterranean Sources,” *Dumbarton Oaks Papers* 59 (2005): 77-78, citing F. J. Hamilton and E. W. Brooks, trans., *The Syriac Chronicle Known as that of Zachariah of Mitylene* (London: Methuen, 1899), 267.

throughout the northern hemisphere. In Asia, Chinese writers recorded that they could not see the North Star and the temperature was very cold.¹¹² Procopius, the contemporary Byzantine historian serving under the general Belisarius, writes in *The History of the Wars under Justinian* that the “sun gave forth its light without brightness . . . it seemed exceedingly like the sun in eclipse, for the beams it shed were not clear nor such as it is accustomed to shed.”¹¹³ John Lydos, a palace administrator under Justinian, adds that the cloud was “moist”.¹¹⁴ Cassiodorus, a contemporary Byzantine statesman, states: “The Sun, first of stars, seems to have lost his wonted light, and appears of a bluish colour.” He also describes the moon losing its light and adds, “We have had a winter without storms, a spring without mildness, and a summer without heat.” He finally describes this cloud as “a hide across the sky” and visible in cloudy weather.¹¹⁵ Finally, Michael the Syrian, a twelfth century bishop, “probably quoting faithfully from John of

¹¹² Arjava, “Mystery Cloud,” 82.

¹¹³ Procopius. *Procopius, with an English Translation by H.B. Dewing in Six Volumes: History of the Wars Books I and II: Vol. 2*, H.B. Dewing trans., (London, William Heinemann, 1914), 329.

¹¹⁴ Arjava, “Mystery Cloud,” 80.

¹¹⁵ Cassiodorus, *The Letters of Cassiodorus: Being a Condensed Translation of the *Variae Epistolae* of Magnus Aurelius Cassiodorus Senator*, trans. Thomas Hodgkin (London: Henry Frowde, 1886), 518-519.

Ephesos, an ecclesiastical historian of the sixth century,” claims that the dust veil lasted eighteen months.¹¹⁶

None of these authors describe a human impact that would qualify it as a natural disaster. In fact, Gregory of Tours, writing a history of the world in the later sixth century, does not mention it.¹¹⁷ Nevertheless, many scholars have treated the Dust Cloud as a natural disaster with some proposing it caused substantial human deaths as well as much subsequent social change.

Prominent among these scholars is David Keys, who has claimed that the AD 536 Dust Cloud was a major contributor to the spread and severity of the AD 541 Justinian Plague and consequently was the spur behind many social changes. His argument that the cloud helped create the plague is grounded on the theory that a dust cloud “without storms” would have created a “dry fog”, which would result in a drought.¹¹⁸ In the rainfall following this hypothetical drought, plague rodents in East Africa would reproduce at an abundant rate. Then through the established trade routes, they would have spread the disease, ultimately to Europe. And so, the Dust Cloud created

¹¹⁶ Arjavia, “Mystery Cloud,” 78.

¹¹⁷ Arjavia, “Mystery Cloud,” 83.

¹¹⁸ Keys, *Catastrophe*, 18-19.

the plague, which devastated Europe and changed the world.¹¹⁹

However, not only does Keys' conclusion rest on a single, potentially faulty fact but it also does not consider many intervening factors. First, if Lydos is correct that the dust was "moist", the assumption of a drought and an end-of-drought explosion in the plague rat population is faulty. But even if the fog was "dry", Richard Strothers notes that the time gap between the fog and the plague is lengthy and, more importantly, calculates the mathematical improbabilities of Keys' hypothetical causation string:

The chance occurrence of such extreme events only 1 to 5 years after the appearance of a great Mediterranean dry fog (itself an extreme event) is a very unlikely coincidence . . . the odds can be roughly estimated as $(5 \text{ yr}/100 \text{ yr})^6 \sim 10^{-8}$.¹²⁰

Strothers thus argues that the chances that the dust veil caused the Justinian plague are so unlikely that one could not be the result of the other.¹²¹

Major political changes have also been attributed to this Dust Cloud. For example, Keys contends that it began the Slavic invasion of Eastern Rome. He argues the cloud caused a

¹¹⁹ Keys, *Catastrophe*, 18-19.

¹²⁰ Richard Strothers, "Volcanic Dry Fogs, Climate Cooling, and Plague Pandemics in Europe and the Middle East," *Climatic Change* 42 (1999): 720.

¹²¹ Strothers, "Volcanic Dry Fogs," 720.

famine among the Slavic tribes and destabilised the remaining Eastern Roman Empire, thus providing both a motivation and a window of opportunity for the tribes to begin their invasion of Byzantium.¹²² The first successful raids then motivated Slavic tribes to expand into the Empire.¹²³

This theory does not consider other factors, such as the timing of the Slavic invasions, the nature of the first Slavic raids, and their political and military context. J. Liebeschuetz claims that extensive Slavic attacks against Byzantium might have begun in the AD 520s.¹²⁴ Though this claim has been contested, the date of the beginning of the Slavic raids is more ambiguous than Keys allows.¹²⁵ Moreover, these raids began as annual events, suggesting the tribes initially sought plunder, not fertile land to ameliorate Keys' hypothetical famine.¹²⁶ These annual Slavic raids only became full-scale migrations, or "invasions", in the late AD 570s, decades after the Dust

¹²² Keys, *Catastrophe*, 34.

¹²³ Keys, *Catastrophe*, 34.

¹²⁴ J.H.W.G. Liebeschuetz, "The Lower Danube under Pressure," in *The Transition to Late Antiquity: On the Danube and Beyond*, ed A.G. Poulter (Oxford: Oxford University Press, 2007), 111.

¹²⁵ See, e.g., Florin Curta, "Review of *The Transition to Late Antiquity on the Danube and Beyond*, ed. A. G. Poulter (Oxford, 2007)," *The Classical Review* 59, no. 1 (2009): 228.

¹²⁶ Jelena Jarić, "The Barbarian Incursions on Macedonia in the Early Middle Ages: Defining Chronology, Geography and Factors," *Macedonian Historical Review* 1 (2010): 12.

Cloud.¹²⁷ Finally, at the time of the cloud, Justinian had begun his attempt to reconquer the Western Roman Empire's former territories. The vigour of his attempt not only became a major factor in bankrupting the Eastern Roman Empire, but it also left the Danube militarily weak.¹²⁸ It seems to have become easily penetrable.¹²⁹ This military weakness provided not only an opportunity but also perhaps another motive for the Slavs to attack the Danube territory. Simply put, a direct correlation between the cloud and the political change resulting from the Slavic invasions is far too tenuous to make.

Thus, though the AD 536 Dust Cloud was a major natural phenomenon observed throughout the northern hemisphere, whether it was a natural disaster is open to question because it is impossible to prove it caused substantial disruption of any society.¹³⁰ These efforts to make the

¹²⁷ Nadine Elizabeth Korte, "Procopius' Portrayal Of Theodora In The Secret History: 'Her Charity Was Universal,'" *Hirundo: The McGill Journal Of Classical Studies* 3, (2004): 111; John Van Antwerp Fine, Jr., *The Early Medieval Balkans: A Critical Survey from the Sixth to the Late Twelfth Century* (Ann Arbor, US: University of Michigan Press, 1991), 29.

¹²⁸ Fine, *Early Medieval Balkans*, 22-24; Jarić, "Barbarian Incursions," 12.

¹²⁹ Liebeschuetz, "Lower Danube under Pressure," 112.

¹³⁰ David Keys is not the only person recently to attempt attributing much to this disaster. Bo Graslund and Neil Price in "Twilight of the Gods" and in "Excavating the Fimbulwinter" have attempted to link this disaster to major social change within Scandinavia and have suggested it may even be the source of the legend of the Nordic Apocalypse's Fimbulwinter. Bo Graslund and Neil Price "Twilight of the gods? The 'dust veil event' of AD 536 in critical perspective," *Antiquity* 86 (2012), 428-443; Bo Graslund and Neil Price, "Excavating the Fimbulwinter: Archaeology, geomorphology and the climate event(s) of AD 536," 109-132 in *Past Vulnerability: Volcanic Eruptions and Human Vulnerability in Traditional Societies Past and Present*, ed. Felix Riede (Aarhus, DK: Aarhus University Press, 2015).

connection, however, are useful to illustrate the potential pitfalls of allowing a cause analysis to proceed too far into speculation. Not constraining conclusions risks ignoring or failing to account for contrary evidence, in turn obscuring a more accurate analysis. Moreover, in the instance of the impact of natural disasters, overestimating the importance of natural events as a prime mover in human events runs the risk of underestimating human strength and agency and of adopting an overly deterministic and structured view of history.

1.3.4 Limiting the Concept of Impact

To avoid the dangers exemplified in this analysis of the Vesuvius eruption, the Black Plague, and the Dust Cloud, the concept of impact was therefore limited for purposes of this study. The initial limitations were on location and time. The examined locale was restricted to the location reported to have physically experienced the disaster or where the disaster as described would logically have physically reached. Next, the timeframe in which a natural disaster could be said to cause an impact was tightened. Lindell's "focused time" concept for a *modern* natural disaster was not useful. Questions of pre-impact and post-impact are not helpful in the Early Middle Ages when an emergency response would likely be non-existent and the recovery would be uncoordinated and slow. If crops are

lost, for example, a resulting famine would take time to develop, and recovery could not begin until at least one subsequent crop was planted and harvested. If the cattle die, other cows must be bought or born. If a plague comes, fewer working hands are available to work. Therefore, attempting to take this medieval reality into account, the timeframe a disaster can impact was set at five years to allow the damage to reveal itself but not allow enough time for intervening causes to develop.

Finally, the type of impact investigated was also restricted. After Hurricane Katrina, the responses were almost all altruistic, mitigating its impact. Evidence of an altruistic response also survives for the Vesuvian eruption. But Pompeii was also looted as were many stores in New Orleans. And while the political response to Vesuvius is unknown, Democrats unabashedly politicised President George W. Bush's response to Katrina to win power in the House and Senate in 2006.¹³¹ These exploitations of disaster are a type of impact that is visible and unambiguous and that occurs in the disaster's immediate aftermath. In the Early Middle Ages, these potentially visible impacts would include changes in power relations, eruptions of local warfare, or invasions from outside

¹³¹ Adam Nagourney, "Democrats Try to Use Katrina as G.O.P. Used 9/11," *The New York Times* (22 April 2006), accessed 7 November 2019, <https://www.nytimes.com/2006/04/22/us/22dems.html>.

forces. One particular type of potential political exploitation stands out in this time period—Viking aggression.

In the late ninth century, the Wessex king, Alfred the Great, began sponsoring *The Anglo-Saxon Chronicle* (ASC).¹³² In one of the ASC's most famous entries, the one for AD 793, the scribe records:

*Her wæron reðe forbycna cumene ofer Norþanhymbra land] þæt folc earmlice bregdon, þæt wæran ormete ligræscas,] wæran geseowene fyrene dracan on þam lyfte fleogende. Þam tacnum sona fyligde mycel **hunger**] litel æfter þam þæs ilcan geares on .vi. idus Ianuarii earmlice heðenra manna hergung adiligode Godes cyrican in Lindisfarenae, þurh reafiac] manslyht.¹³³*

While fiery dragons most likely did not fly over Northumbria, something happened that the people understood to be an omen of disaster, and indeed a double disaster struck. The annal first reports the human experience of a natural disaster, a “great famine”. It secondly reports an immediate Scandinavian aggressor’s raid. This entry makes clear that the famine preceded the attack, and there is no time gap to open questions of intervening or attenuated cause, raising the question of whether one impact of this natural disaster was the aggressors’

¹³² Swanton, ASC, 4.

¹³³ Susan Irvine, ed., *The Anglo-Saxon Chronicle: A Collaborative Edition Vol. 7, MS. E* (Cambridge: D.S. Breyer, 2004), 42 (Emphasis added). “Here terrible portents came about over the land of the Northumbrians, and miserably frightened the people; these were immense flashes of lightning, and fiery dragons were seen flying in the air. A **great famine** immediately followed those signs, and a little after that in the same year on 8 January, the raiding of heathen men miserably devastated God’s church in Lindisfarne island by looting and slaughter.” Swanton, ASC, 55-57 (Emphasis added).

purposeful exploitation of the weakened malnourished condition of the people of Lindisfarne.

A famine that weakened not only the malnourished Northumbrian population's capacity for defence but also its resolve would create an ideal situation for attack.

But was this Northumbrian aggressor alone in his exploitation of disaster? A single exploitative impact could be a coincidence, but a pattern would suggest a thread of purpose. Thus, annal entries like this provide precisely the type of data supporting a direct correlation between a natural disaster and a politically exploitative impact.

That this specific entry has been dubbed the advent of the "Viking Age" makes it even more intriguing. Though it is not clear whether this was the actual first attack by the group of Scandinavian aggressors now popularly known as "Vikings", it is the earliest clear-cut record of an attack and has been given an unofficial status by many scholars as an appropriate date for the beginning of the "Viking Age", the period lasting from approximately AD 793 to AD 1066 when Scandinavian aggressors raided and then settled throughout Europe.

The ninth century that followed this attack was also a time of major political change throughout not only the Anglo-Saxon kingdoms but also Europe as a whole, including the Carolingian Empire. Just as did *The Anglo-Saxon Chronicle*,

Carolingian annals recorded events but in the Carolingian Empire. Both *The Annals of St Bertin* (AB) and *The Annals of Xanten* (AX) note an AD 834 Scandinavian attack on the *emporium* of Dorestad as well as major flooding throughout the Empire.¹³⁴ Thus, both the AB and AX record an attack and a natural disaster around the same time, again firmly correlating a natural disaster with a Scandinavian aggressor's raid.

This tight correlation between a natural disaster and a Scandinavian aggressor's raid combined with the fact that vast amounts of written material on the Viking Age survive within England, Ireland, and the former Carolingian Empire encouraged further constraint on the concept of impact. Not only were time and place limited but in addition this particular type of political exploitation in this particular area became the primary type of impact to be studied.

1.4. Conclusion

An attack on Lindisfarne is a long way from looting after Hurricane Katrina. Yet both represent the same impulse to exploit vulnerabilities created by natural disasters. Studying this impulse as it manifested in the Early Middle Ages required not only a careful definition of the term "natural disaster" but also

¹³⁴ Janet Nelson, trans., *The Annals of St-Bertin: Ninth Century Histories*. Vol. 1. (Manchester: Manchester University Press, 1991), 30; von Simson, AX, 9.

constraints on the concept of impact. Thus for purposes of this study, a natural disaster is an event originating from natural sources that seriously disrupts a society, causes widespread losses, and exceeds a society's ability to cope immediately. A relevant impact is one which occurred within five years of the disaster within the location described as physically experiencing the disaster or where the disaster as described would logically reach. Perhaps most importantly, however, the type of impact on which this study will focus is political exploitation in the form of Scandinavian aggression. To accommodate these definitions and constraints, the basic question became: Was one impact of natural disasters in the Early Middle Ages that Scandinavian aggressors exploited them militarily? Could they have been a factor in the decision of when and where to attack? And ultimately, if the answer to this question revealed a pattern, what were the geopolitical implications of that pattern especially in terms of our understanding of the Viking Age? With this newly reframed question in hand, the next step was to examine the available written sources to find those most productive of information about both natural disasters and Scandinavian aggressions. This examination led in turn to a final narrowing of the inquiry's geographic and temporal focus.

Chapter 2. Where and When

Of course, exploring whether one impact of natural disasters was their military exploitation by Scandinavian aggressors first required gathering data. Although the written materials of Northwest Europe appeared at first to offer a rich mine of data across a wide geographic and temporal area, a closer examination revealed a more complicated picture that in turn led to narrowing the geographic focus to the Carolingian Empire. Examining the progression of Scandinavian aggressions on the Carolingian Empire then led to a contraction of the investigated time range. With the question formulated and the place and time of study settled, the investigation of whether Scandinavian aggressors took advantage of natural disasters could proceed.

2.1 Limiting Geographic Focus by Following Primary Sources

Because a disaster is an event that originates from natural sources and impacts humanity, establishing a clear body of data required that the primary source material be written material. Many different types of literature surviving from the Early Middle Ages have been studied as historical documents. For example, legal documents such as government decrees,

tax returns, or property diplomas, though not historical in their original intent, provide supporting evidence of the effect of the plague in Yorkshire.¹ The most suitable materials for this study, however, are the narrative contemporary annals and chronicles. Still, not all annals are equal because not all provide the same amount or types of data and not all are trustworthy. Therefore, the geographic focus of the inquiry had to be limited to those areas with the most useful annals.

2.1.1 Selecting the Primary Source Material

To investigate the correlation between two potentially related events, a narrative source is necessary to provide a background timeline. Examples of narrative sources include poems, hagiographies, sermons, comprehensive histories, and annals.

Narrative sources such as poems, hagiographies, sermons, and histories provide data on early medieval natural disasters, but certain factors render them of little use in establishing a clear supportable correlation. Poems may reference real events, as *Beowulf* does in recording King Hygelac's raid of Frisia, confirmed as factual by both Gregory of Tours in the *Liber Historiae Francorum* and Frisian oral tradition

as evidenced in the *Liber Monstrorum*.² Yet the author of *Beowulf* does not purport to provide an historical account, and any dates or other details would need confirmation by other texts. If such texts exist, they are the better source. If they do not exist, confirmation is not possible.

In contrast, valuable historical data, including natural disasters, is preserved in hagiographies such as Alcuin's *Vita Willibrordi Archiepiscopi Traiectensis* and sermons such as the sixth-century cleric Gildas' *De Excidio et Conquestu Britanniae*. While describing Willibrord's faith-spreading journeys, Alcuin not only provides much data on pre-Christian Frisia but also reports a natural disaster, probably a drought: "*loca circuibat maritima, in quibus aquae dulcis penuriam patiebantur*".³ Similarly, in his sermon *De Excidio et Conquestu Britanniae*, Gildas notes a famine that may have forced some Britons to surrender but may also have helped others rally to win the

² Frederick M. Biggs, "History and Fiction in the Frisian Raid," in *The Dating of Beowulf: A Reassessment*, ed. Leonard Neidorf (Woodbridge, UK: Boydell & Brewer, 2014), 140-141.

³ Alcuin, *Vita Willibrordi Archiepiscopi Traiectensis* in *Passiones Vitaeque Sanctorum Aevi Merovingici*, vol. 7, eds. B. Krusch and W. Levinson (Hannover: MGH, 1920), 129. "[He was] travelling through the coastal regions where the people were suffering from the lack of fresh water." Alcuin. "Alcuin [sic] (735-804): *The Life of Willibrord, c.796*," (New York: Fordham University Internet Medieval Source Book, 2000), in *The Anglo-Saxon Missionaries in Germany, Being the Lives of SS. Willibrord, Boniface, Leoba and Lebuin together with the Hodoepericon of St. Willibald and a selection from the correspondence of St. Boniface*, trans. C. H. Talbot (London: Sheed and Ward, 1954), <https://sourcebooks.fordham.edu/basis/Alcuin-willbrord.asp>.

siege of Baden Hill during the Anglo-Saxon invasions.⁴

Neither of these sources, however, provides specific details or names locations, rendering them useless for current purposes.⁵

Because other hagiographies and sermons are similarly imprecise, they too cannot be used.

More comprehensive historiographical works such as Gregory of Tours' *History of the Franks* and Bede's *Ecclesiastical History of the English People* also contain data on natural disasters.⁶ Gregory of Tours, for example, notes several,⁷ including the arrival of the Justinian Plague in Marseilles in AD 588 and a particularly severe winter, probably in AD 548.⁸ Bede also references natural disasters in his *Ecclesiastical History of the English People* as he details the

⁴ Gildas, "De excidio et Conquestu Britanniae" in *Scriptores: Chronica Minora Saec. iv, v, vi, vii*, vol. 3, ed. Theodor Mommsen (Hannover: MGH, 1898), 38.

⁵ Gildas, *Works*, (New York: Fordham University Internet Medieval Source Book, 1999), in *Six old English chronicles, of which two are now first translated from the monkish Latin originals*, ed. John Allen Giles (London: G. Bell, 1891), <https://sourcebooks.fordham.edu/basis/gildas-full.asp>.

⁶ Gregory of Tours, *Gregorii Episcopi Turonensis Libri Historiarum X*, eds. B. Krusch and W. Levinson (Hannover, MGH, 1951); Bede, *Ecclesiastical History: Books 1-3, Vol. I*, trans. J.E. King (Cambridge, US: Loeb Classic Library, 1930).

⁷ Gregory of Tours, *A History of the Franks*, trans. Lewis Thorpe (London: Penguin Books, 1974), 2, Kindle.

⁸ Gregory of Tours, *A History of the Franks*, 509-510; Gregory of Tours, *Gregorii Episcopi Turonensis Libri Historiarum X*, eds B. Krusch and W. Levinson (Hannover: MGH, 1951), 132.

Anglo-Saxons rise to power in what is now England.⁹ For example, Bede notes a famine that reached from Constantinople to the Britons as they fought Irish invaders shortly before Vortigern invited the Anglo-Saxons into Britannia. Bede reports that some Britons surrendered because of hunger while others, trusting in God, continued to fight and eventually routed their Irish enemies.¹⁰ While this chapter tempts an effort at correlation, the entry indicates the Irish had been plundering the Britons for many years so not only was this not an isolated battle but also the ravaging of the Irish had caused at least part of the famine. In addition, the entry is presented almost as backstory for the subsequent times of plenty, corruption, and plague. Finally, the history provides neither specific dates nor locations.

Moreover, while both Gregory and Bede give details of natural disasters their perspectives share the flaw of an overriding interest in the Christianisation of their peoples, which colours their reports and impacts their ability—or possibly desire—to provide a clear, orderly timeline. Gregory devotes a chapter to the conversion of the first Merovingian ruler, Clovis, but only a paragraph to the AD 588 Justinian plague in

⁹ Peter Hunter Blair, *An Introduction to Anglo-Saxon England*, 3rd ed. (Cambridge: Cambridge University Press, 2003), 160.

¹⁰ Bede, *Ecclesiastical History*, 64-67.

Marseilles.¹¹ Similarly, in Book 3, Chapter 17, Bede discusses an AD 653 miracle when a church wall Bishop Aidan had leaned on survived a fire that destroyed the rest of the building.¹² In the next chapter, Bede takes the reader backward almost twenty years to AD 635 to describe the reign of King Sigebert, so devout he abdicated his throne for a monastery then died in battle.¹³ Bede takes another three chapters to bring the reader back to AD 653.¹⁴

But the chief flaw of all these types of narrative evidence is that they are not systematic. Though *Beowulf* may be based in fact, it describes only a single conflict. Gildas' sermon references a famine and battle, but only one. Similarly, while Bede describes several natural disasters, neither his work nor any claims he made about his work suggest an effort to record them systematically. Therefore, though these types of narrative sources may provide information on the impact of an individual natural disaster, they cannot provide the data necessary to investigate the impact of natural disasters generally. Annals, on the other hand, do have the necessary trait of systematically recording events with more precise locations and dates.

¹¹ Gregory of Tours, *A History of the Franks*, 143-145 and 509-510.

¹² Bede, *Ecclesiastical History*, 404-413.

¹³ Bede, *Ecclesiastical History*, 412-416.

¹⁴ Bede, *Ecclesiastical History*, 429.

Annals have been written since at least the Roman Empire when the chief priest began writing the *Annales Maximi*, perhaps as far back as 400 BC given that they record an eclipse that year.¹⁵ With a seemingly straightforward account of the important events of the year, everything the author found noteworthy was included, from eclipses to corn shortages.¹⁶ These first annals ended by 130 BC.¹⁷

Like the *Annales Maximi*, medieval annals began as concise year-by-year records of events arranged chronologically within each year. In the sixth century, Irish monastic men originating in Iona began writing brief notes on events they found memorable each year.¹⁸ The original source, designated *The Chronicle of Ireland*, was followed by many annals, including *The Annals of Ulster* (AU).¹⁹ The Carolingian Empire took up the practice in the eighth century when Charlemagne sponsored the *Royal Frankish Annals* (RFA). These annals begin their narrative in AD 741 with the

¹⁵ Jackie Elliott, *Ennius and the Architecture of the Annales* (Cambridge: Cambridge University Press, 2013), 23-24.

¹⁶ Elliott, *Ennius and the Architecture of the Annales*, 28.

¹⁷ "Sources used by Roman Historians" in E.J. Wiesenberg et al., *Chronology, Encyclopædia Britannica* (Encyclopædia Britannica, Inc., 2014), accessed 26 June 2020. <https://www.britannica.com/topic/chronology/Jewish#ref523273>.

¹⁸ Roy Flechner, "The Chronicle of Ireland: Then and Now," *Early Medieval Europe* 21, no. 4 (2013): 435.

¹⁹ Flechner, "Chronicle of Ireland," 422-425.

death of Charlemagne's grandfather, Charles Martel, and stop after AD 829.²⁰ Other Carolingian annals followed, however, and provide a contemporary record of events through at least AD 901. In the late ninth century, the Anglo-Saxons continued the practice when Alfred of Wessex began the ASC. These annals contain much information on contemporary annual events during this time, the first half of the Viking Age. Thus, the annals provide the most likely source of material across these three different cultures. Unfortunately, the written records available in Ireland and England have significant problems undermining their usefulness.

2.1.2 Evaluating the AU and the ASC

Among the earliest insular sources are the Irish annals, filled with records of natural disasters and Scandinavian aggressions.²¹ These annals come from a lost original source, now labelled *The Chronicle of Ireland*.²² Among its daughter chronicles is the *Annals of Ulster* (AU), which cover Irish events

²⁰ Bernard Scholz, *Carolingian Chronicles: Royal Frankish Annals and Nithard's Histories* (Ann Arbor, US: University of Michigan Press, 1970), 37.

²¹ This information appears in Donnchadh Ó Corráin and Mavis Cournane, comps., *The Annals of Ulster* (Cork, Ireland: Corpus of Electronic Texts, 2005, 2008), 250-448. <http://celt.ucc.ie/published/G100001A/index.html>.

²² Flechner, "Chronicle of Ireland," 422-425.

from AD 431 until the later Middle Ages and mention numerous dynasties and peoples, as shown in Figure 2-1 below.²³

Figure 2-1: The Irish Territories, “[D]ynasties and peoples mentioned in [the AU]”, based in Evans, 2010, xv.



Of the Irish annals, the AU are continuous, provide the most detail and have the most information on both natural disasters and Scandinavian aggressions.²⁴

²³ Daniel McCarthy, “The Original Compilation of *The Annals of Ulster*,” *Studia Celtica* 38, no.1 (2004): 70; Nicholas Evans, *The Present and the Past in Early Irish Annals* (Woodbridge, UK: Boydell & Brewer Press, 2010), xv, Map 2.

²⁴ McCarthy, “Original Compilation of *The Annals of Ulster*,” 69.

The information on natural disasters is abundant. For example, thirty-one are recorded between AD 780 and AD 900. Many were severe, judging from details the authors added. For example, in AD 804, the authors record a “*Tonitruum ualidum*” that struck the day before St Patrick’s Day, adding that the storm killed 1,010 people and divided an island.²⁵ In AD 818, the AU record cold so severe the rivers froze.²⁶ In AD 825, a “*magna pestilentia*”, great pestilence, specifically affected the “*senioribus & pueris & infirmis*”, elders, children, and infirm.²⁷

The AU also report many Scandinavian aggressions, the first occurring a year after the Lindisfarne attack. Though some entries are vague such as the AD 794 notation that “[*o*]astatio omnium insolarum Britannie a gentilibus”,²⁸ in other entries the authors specifically name territories attacked and detail leaders, number of deaths, or involved communities. For example, in AD 806, “*Familia lae occisa est a gentilibus, id est .lxiii*”.²⁹ The most common type of entry, however, is represented by the seemingly more deadly attack detailed in AD 827 when a

²⁵ Ó Corráin and Cournane, AU, 260-261.

²⁶ Pádraig Bambury and Stephen Beechinor, comps., *The Annals of Ulster* (Cork, Ireland: Corpus of Electronic Texts, 2000), 275. <https://celt.ucc.ie/published/T100001A/index.html>.

²⁷ Ó Corráin and Cournane, AU, 282-283.

²⁸ Ó Corráin and Cournane, AU, 250. “Devastation of all the islands of Britain by heathens”. Bambury and Beechinor, AU, 251.

²⁹ Ó Corráin and Cournane, AU, 262. “The community of Í, to the number of sixty-eight, was killed by the heathens.” Bambury and Beechinor, AU, 263.

“Coscradh dunaidh Laighen do gentibh ubi ceciderunt Conall m. Con Congalt, rex na Fortuath, & alii innumirabiles”.³⁰ A final example of the precise detail given by the authors of the annals appears in the record of AD 848 when the Irish won a victory: *“Bellum re n-Olcobur, ri Muman, & re Lorggan m. Cellaig co Laighniu for gennti ecc Sciath Nechtain in quo ceciderunt Tomrair erell, tanise righ Laithlinne. . . & da cet dec imbi”*.³¹

These examples suggest the AU would be a good data source for investigating a possible correlation. However, several historiographical problems defeat their usefulness, beginning with an internal dating error. As Daniel McCarthy explains, between AD 612 and AD 663, the contemporary scribe left out one “kalend”, the designator indicating the beginning of a year. Therefore, every recorded year after this omission is inaccurate by one year. When later scribes attempted unsuccessfully to correct the error, they probably compounded it.³² Therefore, correlating events within the annals themselves is difficult, and correlating events described

³⁰ Ó Corráin and Cournane, AU, 284. “[The] encampment of the Laigin was overwhelmed by the heathens, and Conall son of Cú Chongalt, king of the Fortuatha, and countless others fell there.” Bambury and Beechinor, AU, 285.

³¹ Ó Corráin and Cournane, AU, 306. “Ólchobor, king of Mumu, and Lorcán son of Cellach, with the Laigin, won a battle against the heathens at Sciath Nechtain, in which fell the jarl Tomrair, tanist of the king of Lochlann, and two hundred about him.” Bambury and Beechinor, AU, 307.

³² Daniel McCarthy, “The Chronological Apparatus of the Annals of Ulster AD 82-1019,” *Peritia* 16 (2002): 282.

in these annals with events described in other sources is almost unmanageable except in circumstances like a papal death.

The second historiographical problem is that after AD 740, the annals suffer from three important unknowns: where they were written, the method by which the authors received the data, and the identities of the authors.³³ Authorial identity and bias impact the decision of what events to record as well as how they are recorded. With no knowledge of who the authors were or their circumstances, this bias cannot be evaluated.

A final historiographic concern regarding the AU might at first seem counterintuitive. While the annals indeed record numerous natural disasters, they also record so many Scandinavian aggressions that establishing a one-to-one correlation is impossible. For example, bracketing out the

³³ Although the origin of the annals can be traced reliably to Iona, so far the location of its composition from AD 740 through the ninth century has not been satisfactorily determined though there has been speculation. Because of the frequent mentions of the Irish monastery of Clonmacnoise and the middle regions of Ireland, Daniel McCarthy has proposed a continuation at that monastery from c. AD 753 through c. AD 1227. McCarthy, *The Irish Annals: Their Genesis, Evolution, and Bibliography*, 171. In contrast, T.M. Edward-Charles and Nicholas Evans have noted that after AD 740, the main geographic areas referenced are Brega and Armagh, supporting the theory, Evans argues, that the author was in these counties, not the Clonmacnoise monastery, which is more west towards the centre of Ireland in what is now the county of Offaly. Charles-Edwards, *The Chronicle of Ireland*, 7; Evans, *The Present and the Past in Early Irish Annals*, 20, 26. Regardless of whether either view is right, no one is sure, and because the authors' locations are unknown, how they received their information is also unknown. If they received information at third or fourth or fifth hand, the information would not be reliable. Finally, the authors' identities are also unknown. When the annals were written in Iona, the authors were probably ecclesiastical members of that monastery, and if the manuscript was continued in Clonmacnoise, the later authors would probably be clergy there. However, if they were written in Brega or Armagh or elsewhere, their identities are completely unknown.

dating issue, both the renewed intensity of attacks in AD 823 through AD 824 after an AD 822 severe cold that froze rivers and the sheer number of aggressions in AD 825 during a plague and famine could indicate these natural disasters factored in the decision of when and where to attack.³⁴ The same analysis might apply to the next natural disaster in the winter of AD 848, and indeed an attack happened that year.³⁵ However, in the twenty-three years between these natural disasters and subsequent aggressions, the annals report Scandinavian aggressions in every year from AD 831 to AD 843.³⁶ Simply put, the number of reported Scandinavian aggressions without clearly occurring unusual natural conditions makes any correlation tenuous. Hence, despite the wealth of detail provided in the AU, the historiographic problems make them unsuitable for examining a potential correlation between natural disasters and Scandinavian aggression.

In the Anglo-Saxon kingdoms, several native sources provide historical information. The letters of Alcuin of York and the Mercian royal diplomas provide insight into the period when

³⁴ Bambury and Beechinor, AU, 279-283.

³⁵ Bambury and Beechinor. AU, 307-308.

³⁶ Bambury and Beechinor, AU, 287-301.

Mercia was the hegemon of the Anglo-Saxon kingdoms,³⁷

shown in Figure 2-2 below.³⁸

Figure 2-2: The Anglo-Saxon Kingdoms c. 800 by Ionita, edmaps.com, 2006.



Mercia lost its hegemonic status in AD 825 after its defeat by Egbert of Wessex at the Battle of Ellendun.³⁹ This paved the way for the rise, approximately fifty years later, of King Alfred and thus the composition of another major source of

³⁷ Michelle P. Brown and Carol Ann Farr, "Introduction: Mercia, a Culture in Context" in *Mercia: An Anglo-Saxon Kingdom in Europe*, eds. Michelle P. Brown and Carol Ann Farr (London: Leicester University Press, 2001), 1-2.

³⁸ H.R. Loyn, *Anglo-Saxon England and the Norman Conquest*, 2nd ed. (New York: Routledge, 1991), 5; Cristian Ionita, "British History: The Anglo-Saxon Kingdoms, ca. 800," (Edmaps.com: A Canadian View, 2006), accessed 14 August 2020, https://edmaps.com/html/anglo-saxon_kingdoms__ca_800.html.

³⁹ Keynes, "Mercia and Wessex in the Ninth Century," 313.

information, Asser's *The Life of King Alfred*.⁴⁰ King Alfred's rise also led to the writing of the primary source of information about the period, the ASC. Because the oldest version of the ASC, the Winchester Manuscript, seems to have been begun no later than AD 892, the chronicle can be dated as beginning, at the latest, ninety-nine years after the Lindisfarne raid.⁴¹ It was then written and disseminated by scribes directly under the control of Alfred the Great.⁴² This collection of written sources provides the systematic information of a collection of annals plus the comparative information of other contemporary sources. However, problems abound.

The first problem is that the only source that records any natural disasters is the ASC; not one of the royal diplomas nor the letters nor Asser's *Life of Alfred* records any. Yet the ASC records only two between AD 780 and AD 900, one of which was not a true natural disaster. The first was the famine recorded with the AD 793 Lindisfarne attack. The second was the famine a Scandinavian army suffered while under siege in a fortress in Buttington in AD 894. This famine, however, was

⁴⁰ Simon Keynes and Michael Lapidge, "Introduction," in *Alfred the Great: Asser's Life of King Alfred and other Contemporary Sources*, eds. and trans. Simon Keynes and Michael Lapidge (London: Penguin Classics, 1983), 51-53.

⁴¹ Swanton, ASC, xxi-xxii.

⁴² David Pratt, *The Political Thought of King Alfred the Great* (Cambridge: Cambridge University Press, 2007), 180.

likely manmade due to the siege.⁴³ That these Anglo-Saxon kingdoms escaped any type of natural disaster for 100 years seems extremely unlikely, especially given the many disasters recorded in the AU. At least some of the Irish natural disasters would likely have extended to the nearby Anglo-Saxon kingdoms, for example, the *scamach* scourges of AD 783 and AD 786⁴⁴ and a snowfall on 29 April AD 789, suggesting the winter in Ireland was long and cold.⁴⁵ Studying the impact of natural disasters is impossible if there is no record of any. Moreover, the total absence of natural disaster notations calls into question the reliability of the ASC, especially since it is similarly reticent about Scandinavian aggressions.

The ASC report two Scandinavian aggressions in the late eighth century, the events at Lindisfarne in AD 793 and an earlier AD 787 incident generally considered the Anglo-Saxon

⁴³ Swanton, ASC, 87.

⁴⁴ Bambury and Beechinor, AU, 239 and 243. Modern scientists believe *scamach* was influenzal pneumonia, which is highly contagious. C. Crawford, "Disease and Illness in Medieval Ireland," (PhD. Thesis, National University of Ireland, 2011), 212, <https://mural.maynoothuniversity.ie/3573/1/CrawfordPhD.pdf>.

⁴⁵ Bambury and Beechinor, AU, 245. Dendrochronological scientific data supports the AU's report of an especially cold spring that year with the temperature beginning to drop after AD 789. Francis Ludlow, "Tree Ring Chronology of Meteorological Extremes for Ireland, AD 425-1650," *The Irish Meteorological Society Newsletter* 5 (2011): 58. With both written and scientific evidence suggesting the winter was cold in Ireland and only the Irish Sea separating the Irish kingdoms from what-is-now England, it seems likely the weather affecting one island would affect the other.

kingdoms' first Scandinavian encounter.⁴⁶ The Petersborough

Manuscript reports:

Her nam Breohtric cining Offan dohter Eadburge.] on his dagan comon ærest .iii. scipu Norðmanna of Herðalande;] þæ se gerefa þærto rad,] he wolde drifan to ðes cininges tune þy he nyste hwæt hi wæron,] hine man ofsloh þa; ðæ wæron þa erestan scipu deniscra manna þe Angelcynnes land gesohton.⁴⁷

All that is clear from this report is that “Danish” men had a confrontation with the reeve, leaving open the question of whether it was a planned raid.

In contrast to this spare description, the ASC describe the Lindisfarne attack in detail that suggests a planned attack. As the first attack on a Christian centre, many prominent Christian leaders reacted in horror, as Alcuin shows in his four letters describing the raid.⁴⁸ Not surprisingly, therefore, the ASC gave it much fanfare. If one relied solely on the ASC, however, one might conclude that the terror from Scandinavian aggressors ceased after a second raid in AD 794 and did not

⁴⁶ The event is also sometimes dated to AD 789. Swanton, ASC, 55.

⁴⁷ Irvine, ASC, 50. “Here Beohtric took as wife King Offa’s daughter Eadburh, and in his days there came for the first time 3 ships of Northmen from Hordaland; and then the reeve rode there and wanted to compel them to go to the king’s town because he did not know what they were; and then they killed him. These were the first ships of the Danish men that sought out the land of the English race.” Swanton, ASC, 55.

⁴⁸ One letter was to the then king of Northumbria, King Ethelred. Another was to the bishop and monks of Lindisfarne, a third to the monks of Jarrow, and a final to the monks of Hexham. G.F. Browne, *Alcuin of York: Lectures Delivered in the Cathedral Church of Bristol in 1907* (London: Society for Promoting Christian Knowledge, 1908), 122.

resume until AD 832/835 when raiders overran the Island of Sheppey.⁴⁹

Asser's *Life of King Alfred* is similarly incomplete. Asser begins recording battles against Scandinavian aggressors in AD 851, two years after Alfred was born and fifty-eight years after the attack on Lindisfarne.⁵⁰ Later battles are included and sometimes Asser describes them in more detail than the ASC, but the ASC is his source material until AD 887.⁵¹

However, six royal Mercian diplomas written between AD 792 and AD 822 show that Scandinavian aggressors ran rampant in at least one Anglo-Saxon kingdom,⁵² and that in fact, assaults on Kent were common.⁵³ In s160, King Coenwulf of Mercia and King Cuthred of Kent joined together in AD 804 to grant land at Canterbury to the Abbess Selethryth to serve "*ad necessitatis refugium*" against an encircling enemy.⁵⁴ Later land grants refer to a pagan camp situated in Kent⁵⁵,

⁴⁹ Swanton, ASC, 63.

⁵⁰ Keynes and Lapidge, *Alfred the Great*, 68

⁵¹ Keynes and Lapidge, *Alfred the Great*, 55.

⁵² Downham, "The Vikings in England," 342. The relevant diplomas are s134, s160, s168, s177, s186, and s1264. An index of the diplomas can be found in Peter Sawyer, *Anglo-Saxon Charters: An Annotated List and Bibliography* (London: Offices of the Royal Historical Society, 1968).

⁵³ Loyn, *Anglo-Saxon Kingdoms and the Norman Conquest*, 48.

⁵⁴ J.H. Kemble, *Codex Diplomaticus Aevi Saxonici*, vol. 1 (London: Cambridge University Press, 2011), 230.

referencing an “*arcis munitione*” and wishing for its “*distructionem*”.⁵⁶ Thus, these records show not only Scandinavian aggressions against the kingdom but also a Scandinavian *presence* within Kent, a base from which to attack every other Anglo-Saxon kingdom.⁵⁷ With Mercia being the effective hegemon and King Coenwulf repeatedly stating he could not defeat the Scandinavian presence in Kent, these diplomas provide telling evidence of the aggressors’ relative strength and control despite the ASC’s silence.

Given the fragmentary and incomplete information contained in the ASC and Asser’s *Life of King Alfred* as compared with the many natural disasters the AU describe or the aggressions that the Mercian royal diplomas indicate, it is worth considering whether there is an arguable reason the scribes would under-report. The likely under-reportage in Asser’s *Life* is easiest to understand. Throughout the Bible, God repeatedly causes natural disasters to punish the Jewish tribes and their kings for disobeying his edicts. For example, in II Samuel 24:1-25, God devastates the Jewish tribes with a plague and nearly kills Jerusalem after King David decides to

⁵⁵ J. Earle, *A Hand-Book of the Land-Charters and other Saxon Documents* (Oxford: Clarendon Press, 1888), 86-9.

⁵⁶ Kemble, *Codex Diplomaticus*, 253-55 (s177); Earle, *A Hand-Book of the Land-Charters and other Saxon Documents*, 100-102 (s186), 82-85 (s1264).

⁵⁷ Downham “The Vikings in England,” 342.

conduct a census against God's will, eventually relenting after David begs forgiveness. In another instance, God explicitly tells King Solomon he might punish Israel through natural disasters:

If I shut up heaven, and there fall no rain, or if I give orders, and command the locust to devour the land, or if I send pestilence among my people: And my people, upon whom my name is called, being converted, shall make supplication to me, and seek out my face, and do penance for their most wicked ways: then will I hear from heaven, and will forgive their sins and will heal their land.⁵⁸

Therefore, even if Alfred responded admirably, the very existence of a natural disaster could be seen as God's punishment for sin. Given that Asser's *Life* was intended to promote Alfred as an extraordinary leader and to support Asser's work to consolidate an alliance with the Welsh principalities, Asser would not want to tarnish Alfred's heroic image by reporting on events that suggested he was sinful.⁵⁹

Like Asser's *Life*, the ASC also had a specific purpose. It was begun, produced, and disseminated directly from Alfred's royal household.⁶⁰ Some scholars contend Alfred's conscious goal in commissioning the ASC was to glorify himself and promote loyalty.⁶¹ Indeed, by the time the ASC was begun,

⁵⁸ 2 Chronicles 7:13-14.

⁵⁹ Keynes and Lapidge, *Alfred the Great*, 96-98.

⁶⁰ Nicholas Brooks, "Why is *The Anglo-Saxon Chronicle* about Kings?" *Anglo-Saxon England* 39 (2010): 62.

⁶¹ James Campbell, *The Anglo-Saxon State* (London: Hambledon and London, 2000), 143.

Alfred had conquered Mercia, was expanding his kingdom even further, and could have been seen as another greedy conqueror. With a carefully written ASC, however, Alfred could glorify himself as a hero, freeing and uniting the kingdoms to defeat a common enemy, the pagans. Accordingly, the royal agenda would not want to include either natural disasters or Scandinavian aggressions in the official record.

Thus, though the ASC's note on Lindisfarne is precisely the type of information needed to investigate potential correlations between natural disasters and Scandinavian aggressions, the famine it reports is the only true natural disaster reported for much of the ASC and the subsequent reporting of Scandinavian aggressions is clearly lacking. Therefore, like the AU though for different reasons, the ASC cannot serve as a reliable data source to correlate attacks with natural disasters.

2.1.3 Evaluating the Carolingian Annals and Limiting the Geographic Focus of the Inquiry.

Fortunately, across the Channel, the Carolingian Empire was not only experiencing natural disasters and Scandinavian aggression but was also keeping detailed annals, often referred

to collectively as the *Reichsannalen*.⁶² The work of these authors provides a wealth of information about the Carolingian Empire beginning with the *Royal Frankish Annals* (RFA).

The reasons the RFA began to be written cannot be firmly established but sometime between AD 788 and AD 792, Charlemagne or members of his court decided to begin a record of his achievements which continued throughout his reign. This happened at the same time Charlemagne established a large public court at Aachen, suggesting this new court might have given birth to these records.⁶³

Regardless of the reasons, the annals appear to be a clear, meticulous, official, year-by-year record by the Carolingian dynasty of memorable events. Their structure and organization establish a basic sense of what happened and in what order. The year is an orderly journey often ending with a report of where Charlemagne celebrated Christmas, sometimes adding where he celebrated Easter.⁶⁴ The author ends each year with “and the date changed to” then takes the reader on another orderly journey starting with the new year.⁶⁵

⁶² L. Van der Essen, “Ecclesiastical Annals,” *Catholic Encyclopedia* (New York: Robert Appleton, 1907), accessed 23 June 2020 from *New Advent*. <https://www.newadvent.org/cathen/01531b.htm>.

⁶³ McKitterick, *History and Memory*, 101-102.

⁶⁴ McKitterick, *History and Memory*, 100.

⁶⁵ McKitterick, *History and Memory*, 100.

Importantly, the RFA were not the only annals being written in the Carolingian Empire. Thus, though the RFA themselves ended after AD 829, the tradition continued in other annals. Among these other annals not under direct royal control are *The Annals of Xanten* (AX) covering the period AD 790 to AD 873, *The Annals of St Bertin* (AB) covering the period AD 830 to AD 882, and *The Annals of Fulda* (AF). Although it is still unclear when the AF became contemporary and independent, by AD 838 they were covering events in detail and kept covering them until AD 901.⁶⁶ Each of these annals is organized in the same systematic manner as the RFA and their dates often overlap.

Thus, at the outset, the Carolingian annals have merit in their systematic structure and their broad coverage of locations and times. In addition, the overlap in years and the recording of events of national significance creates the possibility of cross-checking and confirmation from one set of annals to the next. All of this would be of no use, however, if the Carolingian annals had the same problems as the AU and the ASC. Fortunately, that is not the case.

The Carolingian annals do not have the same debilitating historiographical problems as the AU. The dating is precise. Arithmetical dating calculations had been widely debated in the

⁶⁶“Introduction,” in Reuter, AF, 4.

Frankish Empire earlier in the eighth century, but by the time of the annals a consensus had been reached and the dating is based on Dionysius Exiguus' calculations for Easter.⁶⁷

Rosamond McKitterick illustrates the importance of the annals' orderly progression by comparing it to *The Chronicle of Fredegar*, which documents the end of the Merovingian Empire to the beginning of the Carolingian Empire and treats time sloppily. A chapter in the chronicle may cover one year or several, depending on the author's whim, in contrast with the RFA's orderly tradition that proceeds in a steady, measured, and therefore comprehensible manner.⁶⁸

Moreover, again unlike the AU, the RFA and the other Carolingian annals are not plagued with unknowns making impossible the assessment of author bias. Though the specific authors of the RFA are not known, they are known to have been sponsored by Charlemagne and to have been written in connection with his courts. Therefore, regardless of any author's specific identity, the inherent bias is clear and patriotic, giving the RFA excellent propaganda value. As McKitterick observes, "Rather than thinking of the annal entries as year-by-year jottings, they should be recognised as a skilfully constructed and highly selective portrayal of the careers of the

⁶⁷ McKitterick, *History and Memory*, 95.

⁶⁸ McKitterick, *History and Memory*, 100.

Carolingian rulers whose fortune and success is identified with that of the Frankish people.”⁶⁹ Because events are always framed as “the Franks” fighting and/or defeating others, the RFA would have helped forge a patriotic Frankish identity.⁷⁰ As for the AB, the primary authors are known—Prudentius of Troyes and Hincmar of Rheims. Exactly who composed the AF is subject to debate, but specific individuals have been named. The first author, theorised to have written from AD 830-838, is Einhard, Charlemagne’s biographer; the second, from AD 838-AD 863, the scholar Rudolf of Fulda; and the third, from AD 865 until its end, Rudolf’s student Meginhard.⁷¹ The authors and location of the AX are the least known, but educated guesses are possible. Thus, the Carolingian annals present a much more solid historiographical record than do the AU.

Finally, unlike the ASC, the Carolingian annals do not shy away from recording natural disasters or Scandinavian aggressions. For example, of the seventy-two years covered by the AX almost one-third report natural disasters—from extremely cold winters to plagues. In the AB the number is again almost one-third, while in the AF, it increases to almost two-thirds. Each of these annals sometimes notes more than

⁶⁹ McKitterick, *History and Memory*, 102.

⁷⁰ McKitterick, *History and Memory*, 118-119.

⁷¹ Reuter, AF, 5.

one disaster during a single year and reports are sometimes confirmed from one of the annals to the other. For example, the AB lists three natural disasters in AD 846—a terrible wind, “legions” of wolves, and a flood⁷²—and the last disaster recorded in the AX was an AD 873 locust plague, which is also referenced in the AB and AF.⁷³ Frequent Scandinavian aggressions are noted as well. The AX’s first reference is in AD 834, also cited in the AB.⁷⁴ Their last is in AD 873, when the AB and AF also note attacks.⁷⁵ The AB note six attacks in AD 859.⁷⁶ The AF’s last recorded attack is in AD 891.⁷⁷ Thus, the Carolingian annals not only escape the historiographical pitfalls of the AU but also unlike the ASC, they provide a substantial record of both natural disasters and Scandinavian aggressions. This combined with the variety of annals from several sources across an entire century make the Carolingian annals the clearest and most comprehensive source of data for the collection of information about both natural disasters and Scandinavian aggressions. Accordingly,

⁷² Nelson, AB, 62-63.

⁷³ von Simson, AX, 33; Nelson, AB, 184; Reuter, AF, 71.

⁷⁴ von Simson, AX, 9; Nelson, AB, 30.

⁷⁵ von Simson, AX, 32; Nelson, AB, 183-85; Reuter, AF, 72-73.

⁷⁶ Nelson, AB, 89-91.

⁷⁷ Reuter, AF, 121-23.

an investigation of Ireland and England was put aside, and the geographic focus of this inquiry was narrowed to the Carolingian Empire.

This Empire at its height—depending on the ebb and flow of political power—covered “approximately one million square kilometres, stretching south from the English Channel to central Italy and northern Spain, and east from the Atlantic to the fringes of modern Hungary, Poland and the Czech Republic”.⁷⁸ One major exception to this extensive area of control was the Jutland peninsula, ruled by the Danes. The first clear raid conducted by a Dane against this enormous Empire occurred in AD 810 in Frisia, just west of this peninsula. By AD 911, Scandinavian aggressors had raided, attacked, settled, and even assimilated into Carolingian society from Frisia westward all the way through Normandy, where Rollo of Normandy was named the *dux*. Thus, the aggressions in the Carolingian Empire present a picture of two distinct cultures, first in conflict and then in a form of resolution, a fact which led to the final limitation on the reach of this investigation.

⁷⁸ Marios Costambeys, Matthew Innes, and Simon MacLean, *The Carolingian World* (Cambridge: Cambridge University Press, 2011), 3-4.

2.2 Limiting the Temporal Range: Carolingians and Vikings in Collision

That the annals of the Carolingian Empire are so different from those of Ireland and England is not surprising given that the Carolingian Empire was fundamentally different from the Anglo-Saxon and Irish kingdoms. It was geographically much larger and had a powerful military. Most importantly, however, it was ruled by the Carolingian family not only in name for almost a century but also in fact for much longer. In addition, its leaders considered one of its core missions to spread Christianity, specifically including through conquest. In contrast, the Danes and other Scandinavian peoples were pagan, and their political structure was far less organised. It is unclear whether the many Scandinavian leaders the RFA identify as a *rex* were “kings” in any modern sense of the word or more accurately “chiefs”.⁷⁹ Both cultures, however, attempted to expand as the Viking Age progressed, and while the Carolingians fell apart in multiple succession crises with extensive fraternal rivalry, Scandinavian aggressors attacked, gained control of much territory, and began to assimilate into the larger Empire.⁸⁰

⁷⁹ Sverre Bagge, *From Viking Stronghold to Christian Kingdom: State Formation in Norway, c. 900-1350* (Copenhagen: Museum Tusulanum Press, 2010), 23.

⁸⁰ Costambeys, Innes, and MacLean, *Carolingian World*, 4.

2.2.1 Understanding the Carolingians

One major difference between the Carolingian Empire and the Scandinavian aggressors is that much more is known about the historical origins of the Empire. As the Western Roman Empire lost power in the fifth century, Frankish tribes began to dominate Gaul and regions east of Gaul.⁸¹ These various tribes then united under a single tribe, the Merovingian Franks, and then under a single ruler, Clovis I.⁸² Gregory of Tours reports that Clovis adopted his wife's Nicene version of Christianity, thus establishing Roman Christianity as the religion of the Frankish elites.⁸³ The Merovingian family ruled for more than two centuries with multiple military successes as the empire expanded.⁸⁴ Their system of rule, however, included a fatal factor, the office called the "Mayor of the Palace". Paul Fouracre describes this office as the noble in charge of

⁸¹ Peter Heather, *Empires and Barbarians: Migration, Development and the Birth of Europe* (Basingstoke, UK: Pan Macmillan, 2010), location 5730-5570, Kindle.

⁸² Ralph W. Mathisen, "Clovis, Anastasius, and Political Status in 508 C.E.: The Frankish Aftermath of the Battle of Vouille," in *The Battle of Vouillé, 507 CE: Where France Began*, eds. Ralph W. Mathisen and Danuta Shanzer, Millennium-Studien / Millennium Studies Vol. 37 (Berlin: Walter de Gruyter, 2012), 79-81.

⁸³ Gregory of Tours, *A History of the Franks*, trans. Lewis Thorpe, 144-145.

⁸⁴ Paul Fouracre and Richard A. Gerberding, "Introduction," in *Late Merovingian France: History and Hagiography 640–720*, eds. Paul Fouracre and Richard A. Gerberding (Manchester: Manchester University Press, 1996), 13-14.

negotiations between the king and aristocrats.⁸⁵ These mayors, nominally serving under the Merovingian family, passed the office down through generations and became immensely powerful as the empire grew and changed.⁸⁶

One of these mayoral families was the “Pippinids”. By the beginning of the eighth century, they had gained almost complete control of the position.⁸⁷ The Pippinid Charles Martel became Mayor of the Palace in AD 715. As de facto ruler of the Frankish Empire, he faced down several revolts, gained control of duchies that had been semi-independent, and conquered small kingdoms like Frisia.⁸⁸ After Charles’s death in AD 741, his sons Pippin the Short and Carloman came into power and appointed a Merovingian king, Childeric III, as titular ruler.⁸⁹ According to the RFA, however, Carloman conveniently and willingly retired to a monastery in AD 746, leaving Pippin the Short in complete control of the entire empire as the mayor.⁹⁰ Then, in AD 749, Pippin asked the

⁸⁵ Fouracre and Gerberding, *Late Merovingian France*, 11.

⁸⁶ For example, Austrasia’s Mayor of the Palace, Grimoald, overthrew King Dagobert in the AD 650s and put his own son on the throne. And again, the Neustrian Mayor of the Palace Erchinoald had the power to give King Clovis II one of his slaves to be a wife, Queen Balthild. Fouracre and Gerberding, *Late Merovingian France*, 18-20.

⁸⁷ Fouracre and Gerberding, *Late Merovingian France*, 24-25.

⁸⁸ B. de Simson, ed., *Annales Mettenses Priores* (Hannover: MGH, 1905), 29.

⁸⁹ Scholz, RFA, 38.

contemporary pope, Zachary, for permission to assume the title of king. He argued that since he was the true power over the Merovingian Empire, he should also assume the title. When Pope Zachary approved, Pippin exiled Childeric III to a monastery and in AD 750 named himself the king of the Frankish Empire.⁹¹ When Pippin died in AD 768, his sons, Charlemagne and Carloman, jointly assumed the throne.⁹² When Carloman died in AD 771, Charlemagne became the sole ruler of a united empire in an uncontested dynasty approved by the pope himself.

Charlemagne ruled the Carolingian Empire alone from AD 768 until his death in AD 814. During his reign, most of the Empire was loyal apart from the many revolts in Saxony and one direct challenge in AD 792 when he quashed a rebellion led by his son Pippin the Hunchback.⁹³ Contemporary sources such as his biographer Einhard laud both his piety and his

⁹⁰ Scholz, RFA, 38.

⁹¹ Scholz, RFA, 39.

⁹² For the full history of his campaigns see Scholz, RFA, 39-46. Janet Nelson, *King and Emperor: A New Life of Charlemagne* (London: Penguin, 2019), 95.

⁹³ Scholz, RFA, 70-71.

military successes.⁹⁴ These campaigns of conquest constantly expanded the Empire as shown in Figure 2-3 below.⁹⁵

Figure 2-3: Charlemagne's Empire AD 814 by Ionita, Edmaps.com, nd.



In fact, by AD 800, Charlemagne wielded such power that Pope Leo III named him emperor.⁹⁶ If Leo III was the religious leader of Christianity, Charlemagne had become its political leader.

Despite Charlemagne's personal religious and military prestige, the power structure of his Empire was not centralized, not even enough to be based on taxation.⁹⁷ Instead, because the Carolingian emperors and kings were massive land owners,

⁹⁴ The praise appears throughout his biography. The edition cited here is Einhard, *Einhardi Vita Karoli Magna: Editio Sexta*, ed. O. Holder-Egger (Hannover: MGH, 1911).

⁹⁵ Cristian Ionita, "Charlemagne's Empire," (Edmaps.com: A Canadian View, nd), accessed 14 August 2020. https://edmaps.com/charlemagne__empire_814.jpg.

⁹⁶ Scholz, RFA, 81.

⁹⁷ Wickham, *Framing the Early Middle Ages*, 120.

they guaranteed loyalty from aristocrats by granting land, relying on these aristocrats to raise an army.⁹⁸ Therefore, although the Empire was stable, its power structure was decentralised among an effective but strong aristocracy which served the Carolingian emperors and kings while also controlling land the king had gifted them. These strong aristocrats were the power tier closest to the peasant populace, who were themselves decentralised and independent, living in a primitive and self-reliant setting as they tended their own crops and livestock.⁹⁹

This decentralized political structure was problematic for both maintaining power and responding to natural disasters. In fact, it could reasonably be argued that the politics of land gifting was a factor in the demise of the Carolingian Empire. As the Empire grew, so did the number of aristocrats, who became more powerful as they controlled more land. As Jinty Nelson observes, “Viewed spatially, elites regionally and locally held the stage, intimately involved in sharing and grasping power, intermittently in touch with the palace. Decentring was required then.”¹⁰⁰ Some of these aristocrats eventually gained enough

⁹⁸ Wickham, *Framing the Early Middle Ages*, 121-122.

⁹⁹ Verhulst, *Carolingian Economy*, 14-15.

¹⁰⁰ Jinty Nelson, “Charlemagne and Europe,” *Journal of the British Academy* 2 (2014): 138.

power to make their own claims. For example, by the time Charles the Fat was deposed in AD 888, Count Odo, who defended Paris when Scandinavian aggressors laid siege to it in AD 886, had accrued enough power and fame to become king of West Francia.¹⁰¹

Besides potentially leading to the end of the Empire, the decentralized structure may also have impeded a governmental response to a natural disaster. Because the Carolingians could not demand taxes, unlike Titus when he responded to the Vesuvian disaster, Carolingian rulers had little to no central source of funds from which to supply aid. Moreover, ultimate responsibility for the peasant populace, who likely felt the effects of a natural disaster most keenly, was in the hands of the aristocracy.¹⁰² The highest level of political power was unlikely even to feel the responsibility to provide physical aid during a natural disaster. In fact, in several letters, Charlemagne's only offering during or after natural disasters was advice, and the advice was often based on the Christian dogma of repentance.¹⁰³

¹⁰¹ Reuter, AF, 116.

¹⁰² van Rhijn, "Charlemagne and the Government of the Frankish Countryside," 159-162.

¹⁰³ van Rhijn, "Charlemagne and the Government of the Frankish Countryside," 162.

The core mission of the Empire, however, was not to provide such help but to spread Christianity. The Carolingians justified their kingdom, conquests, and identity upon Christianity. Charlemagne's army was the *castra dei*, God's army, and their conquests were the actions of a militant *ecclesia*, "assembly of God's people", with the purpose of spreading God's law.¹⁰⁴ Even the Empire's hard-to-define borders were based on the spread of Christian belief.¹⁰⁵ As Charlemagne conquered these regions with pagan peoples, his method of welcoming them into the Empire was to convert and baptise their leaders.¹⁰⁶ Little opposition to this practice was recorded except in Saxony. Charlemagne tried to take control of the region beginning in AD 772, and in an attempt to eradicate their pagan beliefs, as the RFA report and celebrate, Charlemagne destroyed their pagan idol Irminsul.¹⁰⁷ The Saxons, however, continued to refuse to accept Christianity.¹⁰⁸ At a certain point—Yitzak Hen guesses the year may have been AD 795—Charlemagne began forcing Saxons to convert.¹⁰⁹ In an AD 796 letter, Alcuin of York sharply criticised

¹⁰⁴ Alberi, "Like the Army of God's Camp" 1-2.

¹⁰⁵ Alberi, "Like the Army of God's Camp," 12-13.

¹⁰⁶ Alberi, "Like the Army of God's Camp," 13.

¹⁰⁷ Scholz, RFA, 48-49.

¹⁰⁸ Yitzak Hen, "Charlemagne's Jihad," *Viator* 34 (2006): 33-34.

¹⁰⁹ Hen, "Charlemagne's Jihad," 14.

the new policy as not Christian, but Charlemagne continued.¹¹⁰

He did not finally pacify Saxony until AD 804, however, when he began exiling Saxons into other regions of his Empire.¹¹¹

The embedded nature of Christianity and its importance is evident in contemporary sources such as the RFA, Einhard's *Life of Charlemagne*, the work of the monk of St Gall Notker Balbulus, or the works of later historians such as Nithard and Regino of Prüm, who are all concerned with portraying Charlemagne as a pious icon, sometimes making their factual accuracy suspect. Less suspect factually are the manifestos, actions, guides to life, and letters written to admonish others on how to live and rule. In his letters, Alcuin often refers to Charlemagne as "David".¹¹² Einhard, writing to his son Vussin, admonishes him to pursue good habits and advises him with several biblical quotes.¹¹³ Similarly, in the AD 840s, a noblewoman Dhouda wrote a guide to life directed to her own son—at that time a hostage—citing every biblical book in how he should live a moral life.¹¹⁴ In other instances, Carolingian

¹¹⁰ Hen, "Charlemagne's Jihad," 40.

¹¹¹ Scholz, RFA, 83-84.

¹¹² See, e.g., how he addresses Charlemagne in Letter 72, in Allott, *Alcuin of York: His Life and Letters*, 88.

¹¹³ Jinty Nelson, "Lay Readers of the Bible in the Carolingian Ninth Century" in *Reading the Bible in the Middle Ages*, eds. Jinty Nelson and Damien Kempf (New York: Bloomsbury Academic, 2015), 24.

¹¹⁴ Nelson, "Lay Readers of the Bible," 52.

nobility ceremoniously burned non-canonical texts.¹¹⁵ Thus, the Carolingians and Charlemagne were fully imbued with and wholeheartedly endorsed contemporary Christianity and its values and believed in upholding “God’s law”.¹¹⁶

Thus, devotion to God and adherence to certain religious dogma seem to have been a requirement of official life. Yet the need to act in accordance with Christian values is less clear. The history of the Carolingian Empire is filled with convenient deaths, willing exiles, betrayals, and other actions in apparent contravention of Christian values. For example, the death of Charlemagne’s brother Carloman in AD 771 was remarkably convenient. The RFA give only the date, 4 December, and the location, the villa of Samoussy.¹¹⁷ That Carloman’s wife and sons immediately departed to Italy, however “needless” it was, suggests they may have feared for their own safety.¹¹⁸ In AD 833, Louis the Pious’ sons revolted. Lothar captured his father and forced him to confess to non-Christian acts and ask for penance. The humiliation and condemnation were so severe the AB author says that the other two sons, who had also revolted, intervened and freed their father.¹¹⁹ In AD 856, Lothar

¹¹⁵ Alberi, “Like the Army of God’s Camp,” 12.

¹¹⁶ Alberi, “Like the Army of God’s Camp,” 7.

¹¹⁷ Scholz, RFA, 48.

¹¹⁸ Scholz, RFA, 48.

¹¹⁹ Nelson, AB, 27-29.

II, married the noblewoman Theutberga even though he had a noblewoman mistress who had borne his son Hugh.¹²⁰ Two years after the marriage, Lothar II attempted to divorce his wife to marry his mistress. The pope, however, did not grant Lothar II's request until AD 869, over ten years later. Lothar II died on his return to his kingdom so was unable to marry the mistress and his son by her was deemed illegitimate.¹²¹ Possible murder, repeated betrayal, and open adultery might have all been seen as a means to maintain a stable kingdom. But the flip side is that while the Carolingians extolled Christianity and their duty to convert pagans, they were also willing to ignore certain sins of the nobles.

However sincerely or insincerely pious Carolingian royalty and aristocrats may have been, the religious views of the peasant culture are unknown. Before the sixth-century Merovingian king Clovis converted to Christianity, the Franks followed a pagan religion.¹²² That faith continued outside the Merovingian aristocracy and kingdom. More than 200 years later, according to Alcuin's *Life of St Willibrord*, Willibrord failed to convert King Radbord of the neighbouring kingdom of Frisia.

¹²⁰ Costambeys, Innes, and MacLean, *Carolingian World*, 397.

¹²¹ Costambeys, Innes, and MacLean, *Carolingian World*, 397.

¹²² Gregory of Tours, *A History of the Franks*, trans. Lewis Thorpe, 143-144.

King Radbord died late in AD 719, preferring to reside with his ancestors in Hell rather than with his enemies in Heaven.¹²³

While Frisia was conquered and officially Christianised by Charles Martel in AD 734, paganism persisted, as illustrated by the fact that until Charlemagne forcefully exiled the Saxons, every attempt he made to convert them was a failure. Though Saxons seem to have been the most tenacious in opposing Charlemagne's message of conversion, their resistance shows that the peasant culture's acceptance of Christianity was not guaranteed. One of the reasons the pagan Scandinavian aggressors so alarmed priests could have been that they were still working to convert the people, and neighbouring pagan raiders endangered their efforts.

In any case, the Carolingian nobility saw the world in a Christian light, took advice from biblical passages, and thus lived in a world imbued with Christian thought. One contemporary measure of Charlemagne's achievement both in military and religious terms might have been the broadening of Christianity to an ever-wider world. That achievement was threatened in more ways than one by the aggressions of pagan Scandinavians whose organisational structure and beliefs were radically different from the Carolingians.

¹²³ Alcuin, Alcuin [sic] (735-804), *The Life of Willibrord, c.796*, trans. C.H. Talbot, Fordham University Internet Medieval Source Book, 2000), <https://sourcebooks.fordham.edu/basis/Alcuin-willbrord.asp>.

2.2.2 Understanding the Vikings

Much less is known about the Scandinavian warrior bands popularly referred to as the “Vikings”, but they had a long and rich history beginning well before the Viking Age. Contemporary authors, of course, rarely called these aggressors “Vikings”, usually referring to them with generic terms such as *pagani*, “pagans”, *pyratae*, “pirates”, or *Nordmanni*, “Northmen” or occasionally with terms of origin such as “Norwegians” or “Danes”.¹²⁴ These terms, however imprecise, confirm that they primarily originated from the Scandinavian territories now constituting Denmark, Norway, and Sweden, as seen in Figure 2-4 below.¹²⁵

¹²⁴ von Simson, AX, 9; Recensuit G Waitz, ed., *Annales Bertiani* (Hannover: MGH, 1883), 15; Kurze, AF, 35, 39; Stefan Brink, “Who Were the Vikings?” in Brink, *The Viking World*, 4-5.

¹²⁵ Map, *The Viking World*, xxiii, Illus 1.

Figure 2-4: World of the Scandinavian Aggressors in Brink, 2008, xxii



Topographically, this territory was typified by mountains, forests, bogs, and a maritime landscape of fjords and islands.¹²⁶ This led to the development of a sophisticated maritime culture culminating in the development of the famous longship.¹²⁷ Thus when Louis the Pious helped the Scandinavian *rex* Heriold retake Danish territory, he provided Saxon and Obodrite men, presumably to man the ships, because a land-based army would have had difficulty marching through the waterlogged landscapes of Jutland.¹²⁸ These seaways meant that the focus on ships was an everyday reality and a central part of military campaigning.

¹²⁶ Jesch, *Viking Diaspora*, 20.

¹²⁷ Jan Bill, "Viking Ships and the Sea" in Brink, *The Viking World*, 170.

¹²⁸ Fridericus Kurze, ed., *Annales Regni Francorum* (Hannover: MGH, 1895), 152.

There is strong evidence from the sparse Roman written records and archaeological surveys within Denmark indicating that many Scandinavians were already professional warriors during the apex of the Roman Empire. After the Roman expansion was halted when an alliance of Germanic tribes annihilated three Roman legions in AD 9 at the Battle of Teutoburg Forest, the Romans sought allies and so therefore cultivated relationships with Scandinavian leaders north of Germania.¹²⁹ From the first through fifth centuries, Scandinavian magnates and the Roman Empire appear to have had cooperative diplomatic relationships. Indeed, Scandinavian chieftains and their retinue appear to have aided Rome often, even serving as mercenaries in the Roman Imperial Army and receiving training.¹³⁰ This relationship is shown in sites such as a burial in Hoby island, Denmark, during the first century AD, which contains a silver Roman banquet set. The set's iconography is entirely classical, with scenes from the *Iliad*, and was gifted by a man named Sillius. Coincidentally, the Roman commander of north Germania between AD 14 and AD 21 was named Silius, which suggests the buried leader and Sillius

¹²⁹ Angelo Forte, Richard Oram, and Frederik Pedersen, *Viking Empires*. (Cambridge: Cambridge University Press, 2005), 17-19.

¹³⁰ Forte, Oram, and Pedersen, *Viking Empires*, 51.

might have been allies.¹³¹ Forte, Oram, and Pedersen liken their apparent alliance to the alliances the United States cultivated during the Cold War in the latter half of the twentieth century, which were intended to contain the Soviet Union in a pincer movement.¹³²

These diplomatic relationships between Rome and Scandinavian chieftains, which could have lasted all the way through the collapse of the western Roman Empire, might have helped to accelerate the already-stratifying society, as the different Scandinavian peoples began to develop a noble warrior class.¹³³ Their chieftains clearly had control of major resources and were able to gradually increase their spheres of control. This has been demonstrated through archaeological surveys such as the excavations of weapon sacrifices found in Illerup Ådal, Denmark. The weapons appear to have originated from armies invading Jutland from what are now Poland, Sweden, and Norway.¹³⁴ These invaders' weapons were manufactured, some even originated from Rome, and the men had common clothing that fell just short of a uniform, which points to their leader's competence and the resources he must

¹³¹ Forte, Oram, and Pedersen, *Viking Empires*, 26-27.

¹³² Forte, Oram, and Pedersen, *Viking Empires*, 27.

¹³³ Forte, Oram, and Pedersen, *Viking Empires*, 29, 51.

¹³⁴ Forte, Oram, and Pedersen, *Viking Empires*, 38-39.

have been able to command.¹³⁵ The ancient fortifications uncovered in modern Denmark also attest to these chieftains' abilities to mobilise the population and safeguard their people.¹³⁶ Both of these show that long before the Viking Age began, the capacity of the Scandinavian peoples for military activity was advanced, with warriors equipped with weapons by their leader.¹³⁷

While the western Roman Empire collapsed, they had heavily influenced Scandinavian society, and the Scandinavians continued unabated.¹³⁸ Nevertheless, much less is known about them. In AD 515, according to not only Gregory of Tours but also the Old English poem *Beowulf*, the *rex* of the Danes led a raid on Frisia, and the Danes were crushed before they could escape.¹³⁹ This must have been a major defeat, because although they do not disappear from European lore, their activities become absent from records of contemporary

¹³⁵ Forte, Oram, and Pedersen, *Viking Empires*, 36-37.

¹³⁶ Forte, Oram, and Pedersen, *Viking Empires*, 51, 30-31.

¹³⁷ Forte, Oram, and Pedersen, *Viking Empires*, 51.

¹³⁸ Evidence of Rome's influence even lies in the names for currency. It is commonly assumed that the terminology for the Icelandic *aurar* is based on the Roman term for gold, *aureus*, and that its weight was based on the Roman *uncia*, ounce. Dagfinn Skre, "Scandinavian monetisation in the first millennium AD – practices and institutions," in *Encounters, Excavations and Argosies: Essays for Richard Hodges*, eds. J. Mitchell, J. Moreland, and B. Leal. Oxford: Archaeopress Publishing Ltd, 2017, 291-299.

¹³⁹ Edwin Morgan, trans., *Beowulf: A Verse Translation into Modern English* (Manchester, UK: Carcanet Press, 2002), 32; Gregory of Tours, *A History of the Franks*, 163.

European history.¹⁴⁰ It is clear, however, that they remained connected to continental Europe, and indeed the sixth century historian Jordanes, in his work *The History of the Goths*, claims the Goths originated from the island of “Scanza”, or Scandinavia, and describes several tribes he claims were living there, including the *Screrefennae* (Sami), *Suehans* (Swedes), and *Dani* (Danes). These tribes, however, do not seem to have had much political influence in western Europe until they reappeared in the eighth century.¹⁴¹

The specific region of Scandinavia from which the raider who attacked Lindisfarne originated is unknown, but when the Scandinavians do reappear in Carolingian sources, the Carolingian authors specifically focus on the Danes. From their records, it is clear that the Danes had a far more organic system of government than the Carolingians. Although several rulers attempted to unite them under a single monarch throughout the Viking Age, none appear to have fully succeeded until the tenth/eleventh century. The reasons the

¹⁴⁰ Lotte Hedeager, *Iron Age Myth and Materiality: an Archaeology of Scandinavia AD 400–1000* (London: Routledge, 2011), 32.

¹⁴¹ Jordanes, *The Project Gutenberg eBook: The Origin and Deeds of the Goths*, ed. Ted Gavin et. al., and trans. Charles C. Mierow (Salt Lake City, USA: Project Gutenberg, 2005), accessed 8 January 2022. <https://www.gutenberg.org/cache/epub/14809/pg14809.html>; Frode Iversen, “Between Tribe and Kingdom – People, Land, and Law in Scandza AD 500–1350”, in *Rulership in 1st to 14th century Scandinavia: Royal graves and sites at Avaldsnes and beyond*, ed. Dagfinn Skre (Berlin, DE: Walter de Gruyter GmbH, 2020), 249-250; Hedeager, *Iron Age Myth and Materiality*, 32.

kingdoms centralised and Christianised remains unclear, but some have theorised that one major reason it happened in Denmark, which Harald Bluetooth finished consolidating c. AD 965, was as a countermeasure to the rise of Carolingian/German power.¹⁴² Denmark's unified power in turn unified Norway, which sources claim first became a kingdom under Harald Finehair at the end of the ninth century.¹⁴³ His unification did not last, however, as the monarchy disintegrated after his death.¹⁴⁴

In any case, the warrior bands themselves seem not to have been centrally organised. Lately this has led some scholars to champion the idea that these Scandinavian fleets were “hydrarchies”, independent maritime polities with their own structures and organisation that shared spoils and held leaders to account.¹⁴⁵ Like the mythical “Hydra” with many heads,

¹⁴² Bagge, *Viking Stronghold to Christian Kingdom*, 23-24.

¹⁴³ Bagge, *Viking Stronghold to Christian Kingdom*, 25-26. Bagge points to further discussions in Niels Lund, “Scandinavia,” in *The New Cambridge Medieval History*, ed. Rosamond McKitterick (Cambridge: Cambridge University Press, 2008), 202-27, and to Inge Skovgaard-Petersen, “The making of the Danish kingdom,” 168-183, and Claus Krag, “The Early Unification of Norway,” 184-201 in *The Cambridge History of Scandinavia, Vol. I: Prehistory to 1520*, ed. Knut Helle (Cambridge, Cambridge University Press, 2008).

¹⁴⁴ See further discussions in Stefan Brink, “Christianisation And The Emergence Of The Early Church In Scandinavia,” 621-628; Claus Krag, “The Creation Of Norway,” 645-651; and Else Roesdahl “The Emergence Of Denmark and The Reign Of Harald Bluetooth,” 652-664; in *The Viking World*, ed. Stefan Brink in collaboration with Neil Price (New York: Routledge, 2011).

¹⁴⁵ Chris Cooijmans, *Monarchs and Hydrarchs: The Conceptual Development of Viking Activity across the Frankish Realm (c. 750– 940)* (New York: Routledge, 2020), 31-35.

these theoretical polities were interdependent but dispersed, so that if one ship was lost, the fleet was not crippled.¹⁴⁶

Regardless of whether this was the precise organisation, the leaders of these warrior bands became powerful political and military figures, raiding, trading, and eventually migrating to other territories from before the late-eighth century until at least the eleventh.¹⁴⁷

A second fact confirmed by the contemporary generic terms is that these people were not Christian. Little firm knowledge of their belief-system remains, but place names in pre-Christian Scandinavia reflect these pagan beliefs in sites named after deities or referenced as cult sites.¹⁴⁸ The extensive Old Norse poetry thought to have been composed during the ninth century and now preserved in late eleventh-and twelfth-century Icelandic texts also demonstrates a longstanding and rich mythology including a pantheon of deities.¹⁴⁹ However, there is extremely little data on this religious tradition, such as how homogenous it may have been and/or what constituted its rituals or festivals.¹⁵⁰

¹⁴⁶ Cooijmans, *Monarchs and Hydrarchs*, 31-35.

¹⁴⁷ Judith Jesch, *The Viking Diaspora* (New York: Routledge, 2015), 7.

¹⁴⁸ Christopher Abram, *Myths of the Pagan North: The Gods of the Norsemen* (New York: Bloomsbury, 2011), 59-60, 79-80, Kindle.

¹⁴⁹ Abram, *Myths of the Pagan North*, 81.

So knowledge of origins of Vikings, their structure of governance, and their religion are clearly three areas of striking difference between these groups and the Carolingians. One area of similarity, however, is in their drive for expansion.

2.2.3 Understanding the Viking Expansion

By the mid-eighth-century, Scandinavians originating from the territories that now comprise Denmark, Norway, and Sweden, began to expand their sphere of influence, attacking territories far beyond their homelands. Unlike the Carolingians, this expansion seems not to be related in any way to spreading their religion though exactly why it began is not fully understood. One theory focuses on plunder and piracy. In late Iron Age Scandinavia, outside of trade *emporias*, the market economy was small and there was no universal form of currency. This remained the case well into the tenth century, with precious metals only used in towns as token money for payments.¹⁵¹ As a result, socially embedded within society was the concept that exchanging goods came primarily from exchanging gifts. The social dynamic of this economy was that

¹⁵⁰ Stefan Brink, "How Uniform Was the Old Norse Religion" in *Learning and Understanding in the Old Norse World: Essays in Honour of Margaret Clunies Ross*, eds. Kate Heslop, Judy Quinn, and Tarrin Wills (Turnhout: Brepols, 2007), 124-125.

¹⁵¹ Dagfinn Skre, "Monetary Practices in Early Medieval Western Scandinavia (5th–10th Centuries AD)," *Medieval Archaeology* 61, no. 1 (2017): 15-16.

a gift exchange was an exchange of power. Exchanging gifts with another person created a relationship with that person, along with an obligation on the other person's part to give back.¹⁵² It established alliances, allowed a person to gain status, and created prestige, because a person with the ability to give more gifts gained more power. Therefore, although the value of the gifts was relative, the exchange itself created the economy and allowed the pre-monetary society to thrive.¹⁵³ These gifts came from many sources, and one of course was plunder.¹⁵⁴ The Carolingians' constant expansion under Charlemagne was also restricting the Vikings' access to trade, which may have spurred Viking raiders to look elsewhere for wealth, including in the Anglo-Saxon and Irish kingdoms.¹⁵⁵

Many have therefore argued that at least at the beginning, even though aggressors would have already been wealthy, their goal was to gain "portable" wealth from networks

¹⁵² John Sheehan, "Viking raiding, gift-exchange and insular metalwork in Norway," in *Early Medieval Art and Archaeology in the Northern World: studies in honour of James Graham-Campbell*, ed. Andrew Reynolds and Leslie Webster (Leiden, NL: Brill, 2013), 811-812.

¹⁵³ Sheehan, "Viking raiding, gift-exchange and insular metalwork in Norway," 810-811.

¹⁵⁴ Dagfinn Skre "Towns and Markets, Kings and Central Places in South-western Scandinavia c. ad 800–950," in *Kaupang in Skiringssal*, ed. Dagfinn Skre (Oslo, NO: Aarhus University Press, 2007), 448.

¹⁵⁵ Bjørn Myhre, "The Early Viking Age in Norway," *Acta Archaeologica* 71, no.1 (2000): 44.

of monasteries to invest in this gift economy.¹⁵⁶ And indeed, the annals describe the earliest Scandinavian aggressions as if they were individual raids by unknown pirates seeking plunder.¹⁵⁷ The letters of Alcuin of York regarding the Lindisfarne attack are illustrative.¹⁵⁸ The description in his letter to King Ethelred of Northumbria indeed suggests pirates sacking a monastery for its portable wealth: “*Ecce ecclesia sancti Cudberhti sacerdotum Dei—sanguine aspersat, omnibus spoliata ornamentis.*”¹⁵⁹ Similarly, his letter to the monks of Lindisfarne fits the model of an individual raider sacking a monastery for profit, this time in slaves, as he promises to try to help Lindisfarne’s “*pueris, qui in captivitate a paganis*

¹⁵⁶ J. H. Barrett, “What Caused the Viking Age?” *Antiquity* 82, no. 317 (2008): 675.

¹⁵⁷ See, e.g., the descriptions of the first two raids on Northumbria in AD 793 and AD 794/796 in Swanton, ASC, 54-7; the descriptions of the first two raids on Ireland in AD 794 and AD 795 in Bambury and Beechinor, AU, 249-52; and the descriptions of the first two continuous raids on Carolingian Europe in AD 834 and AD 835 in Nelson, AB, 30, 33, and in von Simson, AX, 9-10.

¹⁵⁸ See note 49 in this chapter.

¹⁵⁹ The Latin text of this letter is available in a number of sources, including Alcuin, “Epistolae,” in *Epistolae Merovingici et Karolini Aevi*, vol. 4, ed. Ernestus Dümmler (Berlin: MGH, 1895), 42, and Arthur West Haddan and William Stubbs, *Councils and Ecclesiastical Documents Relating to Great Britain and Ireland*, vol. 3 (London: Macmillan and Co., 1871), 492-5. Dorothy Whitelock translates this passage as: “Behold, the church of St Cuthbert spattered with the blood of the priests of God, despoiled of all its ornaments.” Alcuin, “Letters of Alcuin,” in *English Historical Documents: c. 500-1042*, ed. and trans. D. Whitelock, vol. 1 of *English Historical Documents*, gen. ed. David Charles Douglas (London: Eyre Methuen, 1979), 842. Other sources also provide translations, including Browne, *Alcuin of York: Lectures Delivered in the Cathedral Church of Bristol in 1907*, 128-132, and Stephen Allott, ed. and trans., *Alcuin of York: His Life and Letters*, no.12.

abductim sunt,” the abducted monastery boys.¹⁶⁰ However, the narrative shifts a bit when this major diplomat and advisor to Charlemagne next says he will try to bring help: “*Cum dominus noster rex Karolus. . . domum revertetur, nos Deo iuvante ad eum venire disponimus.*”¹⁶¹ Why would Alcuin, a diplomat at a foreign court, have felt it necessary to involve the great foreign monarch Charlemagne in negotiations with this unknown individual raider? This offer suggests the aggressor was not merely a pirate sacking a monastery for wealth but perhaps a powerful leader expanding his sphere of influence, which may in turn suggest an additional reason for Alcuin’s terror. Indeed, by AD 804, a group of Scandinavian aggressors had established a camp in Kent, further supporting the idea that this assailant was not just seeking wealth and that piracy and plunder is not the full story behind early Scandinavian aggression.¹⁶² This seems especially true given that the Scandinavian assaults occurred over such a broad area, grew

¹⁶⁰ Alcuin, *Epistolae Merovingici et Karolini Aevi*, 58. See also, Haddan and Stubbs, *Councils and Ecclesiastical Documents*, 472-473. “[The] youths who have been led into captivity by the pagans”. Whitelock, *English Historical Documents*, 846, as translated by Browne, *Alcuin of York: Lectures Delivered*, 132-5, and Allott, *Alcuin of York: His Life and Letters*, no.26.

¹⁶¹ Alcuin, *Epistolae Merovingici et Karolini Aevi*, 58. “When our Lord King Charles is home . . . we plan, God helping us, to go to him.” Whitelock, *English Historical Documents*, 846.

¹⁶² Clare Downham, “The Vikings in England,” in Brink, *Viking World*, 342.

more sizable over time, and targeted more substantial networks.¹⁶³

The earliest Scandinavian aggression appears to have been in the Baltic Sea area and what is now Russia. Since Baltic societies were not yet literate, far less information survives about the raids, but Marika Mägi says that they began much earlier and were at least equally as significant as those in the West.¹⁶⁴ A boat-burial in Salme, Estonia, shows that Scandinavian raiders were engaged in Viking-style raids in the Baltic region since at least AD 750, more than forty years before the AD 793 attack on Lindisfarne, Northumbria.¹⁶⁵ Moreover, archaeological evidence shows that as far away as northern Russia the Scandinavian settlement of Staraya Ladoga—situated as a trading post between the Middle East and Sweden—had already been established by the mid-eighth century.¹⁶⁶

¹⁶³ Barrett, “What Caused the Viking Age?” 675.

¹⁶⁴ Johan Callmer, Ingrid Gustin and Mats Roslund, “Introduction,” in *Identity Formation and Diversity in the Early Medieval Baltic and Beyond*, Johan Callmer, Ingrid Gustin, and Mats Rolund, eds., (Leideen, NL: Brill Publishing, 2017), 1-2; Marika Mägi, *The Viking Eastern Baltic* (Leeds, UK: Arc Humanities Press, 2019), 1.

¹⁶⁵ Charlotte Hedenstierna-Jonson, “Entering the Viking Age through the Baltic,” in *Relations and Runes: The Baltic Islands and Their Interactions During the Late Iron Age and Early Middle Ages*, eds. Laila Åhfeldt et al. (Visby, SE: Riksantikvarieämbetet, 2020), 12.

¹⁶⁶ Simon Franklin and Jonathan Shepard, *The Emergence of Rus: 750-1200* (New York: Routledge, 2013), 12.

Moreover, although there was no active Scandinavian colonisation on the coastline of present-day Finland, Estonia, and Latvia—all part of the trade route called the *Austrvegr*, the “Eastern Way”—the Scandinavians clearly had a large influence on the culture as the Baltic Finns, Scandinavians, and natives seem to have shared a “cultural milieu” with a shared warrior culture¹⁶⁷ Further south, among the ethnic Balts in present-day Lithuania and Poland, the Scandinavians did attempt to found active colonies. These were middle-ground colonies, where their cultural influence only reached about a dozen miles inland.¹⁶⁸ Despite their minimal cultural impact on the native Balts, however, colonies such as Grobina, Truso, and Kaup would have been important waypoints for any trader travelling the “Amber Way”, an ancient trade route situated on the Vistula River.¹⁶⁹

Although Scandinavians seem to have lost interest in the Amber Way after the mid-ninth century, the numerous hillforts that dot what was once the Eastern Way are a testament to the conflict that undoubtedly occurred there as recorded and discussed in saga literature centuries later.¹⁷⁰ By the tenth

¹⁶⁷ Mägi, *Viking Eastern Baltic*, 21; 23-24.

¹⁶⁸ Mägi, *Viking Eastern Baltic*, 22-23.

¹⁶⁹ Mägi, *Viking Eastern Baltic*, 35.

¹⁷⁰ Mägi, *Viking Eastern Baltic*, 12-13; 35; 61-64.

century, Scandinavians had successfully taken control of and were settling in places as far inland as Kyiv on the Dnieper River.¹⁷¹ Evidence shows that Scandinavian settlements arose throughout modern-day Russia and Ukraine, especially around Lake Ladoga, Novgorod, and Kyiv.¹⁷² This would have served as the entrance to the Volkhov River on the Eastern Way.¹⁷³ As the prominence of the Eastern Way then waned in the tenth century, Scandinavian artefacts began to be abundant on the Daugava Way, a trade route through the Daugava and the Dnieper River which ran from the eastern Baltic through recently-captured Kyiv to the Black Sea and Constantinople. Thus the Daugava Way had essentially replaced the Eastern Way, and the hillforts that then began to dot the route show that the aggression continued.¹⁷⁴

When Scandinavian raids reached the British Isles, although their first recorded raids were within the Anglo-Saxon kingdoms, Irish annals record more raids. The first recorded Viking raid, as reported by the AU, seems to have happened in

¹⁷¹ Jonathan Shephard, "The Viking Rus and Byzantium", in Price, *Viking World*, 498-499.

¹⁷² Wladyslaw Duczko, *Viking Rus: Studies on the Presence of Scandinavians in Eastern Europe* (Leiden, NL: Brill Publishing, 2004), 60.

¹⁷³ Mägi, *Viking Eastern Baltic*, 42.

¹⁷⁴ Mägi, *Viking Eastern Baltic*, 68-69.

AD 794/5.¹⁷⁵ In the beginning, raiders seem to have probed islands such as Iona, Rathlin, Inishbofin, and Inishmurray in AD 794/5, or St Patrick's Island in AD 798.¹⁷⁶ It has long been assumed they were disparate hit-and-run raids and mostly exploratory, although every raid was an assault on an outlying monastic centre.¹⁷⁷ Coincidentally, because monasteries played a powerful role in Irish politics, many Irish kings had also attacked them.¹⁷⁸

Whether Scandinavian raids were hit-and-run or exploratory, in the AD 830s they grew more threatening. Sixty ships appeared on the Boyne and Liffey in AD 836-837, and more appeared on the island's other major waterways such as

¹⁷⁵ Bambury and Beechinor, AU, 251.

¹⁷⁶ Seán Mac Airt, trans., and Beatrix Färber, comp., *Annals of Inisfallen* (Cork, IE: Corpus of Electronic Texts, 2008), 119-120. <https://celt.ucc.ie/published/T100017/index.html>; Bambury and Beechinor, AU, 253-254.

¹⁷⁷ Emer Pucell, "The First generation in Ireland, 795-812: Viking raids and Viking bases?" in *The Vikings in Ireland and Beyond: Before and after the Battle of Clontarf*, eds. Howard B Clarke and Ruth Johnson (Dublin, IE: Four Courts Press, 2015), 41-42.

¹⁷⁸ Donnchadh Ó Corráin, "Prehistoric and Early Christian Ireland," in *The Oxford Illustrated History of Ireland*, ed. R.F. Foster (Oxford: Oxford University Press, 2000), 30.

the Bann, Erne, Shannon, and Lough Neagh.¹⁷⁹ In AD 840-41, the Scandinavians first overwintered on Lough Neagh.¹⁸⁰

These first Norsemen became an established power on the Liffey especially, but several defeats in AD 848 prevented their expansion into other Irish kingdoms and instead led to entrenchment in the area that grew into Dublin.¹⁸¹ They then became heavily involved in Irish politics and infighting, helping the native Irish kings as allies and mercenaries.¹⁸² Early medieval Ireland was an extremely stratified society, ranking from unfree slaves, free farmers, to lords and kings.¹⁸³ Farming was essential to the Irish economy, and barter was the main form of currency.¹⁸⁴ Ireland was also highly connected, with many different roads and long-distance trade networks.¹⁸⁵ Therefore, the Vikings with their longships and gift economy would have fit right in.

¹⁷⁹ Bambury and Beechinor, AU, 287; 295-296: John O'Donovan, trans., and Emma Ryan, comp., *Annals of the Four Masters* (Cork, IE: Corpus of Electronic Texts, 2002), 455-456. <https://celt.ucc.ie//published/T100005A/index.html>; Ó Corráin, "Vikings and Ireland," 429; Bambury and Beechinor, AU, 287-300.

¹⁸⁰ Bambury and Beechinor, AU, 299-300.

¹⁸¹ Downham, *Viking Kings of Britain and Ireland*, 41; 307-308.

¹⁸² Ó Corráin, "Vikings and Ireland," 430. See, for example, Aed son of Niall's attack on Mide in AD 862. Bambury and Beechinor, AU, 319-320.

¹⁸³ Clare Downham, *Medieval Ireland* (Cambridge: Cambridge University Press, 2017), 80.

¹⁸⁴ Downham, *Medieval Ireland*, 31-32, 55.

¹⁸⁵ Downham, *Medieval Ireland*, 43-44, 60.

In the early AD 860s, the Scandinavian brothers Óláfr (Amlaíb), Ásl (Auisle), and Ívarr (Ímar), established a dynasty centred on Dublin.¹⁸⁶ The Vikings under these brothers would have been an ethnic mix of Norwegians and Danes, but they have been commonly termed “Norse” because of the supposed origins of Ívarr and his brothers in Norway.¹⁸⁷ And although their origins have not been pinpointed from literature, the number of insular artefacts found in Norway and Denmark seems to point toward a stronger connection between the Irish and Norway as opposed to the Irish and Denmark.¹⁸⁸ After securing their place in a series of victories in the early AD 860s, in AD 864 Ívarr seems to have left Ireland, perhaps travelling to Strathclyde, and does not appear to have returned until AD 871.¹⁸⁹ The neighbouring Irish kings took advantage of this

¹⁸⁶ Ó Corráin, “Vikings and Ireland,” 429; Bambury and Beechinor, AU, 299-301.

¹⁸⁷ Harold Mytum, “The Vikings and Ireland: Ethnicity, Identity, and Culture Change,” in *Contact, Continuity, and Collapse: The Norse Colonization of the North Atlantic*, ed. James Barrett (York, UK: Brepols Publishing, 2003), 114-115.

¹⁸⁸ Egon Wamers, “Continental and Insular metalwork,” in *Kaupang Excavation Project Publication Series Volume 3; Things from the Town: Artefacts and Inhabitants in Viking-age Kaupang*, ed. Dagfinn Skre (Aarhus, DN, Aarhus University Press, 2011), 97; Aina Margrethe Heen-Pettersen, “Insular artefacts from Viking Age burials from mid Norway. A review of contact between Trøndelag and Britain and Ireland,” *Internet Archaeology* 38 (2014): 8, 13-14.

¹⁸⁹ Downham, *Viking Kings of Britain and Ireland*, 49. On the victories, see, Bambury and Beechinor, AU, 319-322. On Ívarr, see, Conell Mageoghagan, trans. And Rev Denis Murphy, ed., *The Annals of Clonmacnoise from the Earliest Period to A.D. 1408* (Dublin, IE: University Press for the Royal Society of Antiquaries of Ireland, 1896), 141.
<https://archive.org/details/annalsofclonmacn00mage/page/140/mode/2up>.

absence to defeat those left behind several times, with the king of Brega, Flann son of Conaing, defeating them in AD 865 or AD 866, and Aed, son of Niall, overking of the Northern Ui Néill, burning down some if not all of their bases in AD 866.¹⁹⁰ The Norse were also defeated in Munster and Leinster in AD 866 and AD 867.¹⁹¹ Ásl was then murdered, which may have prompted Óláfr to return to Ireland during AD 867, where he committed an unspecified act of treachery.¹⁹² Óláfr's son died in battle in AD 868, and Óláfr himself was killed in Scotland by King Constantine I in AD 871 or AD 872.¹⁹³ Only Ívarr remained in Ireland.¹⁹⁴ The Norse dynasty appeared entrenched but in AD 902, the kingdoms of Brega and Leinster teamed up and drove them out of Ireland.¹⁹⁵ Consequently, the Norse appear to have fled to bases in Scotland, where they attacked Fortriu in

¹⁹⁰ Downham, *Viking Kings of Britain and Ireland*, 49-50. See Bambury and Beechinor, AU, 321-323; and O'Donovan and Ryan, *Annals of the Four Masters*, 501-502; for their entries on AD 864 through AD 866.

¹⁹¹ Downham, *Viking Kings of Britain and Ireland*, 49-50. See O'Donovan and Ryan, *Annals of the Four Masters*, 503-507, for more information.

¹⁹² Downham, *Viking Kings of Britain and Ireland*, 49-50. Bambury and Beechinor, AU, 323-324; Mac Airt, *Annals of Innisfallen*, 135. On Óláfr's death see Benjamin Hudson, "The Scottish Chronicle," *The Scottish Historical Review* 77,2, no. 204 (1998), 154.

¹⁹³ Downham, *Viking Kings of Britain and Ireland*, 51; Bambury and Beechinor, AU, 325-327.

¹⁹⁴ Downham, *Viking Kings of Britain and Ireland*, 51; Bambury and Beechinor, AU, 329-330.

¹⁹⁵ Ó Corráin, "Vikings and Ireland," 431; Bambury and Beechinor, AU, 353-354.

AD 904.¹⁹⁶ In AD 914, however, they returned to Ireland when Ívarr's grandson Røgnvaldr captured Waterford. In AD 917 another grandson, Sigtrygr, seized Dublin, and thus the Norse Dublin dynasty re-established itself as a power once again.¹⁹⁷ The Norse continued to be powerful in Irish politics throughout the rest of the tenth century until a series of defeats in AD 980, AD 999, and 1014 changed their fortune.

In AD 980, Amlaíb Cuarán, the Norse king of Dublin, invaded Meath. Its king, Mael Sechnaill mac Domnaill met him at the battle of Tara and crushed him.¹⁹⁸ Next, in AD 999, the aspiring High King of Ireland Brian Boru met and defeated Amlaíb's son Sitric Silkenbeard at the battle of Glenn Máma. Brian Boru allowed Silkenbeard to stay king of Dublin as long as he submitted to his overlordship.¹⁹⁹ Fifteen years later, in AD 1014, an alliance between the Irish of Leinster and several Norse groups, including Sitric Silkenbeard of Dublin, and the Irish of Leinster, rebelled against Brian Buru, and the two forces

¹⁹⁶ Ó Corráin, "Vikings and Ireland," 431; Bambury and Beechinor, AU, 355-356.

¹⁹⁷ Clare Downham, "Vikings' settlements in Ireland before 1014," in *Northern World: Celtic-Norse Relationships in the Irish Sea in the Middle Ages 800-1200*, Jón Viðar Sigurdsson, Timothy Bolton, and Timothy Bolton, eds. (Leiden, NL: Brill, 2014), 9.

¹⁹⁸ Ó Corráin, "Vikings and Ireland," 432; Bambury and Beechinor, AU, 415-416.

¹⁹⁹ Mac Airt and Färber, *Annals of Innisfallen*, 173-176.

met at the Battle of Clontarf.²⁰⁰ Although Clontarf is celebrated as a resounding Irish victory, the reality was probably more akin to a stalemate, since Brian Boru and his field commander were killed, Dublin was left standing, and Sitric Silkenbeard survived.²⁰¹ Nevertheless, Brian Boru's forces held the field, both forces were exhausted, and Norse power continued to decline.²⁰² Although place-name evidence does suggest that the Norse had a strong rural presence, they did not have control, and henceforth, they often seemed to be junior partners to provincial Irish kings.²⁰³ Because no Irish king was able to conquer the whole of Ireland, coastal towns such as Dublin and Waterford remained under Norse control well into the twelfth century, with control of powerful fleets and international trade. The growth of these towns throughout the Viking Age had aided the development in Ireland of a market-based economy.²⁰⁴ Nevertheless, their power as dominant kingdoms had ended,

²⁰⁰ Bambury and Beechinor, AU, 447-449.

²⁰¹ Howard Clarke, "King Sitriuc Silkenbeard: a Great Survivor," in Clarke and Johnson, *The Vikings in Ireland and Beyond*, 253-254

²⁰² Clarke, "King Sitriuc Silkenbeard," 253-254; Downham, *Viking Kings of Britain and Ireland*, 86.

²⁰³ William J. Smyth, "The Scandinavian Impact—a Geographical Exploration," *History Ireland* 28, no. 2 (2020):17; John Sheehan, "The Longphort in Viking Age Ireland," *Acta Archaeologica* 79 (2008): 282.

²⁰⁴ Downham, *Medieval Ireland*, 60.

and if they had ever had any aspirations to dominate the island, they did not succeed.²⁰⁵

To begin this long path of military conquest and entrenchment, however, the Vikings seem to have followed a clear strategy. Once the Vikings began landing in Ireland, they established themselves by creating many coastal naval bases that the Irish annals call *longphorts*.²⁰⁶ *Longphorts* probably did not have a homogenous design, but they were still powerful.²⁰⁷ A *longphort* would probably be defended with a moat and rampart, and archaeological excavations at Woodstown, Ireland show a deep outer ditch, shallower inner ditch, and wooden reinforcement indicative of a palisade.²⁰⁸ The first two *longphorts* appear to have been on the Liffey and Boyne, but the marauding fleets continued to create more, as mapped in Figure 2-5 below.²⁰⁹

²⁰⁵ Downham, *Medieval Ireland*, 112-113.

²⁰⁶ Sheehan, "Longphort in Viking Age Ireland," 282.

²⁰⁷ Ben Raffield, "Antiquarians, Archaeologists, and Viking Fortifications," *Journal of the North Atlantic* 20 (2013): 21-22.

²⁰⁸S. Harrison, "Beyond Longphort? Life and Death in Early Viking-Age Ireland" in *Everyday Life in Viking-Age Towns: Social Approaches to Towns in England and Ireland, c. 800-1100*, eds. Letty ten Harkel and Dawn Hadley, (Oxford: Oxbow Books, 2013), Arjen Heijnis, "Early Viking camps in Scandinavia and abroad," in *The Fortified Viking Age 36th Interdisciplinary Viking Symposium in Odense, May 17th, 2017*, eds. Jesper Hansen and Metter Bruus (Odense, DK: Research Center Centrum Odense City Museums: University Press of Southern Denmark, 2018), 37-38.

²⁰⁹ Clare Downham, "Vikings' settlements in Ireland before 1014," 7. From Clare Downham, "Britain and Scandinavian Ireland: the dynasty of l  'varr and Pan-Insular Politics to 1014," PhD Thesis, University of Cambridge, 2003. https://www.academia.edu/25550686/Vikings_settlements_in_Ireland_before1014 (Labels added).

Figure 2-5: Identified Ninth-Century Viking Longphorts in Ireland in Downham, 2003, 7.



This period is often termed the “second phase” of Viking activity in Ireland.²¹⁰ During this period, which lasted roughly between AD 837-876, the sporadic raiding of the first forty years was replaced by what might aptly be called invasion with larger fleets operating from set points within Ireland itself.²¹¹ Although most *longphorts* were temporary and would have simply served as waypoints, others were not so short-lived. Indeed, Dublin, Waterford, Wexford, Cork, and Limerick all grew out of these

²¹⁰ Sheehan, “*Longphort* in Viking Age Ireland,” 282.

²¹¹ Harold Mytum, “The Vikings and Ireland: Ethnicity, Identity, and Culture Change,” in *Contact, Continuity, and Collapse: The Norse Colonization of the North Atlantic*, ed. James Barrett (York, UK: Brepols Publishing, 2003), 118.

naval bases.²¹² While the first *longphort* in the area that grew into Dublin was probably established during AD 841, the areas that would become Cork and Limerick had *longphorts* by AD 848, and Waterford had one by AD 860.²¹³ When Wexford was established is less clear.

Alex Wilson finds the locations of these bases counterintuitive. The terrain was marshy and did not have much farmland, so living there might have been troublesome.²¹⁴ He speculates that their locations might be because the Norse were seafarers and these areas granted them easy access to the sea and would help later settlers establish a trade route. Moreover, as these first raiders would have probably wanted to avoid confrontations, the location provided natural defences.²¹⁵ He suggests the spots may also have been chosen because no one else wanted to settle there.²¹⁶

Of special note, however, is that all these *longphorts* which later turned into towns shared something in common:

²¹² Sheehan, "*Longphort* in Viking Age Ireland," 282-283; Maurice F. Hurley, "The Vikings in Munster: Evidence from Waterford and Cork," *Archaeology Ireland* 7, no. 3 (1995): 23-25.

²¹³ Bambury and Beechinor, AU, 299-300, 307-308, 317-318; Alex Wilson, "The Vikings in Munster," in *Languages, Myths and Finds Volume 3: The Vikings in Munster: Volume 3*, eds. Tom Birkett and Christina Lee (Nottingham, UK: Centre for the Study of the Viking Age, University of Nottingham 2014), 25, 28, 31.

²¹⁴ Wilson, "Vikings in Munster," 24.

²¹⁵ Wilson, "Vikings in Munster," 24.

²¹⁶ Wilson, "Vikings in Munster," 24.

they were not built near rivers, but instead practically on top of them.²¹⁷ Indeed, in 1992 Patrick Wallace noted that “[i]nsofar as excavation has revealed them to date, Hiberno-Norse towns were situated on naturally defended high ground above the confluences of tidal river estuaries and their tributaries or marshes.”²¹⁸ Dublin was built on the Liffey estuary, and it is speculated the first base may have been on Usher Island.²¹⁹ Cork was built on an island in the Lee estuary, Limerick was built on King’s island, north of the confluence of the Shannon estuary and the tributary Abbey River.²²⁰ Waterford was built on an island at the confluence of the Suir estuary and John’s River.²²¹ Wexford, “the ford of the waterlogged island”, is at the convergence of the Slaney estuary and Bishops Water River.²²²

While maintaining a strong military dimension, over time these *longphorts*-turned-towns became integral to international trade, and the Norse heritage community remained traders long

²¹⁷ Wilson, “Vikings in Munster,” 24.

²¹⁸ Patrick Wallace, “The Archaeological Identity of the Hiberno-Norse Town,” *The Journal of the Royal Society of Antiquaries of Ireland* 122 (1992): 62.

²¹⁹ Jacinta Prunty and H.B. Clarke, eds., *Reading the Maps: A Guide to the Irish Historical Towns Atlas* (Dublin, IR: Royal Irish Academy, 2011), 173.

²²⁰ Wilson, “Vikings in Munster,” 31.

²²¹ Wilson, “Vikings in Munster,” 24.

²²² Edward Bourke, “Life in the Sunny South-East: Housing and Domestic Economy in Viking and Medieval Wexford,” *Archaeology Ireland* 9, no. 3 (1995): 34.

after their military power had been eclipsed.²²³ By the Later Middle Ages they had become known as the “Ostmen,” with highly developed navies for hire.²²⁴ Clare Downham, borrowing a term from P. D. Curtin, calls the trading network the Norse created a “militarised trade diaspora”, and in Ireland this network was founded in the *longphorts*.²²⁵ The fact that a few key settlements became permanent and flourished points to the fact that the establishment of these *longphorts* seems to have helped the Vikings gain a strategic foothold on the Irish coast and keep it. Indeed, the Norse kept control of these settlements until the Anglo-Norman invasion of 1171, which is a testament to the success of this branch of the Viking expansion.²²⁶

The Norse actors who played such a large role in Irish politics were also active in what is now Scotland, although reliable written evidence is scarce, being limited to occasional references in the Irish annals, the ASC, and the *Scottish Chronicle*, which originates from a king’s list and has

²²³ Clare Downham, “Coastal Communities and Diaspora Identities in Viking Age Ireland,” in *Maritime Societies of the Viking and Medieval World*, eds. James H. Barrett and Sarah J. Gibbon (Leeds, UK: Maney, 2015), 371, 379-380.

²²⁴ Downham, *Medieval Ireland*, 111-112; Bambury and Beechinor, AU, 171-172.

²²⁵ Downham, “Coastal Communities and Diaspora Identities,” 372; P F Curtin, *Cross-cultural Trade in World History* (Cambridge: Cambridge University Press, 1984), 5, 32- 35, 236.

²²⁶ Downham, *Medieval Ireland*, 111-112; Bambury and Beechinor, AU, 171-172.

undergone much revisionism.²²⁷ According to these sources, as well as archaeological and place-name evidence, these Vikings ravaged Scotland, but concentrated especially on the Scottish islands and western Scotland. Overall, they must have had a huge impact. Vikings took control of Orkney, Shetland, and the Inner Hebrides as well as dominated western Scotland.²²⁸

Western Scotland remained under nominal Norse control until the Treaty of Perth in 1266, and the kingdom of Scotland only gained Orkney and Shetland in 1468 and 1469, respectively.²²⁹

The first mention of an earl of Orkney is in the AU's description of the battle of Clontarf, when it records that a Norse jarl of Orkney, Siucraid son of Lodui, died in the battle.²³⁰ Based on the number of Norse place-names in the islands and western Scotland, it has been theorised that the Norse culture replaced the native Pictish or Scottish culture already in place there.²³¹

The Norse dismembered the kingdom of Dál Riata, ruled by the Irish "Scots," beginning by at least AD 806 when they raided Iona.²³² They plundered every kingdom in what is now

²²⁷ Woolf, *Pictland to Alba*, 87.

²²⁸ James H Barrett, "The Norse in Scotland" in Brink, *Viking World*, 411.

²²⁹ Barrett, "Norse in Scotland," 411.

²³⁰ Bambury and Beechinor, AU, 447-450.

²³¹ Barrett, "Norse in Scotland," 413.

²³² Alex Woolf, *From Pictland to Alba 789-1070* (Edinburgh, UK: Edinburgh University Press, 2007), 341; Bambury and Beechinor, AU, 261-262.

Scotland, including the Scots of Dal Riata, the Britons of Strathclyde, as well as the Picts of Pictavia.²³³ In fact, the complete lack of pre-Norse place-names in the Outer Hebrides suggests that indeed the Viking settlements were dense, agricultural, and overwhelming.²³⁴

Coincidentally, any reference to the Picts disappears from written records by the end of the ninth century. The AU's last record is the killing of Áed, their last named king, by his "associates" in AD 878.²³⁵ The *Scottish Chronicle's* last reference to Pictavia is when it records that "Donald son of Constantine," the son of Áed's predecessor and Áed's nephew, ruled eleven years while the Norse wreaked havoc upon Pictavia.²³⁶ This Donald probably died in AD 900, and although he would have technically continued the Pictish dynasty, the AU styles him the king of "Scotland". Alex Woolf speculates that as the Scandinavians pillaged both the Scots of Dál Riata and the Picts, Scottish refugees who fled to Pictavia might have taken over the remains of both people, and they then unified into the

²³³ See, for example, the ASC's entry for AD 875 in Swanton, ASC, 72-75.

²³⁴ Andrew Jennings and Arne Kruse, "An Ethnic Enigma – Norse, Pict and Gael in the Western Isles," in *Viking and Norse in the North Atlantic: Select Papers from the Proceedings of the Fourteenth Viking Congress, Tórshavn, 19-30 July 2001*, eds. Andras Mortensen and Símun V Arge (Tórshavn, DK: Føroya Fróðskaparfelag, 2005): 260.

²³⁵ Woolf, *Pictland to Alba*, 320; Bambury and Beechinor, AU, 333-334.

²³⁶ Hudson, "Scottish Chronicle," 155.

“Scots”.²³⁷ Unfortunately, while it is clear that the Norse dominated Scotland during the Viking expansion, and that these Norse were to a large extent the very same people who held such sway in Ireland, very little direct information survives on them, and so any further examination of the Viking expansion in Scotland must rely on the evidence of Norse place-names and archaeology for now.

In contrast, much is known about the Viking expansion in England because of some of the most comprehensive archaeological excavations on what a Viking army consisted of. The raids on England began with the attack on Lindisfarne in AD 793, and the royal Mercian diplomas indicate that these attacks continued throughout the next seventy-plus years. The Great Heathen Army, however, did not invade England until AD 865, when they took over Northumbria, East Anglia, and Mercia and held sway until they were defeated by Alfred of Wessex in AD 878 in the Battle of Edington.²³⁸ One of their winter camps has been discovered at Repton, Derbyshire; another at Heath Wood, Derbyshire; and another at Torksey, Lincolnshire. Recently yet another may have been discovered in Foremark,

²³⁷ Woolf, *Pictland to Alba*, 320-322.

²³⁸ Downham “The Vikings in England,” 342.

Derbyshire.²³⁹ During their invasion of England, however, the camp established by the Great Heathen Army in what is now Torksey, Lincolnshire, was strategically located within striking distance of both Northumbria and Mercia.²⁴⁰ Dawn Hadley and Julian Richards have found evidence at this AD 872-73 winter camp that the army was indeed “great.”²⁴¹

Plunder was being processed on a massive scale. There was intensive trade and exchange in goods and probably in slaves. The evidence from Torksey suggests a hybrid economy with monetary as well as bullion transactions and the minting of coins, reflecting something of the complexity of the multiple economic systems that co-existed during the Viking Age.²⁴²

They estimate the Great Heathen Army ranged from 1,500 to 5,000 people and was probably enlarged with camp followers that included women, children, traders, and craftworkers.”²⁴³

The Great Heathen Army also had a camp in the kingdom of Mercia at what is now Repton, Derbyshire.²⁴⁴ The

²³⁹ Cat Jarman, “Resolving Repton” *Current Archaeology* 352 (2019), accessed 7 January 2022.
<https://archaeology.co.uk/articles/features/resolving-repton.htm>

²⁴⁰ Swanton, ASC, 69; Dawn Hadley and Julian Richards, “The Winter Camp of the Viking Great Army, AD 872-3, Torksey, Lincolnshire.” *The Antiquarian Journal* 96 (2016): 31.

²⁴¹ Hadley and Richards, “Winter Camp of the Viking Great Army,” 25, 31.

²⁴² Hadley and Richards, 62.

²⁴³ Hadley and Richards, 58-59.

²⁴⁴ Martin Biddle and Birthe Kjølbye-Biddle, “The Repton Stone,” *Anglo-Saxon England* 14 (1986): 233-34.

discoveries of Martin Biddle and Birthe Kjølbe-Biddle suggest that a well-established, substantial army with an ample camp following spent winters in this AD 873-874.²⁴⁵ Recent radiocarbon dating has reinforced this theory, and also suggested this camp was long-lasting.²⁴⁶ The substantial number of coins indicates markets were held during or between military campaigns, and the Scandinavians had put considerable effort into remodelling the monastery at Repton into a defensive fortification.²⁴⁷ Moreover, while eighty percent of the burials were Scandinavian males, the other twenty percent were female and apparently Anglo Saxon.²⁴⁸

Some senior members of the Great Heathen Army buried at Repton had adopted Christian burial rites but at the nearby, notably different cemetery at Heath Wood, the burials

²⁴⁵ For a short summary of their work, see, e.g., Martin Biddle and Birthe Kjølbe-Biddle, "Repton and the Vikings," *Antiquity* 66, no. 250 (1992), 36-51. The dating of excavations appears on page 38. Also see

²⁴⁶ Catrine L. Jarman et. al, "The Viking Great Army in England: new dates from the Repton Charnel," *Antiquity* 26, no. 361, no. (2018): 197; Cat Jarman, "Resolving Repton" *Current Archaeology* 352 (2019), accessed 7 January 2022. <https://archaeology.co.uk/articles/features/resolving-repton.htm>

²⁴⁷ Martin Biddle and Birthe Kjolbye-Biddle, "The Repton Coin Finds: Archaeological and Historical Significance," in Martin Biddle et al., "Coins of the Anglo-Saxon Period from Repton, Derbyshire: II," *British Numismatic Journal* 56 (1986): 31; Julian Richards, "Excavations at the Viking Barrow Cemetery at Heath Wood, Ingleby, Derbyshire," *The Antiquaries Journal* 84 (2004): 102.

²⁴⁸ Martin Biddle and Birthe Kjølbe-Biddle, "Repton and the Vikings," 45.

retained the pagan Scandinavian practices.²⁴⁹ Julian Richards argues this difference reflects the AD 874 split in the Great Heathen Army. According to the ASC, the leader Halfdan, content with Northumbria, settled there in AD 875.²⁵⁰ The other leader Guthrum wanted to continue the fight and invaded East Anglia.²⁵¹ Repton, therefore, would have been Halfdan's cemetery of settlers and Heath Wood was Guthrum's cemetery for warriors.²⁵² The army, therefore, was both large enough to support such a split and contained a significant contingent that had already begun to assimilate. Thus, these archaeological studies suggest that certainly by AD 865 the initial group of raiders of the Anglo-Saxon kingdoms had transformed into an invading army interested in expansion and control.

As the next hundred years passed, the Vikings gained and lost control of various areas of Britain. By AD 926, however, their last redoubt was York, which they lost to Aethelstan in AD 927.²⁵³ After Aethelstan's death in AD 934, however, control of York and other areas of England was

²⁴⁹ J.D. Richards, "Pagans and Christians at the Frontier," in *The Cross Goes North: Processes of Conversion in Northern Europe, AD 300-1000*, ed. M.O.H. Carver (York, UK: York Medieval Press, 2003), 389.

²⁵⁰ Swanton, ASC, 74.

²⁵¹ Richards, "Pagans and Christians at the Frontier," 392-93.

²⁵² Richards, "Pagans and Christians at the Frontier," 393.

²⁵³ Downham "The Vikings in England," 344.

always in conflict between the Vikings and the Anglo-Saxons, and this conflict only ended when the Normans took over England beginning in 1066.²⁵⁴

In Continental Europe, the pattern of progression was no different. The earliest recorded raid in the Carolingian Empire was in Frisia in AD 810, and its description fits a disconnected sortie. In AD 834, Scandinavian aggressors hit Dorestad, their largest target to that date in the Carolingian Empire and the centre of a large economic system based on the Rhine delta and its tributaries.²⁵⁵ The recorded targets moved steadily westward; Antwerp on the Scheldt (AD 836), Rouen on the Seine (AD 841), Nantes on the Loire (AD 843), and after these first raids, many territories between. By AD 853 Louis then Lothar had already sworn one Scandinavian into service to steward Dorestad on the Rhine, other raiders were freely pillaging the Seine, and a Scandinavian fleet had landed on the Loire.²⁵⁶ In AD 885 through AD 886, Scandinavian aggressors

²⁵⁴ Downham "The Vikings in England," 346-347. Also see

²⁵⁵ Esther Jansma and Rowin J. Van Lanen, "The Dendrochronology of Dorestad: Placing Early-Medieval Structural Timbers in a Wider Geographical Context," (January 2016): 5-6. https://www.researchgate.net/publication/313389163_The_dendrochronology_of_Dorestad_placing_early-medieval_structural_timbers_in_a_wider_geographical_context. Previously published in *Golden Middle Ages in Europe: New Research into Early-Medieval Communities and Identities*, eds., Annemarieke Willemsen and Hanneke Kik (Turnhout: Brepols, 2015), <https://doi.org/10.1484/M.STMH-EB.5.109460>.

²⁵⁶ Nelson, AB, 69, 75-77; *The Chronicle of Regino of Prüm in History and politics in Late Carolingian and Ottonian Europe: The Chronicle of Regino of Prüm and Adalbert of Magdeburg*, trans. Simon MacLean (Manchester:

laid siege to Paris on the Seine. When the contemporary Carolingian king/emperor, Charles the Fat, brought an army to face them, he paid them to lift the siege and harass Burgundy instead.²⁵⁷

The AF's last mention of these aggressors is a Frankish victory in AD 891, and the last note in *The Annals of St Vaast* (AV) is a Frankish victory in AD 898.²⁵⁸ Despite these victories, Scandinavian armies remained in the Empire. In the AD 911 Treaty of St Clair sur-Epte, Charles the Simple swore in a likely veteran of the Siege of Paris, Rollo of Normandy, to guard Rouen and its surrounding territory, an area that eventually blossomed into the duchy of Normandy.²⁵⁹

At this point, records of Scandinavian aggressions began to disappear from Carolingian sources. One of the last records was Flodoard of Rheims' report that in AD 930 the West Francian King Raoul fought and nearly "annihilated" the

Manchester University Press, 2009), 153. This source will be referenced in short form hereafter.

²⁵⁷ Reuter, AF, 97-101; *The Annals of St Vaast* in von Simson, AX, 58-62; Steve Bivans, ed and trans, *Vikings, War, and the Fall of the Carolingians: A Critical English Translation of the Annals of Saint Vaast* (self-pub.: CreateSpace/Shireness Publishing, 2017), 60-62, Kindle. Hereinafter, these second two texts will be cited using a short form.

²⁵⁸ Reuter, AF, 121-123; Bivans, AV, 78-79.

²⁵⁹ Simon Coupland, "From Poachers to Gamekeepers: Scandinavian Warlords and Carolingian Kings," *Early Medieval Europe* 7, no.1(1998), 112. For more information on the treaty itself, see also Felice Lifshitz, ed., "*Dudo of St. Quentin's Gesta Normannorum*," *ORB Online Library*, accessed 22 May 2019, http://the-orb.arlima.net/orb_done/dudo/dudindex.html.

Scandinavian aggressors who were still occupying the Loire.²⁶⁰

Later, in Brittany, where Scandinavian invaders were also attempting to settle, in AD 937 Breton royalty returned from exile and, after a three-year war, defeated then drove them away in AD 939.²⁶¹ Although raids on Brittany do not seem to have fully ceased until the beginning of the eleventh century, Scandinavian aggressors seem to have never regained their former power.²⁶²

Why is the story of Viking expansion in the Carolingian Empire so much briefer than that of other areas?

In Eastern Europe, Scandinavians conquered places as far as Kyiv, and their settlements would evolve into the Russian princedoms that have now united into modern-day Russia.²⁶³ In Ireland, Scandinavian Dublin only lost its autonomy after Henry III invaded Ireland in 1171. In the British Isles, although Alfred of Wessex united the Anglo-Saxons through his fight with Scandinavian invaders and his success allowed his grandson Aethelstan to found England in AD 927, this effort took his

²⁶⁰ Flodoard of Rheims, *The Annals of Flodoard of Reims: 919-966*, eds. and trans. Steven Fanning and Bernard S Bachrach (Ontario: University of Toronto Press, 2011), 19.

²⁶¹ Fanning and Bachrach, *The Annals of Flodoard*, 30-32.

²⁶² Neil Price, "The Viking Conquest of Brittany" in Brink, *Viking World*, 459.

²⁶³ Simon Franklin and Jonathan Shepard, *The Emergence of Russia 750-1200* (London, Routledge, 2014), xvii-xxii.

whole life.²⁶⁴ Then in 1013 England was conquered by Scandinavian Sveinn Haraldsson, who was followed by Cnut the Great, and it was not retaken until 1042 by the English king Edward the Confessor.²⁶⁵ Twenty-four years later, in 1066, Edward's successor and the last Anglo-Saxon king Harold II defeated a force from Scandinavia at Stamford Bridge, but less than three weeks later he himself was defeated at the Battle of Hastings by William the Conqueror, a descendant of the Norseman Rollo who had gained the Duchy of Normandy in AD 911.²⁶⁶ Therefore, even though from then-on England would be far more connected politically to northern France than to Scandinavia, it was connected to the part of northern France that had been given to Scandinavian aggressors. Indeed, although Judith Jesch in *The Viking Diaspora* chooses to define the Viking Age as a period lasting from AD 750 through AD 1100, she says that its "aftermath" arguably lasted until the sixteenth century.²⁶⁷

²⁶⁴ Alfred died in AD 901. Swanton, ASC, 91-93. Aethelstan gained control of all the Anglo-Saxon kingdoms, including Viking-ruled Northumbria, in AD 927, and he adopted the title *rex totius Britanniae* afterwards. Swanton, ASC, 107; Sarah Foot, *Aethelstan: the First King of England* (New Haven, US: Yale University Press, 2011), 20,154.

²⁶⁵ Downham, "Vikings in England," 346.

²⁶⁶ Downham, "Vikings in England," 347.

²⁶⁷ Jesch, *Viking Diaspora*, 10.

Yet in the Carolingian Empire, it appears that after the Carolingians fought the Vikings unsuccessfully during the years they were a powerful empire, unlike in other areas, the Carolingians managed to halt the expansion in the decades after the empire fell apart. Certainly, Scandinavian culture does not seem to have permeated Carolingian Europe to the extent it did the British Isles.²⁶⁸ Nor do Scandinavians seem to have settled in Carolingian Europe to the same extent they did in Scotland, Ireland, and England, where in Scotland they had settled and taken over places such as Orkney, Shetland, and the Outer Hebrides; or in Ireland, where they had settled and founded major coastal cities; or in England, where they settled and contributed to cities such as Lincoln and York.²⁶⁹ In contrast, within the Carolingian Empire, they only seem to have permanently settled in Normandy.²⁷⁰ Despite this, for over a century, dozens—possibly hundreds—of loosely organized Scandinavian warrior bands had successfully pillaged the Carolingian Empire, pitting their pagan culture against the

²⁶⁸ Jesch, *Viking Diaspora*, 27. Lesley Abrams has said, however, that although Scandinavia seems to have had a lighter footprint in Normandy than in the British Isles, this might not be “real”. Metal-detecting has been highly restricted in France, and so the investigations of Normandy have been less comprehensive than those in the UK and Ireland. Lesley Abrams, “Early Normandy,” in *Anglo-Norman Studies 35: Proceedings of the Battle Conference 2012*, David Bates, ed., 48-49. (Woodbridge, UK: Boydell and Brewer, 2013), 47.

²⁶⁹ Jesch, *Viking Diaspora*, 25-27,

²⁷⁰ Jesch, *Viking Diaspora*, 27-28.

pervasive Christianity of the Carolingians, and had gained prominent positions within the Empire. And yet, paradoxically, in the fragmenting Carolingian Europe, soon after Rollo swore allegiance to the West Francien king Charles the Simple in AD 911, the rest of the Scandinavian aggressors with all their power apparently disappeared and did not come back. While this is certainly possible, it is peculiar. And it is this peculiarity that led to the narrowing of the timeframe of this study.

2.2.4 Narrowing the Temporal Range of the Inquiry

The Viking Age changed the face of Europe, and yet one central question about it remains unresolved despite much attention. Why did the Scandinavians first venture out of their home territories?²⁷¹ This is a push/pull question. Internal push factors are reasons that made Scandinavian aggressors decide to leave, factors such as political change or extreme weather at home. External pull factors are reasons that drew them out, for example, seeking plunder or even adventure. While both types of factors are likely involved, there is one question that has rarely if ever been asked: What caused them to choose where and when to attack? For example, why did the first raider who struck the Carolingian Empire choose to attack in Frisia, as

²⁷¹ For a brief review of some of the scholarship on this issue, see the discussion herein in Chapter 8, section 1.

opposed to somewhere else? And having chosen Frisia, why raid in AD 810? Why not AD 808? Or AD 811? Correlating natural disasters and aggressors' raids might suggest an answer because the devastation a region would suffer after a natural disaster would make it more vulnerable and would give an aggressor a military advantage.

But that factor would have changed as the Vikings began to settle and assimilate into the territories they had formerly raided. Thus, by the time of the assimilation of Rollo in AD 911 and the peculiar disappearance of the power of many of the Viking aggressors, the collision of the Carolingians and Scandinavian aggressors had begun to move toward a sort of resolution. As the two cultures began to openly inhabit the same territories, the natural disasters that weakened the Carolingians and made them vulnerable to potential military exploitation by the Scandinavians also weakened the Scandinavians. Studying the impact of natural disasters in the Early Middle Ages as it occurred in the form of political exploitation of the Carolingians by Scandinavian raiders therefore would become much less productive after AD 911. For this reason, the final limitation on the scope of this investigation was to restrict the time period studied to the years between the first raid on Northumbria in AD 793 and Rollo's

assimilation into Normandy, generally considered the first half of the Viking Age.

2.3 Conclusion

The initial question that began this investigation was a broad one: What was the impact of natural disasters in the Early Middle Ages? Defining terms and limiting the type of impact to be examined led to a focus on Scandinavian aggression against weakened populations as a possible impact in the form of political exploitation. Evaluating available types of evidence further focused the question because the Carolingian annals constitute the most suitable source of information. But once the Vikings began to settle in an area, both they and the Carolingians suffered jointly from any disasters. Therefore, the question as refined by these essential preliminary examinations became: Was Viking aggression one impact of natural disasters in the ninth-century Carolingian Empire. Mining the annals for data, however, first required the selection of the annals most promising for analysis and then the development of a specific methodology. Transferring the data to charts that collectively spanned the ninth century began to provide the first tentative answer to the question and to open the possibility of larger questions to come.

Chapter 3. Approaching the Data

With *natural disaster* and *impact* clearly defined and limited, with mention of the famine before the first AD 793 Scandinavian attack providing a thread to follow, and with the Carolingian annals selected as the primary sources for investigation, the next steps became choosing the specific annals to study and conducting a rigorous examination of the enormous amount of data contained in each annal. This examination necessitated addressing historiographical concerns inherent in the source material and then determining which categories of data to extract and how the data should be presented. To simplify and aid in the analysis, the mined data was organized into charts, attached to this survey in Appendix 1. An examination of these charts revealed certain trends and patterns appearing to suggest Scandinavian aggressors might have taken advantage of natural disasters to determine when and where to strike. Problems inherent in the charts, however, prevented drawing firmer conclusions and required broader and deeper study.

3.1. Choosing the Annals

As explained earlier, contemporary annals are the best written evidence of human experience during this period, and the Carolingians were dedicated annal writers. Not all the annals,

however, can support the required data mining and even those that can are imperfect and present historiographical difficulties which must be considered both to extract the information and to understand it.

Because only a handful of annals could be meaningfully examined, the many available were winnowed according to their usefulness. As a result, only four of the five ecclesiastical annals in the *Reichsannalen* were selected as primary sources of data. *The Annals of St Vaast* (AV) were passed over because they were begun in AD 874 when Scandinavian aggressors were firmly embedded in the Carolingian Empire and the aggressors themselves would have simultaneously suffered from these natural disasters, thus complicating the necessary separation of data.¹

The chosen annals were, first, *The Royal Frankish Annals* (RFA), documenting AD 741-829; second, *The Annals of Xanten* (AX), documenting AD 741-872; third, *The Annals of St Bertin* (AB), documenting AD 830-882; and fourth, *The Annals of Fulda* (AF), documenting AD 838-901. Some knowledge of the origins of each of these annals survives, the authors are well-informed about national and international affairs, and each

¹ Bivans, AV, Kindle, loc. 104-107.

records many natural disasters.² Also, each annal was written in a different location within the Carolingian Empire, and all save the RFA were written by independent clergy. Together, therefore, they provide a continuous and occasionally overlapping record of over one hundred years of Carolingian history written from different locations throughout the Empire at different times by different individuals.³

3.2 Addressing Historiographical Concerns

Even so, the four selected annals raise several problems. First, the very reason for choosing annals across a spectrum of time and place leads to historiographical concerns involving confirmation and author bias. A more important concern, however, lies in the question of how to view the calendar because of the relatively loose approach to dating during the time and the modern lack of knowledge about when each season changed.

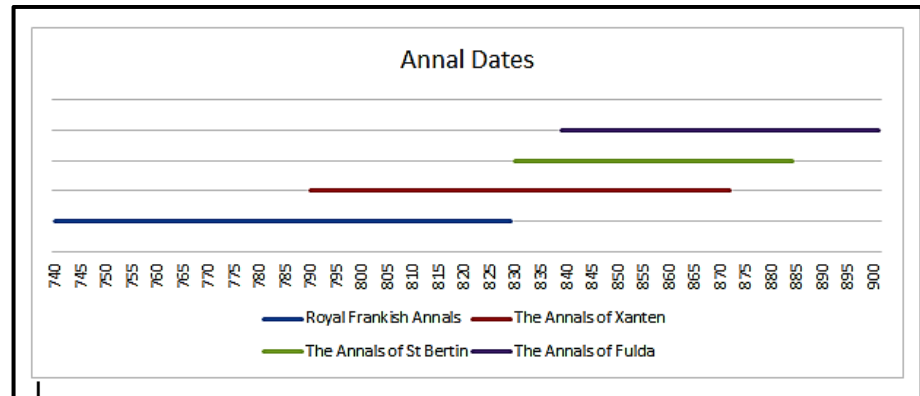
² Van der Essen, "Ecclesiastical Annals," accessed 23 October 2019, <http://www.newadvent.org/cathen/01531b.htm>.

³ Two other sources, *The Chronicle of Regino of Prüm* and *Nithard's Histories*, were also carefully examined but ultimately rejected because of dating inconsistencies. Both Regino and Nithard were heavily involved in royal affairs, but they were recording events long after they happened and had the benefit of hindsight. MacLean, Regino, 3; Scholz, RFA, 121. They were clearly selective, including some years and omitting others. Because of this, the charts would not have been objective, and so they were put aside in favour of the RFA, AX, AB, and AF.

3.2.1 Determining Time Periods and the Confirmation Problem

This set of annals was chosen in part because although each annal covers a different time period, when combined they report memorable events through almost the entire first half of the Viking Age. See Figure 3-1 below. (Enlarged in Appendix 2).

Figure 3-1: A chart of the timelines of the four chosen annals.



Even in this almost ideal situation, however, certain years appear in only one annal, most notably when the AF alone covers the years AD 883-901.⁴ Consequently, fully corroborating the recordings is impossible, which highlights the problem of author bias. Overlapping periods, however, present their own problem. On one hand, the annals may confirm one another. But sometimes, even though they record the same time period, they do not record the same events. An example occurs in AD 874 when the AF record a severe plague everywhere, but the AB record a famine and do not even note it

⁴ Reuter, AF, 94-142.

as major.⁵ Clearly a disaster happened in AD 874. But what was it and how severe was it? Could both authors be correct? They focus on different geographic areas, but is it one phenomenon or two, and could it be that their interpretation of the severity of each disaster—and thus their relative importance—is simply radically different. Unfortunately, the many dangers inherent in over-speculation prevent resolving this question.

3.2.2 Accounting for Author Bias

The second concern involves the identity of the authors. Although the texts are intended as historical records, the agenda of each author or his sponsors must have influenced not only what he recorded—in other words, what he considered to be memorable—but also the phrases and even individual words he chose to use.⁶

The RFA present precisely this issue. Unlike earlier chronicles of the Merovingian period, this annal is exemplary in its methodology in that it clearly dates events every year, but

⁵ Reuter, AF, 75; Nelson, AB, 185-89.

⁶ The author's bias is particularly clear in *Regino* and *Nithard's Histories*. Regino records few natural disasters so no correlation is possible. *Nithard's Histories* only extend through March AD 843 and are mostly concerned with the ongoing civil wars. The only Scandinavian attack Nithard records is in AD 842 and the only natural disaster is an earthquake in that same year. Schloz, *Nithard's Histories*, Book II, 150. The data extracted from these annals has been preserved for future use but is not included in this text because it is not useful, as explained above.

the authors remain unknown.⁷ Two theorised authors are the chaplain of Louis the Pious, Abbot Hilduin of Saint-Denis, and Einhard, author of *The Life of Charlemagne*. Regardless of their precise identity, what they chose to include and how they described events reflect Charlemagne's agenda, establishing himself as the rightful leader of the Empire.⁸ The Carolingian rulers had overthrown the Merovingian dynasty in AD 751, abolished the office of "Mayor of the Palace", and proceeded to subdue and integrate every region within the Merovingian Empire into the burgeoning Carolingian Empire, a process needing an explanation and some justification.⁹ In his *Life of Charlemagne*, Einhard belittles the Merovingian family, claiming that by the time Pippin the Short took over the Empire, the Merovingian family had become puppets so the real rulers had needed to take control.¹⁰ The RFA reflect this agenda. Until his death, the authors write almost exclusively about Charlemagne's military campaigns, his triumphs, and therefore his glory.¹¹ Moreover, the only natural disasters the authors record up to his death are almost exclusively ones affecting

⁷ McKitterick, *History and Memory*, 99-100.

⁸ Fouracre, "The Long Shadow of the Merovingians," 8.

⁹ Fouracre, "The Long Shadow of the Merovingians," 18.

¹⁰ Einhard, *Einhardi Vita Karoli Magna*, 3-4.

¹¹ Rosamond McKitterick, *Charlemagne and the Formation of a European Identity* (Cambridge: Cambridge University Press, 2008), 31.

Charlemagne's triumphant military, such as the AD 791 horse plague, a focus which, again, glorifies him.¹² Scholars generally agree that although the author is unknown, he was most likely extremely close to or belonged to Charlemagne's court.¹³

The AB present a different issue. These annals seem to continue the RFA the year after the RFA ended. They were found in the old abbey of St Bertin on the border of Middle Francia. Their subject matter, however, is West Francia, suggesting they were not written where they were found. Scholars, including Janet Nelson, posit they were probably begun at Charles the Bald's court in West Francia but later taken up first by Prudentius of Troyes until AD 861 and then by Hincmar of Rheims until AD 882.¹⁴ Prudentius and Hincmar were well known ecclesiastical magnates who took significant interest in theological matters, primarily as subjects of debate.¹⁵ In contrast, they took little interest in what might be described as earthly or contemporary apparent miracles. If these two authors wrote from their bishoprics, they viewed events at quite a geographical distance from Charles the Bald's court, but each

¹² Scholz, RFA, 70.

¹³ Scholz, RFA, 5; McKitterick, *Charlemagne and the Formation of a European Identity*, 31

¹⁴ Nelson, AB, 9-11.

¹⁵ Janet Nelson, "Hincmar's Life in his Historical Writings," in *Hincmar of Rheims: His Life and Works*, eds. Rachel Stone and Charles West (Manchester: Manchester University Press, 2015), 48.

was politically close to the court and well-informed about matters within the Carolingian Empire.¹⁶ They recorded Scandinavian aggressions, local warfare, and noted apparent miracles. In addition, they recorded meetings between the three reigning brothers along with decrees, the full text of treaties made by different nobility, and occasional inspirational Christian speeches delivered by a leader before a serious battle, speeches which are probably fictional or paraphrased at best.¹⁷ This panoply of inclusion creates two issues. The first of course is determining veracity. The second is weighing significance. Were these men reliable? Did they record details accurately when something of less perceived importance affected the people but had no miraculous association? These issues of author reliability are precisely why second and third primary sources are useful for comparison.

The AF present their own set of issues. The AF also seem to continue the RFA independently after they were begun about AD 830 though they did not become a clear contemporary source until AD 838.¹⁸ Continuing until AD 901,

¹⁶ Nelson, "Hincmar's Life," in Stone and West, *Hincmar of Rheims*, 52.

¹⁷ Much has been written about these fictional speeches. See, e.g., Stephen Nichols, "Political Grail: On Theological Fictionality," *MLN* 128, no.4 (2011): S159-S181. Though Nichols is discussing the later medieval period, he emphasizes how stories and speeches reinforce to laity the Christian story in a "modern" way. Another work is that of Sarah Foot and Chase F. Robinson, eds., *The Oxford History of Historical Writing, Volume 2, 400-1400*, (Oxford: Oxford University Press, 2012).

¹⁸ Reuter, AF, 8.

they parallel both the AX and AB for thirty-three years as a third primary source and the AB for an additional nine years before becoming the sole annal at the end of the ninth century. The identity of the authors is still in contention. The annals seem connected to the East Frankish king Louis the German so were probably written by clergy closely connected to his court.¹⁹ The three popularly theorised authors, as advanced by scholar Friedrich Kurze, are first Einhard, author of *The Life of Charlemagne*; then Rudolf of Fulda, a distinguished scholar and hagiographer; and, finally, Rudolf's student, Meginhard.²⁰ Kurze notes two apparent autographs on some manuscripts—"thus far Einhard" after the note on AD 838 and "thus far Rudolf" before the note of AD 864.²¹ Siegmund Hellman, however, observes that the references to Einhard and Rudolf appear on only some manuscripts, could quite easily be red herrings, and thus prove nothing.²²

Whoever they were, the authors wrote mostly about King Louis and took much more interest in individual miracles than in greater theological issues. In AD 850, for example, the AF report a famine. The famine was "*gravissima*", it drove up

¹⁹ Reuter, AF, 9.

²⁰ Reuter, AF, 5.

²¹ Reuter, AF, 5.

²² Reuter, AF, 6-7.

prices, and the bishop Hrabanus had to feed more than 300 people daily.²³ But the AF emphasise the tale of a father who was about to kill his son for food when he saw a wounded deer being attacked by wolves, drove the wolves away, and spared his son. Thus God saved the son from harm and the father from sin.²⁴ The goodness of God is a far more important story to the authors of the AF than the famine.

Fortunately, as in the AB, the authors also record Scandinavian aggressions and local warfare though not nearly as many. For example, once the AF became a fully independent source in AD 838, they report only thirty-two attacks, while the AB report eighty-one.²⁵ The AF also do not provide as much contextualizing detail on each attack. Thus, though the AF often name regions attacked, they name only ten cities, while the AB name almost three times as many cities, a discrepancy that again illustrates the importance of overlapping sources to both corroborate and fill in the gaps of other reports.²⁶

Finally, the origin and sponsor of the AX are—again—unknown, but they were likely begun in the Diocese of Worms,

²³ Kurze, AF, 40.

²⁴ Reuter, AF, 31-32.

²⁵ Nelson, AB, 30-226; Reuter, AF, 23-123.

²⁶ Nelson, AB, 30-226.

possibly in the cathedral compound of Worms itself. Named after the abbey of Xanten because the author witnessed the abbey's devastation, the AX document memorable events from AD 790 until AD 873, paralleling the RFA as a second primary source for thirty-nine years until AD 829.²⁷ Little is known about their production, but the annals appear to have been written by independent authors. The period to AD 811 is likely derived from other sources.²⁸ Then until AD 831, when discussing wars, they focus specifically on the south and the frontiers—Italy, the Slavs, and the Greeks.²⁹ For example, they record that in AD 792, Charlemagne invaded Pannonia, a territory in southeast Europe; they note laconically exactly when he returned to drive out Saxons stationed in Regensburg; and they record that in AD 802 he met with the Greeks and in AD 805 with the Huns.³⁰ The AX do not mention the “Nordmannorum” until AD 826 and then only to record one of the many assemblies where Louis the Pious baptised them. The AX begin describing the “pagani”

²⁷ Beata Spieralska, “Annales qui dicuntur Xantenses,” in *Encyclopedia of the Medieval Chronicle*, Graeme Dunphy and Cristian Bratu, eds (Leiden, NL: Brill, 2016), accessed 10 March 2020, http://dx.doi.org/10.1163/2213-2139_emc_SIM_00152; von Simson, AX, V-VIII; Heinz Löwe, “Studien zu den Annales Xantenses,” *Deutsches Archiv für Erforschung des Mittelalters* 8 (1951): 59-60; Reuter, AF, 143-44.

²⁸ von Simson, AX, V-VIII; Löwe, “Studien zu den Annales Xantenses,” 59-60; Reuter, AF, 143-44.

²⁹ von Simson, AX, 1-7.

³⁰ von Simson, AX, 1-3.

in detail only with the first raid in AD 834.³¹ Coincidentally, much more data is available about the AX as of AD 832. From AD 832 until AD 852, the annals were written in Lorsch Abbey and their author was a royal scribe named Gerward. In AD 852, whoever was writing the AX travelled north to Cologne and began writing from there.³² Both locations were in East Francia near the Rhine River. Unlike those who wrote the AB and AF, the AX's authors were terse, providing too little data to hypothesise on their viewpoints. The AX's short list of events throughout each contemporary year, however, is useful for comparison to those annals with a more prominent agenda.

3.2.3 Solving Problems in Dating

The third historiographical concern is dating. Investigating the potential relationship between natural disasters and exploitative political events requires attempting to pinpoint both the year and—if possible—the date or the season in which a disaster or political event occurred. Fortunately, the year was not usually in controversy because the annals were written annually, and the AX, AB, and AF began noting events during or soon after the previous Christmastide. The only difficulty lay within the RFA, when the author occasionally recorded Easter in the previous

³¹ von Simson, AX, 9.

³² Reuter, AF, 144.

year.³³ In these rare cases, the straightforward approach was simply to treat any event the author recorded for the next year as occurring after Easter onward. Thus, even in the RFA, years could be recorded with few difficulties.

Determining the date, month, and season was also straightforward when the authors were relatively specific. Usually, however, the annals were not precise. The typical structure of the annals, however, helped gauge the timing. Each annal usually recorded events in the order they occurred. For example, for AD 830 the AB note an assembly in February, the beginning of a campaign against Brittany on 2 March, Louis the Pious' first loss of power between 17-24 April, an assembly held by Louis on 1 October when he had regained power, and the fact that he wintered at Aachen.³⁴ All these events, noted in the order they happened, are simple to follow and the dates are fairly specific.

When the author did not clearly name the date or season a relevant event occurred, the annals' structure was again helpful because he usually named the dates or seasons of other events and used words such as "*postea*", "afterwards", or "*interim*", "meanwhile". This contextual information provided the probable timing of a relevant event based on where it fell

³³ For a more detailed discussion of this issue see Chapter 2, section 2.3.

³⁴ Nelson, AB, 21-22.

between the other recorded seasons and dates. In rare cases with no other contextualising date or season, the season was estimated by the event's placement on the list or it was judged indeterminable. The only exception to this rule was to list an agreement or treaty as a single item even if the author detailed the terms as several items.

Determining a season, however, did not precisely date an event, especially since there are no exact records of the days seasons changed on the ninth-century Carolingian calendar. It is even questionable as to how closely people followed the Julian calendar of four seasons, and indeed evidence suggests that before the Julian calendar Germanic people may have followed a bipartite calendar with only two seasons, winter and summer.³⁵ Many festivals, of course, were based on the different seasons, and although the Church first disapproved of these seasonal festivities as vehicles for the Devil, they were eventually accepted.³⁶ Much artwork and literature was also based on seasonality.³⁷ However, the exact dates are unknown.

³⁵ P. S. Langeslag, *Seasons in the Literature of the Medieval North*. (Woodbridge, UK: Boydell Press, 2015), 7-8.

³⁶ Ronald Hutton, "Seasonal Festivity in Late Medieval England: Some Further Reflections," *The English Historical Review* 120, no. 485 (2005): 74.

³⁷ For a discussion of art, see, e.g., Ruth Jacoby, "The Four Seasons in Zodiac Mosaics: The Tallaras Baths in Astypalaea, Greece," *Israel Exploration Journal* 5, no.2 (2001): 225-230. For a discussion of the symbolism of the seasons and their role in courtly literature, see, e.g.,

This problem of a more precise reckoning of time and dating of seasons was resolved by following the yearlong calendar proposed by Professor Dmitri Starostine in 2006. He argues that seasons probably officially changed on certain saint's days because these were the dates the populace owed tithes.³⁸ Because a tithe was due on St. Gorgon's Day, 5 September, the season then changed to autumn. After a tithe on St. Martin's Day, 11 November, the season changed to winter. When a tithe was due on Easter, the season changed to spring.³⁹ Because no tithe was due between Easter and 5 September, the change from spring to summer is less clear. To fill this gap, Starostine turns to an AD 818 pictorial calendar accepted as an attempt by clergy to wed imperial with sacred time.⁴⁰ Nine of the twelve illustrated months depict the agricultural peasant labour for that month, such as fowling in February, harvesting in August, and sowing the winter crop in September. Three months, however, do not picture agricultural labour: January, March, and May even though May would have

Albrecht Classen, "Winter as a Phenomenon in Medieval Literature. A Transgression of the Traditional Chronotope?" *Mediaevistik* 24 (2011): 125-150.

³⁸ Dmitri Starostine, ". . .in die festivitatis: Gift-giving, Power and the Calendar in the Carolingian Kingdoms," *Early Medieval Europe* 14, no. 4 (2006): 478.

³⁹ Starostine, 478.

⁴⁰ Starostine, 478.

been filled with agricultural work.⁴¹ The pictorial calendar, therefore, does not give an exact date for when spring ended but its picture of men ploughing in the month of June suggests that the season changed into summer during May.⁴² Accordingly, 1 June can reasonably be considered the beginning of summer. Following Starostine's calendar allowed seasonal notations to be understood more clearly in chronological order.

A related difficulty involved the fact that the year changes in mid-winter. According to Starostine's calendar, winter season started in November of one year and ended on Easter the next year. Therefore, when a recorded event is clearly traced to the winter season, determining the year the event occurred was often impossible and required a "best guess" approach.

These simple methodologies efficiently addressed the historiographical problem of dating in the annals. A straightforward reliance on the structure of the annals, the counting of entries, and the seasonally based collection of tithes allowed most relevant entries to be dated with sufficient certainty to permit the study of correlations.

⁴¹ Starostine, 479-80.

⁴² Starostine, 479-80.

3.3 Extracting, Organizing, and Charting the Data

Next, a system was developed to mine all the different, disorganised data contained in the four chosen annals. The data from each annal was then compiled in separate charts providing a clear picture of the chronological relationship between natural disasters and exploitative political events in the ninth-century Carolingian Empire. Only then could an analysis of any correlation be undertaken.

3.3.1 Determining the Relevant Categories of Data

The first step was to determine what categories of data to mine. Two were simple, the central ones of natural disasters and Scandinavian aggressions.

Defining “natural disaster” in the context of the ninth century was a necessary initial step but did not resolve the question of which events recorded in the annals fit the definition. A tornado in the distance is terrifying to watch but does not always cause damage. An author’s vivid description of a hailstorm, made doubly frightening to someone viewing it in light of a plague in Egypt or Revelation, is not enough to determine it constitutes a natural disaster. A methodology, therefore, was necessary to categorize and chart most if not all possible natural disasters to determine whether they might

have impacted other events within the Empire. Accordingly, four types of events were selected for inclusion.

The first type was when an author described the natural disaster in ways exactly fitting the definition created. For example, in AD 856, the AB author wrote, "*pestilentia valida, qua magna pars hominum absumitur*".⁴³ This "valid" plague that killed a "sizable" number of men would have seriously disrupted the community, and the greatly reduced population would have needed time to recover. This plague was unquestionably a natural disaster and so was included.

This first type of event, however, did not include events such as the AD 801 earthquake, where the RFA notes, "*Ibi dum esset, II. Kal. Mai. hora noctis secunda, terrae motus maximus factus est, quo tota Italia graviter concussa est . . . et in quibusdam locis urbes montes ruerunt.*"⁴⁴ Here, the author did not report any societal disruption or deaths but it is logical to assume that mountains falling on cities caused serious disruptions and deaths. Therefore, a second category of events was created: When an author recorded a specific event but was ambiguous about its aftermath, if the event would have probably resulted in a serious disruption of the society, caused

⁴³ Waitz, AB, 46. "A serious pestilence carried off a sizeable part of the population." Nelson, AB, 81.

⁴⁴ Kurze, RFA, 114. "On April 30, in the second hour of the night, a tremendous earthquake occurred which shook the whole of Italy . . . and in some places mountains tumbled on top of cities." Scholz, RFA, 81.

widespread losses, and exceeded the society's ability to cope, the event was considered a natural disaster.

These two types of events still did not reach situations like the winter that began AD 845, where the AB note a “[h]iems asperrima,” “very hard winter”.⁴⁵ The annal authors, however, usually do not record winters at all except in the context of a king’s decision to do something during it. So, the authors’ recording a winter indicates they thought it was unusual and their describing it as “asperrima” suggests it was unusually difficult. It is reasonable to conclude from this description that the population would not only suffer from the cold but would also have difficulty protecting their livestock, which would also be suffering and more vulnerable to predatory wildlife, such as wolves. Wolves can live almost anywhere, there were already larger populations of wolves in areas with higher densities of ungulates, and they would be seeking easier prey like farm animals.⁴⁶ Since it is reasonable to conclude the situation created by this winter might have become a natural disaster, a

⁴⁵ Waitz, AB, 33. “A very hard winter.” Nelson, AB, 60.

⁴⁶ On general predatory behaviour during harsher conditions, see Will Cresswell and J.L. Quinn, “Predator Hunting Behaviour and Prey Vulnerability,” *Journal of Animal Ecology* 73, no.1 (2004): 152. This study demonstrated that a predator, the sparrowhawk, seeks more vulnerable prey rather than more available prey. For wolves and their ability to prey on farm animals, see Thomas D. Drummer et al., “Winter Prey Selection and Estimation of Wolf Kill Rates in Yellowstone National Park, 1995- 2000,” *The Journal of Wildlife Management* 68, no.1 (Jan. 2004): 162. On medieval wolves specifically, see Aleksander Pluskowski, *Wolves and the Wilderness in the Middle Ages* (Woodbridge, UK: Boydell, 2006), 18.

third category of events was created: When an author recorded a situation that was unusual in its context and could logically result in serious disruption of the society and exceed its ability to cope, the event was listed as a natural disaster.

Yet one more category was needed because these three do not necessarily include situations such as an earthquake in AD 803. The AX only record this earthquake in Aachen and does not record a result. The RFA also note this earthquake, however, and record many deaths.”⁴⁷ Therefore, to avoid overlooking situations where an author of one annal recorded a situation and suggested no negative results, but the situation could quite logically have produced negative results and it might be recorded in another source indicating negative results, a fourth category of events was created, and these events also are recorded as natural disasters. These four types of events proved sufficient to include every possible natural disaster recorded in the annals and fitting the ninth-century definition.

The second basic data category was every event that can clearly be defined as Scandinavian aggression—plunder, ransom, and land battles. Plunder is those situations in which a Scandinavian aggressor raided a territory, looted it, and apparently left. For example, the AB report that in AD 849, Scandinavian aggressors sacked the city of Périgueux, burned

⁴⁷ Nelson, AB, 67.

it, then left.⁴⁸ Ransom is when an aggressor threatens a region and receives payment to leave. For example, in AD 852, the AB report that Scandinavian aggressors traveled to Frisia, demanded a tribute, and left when it was paid.⁴⁹ Land battles are the familiar military engagements between Franks and Scandinavian aggressors. For example, the AF report that in AD 858, at the time Louis the German invaded West Francia, Charles the Bald had been fighting Scandinavian aggressors on the Loire in an "*obsidione*".⁵⁰ Every record of these three types of aggression was noted and charted.

Many major events other than natural disasters, however, could throw a region or even a kingdom into chaos and become a weakness exploitable by an enemy. Therefore, two additional categories of events, Important Deaths and Local Warfare, were charted to serve as controls.

The general disturbance in power relations resulting from deaths of important people could create a situation an aggressor could exploit. One example is the AD 879 death of Louis the Stammerer as recorded by Hincmar of Rheims in the AB.⁵¹ Because Louis the Stammerer's two sons, Carloman II

⁴⁸ Nelson, AB, 68.

⁴⁹ Nelson, AB, 74.

⁵⁰ Kurze, AF, 50.

⁵¹ Nelson, AB, 216.

and Louis III, were still youths, certain nobles scrambled for power through various revolts. Hugh, the bastard son of the Middle Frankish king Lothar II, tried to regain his father's kingdom, and Boso of Burgundy tried to gain complete control of Burgundy.⁵² A final group of nobles attempted to overthrow the heirs completely, arguing that the adult king of East Francia, Louis the Younger, was more fit for the kingship.⁵³ All these power struggles would likely have created a window of opportunity for an aggressor to exploit.

Similarly, ecclesiastically, the death of a pope would create the potential for political jockeying and turmoil. The pope not only crowned a Frankish king as emperor but also confirmed the archbishops, powerful nobles with their own agendas. In vying for power, every king and every noble wanted the pope's support. In AD 844, after Pope Gregory IV died and Sergius II succeeded him, the AB reports, "*Hlotharius filium suum Hludowicum Romam cum Drogone Mediomatricorum episcopo dirigit, acturos, ne deinceps decedente apostolico quisquam illic praeter sui iussionem missorumque suorum praesentiam ordinetur antistes.*"⁵⁴ The

⁵² Nelson, AB, 219.

⁵³ Nelson, AB, 217.

⁵⁴ Waitz, AB, 30. "Lothar sent his son Louis to Rome with Drogo bishop of Metz: they were to take measures to prevent any future pope being consecrated there except on Lothar's orders." Nelson, AB, 57.

pope could be politically manipulated just as any ruler, and a strong leader would want to install a new pope with appropriate political loyalties legitimising the leader's power both politically and as a fighting Christian. To include these deaths and the resulting exploitable power struggles, all deaths of important individuals were included as a control category.

The second control category was local warfare for two reasons. When armed forces and their leaders are involved in other conflicts and cannot guard against outside aggressors, their absence might be exploited by an external enemy. Also, locals themselves might take military advantage of a natural disaster that afflicted their neighbours. Examples of such warfare abound. Louis the German was in constant conflict with the Slavic tribes bordering East Francia.⁵⁵ The different kingdoms within the Carolingian Empire frequently warred with each other, as in Louis the German's invasion of West Francia in AD 858.⁵⁶ Numerous rebellions occurred, such as Carloman's rebellion against his father Charles the Bald from AD 870 to AD 873.⁵⁷ This fourth category designated broadly as "Local Warfare" takes into account every such instance of

⁵⁵ For an example of Louis the German's wars with the Slavs, see his encounters with the Wends from AD 861-AD 865 as recorded by the AB. Nelson, AB, 94-129.

⁵⁶ Reuter, AF, 42-43.

⁵⁷ Nelson, AB, 167-181.

warfare recorded in the annals to allow examination of whether Scandinavian aggressions exploited the resulting disorder.

3.3.2 Designing the Charts

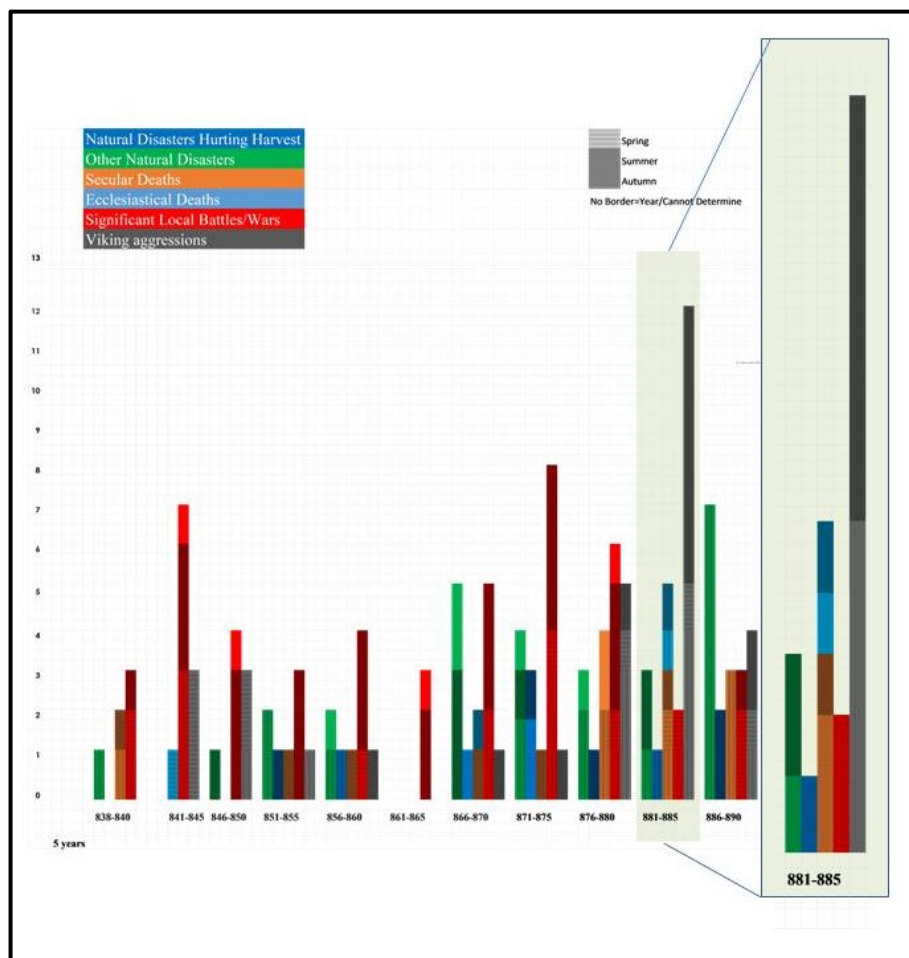
To collate and compare the data gathered in these various categories required developing charts that graphically displayed the data in columns according to date. First, each data category was assigned one or more colours. The columns for natural disasters are green or dark blue. Green indicates those disasters that did not specifically damage the harvest so the extent of the harm can only be guessed. Blue indicates those disasters that did damage the harvest thus creating the potential for food shortages or even a full famine. Scandinavian aggressions are noted in a dark grey column. The column for significant deaths shows secular deaths in orange and ecclesiastical deaths in light blue. Local warfare is indicated by a red column.

The seasons in which events occurred are indicated by lines within the coloured column. Vertical lines represent winter, horizontal lines represent spring, left slanting lines represent summer, and right slanting lines represent autumn. No lines in a column indicates that determining the season was not possible.

The time and frequency of the events is charted on an x/y axis. The horizontal axis represents time. It is divided into five-year periods to track as closely as possible the natural disaster and the beginning of the subsequent recovery, and to ascertain whether exploitative political events also increased relatively during that period. The vertical axis represents frequency, showing the number of events recorded in the period.

How these various design elements work together can be seen in the AF record for the five-year period AD 881 to AD 885, as shown in Figure 3-2 below.

Figure 3-2: Annals of Fulda with years AD 881-885 enlarged.



Focusing on this five-year period shows that the two columns farthest to the left indicate that four natural disasters were recorded during this time. Three of these disasters did not affect the harvest and are shown in green. One of these events was in winter and two were in autumn. The fourth disaster, shown in blue, did affect the harvest and occurred in winter. The third column shows three important secular deaths (orange), one in winter, one in spring, and one in autumn. It also shows two important ecclesiastical deaths (light blue), one in winter and one in autumn. The fourth column in solid red

shows four events of local warfare, all in winter. The last column in solid dark grey shows twelve events of Scandinavian aggression, four in winter, one in spring, three in summer, and four in autumn.

As this look at this five-year period shows, the complete charts in Figures 3-3 through 3-6 below clearly display the information mined in the annals providing a useful tool for examining potential trends or correlations between the categories of events. (Enlarged in Appendix 2).

Figure 3-3: The Royal Frankish Annals

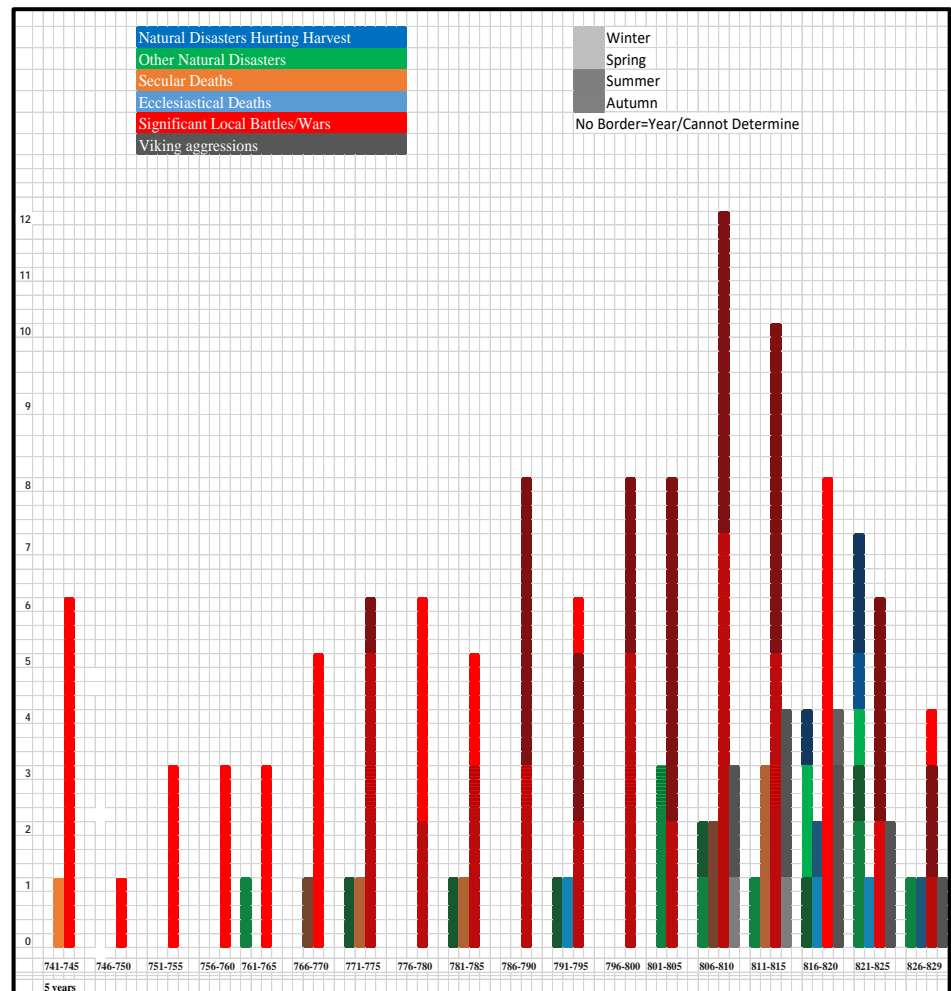


Figure 3-4: The Annals of Xanten

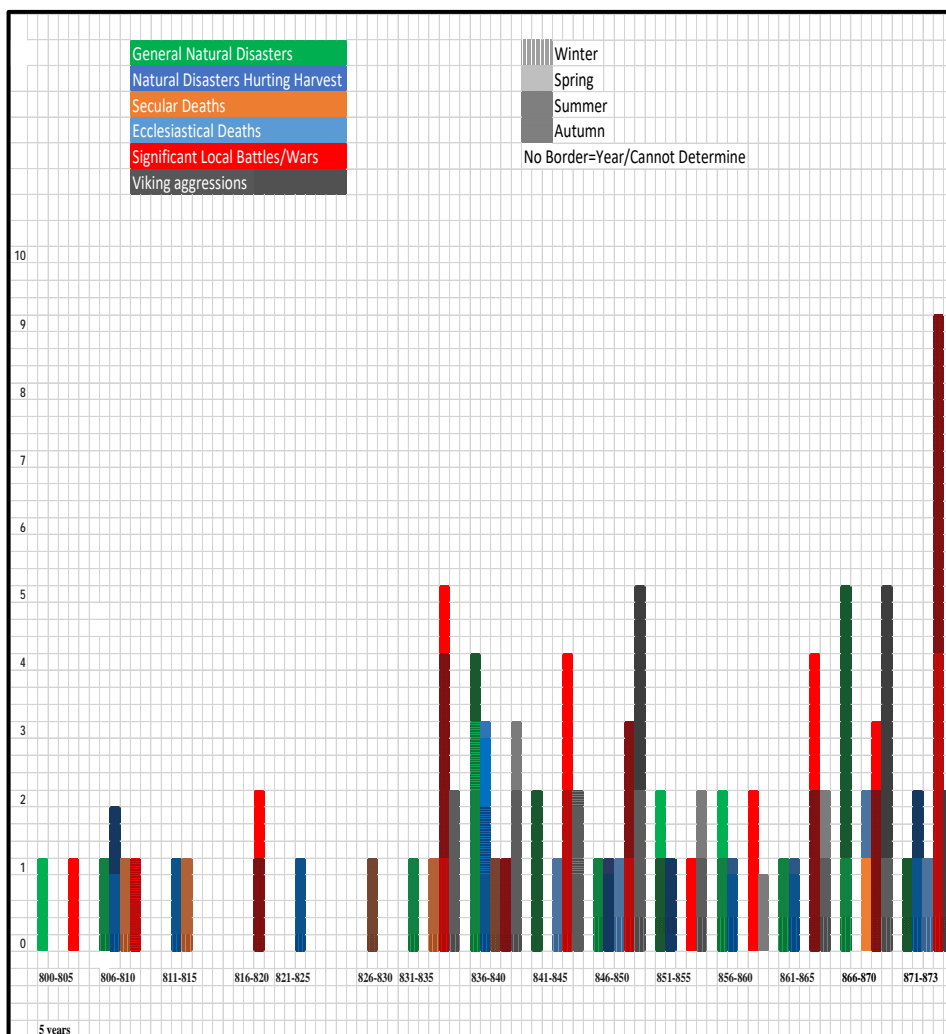


Figure 3-5: The Annals of St Bertin

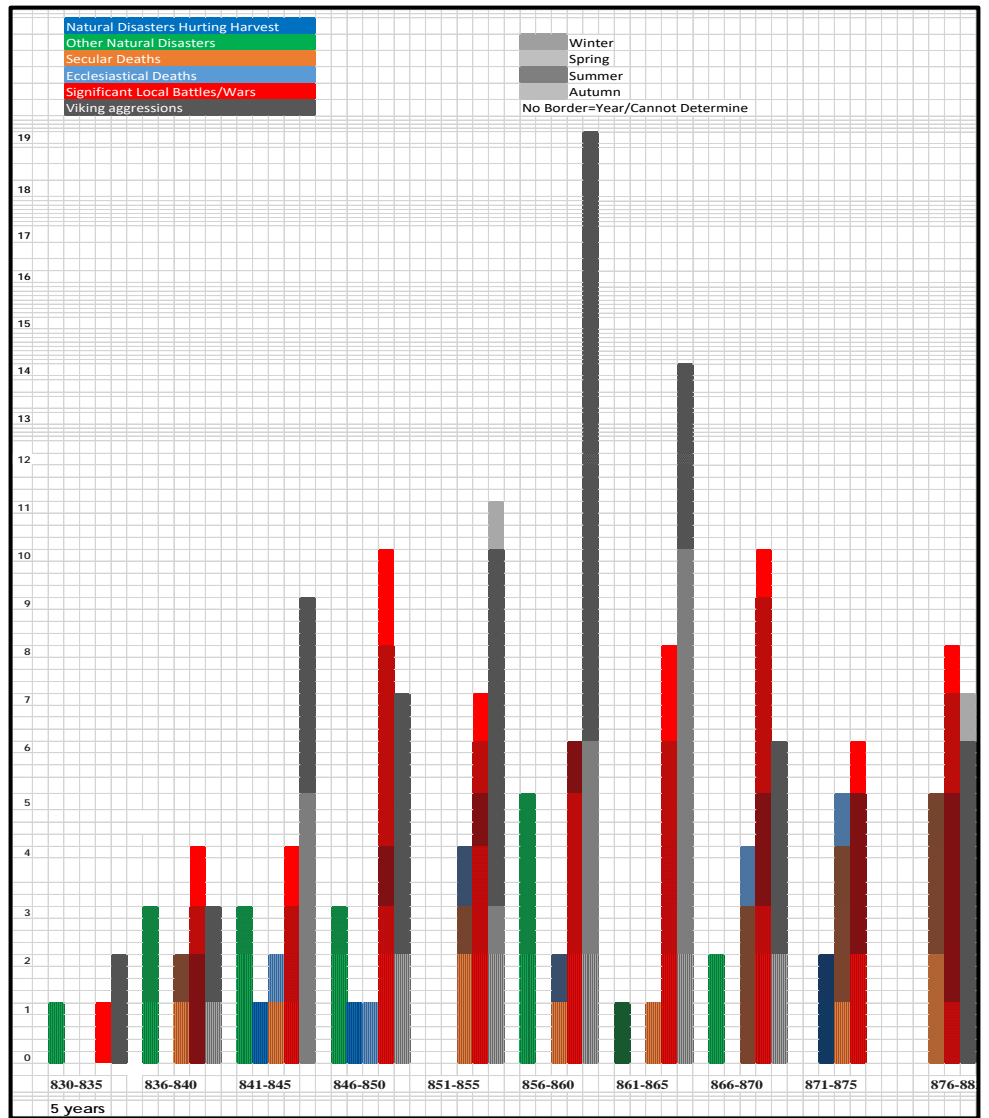
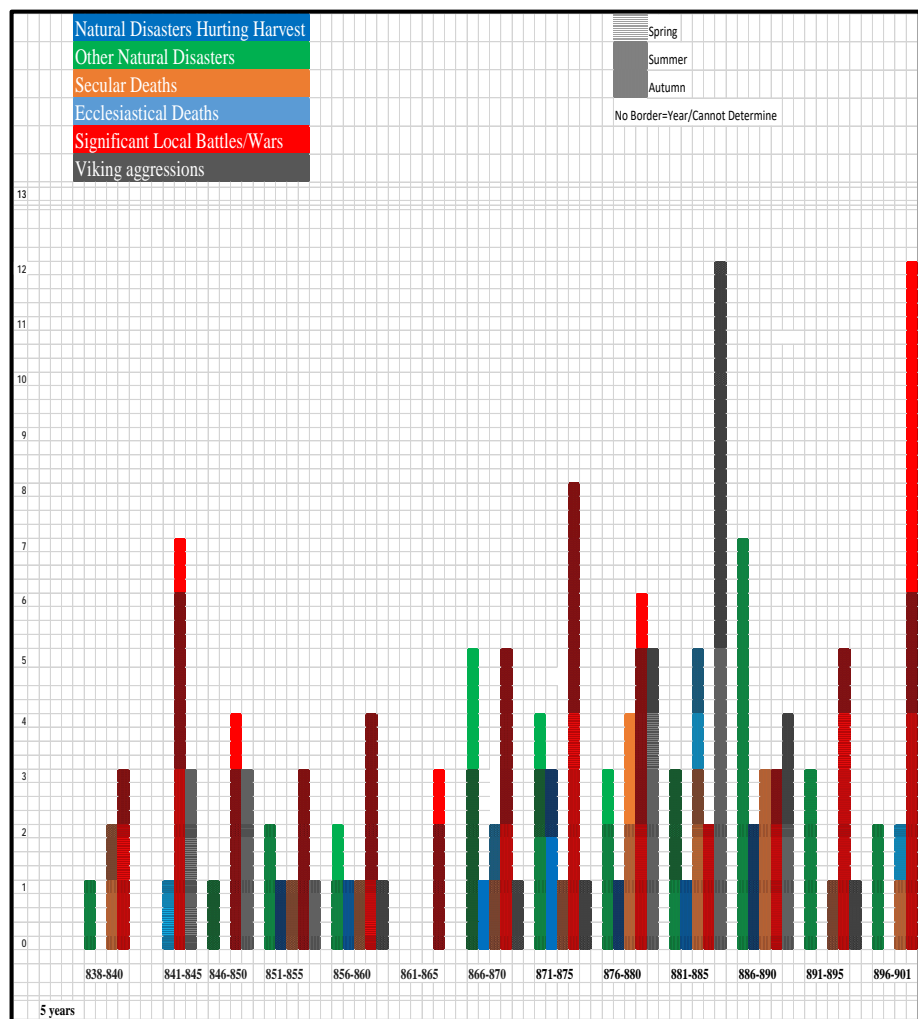


Figure 3-6: The Annals of Fulda



3.4 Analyzing Trends and Patterns

A close study of these four charts reveals certain trends and patterns, and indeed, natural disasters and Scandinavian aggression do appear correlated. In contrast, local warfare is not correlated with natural disasters, and aggression cannot be correlated with either deaths of important individuals or local warfare.

3.4.1 Comparing Natural Disasters and Viking Aggression

Unfortunately, the RFA ends before regular Scandinavian aggressions began so it could not be used to compare aggressions with other categories of data. However, the charted data from the AX, AB, and AF reveals two general points of information about natural disasters and Scandinavian aggression. First, to a certain extent, the increase in one appears to correlate with an increase in the other. Second, aggression does not appear to occur during the natural disaster but shortly thereafter, thus fitting the hypothesis that Scandinavian aggression might constitute exploitation of the natural disaster.

The first natural disaster recorded in the AB occurs in winter in the AD 831-835 period. The first Scandinavian raid, also during this five-year period, was in summer. This alone does not indicate a pattern, but the correlation becomes more significant in the next five-year period. From AD 836 to AD 860, the AB shows an increase in aggressions almost completely coinciding with an increase in natural disasters, the only exception being AD 851-855. Comparing the AB with the AF and the AX shows that in fact two natural disasters occurred during the period AD 851-855, but they do not coincide with the general trend of an increasing number of natural disasters paralleling the number of Scandinavian aggressions. After AD

860 the annals show a decrease in both disasters and aggression, but by that period, the Scandinavian aggressors had fully settled on the Seine and the Loire and would therefore suffer from a natural disaster just as much as the native Frankish population. Therefore overall, the AB clearly illustrate a pattern in which the number of Scandinavian aggressions correlates with the number of natural disasters. While the AB show this hypothetical trend most clearly, the other annals reinforce it.

In both the AX and AF with a few exceptions, the number of Scandinavian aggressions also increased with the number of natural disasters. For example, the AX recorded the most numerous aggressions from AD 866 to AD 870, the same period they recorded the largest number of natural disasters. Between AD 881-885, the AF recorded their second-highest number of natural disasters, five, and also recorded the greatest number of Scandinavian aggressions, twelve. Thus, the AX and AF also show the same trend.

Furthermore, in many cases, as the chart of the AB shows most clearly, aggressors attacked in seasons that seem to take advantage of the natural disaster. For example, in the AD 841-845 period, four disasters struck the Carolingian Empire: three in winter, one in spring. During that same time, aggressors stayed home in winter but attacked nine times in

spring, summer, and autumn. Their post-disaster arrival suggests they might have been taking advantage of the natural disaster's devastation. Similarly, in AD 846-850, three of the four disasters struck in winter but aggressors attacked the empire in winter only twice out of the seven times they attacked during this period. Finally, in AD 856-860, the five natural disasters happened during winter and none directly hurt the harvest. In those five years, Scandinavian aggressors launched only five of their seventeen aggressions on the Carolingian Empire during winter. Again, their leaders could have been taking advantage of the suffering these earlier disasters imposed on the Empire's populace. This trend is also shown in the AX and AF. The AX mirrors the AB in AD 846-850 and demonstrates the same trend again in AD 871-873. In AD 871-873, the three disasters happened in winter and summer, and aggressors attacked in autumn. The AF show five natural disasters happening in winter and summer in AD 881-885 but only four of the twelve aggressions during that time period were in winter and none in summer. Of the other eight, one was in spring and the rest were in autumn.

3.4.2 Examining the Controls

On the other hand, not even a tentative correlation arises between local warfare and natural disasters. In the RFA charts,

five five-year spans show only one natural disaster. During these spans, the number of battles ranged from three to ten. In contrast, the five-year period with the most natural disasters—seven—had only six “local wars.” And AD 806-810, with two natural disasters, had the most battles recorded—twelve. The number of battles relative to natural disasters therefore seems random. The AX, AB, and AF also demonstrate this: local warfare does not parallel natural disasters but is independent of them, with no apparent correlation.

Nor does is there a correlation between local warfare and Scandinavian aggressions. In AD 881-885, the AF record the most aggressions—twelve—and only two local wars, aggressions outnumbering local wars by ten. In the previous five-year timespan, AD 876-880, however, Scandinavians attack five times, the second largest number recorded, and there were six local wars, outnumbering the attacks by one. This same pattern appears throughout the charts of the AB and AX as well, with Scandinavian aggressions occurring regardless of how many local wars occurred in the same timespan.

Finally, important deaths also do not seem to correlate with Scandinavian aggressions. For example, the AB’s highest number of recorded Scandinavian aggressions—nineteen—was in AD 856-860, when the AB reports only two deaths. Thus

in every annal, there appear to be many Scandinavian aggressions whether or not there were important deaths.

Thus, the categorized data as displayed in the charts appears to offer several insights. First, the vulnerability created by a natural disaster apparently did not encourage locals to exploit one another because there is no correlation between local warfare and natural disasters. Nor is there a correlation between local warfare and Scandinavian aggression, suggesting that whatever vulnerability was created by the local warfare, it was not a vulnerability that encouraged aggressors to attack. The same lack of correlation exists between deaths of important individuals and Scandinavian aggression. In contrast, a correlation might indeed exist between Scandinavian aggressions and natural disasters, suggesting that this particular form of vulnerability was one Scandinavians were willing to exploit. Even so, the charts can only suggest a potential correlation; they cannot demonstrate it because charts alone pose several analytical problems.

3.5 Evaluating Three Problems Inherent in the Charts

Though the charts appear to indicate a correlation between natural disasters and Scandinavian aggression, this correlation logically depends on two factors not directly visible in the

charts, location and communication. If the natural disaster occurred in one place and the aggression occurred somewhere else, how can there be a correlation? Similarly, if aggressors did not know a natural disaster had happened, how could they exploit it?

Location cannot be charted because it is unique for each event. Many of the actual entries in the annals, however, give geographic indicators. For example, the Rhine region suffered a famine in AD 850, and an aggressor, Roric, captured the *emporium* Dorestad.⁵⁸ Though it seems likely Roric took advantage of that famine to capture Dorestad, a link cannot be shown in a chart.

On the problem of communication, Danish archaeologist Søren Michael Sindbæk notes evidence suggesting communication in this era was neither difficult nor slow.

Referencing the hagiography of a ninth-century saint, *The Life of Anskar*, he observes:

When Anskar went to Rome, he met the pope, a hub of all western Christianity. The pope personally appointed every archbishop, who in turn appointed every bishop who appointed every priest. If we can assume that every Christian knew a priest, this hierarchy would make Anskar affiliated to everyone in the vast empire of Louis the Pious through less than five degrees of separation.⁵⁹

⁵⁸ Nelson, AB, 69.

⁵⁹ Søren Michael Sindbæk, "The Small World of the Vikings: Networks in Early Medieval Communication and Exchange," *Norwegian Archaeological Review* 40, no.1 (2007): 70.

This affiliation would have not only created a network of clergy and nobles and provided a complex system for communication about current events but it would also have ample cracks for spies. The active economy created another substantial network for quick communications. Michael McCormick contends as demonstrable fact that the Frankish economy was connected to every other Northern European economy, as shown especially by the multiple findings of different forms of commerce at the excavations at Dorestad.⁶⁰ He then goes further, stating the evidence also suggests that every other economy was also likely connected to every other.⁶¹ He notes that trade did not stop at ports but continued upriver to the interior.

The Scandinavians were similarly connected. Until recently, Scandinavian archaeologists have used “Central Places” theory to explain the importance of several trading centres within the Scandinavian world.⁶² This theory maintains that there is a hierarchy of places based on a city’s interactions with its surrounding hinterland, and the “size and economic

⁶⁰ Michael McCormick, *Origins of the European Economy: Communications and Commerce AD 300-900* (Cambridge: Cambridge University Press, 2002), 670.

⁶¹ McCormick, *Origins of the European Economy*, 670.

⁶² Oliver Nakoinz, “Concepts of Central Place Research in Archaeology,” in Kiel Graduate School Human Development in Landscapes ed “(Hrsg.), *Landscapes and Human Development: The Contribution of European Archaeology. Proceedings of the International Workshop*, Kiel Graduate School Human Development in Landscapes, ed. (2010): 255.

significance of a site corresponds to the political position of its leaders.”⁶³

Lately, however, because of several inconsistencies Sindbæk has challenged the central places theory. Instead utilising network theory to examine archaeological excavations in locations such as Ribe in modern-day Denmark, Birka in Sweden, and Staraya Ladoga in present-day Russia, he demonstrates that these *emporia* and the networks that developed between them were being established as early as the seventh century.⁶⁴ They along with other *emporia* were just as connected to each other and Northern Europe as a whole as anywhere else, and communication would have been swift and vast.⁶⁵ Their influence continued to grow, and by the ninth century these emporia included Dublin in Ireland and Hedeby in present-day northern Germany.⁶⁶ In fact, taking as an example Staraya Ladoga, a Scandinavian port situated by the Volkhov River in present-day Russia, Sindbæk points out that Scandinavians were well-connected with people as far-ranging

⁶³ Søren Michael Sindbæk, “Northern Emporia and Maritime Networks: Modelling Past Communication Using Archaeological Network Analysis” in Johannes Preiser-Kapeller and Falko Daim (eds), *Harbours and Maritime Network as Complex Adaptive Systems*, Johannes Preiser-Kapeller and Falko Daim, eds. (Mainz, DE: Verlag des Römisch-Germanisches Zentralmuseums, 2015), 99.

⁶⁴ Sindbæk, “Northern Emporia and Maritime Networks,” 108.

⁶⁵ Sindbæk, “Northern Emporia and Maritime Networks,” 107.

⁶⁶ Sindbæk, “Northern Emporia and Maritime Networks,” 108.

as those in the Middle East.⁶⁷ While some have argued that this connection was the result of the introduction of the Arabian silver coin *dirham* to northern Europe, based on archaeological evidence Sindbæk has instead argued that they had been connected long before the Viking Age, and the only question were the number of necessary contacts in between these places.⁶⁸

Norwegian archaeologist Dagfinn Skre, in researching a later *emporium*, Kaupang, has reached similar conclusions. Founded around the time Scandinavian raiders had reached the British Isles, the coins found in Kaupang come from everywhere in Europe, and although most are Islamic *dirhams*, the earliest coin comes from the fourth century Roman Empire and the latest from the tenth century Islamic Samanids.⁶⁹ They range geographically from as far south as the Middle East, as far east as the Bulgars, and as far west as the Anglo-Saxons.⁷⁰

⁶⁷ Søren Michael Sindbæk, "A Site of Intersection: Staraya Ladoga, Eastern Silver, and Long-Distance Communication Networks in Early Medieval Europe," in Johan Callmer, Ingrid Gustin, and Mats Rolund eds., *Identity Formation and Diversity in the Early Medieval Baltic and Beyond*, Johan Callmer, Ingrid Gustin, and Mats Rolund, eds. (Leiden, NL: Brill Publishing, 2017), 78-80.

⁶⁸ Sindbæk, "Site of Intersection," 85-86.

⁶⁹ Dagfinn Skre, "Kaupang: between East and West; between North and South," in Dagfinn Skre ed, *Kaupang Excavation Project Publication Series Volume 3*; 444; Mark Blackburn, "The Coin Finds," in Dagfinn Skre ed., *Kaupang Excavation Project Publication Series, Volume 2, Means of Exchange: Dealing with Silver in the Viking Age*, ed. Dagfinn Skre (Aarhus, DN; Aarhus University Press, 2008), 30.

Although curiously Carolingian coins disappear after the death of Louis the Pious, this demonstrates the many connections Scandinavians had with the rest of the world.⁷¹

Thus merchants were connected to each other all over Europe and the Mediterranean, and logically, news travelled as quickly and as widely as the goods themselves.⁷² Thus, Scandinavian aggressors would have had ready access to knowledge that natural disasters had weakened particular regions, making them worthy targets. Given that other studies have shown that aggressors chose to invade weaker places, the possibility that they would act on such news seems strong.⁷³

Finally, a third problem with the charts is unrelated to logic but to a simple lack of information. The data as represented by a chart cannot take into account how hard a natural disaster was on the local populace. Some events designated in this data as natural disasters might not have been disasters at all. The “windstorms” the AX noted in AD 837 could have been tornadoes frightening enough to record but having no lasting impact.⁷⁴ Moreover, when the authors

⁷⁰ Blackburn, “Coin Finds,” 30.

⁷¹ Blackburn, “Coin Finds,” 69.

⁷² McCormick, *Origins of the European Economy*, 670.

⁷³ Gareth Williams, “Raiding and Warfare,” in Brink, *Viking World*, 196.

⁷⁴ von Simson, AX, 10.

describe events that undoubtedly qualified as natural disasters, they rarely provide detail on the aftermath. When they do, they usually simply note the disaster ruined the harvest, killed many men, or both. They rarely record further details such as whether the harvest failure resulted in a famine or how many people were affected beyond those who died. The few exceptions stand out. For example, in AD 874 the AF records: “[F]ame et pestilentia per universam Galliam et Germaniam grassantibus pene tertia pars humani generis consumpta est.”⁷⁵ Thus while Scandinavian aggression apparently occurred regardless of a natural disaster’s severity, it would be interesting to determine whether repeated aggressions occurred with more serious disasters.

3.6 Conclusion

Accordingly, the data as illustrated on these charts can only suggest that a link between a natural disaster and an aggression might exist. However, just as the Lindisfarne situation revealed a thread requiring further exploration, the charts reveal a potential correlation inviting further study to resolve the issues within the data by both broadening and

⁷⁵ Kurze, AF, 83. “[T]hrough the hunger and pestilence which raged through the whole of Gaul and Germany, nearly a third of the population was destroyed.” Reuter, AF, 75.

deepening the investigation. Can broadening the research to include available scientific data reveal information about the severity of these natural disasters? Can deepening the inquiry into the annals by focusing on their language increase our understanding of the contemporary view of either the disasters or the Scandinavian aggression? And finally, can all these synthesised together with specific examples of where this military tactic might have been used reveal something more? The next task, therefore, was to employ the two tools of scientific methods and intertextual analyses and discover what they had to offer.

Chapter 4. Dendrochronology and Disasters: Investigating the Potential of Tree Ring Science

The potential correlation revealed in the charted annal data provided no information about the severity of natural disasters or Scandinavian aggressions. Broadening the inquiry to include scientific data, however, allowed exploration of the developing science of paleoclimatology which studies previous climates by examining data provided through climate proxies, including the aftereffects of solar radiation, glacial movement patterns, speleothems, volcanic signals, Greenland ice cores, and dendrochronology sequences.¹ Sometimes the information provided is quite general. For example, while Europe is dominated by many weather systems such as the Arctic Oscillation (AO) or the Scandinavian pattern (SCAND), the primary system that dominates the Northwest European Continent is probably the North-Atlantic Oscillation (NAO).² The

¹ For a full and detailed list of climate proxies and the science, see Michael McCormick et al., "Climate Change during and after the Roman Empire: Reconstructing the Past from Scientific and Historical Evidence," *Journal of Interdisciplinary History* 43, no.2 (2012): Appendix.

² Shangfeng Chen et al., "Combined Influence of the Arctic Oscillation and the Scandinavia Pattern on Spring Surface Air Temperature Variations Over Eurasia," *Journal of Geophysical Research: Atmospheres* 132 (2018): 9411. The AO is a counterclockwise wind pattern at 55°N latitude, and SCAND is a weather circulation pattern primarily centred over Scandinavia with weaker circulation systems in western Europe and Russia. "Arctic Oscillation (AO),"

NAO is defined by the atmospheric variability and circulation of sea-level air pressure between Iceland and the Azores, and this differential controls the power and direction of winds from the west.³ The NAO's index thus indicates what these circulation and weather patterns might be. A positive index indicates that Europe and the eastern US were wet and mild, but Greenland and northern Canada were cold and dry, and a negative index signifies the reverse.⁴ In their study of the NAO over the last 5,200 years, Olsen, Anderson, and Knudsen have found evidence that supports the theory that during the ninth century, the NAO index was stable and primarily positive, which would indicate that the climate throughout Europe favoured wet and mild weather.⁵ This information, however, is far too general to

NOAA National Centers for Environmental Information: National Oceanic and Atmospheric Administration, accessed 20 October 2021. <https://www.ncdc.noaa.gov/teleconnections/ao/>; Climate Prediction Center Internet Team, "Scandinavia (SCAND)," *National Weather Service Climate Prediction Center* (College Park, Maryland USA: NOAA/National Weather Service, 2012), accessed 20 October 2021. <https://www.cpc.ncep.noaa.gov/data/teledoc/scand.shtml>. For more information on these and other weather systems that affect Europe, see, "Teleconnections," *NOAA National Centers for Environmental Information: National Oceanic and Atmospheric Administration*, accessed 20 October 2021. <https://www.ncdc.noaa.gov/teleconnections/>; Climate Prediction Center Internet Team, "Northern Hemisphere Teleconnection Patterns," *National Weather Service Climate Prediction Center* (College Park, Maryland USA: NOAA/National Weather Service, 2012), Accessed 20 October 2021. <https://www.cpc.ncep.noaa.gov/data/teledoc/telecontents.shtml>.

³ Jesper Olsen, N. John Anderson, and Mads F. Knudsen, "Variability of the North Atlantic Oscillation over the past 5,200 years," *Nature Geoscience* 5, no. 11 (2012): 808.

⁴ Olsen et al., "Variability of the North Atlantic Oscillation over the past 5,200 years," 808.

⁵ Olsen et al., "Variability of the North Atlantic Oscillation over the past 5,200 years," 810.

provide insight into the severity of any natural disasters. Nor can it even indicate that any such disasters occurred.

In contrast, examining the many climate proxies studied within paleoclimatology might be able to provide enough data to examine the annual weather patterns within the Northwest European Continent during the ninth century. Ideally, data from many different climate proxies could be combined to create a multi-proxy climate model to show many different aspects of the weather throughout Europe. Multi-proxy models have already been created to model how weather systems would have affected medieval Europe at different times and places, such as Andrew Dugmore's model combining data extracted from Greenland ice cores as well as sea ice to examine how the climate could have affected settlement patterns within the Faroe Islands during the tenth century. Nevertheless, so far, there does not appear to be a similar model for the ninth-century Northwest European Continent.⁶

Although a multi-proxy climate model is currently unavailable, however, there remains one climate proxy that might provide the necessary data. Dendrochronology, or the study of tree rings, can provide meticulous data about specific times in exact locations and therefore may be the most reliable

⁶ Andrew J. Dugmore et al., "The Role of Climate in Settlement and Landscape Change in the North Atlantic Islands: An Assessment of Cumulative Deviations in High-Resolution Proxy Climate Records," *Human Ecology* 35, no. 2 (2007): 169.

method of conducting a pinpoint examination of past climates. Because dendrochronological data sets—though imperfect—do exist for the relevant place and time, the possibility of gleaning potential information about the severity of natural disasters provided sufficient incentive to move forward.

4.1 Reviewing the Science of Dendrochronology

Dendrochronology is based on the fact that the growth rate of a tree is recorded in the size and density of its rings. Because of their uniquely annual development, the relative growth of tree rings thus provides information about climate details for much of each year—temperature changes and precipitation being among the most significant.⁷ The study of tree rings can even provide information about unusual events such as a volcanic eruption because of the effect on the tree’s growth due to the “noise” the volcano makes as well as the potential cold following the eruption.⁸ This data, moreover, can be linked closely or even exactly to an absolute date through cross-dating, which is one reason dendrochronology is a reliable scientific method for determining past climate conditions.^{9,10}

Moreover, although dendrochronology is a complex science, its methods are not difficult to understand. Tree rings grow according to the conditions of their surrounding

⁷ Brian H. Luckman, “Tree Rings as Temperature Proxies,” *Geoscience Canada* 37, no.1 (2010): 39.

⁸ See Jan Esper et al., “Signals and memory in tree-ring width and density data,” *Dendrochronologia* 35 (2015): 62–70.

⁹ Malcolm K. Hughes, “Dendrochronology in climatology—the state of the art,” *Dendrochronologia* 20, nos. 1-2 (2002): 95. See also H. C. Fritts, *Tree Rings and Climate* (New York: Academic Press, 1976), 20-21.

¹⁰ Henry F. Diaz, Malcolm K. Hughes, and Thomas W. Swetnam, eds., *Dendroclimatology: Progress and Prospects* (New York: Springer, 2011), 78.

environment. The width of a tree ring is the most common evidence of those conditions. A wider ring, for example, indicates the year had a higher temperature or more precipitation because the tree had fewer environmental limitations to growth.¹¹ Another less common way to measure climatic features is the density of the wood in the latter half of the growing season or the latewood. The same factors govern Maximum Latewood Density (MXD): warmer weather and more precipitation allow the latewood to be denser.¹² A wider, denser ring represents an environment with fewer limiting factors.

Tree ring data is discovered through two sources: living or dead wood and wooden archaeological objects. To obtain tree ring information from a living tree, scientists insert a borer and extract a “core” sample of the tree’s rings.¹³ These samples are then examined for evidence of patterns. According to Bethany Coulthard and Dan Smith, seven primary principles govern this examination.

The first is the Uniformitarian Principle, which assumes tree growth patterns have not changed; the same biological, physical, and environmental conditions that now affect trees

¹¹ Fritts, *Tree Rings and Climate*, 15-16.

¹² Yu Sun, Lili Wang, and Hong Yin, “Influence of climatic factors on tree-ring maximum latewood density of *Picea schrenkiana* in Xinjiang, China,” *Frontiers Earth Science* 20, no.1. (2016): 126.

¹³ Fritz Hans Schweingruber, *Tree Rings: Basics and Applications of Dendrochronology*, (London: Kluwer Academic Publishers, 1989), 42.

also affected trees in the past.¹⁴ Thus, a present-day tree ring experiencing optimum conditions will have a certain ring width/Maximum Latewood Density. A ninth-century tree with the same ring width and MXL can be assumed to have experienced similar optimum conditions.

The second principle is Limiting Factors. According to this principle, “Annual tree-ring growth cannot proceed faster than permitted by the most limiting environmental factor.”¹⁵ If all factors are positive except one—say, temperature—trees can grow no faster than the temperature allows. If low temperature was the dominant limitation in the ninth century, the resulting tree ring would be narrower.

The third principle is Aggregate Tree Growth. This means tree ring growth is influenced by many complicating factors, “noise”, which must be separated or factored out to minimise them in the analysis.¹⁶ Thus, to “isolate the proportion of annual growth that is controlled by the limiting factor, the impact of these external parameters is statistically removed by standardizing and transforming each variable to an index”.¹⁷

¹⁴ Bethany Coulthard and Dan Smith, “Dendrochronology,” in *Encyclopedia of Quaternary Science*, 2nd ed., eds. Scott A. Elias and Cary J. Mock (New York: Elsevier, 2013), 461, accessed 20 August 2020, <https://www.sciencedirect.com/science/article/pii/B0444527478000636>.

¹⁵ Coulthard and Smith, “Dendrochronology,” 462.

¹⁶ Coulthard and Smith, 462.

¹⁷ Coulthard and Smith, 462.

The fourth principle is Ecological Amplitude. A tree is more sensitive to changes in the climate if it is near the absolute environmental limit for its species, limits including such conditions as a higher latitude or altitude.¹⁸ For example, in Europe, trees more comfortable in lower altitudes are more sensitive to environmental changes if growing within the Alps. Because these uncomfortable trees are more impacted, they produce more distinctly narrower rings reflecting environmental changes than do the comfortable trees. These uncomfortable trees therefore provide clearer evidence of changes within the climate than do native trees.

The fifth principle is Site Selection, the concept of carefully choosing a site depending on the factors to be examined. As Coulthard and Smith explain, "The most useful locations for environmental reconstruction can often be identified based upon site characteristics. For example, trees found growing on bare rocky outcrops are often moisture-sensitive and their tree-ring records contain an historical record of drought conditions."¹⁹ Therefore a study of precipitation amounts might focus on trees in rocky areas but not on those in swampy areas.

¹⁸ Coulthard and Smith, 462.

¹⁹ Coulthard and Smith, 463.

The sixth principle is Replication, the collection of many samples of tree rings from the same site or even the same tree. One tree might have a “false” extra ring or an incomplete ring. Another tree might have more “noise” because a forest fire occurred nearby. By examining as many samples as possible, a dendrochronologist can eliminate false rings, account for missing rings, and factor out incomplete rings thus minimising the effects of “noise” and the danger of errors and increasing the likelihood of finding a common pattern.²⁰

The final principle, one that makes dendrochronology especially useful, is Cross-Dating, which allows for accurate absolute dating of even ancient trees. It builds on a process of matching tree ring growth patterns in living trees, comparing their growth patterns to dead trees, and recognising similarities from now to then by comparing similarities with many samples of these trees. Through this method, it is possible to trace dendrochronological sequences from living trees to old trees and surviving wood.²¹

Given these foundational principles, dendrochronology is a useful tool to evaluate the medieval climate, and this is especially true in measuring changes in precipitation and temperature. These measurements might indicate that a natural

²⁰ Coulthard and Smith, 463.

²¹ Coulthard and Smith, 464.

disaster occurred and perhaps even help measure its severity. Therefore, a methodology was developed to ascertain whether reliable measurements of severity could be achieved with this data.

4.2 Developing a Methodology

The first step in developing a methodology was to find a relevant dataset or datasets. Next came a test of the hypothesis: Can the data indicate the occurrence of a natural disaster. Finally, a methodology was developed to combine the scientific with the annal-derived data, allowing for a pattern analysis similar to the analysis practiced in dendrochronology alone.

4.2.1 Choosing the Datasets

Ideally, a single dataset would contain precipitation and temperature data from the precise locations and times to be examined. For example, because the recorded Scandinavian attacks seem to have been concentrated on the mouths of rivers such as the Rhine, Seine, and Loire, a dataset focusing on these areas would be ideal. At the outset such a dataset seemed to exist, with a tree ring chronology of the Dorestad area developed reportedly in 1972 by dendrochronologists at Hamburg University and discussed by Esther Jansma and

Rowin van Lanen in their 2015 article “The Dendrochronology of Dorestad: Placing Early-Medieval Structural Timbers in a Wider Geographical Context”.²² Dorestad was a city on the Rhine delta in the area now in the Netherlands.²³ Jansma and van Lanen report, however, that despite multiple efforts they were unable to locate this study.²⁴ Unfortunately, this investigation was similarly unsuccessful. Two other studies, however, initially appeared to meet the ideal standard for this investigation.

The first was Jansma and van Lanen’s study examining wooden artifacts excavated in Dorestad—items such as water wells, jetties, staves, and river craft. Their goal was to determine the extent of Dorestad’s trading centre activity from the sixth century until the ninth by analysing dendrochronological data gathered from the wood of these items and comparing it to other timbers found in the

²² Esther Jansma and Rowin van Lanen, “The Dendrochronology of Dorestad” in *Golden Middle Ages in Europe*, A. Willemsen and H. Kik, eds. (Turnhout, Brepols Publishing, 2015), 106.

²³ Menne Kosian et al., “The City and the River. The Early Medieval Emporium (Trade Centre) of Dorestad; Integrating Physical Geography with Archaeological Data in Changing Environments,” *Proceedings of the 17th International Conference on Cultural Heritage and New Technologies 2012* (CHNT 17, 2012) (Vienna: Museen der Stadt Wien – Stadtarchaologie, 2013, https://www.academia.edu/5851685/The_City_and_the_River._The_early_medieval_Emporium_trade_centre_of_Dorestad_integrating_physical_geography_with_archaeological_data_in_changing_environments ,1.

²⁴ Jansma and van Lanen, “The Dendrochronology of Dorestad,” 106.

Netherlands.²⁵ In doing so, they created a dataset specific to Dorestad. Although they successfully demonstrate that Dorestad was indeed an economic powerhouse well before the ninth century, their work has one significant relevant shortcoming: it does not continue into the ninth century. A reused barrel is the single wooden object examined that was constructed from a ninth-century tree, a tree felled at the latest between AD 811 and AD 823.²⁶ Consequently, Jansma and van Lanen's interesting and detailed analysis could not supply the necessary data.

Another study at first appearing potentially useful is Willem Toonan's dissertation, *A Holocene Flood Record of the Lower Rhine*, which calculates the effects of major floods on the environment in the Lower Rhine area.²⁷ Because flooding can cause major environmental damage and the Rhine was attacked frequently, this dissertation seemed potentially useful to measure the extent of floods on towns and villages on the lower Rhine. Toonan, however, measures flood frequencies rather than specific floods and acknowledges that when floods are not extreme they cannot be chronicled individually through

²⁵ Jansma and van Lanen, 106.

²⁶ Jansma and van Lanen, 16.

²⁷ See, Willem H.J. Toonen, *A Holocene flood record of the Lower Rhine*, (PhD Thesis, Utrecht University, 2013), 18, <http://dspace.library.uu.nl/handle/1874/282871>.

tree ring study.²⁸ Yet it is individual floods, not flood frequencies, that constitute natural disasters. Again, an interesting work could not supply the necessary information.

Despite the disappointment of these two contenders, other studies exist allowing an analysis of both precipitation—with or without floods—and temperature in ninth-century Carolingian Empire. In fact, the best method to study the precipitation of the relevant regions probably does not lie in a single tree ring chronology or study of flood sequences but in *The Old World Drought Atlas* (OWDA), fully constructed in 2015.²⁹ The OWDA combined 106 tree ring chronologies to create a series of yearly maps from AD 700 through AD 1000 showing how wet or dry regions in Europe were during the months of June, July, and August.³⁰ Using these 106 datasets, the study found the average of how wet or dry a region was. Then, to estimate this wetness/dryness relative to a norm, it applied a complex algorithm called the “self-calibrating Palmer Drought Severity Index”.³¹ The PDSI is not a simple measurement of how many millimetres of water a region

²⁸ Toonen, *A Holocene flood record of the Lower Rhine*, 149-150.

²⁹ Edward R. Cook et. al., Old World megadroughts and pluvials during the Common Era. *Science Advances* 1, no.10 (2015): 1-9, accessed 11 November 2018, <https://www.ncdc.noaa.gov/paleo-search/study/19419>. All the following illustrations were accessed from the dataset on the website.

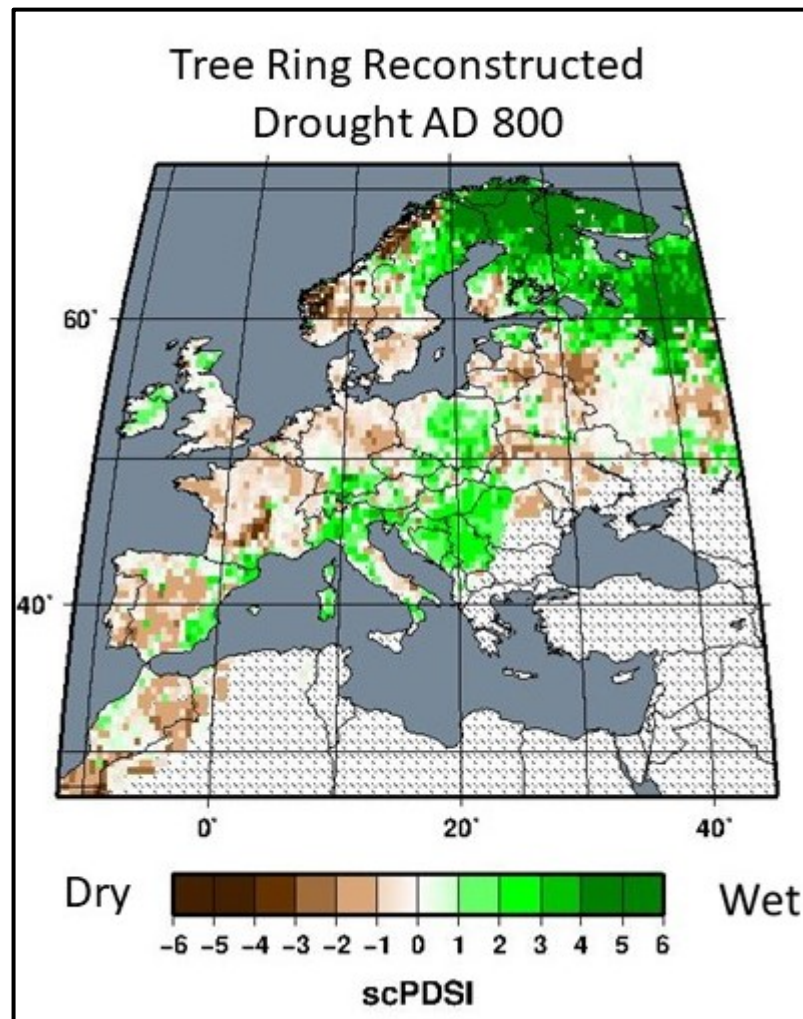
³⁰ Cook et al., OWDA, 9.

³¹ Cook et al., OWDA, 2.

experienced during the summer but includes other variables such as how much soil moisture a region would *need* during a summer because of climactic factors such as temperature and evapotranspiration. This PDSI algorithm rates a region's level of drought on a scale where zero is normal wet/dry. Negative numbers show active drought status: -1 is slight drought; -2 is moderate drought; and -3, -4, and lower become extreme drought conditions. On the other end of the scale, a slight wetness is +1, moderate wetness is +2, and +3, +4, and higher are extreme wetness.³² Having calculated the PDSI for each year, the OWDA plotted it on a map indicating the wetness or dryness of each region through colours. The sample map in Figure 4-1 shows the conditions of AD 800.

³² See Wayne Palmer, "'Meteorological Drought.'" Research Paper No 45 of the Office of Climatology, U.S. Weather Bureau, U.S. Department of Commerce, 1965), <https://ncdc.noaa.gov/temp-abd-precip/drought/docs/palmer.pdf>, for the different variables and basic formula. For an explanation of how the OWDA calculates the Palmer Drought Index, see Nathan Wells, Steve Goddard, and Michael J. Hayes, "A Self-Calibrating Palmer Drought Index," *Journal of Climate* 17, no.12, (2004): 2335-2351.

Figure 4-1: The OWDA in AD 800 in Cook et al., 2015, 1-9



The colours on the Figure 4-1 map indicate that most of Western Europe appears to have been normal, verging on slight to moderate drought. In Northern Italy, the east of Spain, and much of southeast Europe, however, conditions were slightly wet. Farther north, Arctic Sweden was extremely wet while Western Norway suffered extreme drought.

The OWDA, therefore, offers several advantages for examining precipitation during this time. First, it is a compilation

of 105 different tree ring studies taken from areas throughout Europe. It therefore covers not only the relevant location but also is supported by substantial data. Secondly, it covers the entire time period, and thirdly, it clearly charts the results for each individual year. The OWDA, however, does not include any study of temperature. An additional dataset was necessary to investigate this other important aspect of climate.

Major tree ring chronologies for European temperatures include the Hohenheim Oak and Pine Tree-Ring Chronology, covering 12,460 years for south and eastern Germany as well as Switzerland, and the Belfast Oak Tree Chronology, covering 7,000 years for Ireland.³³ Despite the enormous timespan covered by these datasets, they are not useful because they do not include the relevant area. Central Germany, of course, does not include Northern Germany's coast, and Ireland is even more distant, separated by seas and the land mass of England from the area under study.

Another useful dataset would seem to be the dataset Rob Wilson created for his study "Last Millennium Northern Hemisphere Summer Temperatures from Tree Rings: Part I:

³³ Michael Friedrich et al., "The 12,460-year Hohenheim oak and pine tree-ring chronology from Central Europe; a unique annual record for radiocarbon calibration and paleoenvironment reconstructions," *Radiocarbon* 46, no.4, (2004): 1111–1122 (1112); M.G.L. Baillie, "Dendrochronology and Past Environmental Change," *Proceedings of the British Academy* 77 (1992): 5-23.

The long term context.” This study has an exhaustive list of different climates within Europe, China, and other areas.³⁴ The potential value of Wilson’s study of many small areas within Europe, however, is eclipsed by a much larger study of the specific area of focus, Ulf Büntgen’s and other’s survey in “2500 Years of European Climate Variability and Human Susceptibility,” referred to here as the Oak Tree Chronology (OTC).³⁵

The OTC, published in 2011, covers much of Western Europe with a focus on the Rhine, western Germany, Belgium, the Netherlands, and Northern France—in other words, the centre of the Carolingian Empire.³⁶ Figure 4-2 below shows the areas from which tree ring samples were taken and the type of data collected.³⁷ The figure is somewhat confusing for present purposes because it superimposes the relevant tree ring information over a map indicating Roman deforestation trends in Europe at large, but the relevant information is still shown clearly. The blue and white areas represent the 7284 European

³⁴ Rob Wilson et al., “Last millennium northern hemisphere summer temperatures from tree rings: Part I: The long term context,” *Quaternary Science Reviews* 134 (2016): 1-18, accessed 24 May 2017, <https://ntrenddendro.wordpress.com/tr-data/>. The dataset is available on the website.

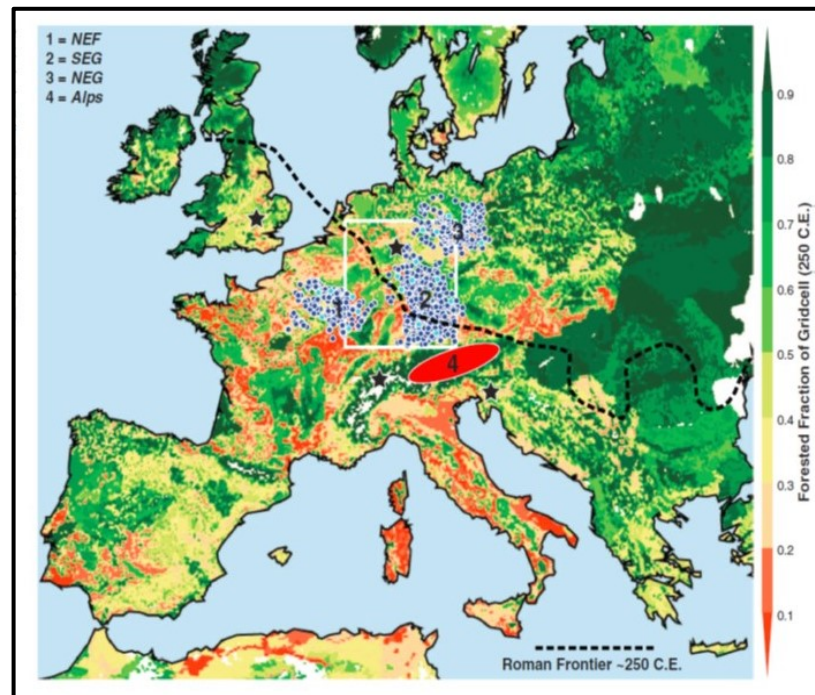
³⁵ Ulf Büntgen et al., “2500 Years of European Climate Variability and Human Susceptibility,” *Science* 331 (2011): 578-582, accessed 24 May 2017, www.sciencemag.org/cgi/content/full/science.1197175/ DC1. The dataset is available on the website.

³⁶ Büntgen et al., OTC, 578-582.

³⁷ Büntgen et al., OTC, 579, Figure 1.

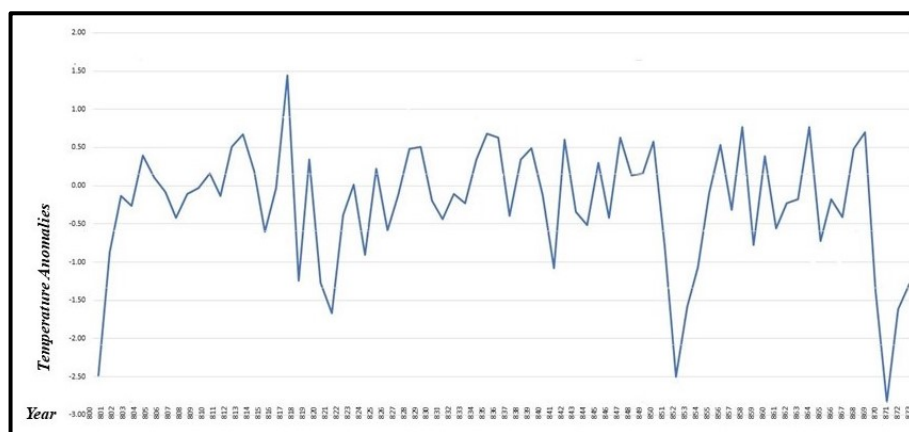
oak samples. The solid red oval represents the 1546 Alpine conifers. The white square indicates an area of precipitation totals used for proxy calibration. Finally, the four black stars represent other tree-ring chronologies used for comparison.

Figure 4-2: The Oak Tree Chronology Map in Büntgen et al., 2011, 579, Figure 1



With many recorded Scandinavian aggressions occurring on or near the Rhine, this dataset offers at least partial coverage of the area under study. Unlike the OWDA that provides individual maps for each year, however, the OTC chart consists of a single dataset spanning from 500 BC to AD 2003. Therefore, a smaller chart focusing on the ninth century had to be created, as shown in Figure 4-3 below.

Figure 4-3: Illustrative chart of OTC temperatures during the years chronicled in the AX



The basic arrangement of the chart is simple. The x axis represents time, with each point representing a single year in the ninth century. The y axis represents temperature.

This temperature data is more complicated than the straightforward notation of dates. To begin, the intersection of the x and y axis does not indicate the “zero” point for the temperature. This is because in the data the “zero point” is the average or normal temperature. Accordingly, the “zero point,” or norm, appears about midway on the y axis. Positive numbers appear above it and negative numbers below it. These negative and positive numbers represent °C variations above and below the norm.³⁸ Thus, on this chart a year with the temperature graphed as +1 is a year when the average temperature was 1 degree above the normal °C. If the year has a temperature of -1, the average temperature was 1 degree below the norm °C.

³⁸ Wilson et al., “Last millennium northern hemisphere summer temperatures,” 9.

This raises the question of what constitutes the norm and how it was derived.

In the OTC, the norm is not stated as a particular temperature. Instead, it is derived from determining an average ring width or an average Maximum Latewood Density.³⁹ The OTC's zero, its norm on the y axis, was found by normalising its dataset through averaging temperature changes from AD 1900-2004, a time period from which many trees still live.⁴⁰ Therefore, the temperature anomalies could be measured by charting the tree ring record of climatic changes, in some cases for millennia, until the present day.

This normalising technique, standard in measuring dendrochronological data, highlights two caveats regarding the temperature charts. First, the "normal" temperature is derived from relative data: scientists must create a standard norm to investigate how ring width and Maximum Latewood Density varied in past climates. Moreover, different dendrochronological datasets derive this norm using different years and different numbers of years. For example, in his study of northern climates, Wilson created his norm by averaging temperatures

³⁹ Edward R. Cook and Kenneth Peters, "Calculating unbiased tree-ring indices for the study of climatic and environmental change," *The Holocene* 7, no.3 (1997): 361.

⁴⁰ Büntgen et al., OTC, 1.

across a 400-year span, AD 1450-1850.⁴¹ In contrast, the OTC averaged only 103 years. The norms of different studies are therefore relative. A second caveat is that all the numbers above and below the norm also represent annual *averages*. Thus, for example, if AD 800 is noted at slightly below -2, this means tree ring data indicates that the average annual temperature for AD 800 was slightly more than 2 °C below the norm. Any seasonal anomalies are normalized into the single average number. The number cannot register dramatic seasonal changes nor can it measure the temperatures outside the growing season. As a result, the number mainly reflects the summer.⁴² If a hot summer was followed by an extremely cold winter, but the summer following that winter was even hotter, the extremely cold winter might not register. The same is true in reverse. If a cold summer was followed by a hot winter that was then followed with a cooler summer, the hot winter might not register. Therefore, dendrochronologists must use the year's summer temperature as representative of the whole year.

All these inherent limitations exist in the data provided by the OTC as well as the data provided by the OWDA.

Nevertheless, as Jansma and Van Lanen have shown, an examination of dendrochronological data can be revealing, and

⁴¹ Wilson et al., "Last millennium northern hemisphere summer temperatures," 9.

⁴² Jansma and van Lanen, "The Dendrochronology of Dorestad," 1-2.

thus dendrochronology offers a potential avenue to examine the problem of severity. A foundational question, however, precedes the question of severity—Can the data reveal whether or not a natural disaster occurred—because if it cannot, logically, it cannot reveal the severity of that disaster.

4.2.2 Testing a Hypothesis: Can Dendrochronological Data Indicate the Occurrence of a Natural Disaster?

Tree ring science can certainly reveal potentially disastrous conditions such as volcanic eruptions. Moreover, drought conditions revealed by the OWDA and dramatic swings in temperature shown in the OTC might also suggest a natural disaster occurred. An example is the climatic conditions between the years AD 816 and AD 818. The OWDA shows most of West and Central Europe in severe drought conditions in AD 816-17 and slightly recovering in AD 818. See Figures 4-4 through 4-6 below.

Figure 4-4: OWDA map for AD 816 in Cook et al., 2015, 1-9

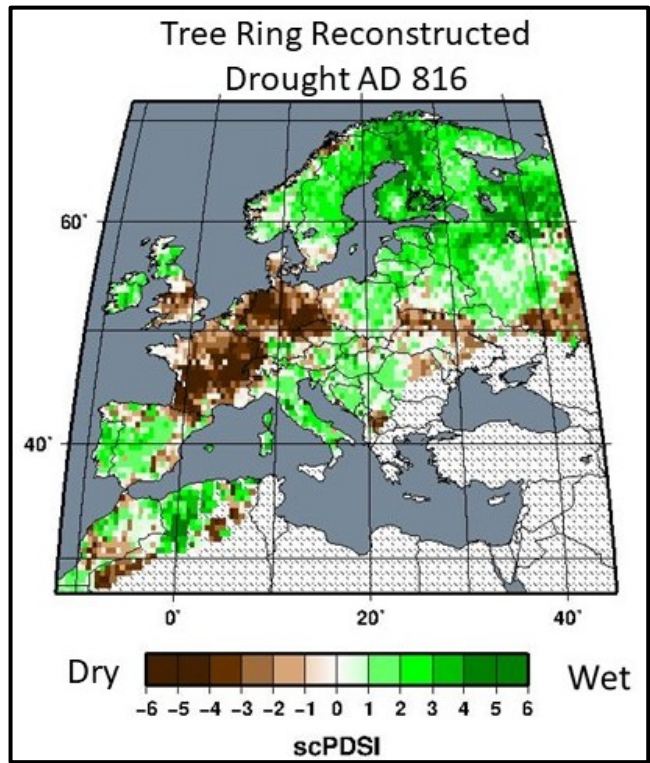


Figure 4-5: OWDA map for AD 817 in Cook et al., 2015, 1-9.

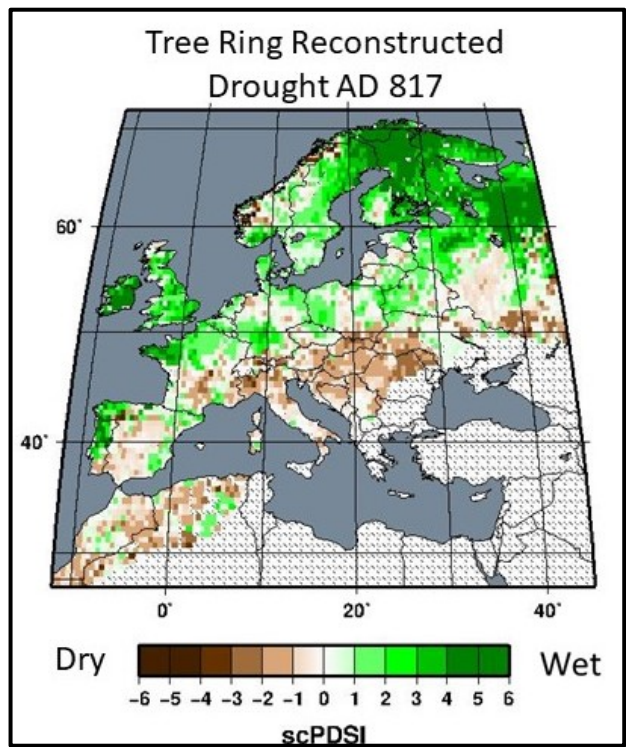
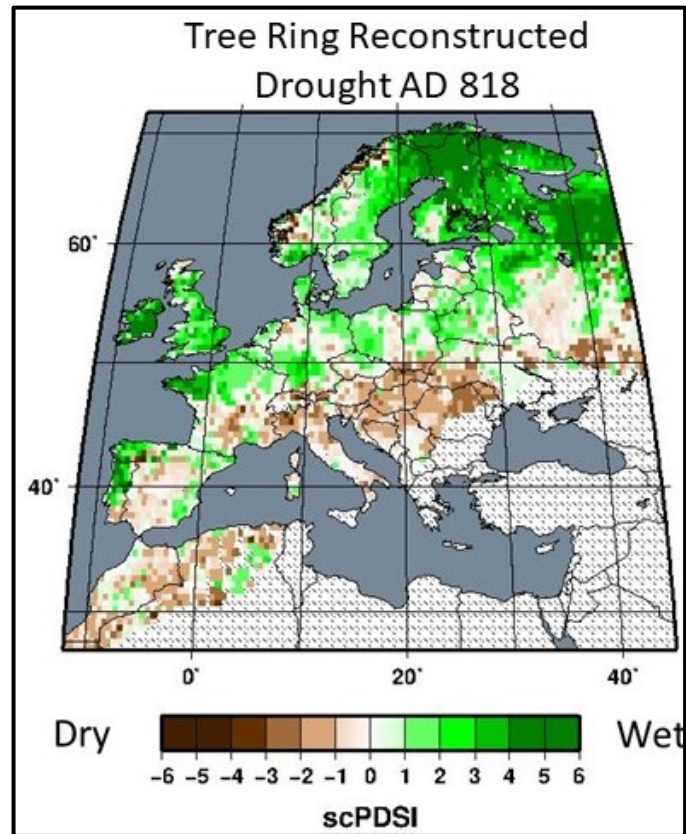
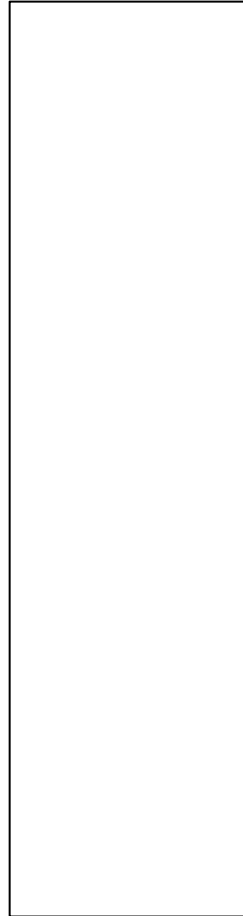


Figure 4-6: OWDA map for AD 818 in Cook et al., 2015, 1-9.



The OTC shows that between AD 816 and AD 817 the temperature spiked followed by a plunge between AD 817 and AD 818. In AD 816, the temperature was -0.03°C below the norm, then rose to 1.45°C above the norm, then fell in AD 818 to -1.24°C below the norm. The swing was so large that on this chart it can be difficult to coordinate years with the data. See Figure 4-7 below.

Figure 4-7: OTC temperature swing from AD 815 to AD 819



But do these dramatic changes in both drought and temperature conditions mean a natural disaster occurred? Theoretically, they could. Extreme cold and extreme heat impede crop growth and also endanger livestock.⁴³ Extreme heat hurts reproduction rates among farm animals and extreme cold reduces milk yields.⁴⁴ The drought conditions combined with a heat spike followed by a cold plunge could therefore be

⁴³ Jerry L. Hatfield and John H. Prueger, "Temperature extremes: Effect on Plant Growth and Development," *Weather and Climate Extremes* 10 (2015): 5.

⁴⁴ A. Nardone et al., "Climatic Effects on Productive Traits in Livestock," *Veterinary Research Communications* 30, Suppl. 1 (2006): 76-78.

especially debilitating. The crops would be vulnerable in *both* growing seasons, and fewer cows would calve, creating the dual danger of less milk immediately and fewer cattle in the long term. Therefore, the dramatic temperature swings alone might lead to the logical conclusion that the situation was ripe for famine. Adding the fact that much of Europe was in drought conditions for much of this time, further impeding crop growth, makes a famine even more likely. But did one occur?

The two annals contemporary with this rise and fall—the AX and the RFA—report many natural disasters. Both the AX and the RFA report a human plague in AD 808, a cattle murrain in AD 810, and a cold winter from AD 810 through AD 811.⁴⁵ The AX report a severe winter in AD 813, and in AD 820, the RFA report a human plague and a failed harvest because of rain.⁴⁶ Neither the AX nor RFA, however, report a famine or even food shortage between AD 816 and AD 818.⁴⁷ Instead, the activity reported is attempted rebellions. The Slavs revolted and were defeated in both AD 816 and AD 817. The Basques also revolted in AD 817. That same year Louis the Pious' nephew attempted to gain control of Italy. In AD 818 another revolt was defeated in Brittany.⁴⁸ The authors never mention

⁴⁵ von Simson, AX, 3-4; Scholz, RFA, 88-93.

⁴⁶ von Simson, AX, 4; Scholz, RFA, 108.

⁴⁷ von Simson, AX, 5-6; Scholz, RFA, 100-104.

arid conditions or high or low temperatures. Nor do they report any obvious problems that may have arisen because of the weather such as a lack of supplies to defeat these revolts. Their reports that Louis handily won demonstrate that the abnormal weather was not an obstacle to him.

What this analysis highlights is that, as discussed in Chapter One of this study and as Margaret C. Nelson and others have pointed out, ultimately a natural disaster is never truly natural.⁴⁹ Though it arises from difficult situations caused by natural factors, it is ultimately a human disaster and the two most important factors creating a natural disaster are the condition of the community before the dangerous situation arose and the ability of the community to respond to the situation. The potential disaster is therefore affected by many more factors than how wet it was, how hot it was, or another climatic anomaly. The community's resilience, the kingdom's strength, and the local elite's acceptance of responsibility are just a few of the human factors involved in creating or preventing a natural disaster.⁵⁰ A flood can be a nuisance or it can destroy a city, depending on the situation.

⁴⁸ von Simson, AX, 5-6; Scholz, AX,100-104.

⁴⁹ Margaret C. Nelson et al., "Climate Challenges, Vulnerabilities, and Food Security," *PNAS* 113, no.2 (2016): 302.

⁵⁰ Nelson et al., "Climate Challenges," 302.

Hence, while dendrochronological data can clearly indicate dramatic rainfall swings or abnormal temperatures that create the possibility of a natural disaster, the data alone cannot indicate a natural disaster occurred. It follows, therefore, that climatological data alone cannot indicate the severity of disaster. To determine the occurrence and severity of a natural disaster, records of human activity must be examined. For these reasons, despite its original appearance of promise, the dendrochronological data is not useful in clarifying the problem of severity. On the other hand, the dendrochronological data does provide a clear picture of temperature fluctuations. This raises the question of whether applying a different methodology would allow events recorded in the annals to be correlated with temperature shifts across the ninth century and in particular whether the Scandinavian aggressions recorded in the annals might in fact be correlated with temperature changes as opposed to natural disasters.

4.2.3 Adjusting the Methodology to Add the Necessary Link: Correlating Dendrochronological Data with Annals

Three categories of events recorded in the RFA, the AX, the AB, and the AF could logically be related to temperature swings—natural disasters, local wars, and Scandinavian aggressions. To investigate this possibility, all historical context was erased and the events were charted simply in relation to

the temperature. Accordingly, a collection of charts was created superimposing the information from the different annals over temperature charts of each dataset. Once again, an illustrative chart is provided in Figure 4-8 below. This example comes from the AX's AD 803 record of a single natural disaster superimposed over the OTC's chart of temperature differences from the norm at the same time.

Figure 4-8: AX AD 803 superimposed over OTC temperatures



As in the previous chart, the x axis simply represents time but the y axis now serves two purposes. Though it still shows the relative temperature variance as before, it now also shows the number of recorded events for a particular year. In this example, the green line on the year AD 803 indicates the one event recorded that year. In AD 801 the temperature was -1.0°C below the norm, then rose to -0.5 °C below the norm, then fell sharply and reached its nadir in AD 803, at -1.6°C below the norm.

Importantly, the chart, by its nature, only notes the relative temperature and the fact that an event was recorded. This natural disaster could have occurred in any month of the year and could have been a flood, a famine, a plague, an earthquake, or some other environmental event that turned into a natural disaster. With the context of this event removed, no conclusions can be drawn about whether a connection between this particular temperature change and this particular disaster exists. A different approach to using dendrochronological data was therefore developed.

4.3 Applying the Dendrochronological Technique of Pattern Analysis to the Charts

The techniques employed in the science of dendrochronology suggested a different approach. The recorded events can be examined in the context of each other and in relation to the changing temperature in search of patterns, patterns which may reveal whether any of these categories of events can be correlated with temperature variances. Accordingly, the information recorded in three different annals was superimposed over the information recorded in the OTC's datasets to produce three separate charts for each of three categories of events. Analysing each of the charts for patterns and potential correlations produced a variety of results.

4.3.1 Analysing the Natural Disasters Data

In the first category of events, natural disasters, temperature might logically be expected to be quite relevant, but no pattern emerged and therefore no correlation could be found. For example, while the AB record sixteen years having disasters, in eight of those years temperatures were rising and in eight they were falling. An even split reveals no pattern. More importantly, a major fault in such a search is that dendrochronology records only summer temperatures.

One illustrative situation is the natural disaster reported by the AB in the beginning of the record for AD 834—the year of the first Scandinavian aggression on Dorestad and also the first aggression followed up by another.⁵¹ The AB report that all the rivers flooded that year, documenting that the Seine flooded in January or February. The AX, at the end of its AD 834 entry, report that all the *land* flooded.⁵² The OWDA complements these two flooding reports because it shows a very wet summer in AD 834 throughout almost all of Europe, including most of the Carolingian Empire and Scandinavia.⁵³ According to OTC data, the temperature was rising in AD 834, perhaps suggesting, for example, that rising temperatures melted snow

⁵¹ This particular aggression will be examined in detail in Chapter 6.

⁵² Nelson, AB, 29; von Simson, AX, 9.

⁵³ Cook et al., OWDA, 1-9.

in the Alps and caused the rivers to flood. However, the Seine flooded during winter, proving that the cause of the flooding—or at least of its onset—was more complicated than rising temperatures.

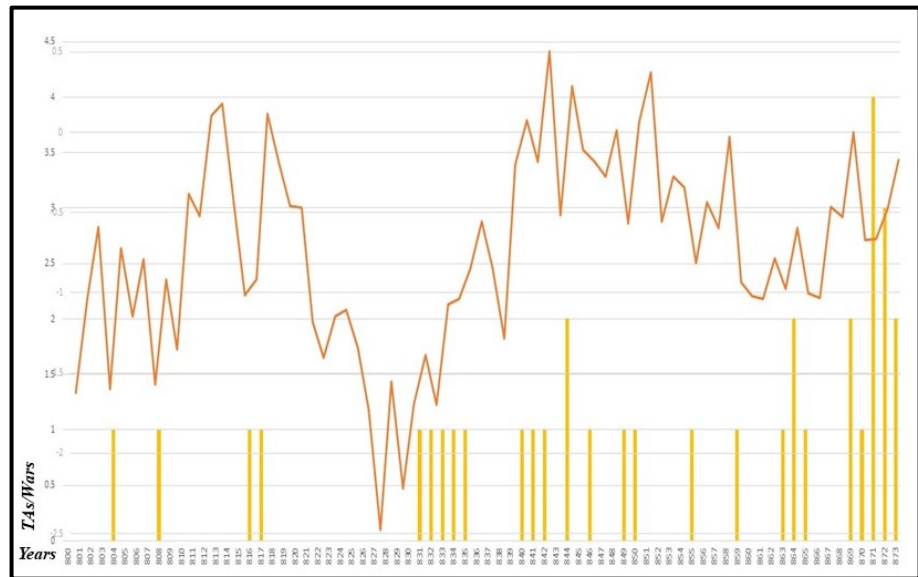
Thus because dendrochronological data only measures summer temperatures, its data may be completely unrelated to natural disasters in other seasons. Unfortunately, this discrepancy undermines any attempt to find patterns or potential correlations between temperature and natural disasters.

4.3.2 Analysing the Local Warfare Data

The next category of event potentially related to temperature is Local Warfare. Only the AX, AB, and AF were examined to explore a possible correlation because the RFA end at AD 829. Each annal's data on local warfare was superimposed over the temperature fluctuations recorded in the OTC. Because the resulting charts may reveal more than did the charts of natural disasters, they are included below and discussed individually.

The first chart, Figure 4-9 below, is of the AX, which chronicles events within the Carolingian Empire from AD 800 to AD 873. (Enlarged in Appendix 2).

Figure 4-9: AX Local Warfare superimposed over OTC temperatures

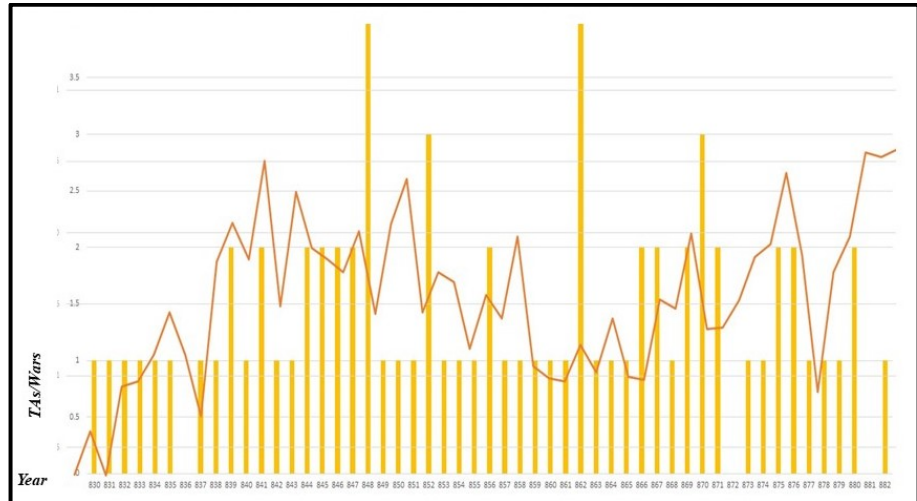


During these seventy-three years, the authors record twenty-six years of warfare. Twenty of these years experienced only one war, four experienced two, one experienced three, and one experienced four. Consequently, it is difficult to establish a pattern within the warfare itself. However, shifting focus to patterns between warfare and temperature shows that each time the AX recorded wars for more than two consecutive years, each series began in a year when temperature was within the norm. Within each of these series of wars, although the temperature fell, the fall was gradual except for the series that began in AD 869 when the temperature had risen. Therefore, the OTC's data on temperatures contrasted with the AX supports the possibility that local wars tended to happen when the temperature was within a normal range or higher. Consistently throughout this chart, a series of wars begins

when the temperature in parts of Germany and Northern France is warmer and on an upswing.

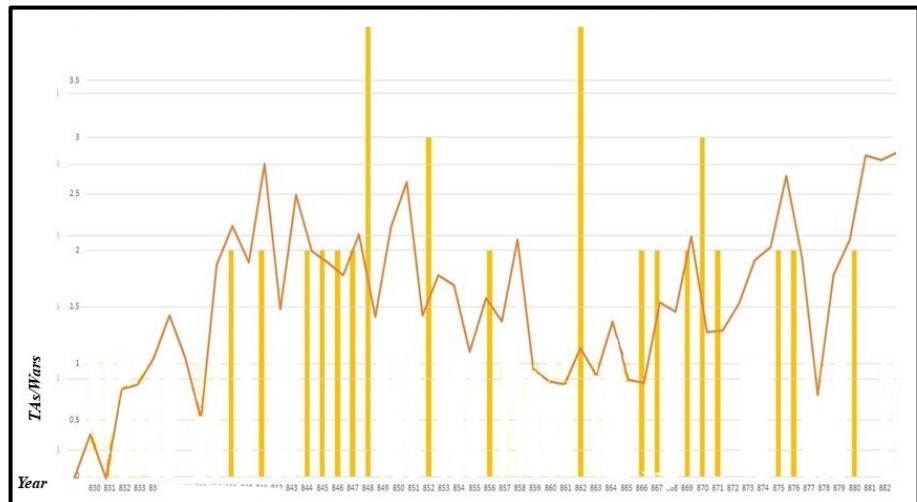
The second annal, the AB, chronicles the Carolingian Empire from AD 830 to AD 882. See Figure 4-10 below. (Enlarged in Appendix 2).

Figure 4-10: AB Local Warfare superimposed over OTC temperatures



As the chart shows, the AB record violence almost annually, with at least one war in forty-nine of fifty-two years. Thirty-one years experienced only one war, fourteen years experienced two, two years experienced three, and two years experienced four. Such common violence obscures any possible relationship between temperature and warfare. Therefore, because a single war was a regular occurrence and seems unlikely to be connected to variances in temperature, the “single war” years were cropped out to allow focus on “multi-war” years, and the first war was cropped out in the remaining “multi-war” years. See Figure 4-11 below.

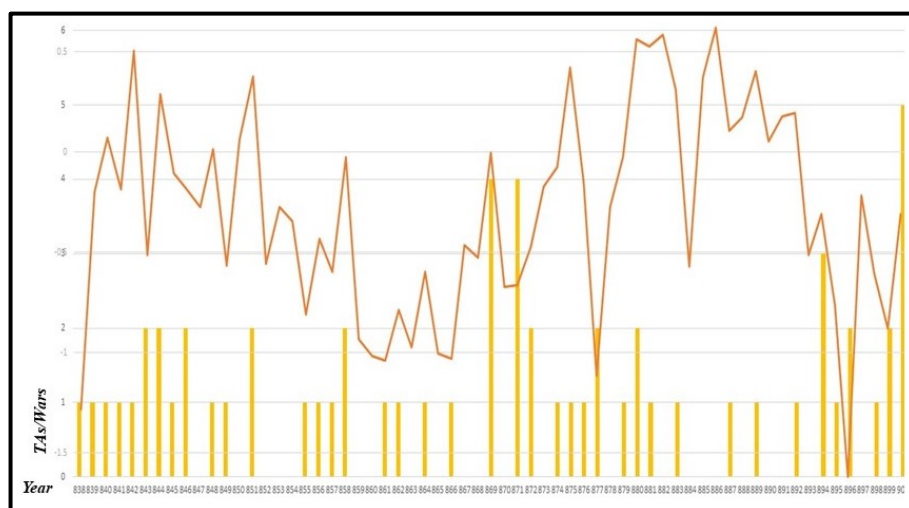
Figure 4-11: AB Local Warfare and OTC temperatures, cropped



This recalibrated chart of the AB suggests, as did the AX chart, that more local warfare occurred when temperatures rose. Of the thirteen years in which two wars were fought, only three experienced falling temperatures, and that fall was slight—from -0.002 to -0.67 degrees C below the norm from AD 869 through AD 870. The temperature was rising in AD 852 when three wars occurred and also in AD 862, when four occurred. Therefore, again, local wars seem to have increased when the temperatures were higher or closer to normal.

The third annal, the AF, chronicles Carolingian events from AD 838 to AD 901. See Figure 4-12 below. (Enlarged in Appendix 2).

Figure 4-12: AF Local Warfare superimposed over OTC temperatures



During these sixty-three years, the authors record forty years of warfare. Twenty-six years experienced one war, ten experienced two, one experienced three, two experienced four, and one—the last year chronicled—experienced five.

As in the AX, the AF usually report only one conflict a year. However, unlike the AX, which recorded war in only one-fourth of the chronicled years, the AF record war in almost two-thirds of the chronicled years. Therefore, focusing on patterns evinced in series as done with the AX cannot be done here. The cropping shortcut used to examine the OTC's temperature as compared to the AB warfare would also be unrevealing because in only fourteen out of the forty war years did the author record more than one war and the wars were not annual, unlike the AB's records. For those two reasons, cropping one war from the AF's charts would be a less helpful.

Because of these two difficulties, different analysis was used focusing on percentages. The annal records war often but rarely reports more than one war. Out of the sixty-three years chronicled, forty years—64 %—experienced war. In those forty years of warfare, the author recorded one war in twenty-six—or 65 %—of those years and two wars in ten—or 25%—of those years. Years involving one or two wars thus constitute 90% of the war years. The other 10% break down as follows: one year with three wars—2.5%, two years with four wars—5%, and one year with five wars—2.5%. Therefore, the routine amount of war during years when war happened was one war sometimes stretching to two wars.

Focusing on temperature, the charts show the temperature was within the normal range of $\pm 0.5^{\circ}\text{C}$ off zero in eighteen of the one-war years and in five of the two-war years. Four one-war years experienced a temperature above $+0.5^{\circ}\text{C}$, and two two-war years experienced a higher-than-normal temperature. Therefore, 80.5 % of the routine amount of conflict occurred when the temperature was at a normal or higher range. This evidence supports the hypothesis that local conflict tended to occur during years when the temperature was normal or above average.

All this suggests a possible correlation between rising or normal temperatures and an increase in local warfare.

Moreover, it seems logical that warring factions would choose to engage in hostilities in warming or normal temperatures. Combatants would be not only physically more comfortable but also more likely to be well fed and better able to travel. As with the analysis of natural disasters, however, this analysis runs squarely into the fact that dendrochronological evidence is taken only from the summer months. Therefore, the rising and falling measure is only of summer temperatures. As a result, the most precise way to attempt a correlation would be to consider only warfare in summer months. Returning to the earlier compilation of data from the annals, ordering each local warfare event throughout the year, placing undated events between recorded dated events, and paying attention to words such as *pre*, *interim*, and *post*, however, makes the picture even murkier. The AX were the least certain as to warfare dates but it was clear that only seven out of the thirty-six wars recorded were fought during spring or summer, or 19.4% of them. In the AB, only eighteen, or 24%, of the seventy-three recorded wars were fought during spring or summer. In the AF, thirty—47%—of the sixty-four recorded wars occurred during the spring or summer. Therefore, most local warfare did not happen during spring and summer, the times dendrochronological data can be gathered. This fact, however, does not render a dendrochronological methodology completely

irrelevant. Normal or warm temperatures, if not extreme, produce more fruitful harvests.⁵⁴ Therefore, the temperatures might give clues as to how productive a harvest was and accordingly provide clues as to how well-prepared kingdoms might have been for war. Nevertheless, a more precise correlation between temperature and local warfare cannot be achieved.

Perhaps more important, however, is the fact that to explore a possible link between local warfare and the weather, the historical and political context of the ninth century had to be removed from the analysis as a factor. Eliminating historical and political context assumes that all war is opportunistic and that temperature is one of the factors in opportunity. In other words, it adopts a view that the stronger will take advantage of the weaker whenever the opportunity presents itself. Thus, if every heat spike saw an increase in hostilities, the conclusion might be drawn that warriors advanced when doing so was easier for them. But the charts show no such clear pattern. Though they may support the idea that routine warfare occurred at the aggressor's convenience, this is not true of non-routine warfare. That the spikes in warfare do not correlate with either a rising or falling temperature proves that factors other than temperature governed the decision to go to war. Those factors,

⁵⁴ Hatfield and Prueger, "Temperature extremes," 5

whatever they were, are the historical and political content removed from this analysis. For all these reasons, no conclusion could be made.

4.3.3 Analysing Scandinavian Aggression Data

Scandinavian aggressions have been defined as including three types of events—land battles, the plunder of a city or area, and the demand and receipt of ransom from a populace the Vikings were poised to attack. Extracting all notations of such events from the three annals recording many aggressions—the AX, AB, and AF—created a record of hostile Scandinavian activity in northern Europe through the course of ninth century and built a wide data base for comparing the timing of Scandinavian aggressions with temperature fluctuations.

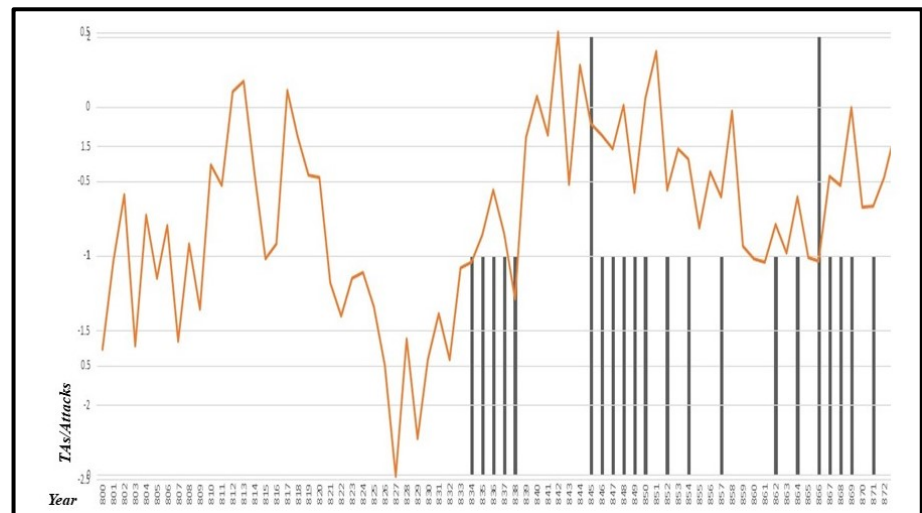
This analysis, however, required a broader view of temperatures because of one significant fact. Much of the recorded Viking military actions consisted not of land war but of specific naval attacks to raid specific targets. A long-distance attack would likely result not just from immediate climatic conditions but from a longer span of time. In fact, the decision to raid might well be based not only on the conditions existing at the time of the raid year but also on the conditions of the previous year. Since the populace would be weaker, an attack

in January following a meagre harvest might be an extremely profitable naval strategy.

Therefore, though a simple comparison of specific-year-to-specific-event was appropriate for natural disasters and local warfare, the same was not true of Scandinavian aggressions. Accordingly, the examination was widened to consider not only the temperature changes during the attack years but also temperature changes during the year before an attack. To facilitate the analysis, temperatures that were rising after the temperature had also risen the previous year were designated "certain" temperatures. Temperatures that were declining from the previous year or recovering from a fall the previous year were designated "uncertain" temperatures. With this adjustment, the data from each annal was superimposed over the temperature data and then analysed.

First, during the seventy-three years chronicled in the AX, AD 800-873, the authors recorded Scandinavian aggressions in twenty-two years. See Figure 4-13 below. (Enlarged in Appendix 2).

Figure 4-13: AX Scandinavian Aggressions superimposed over OTC temperatures



All but two years experienced only one attack. In each of those two years, there were two attacks. Moreover, there are three periods when Scandinavian aggressions occurred annually. In the AD 834-838 series, each year brought only one attack but both the AD 845-850 and the AD 866-869 series began with two attacks in the first year.

Unlike with Local Warfare, the OTC's chart does not suggest a correlation between rising temperatures and Scandinavian aggressions. There are twelve attack years with falling temperatures and ten with rising temperatures. Considering the previous year's temperature, however, suggests a possible correlation between Viking Aggression and uncertain temperatures.

Focusing on the three series of attacks shows that the fluctuations are again noted in different years, but the overall correlation holds. AD 834 starts on a rising temperature after

AD 833 is a rising temperature. Both years were part of a gradual recovery from AD 827 when temperatures reached the lowest point shown on this chart. As the temperature rose and fell during this recovery, there was a drop once more in AD 832, a steady rise through AD 834 and AD 835 to a peak in AD 836, and then another plunge through AD 837 and AD 838. This series of attacks therefore began during a period of cooler than normal though rising temperatures and ended as temperatures plunged again from a peak which was still substantially below normal. The next series, AD 845 through AD 850, began with two attacks as the temperatures were falling at the beginning of a general descent. The temperature continued to fall through AD 847, had a short rise in AD 848, and fell even more in AD 849. Each of these years experienced one attack. The last attack in this series occurred in AD 850 as temperatures began a steep rise back to the norm. The final series of attacks began with two attacks in AD 866 when temperatures were falling. The next three years was a sequence of temperature rises and falls—up in AD 867, down in AD 868, and up in AD 869.

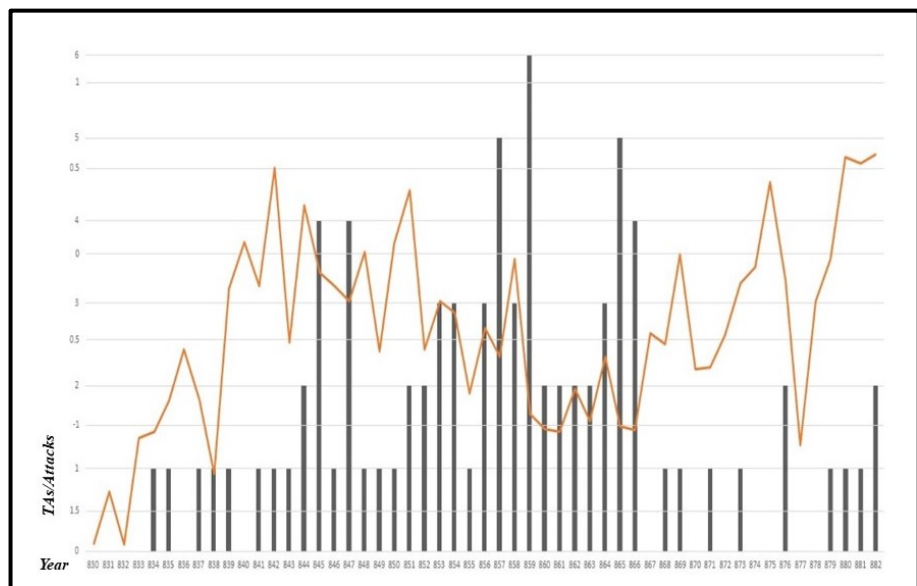
Isolated single attacks show the same trend. The attacks during AD 852, AD 854, AD 857, and AD 864 all happened when the temperature was falling. The isolated attacks of AD 862 and AD 871 happened when the temperature was recovering from a fall the previous year. AD 873 is the only

exception to this because the temperature rose in AD 872. However, just as with AD 834, the AD 872 rise could be considered part of an incomplete recovery from the plunge of AD 870.

Despite these theories on whether the exceptions were during long recoveries, however, there are only four attack years in certain temperatures where the temperature had risen both that year and the year before: AD 834, AD 835, AD 836, and AD 873, or 18.2% of the attacks. This correlation, therefore, favours the theory that uncertain temperatures were a major pull factor.

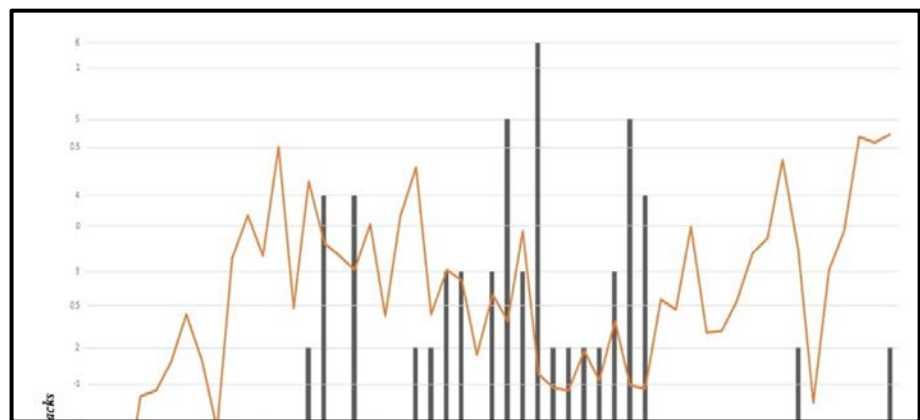
The second annal, the AB, spans from AD 830 through AD 883 and recorded a total of eighty-one attacks in forty different years. See Figure 4-14 below. (Enlarged in Appendix 2).

Figure 4-14: AB Scandinavian Aggressions superimposed over OTC temperatures



Twenty years experienced only one attack. Nine years experienced two. Five experienced three. Three years suffered four. Two years suffered five. And one year suffered a total of six Scandinavian aggressions. As done previously with so many aggressions, the chart was cropped to eliminate the many “single attack” years. See Figure 4-15 below.

Figure 4-15: AB Scandinavian Aggressions superimposed over OTC temperatures, cropped

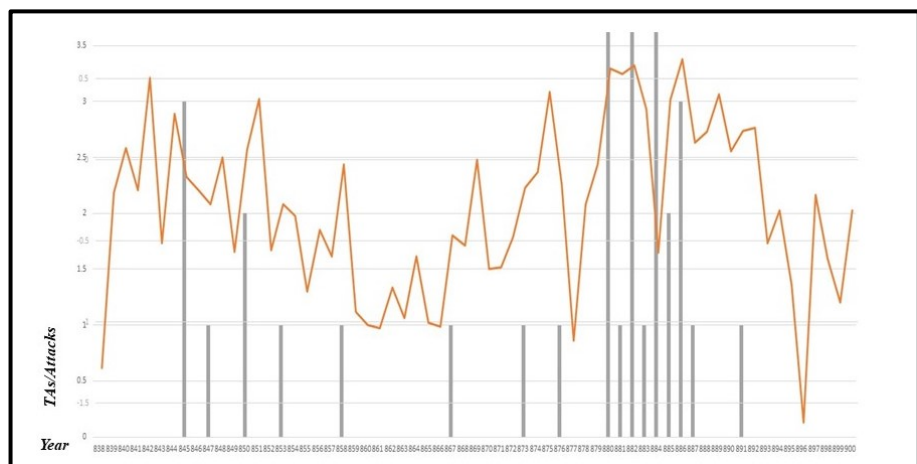


Out of twenty “multiple attack” years, twelve were years when the temperature had fallen and eight were years when the temperature had risen. Out of the eight years when the temperature had risen, in only two had the year before also seen a rise in temperature: AD 851 and AD 876. Even AD 851 and AD 876, however, could be considered years in which the temperature was recovering from a previous fall. The temperature had dropped dramatically in AD 849 and recovered in AD 850, reaching a peak in AD 851 before dropping considerably by AD 852. AD 876 was the peak after the

temperature had dropped significantly in AD 874, and the temperature had dropped amply immediately afterward as shown in AD 877. Hence the cropped OTC chart suggests that 90% of the Scandinavian aggressions occurred when the temperature was cooling or had been cooling the previous year—and this again indicates that uncertain temperatures constituted a pull factor.

The final annal to be analysed is the AF, covering AD 838 through AD 901 and recording seventeen years in which thirty-two Scandinavian aggressions occurred. In ten of those years, the Vikings attacked only once. They attacked twice in two years, three times in two years, and four times in three years. See Figure 4-16 below. (Enlarged in Appendix 2).

Figure 4-16: AF Scandinavian Aggressions superimposed over OTC temperatures



The AF combined with the OTC shows that attacks occurred during seven years of declining temperatures and ten years of rising temperatures. Looking more closely opens a

different picture. Scandinavian aggressors struck during thirteen years when the temperature had fallen either during the attack year or in the year immediately before the attack. Out of the ten years Scandinavian aggressions occurred when the temperature was rising, six years were after the temperature had fallen the previous year and only four were after the temperature had been rising the year before the attack year: AD 873, AD 880, AD 886, and AD 891. Accordingly, this chart also supports the hypothesis of a correlation between uncertain temperatures and Scandinavian aggressions.

Thus, all three annals consistently demonstrate an almost even distribution of Scandinavian aggressions in rising and falling temperatures. The picture changes, however, upon extending the time frame to also examine temperatures in the year before the attack. This extension together with developing a definition of certain and uncertain temperatures suggests Scandinavian leaders may have taken advantage of uncertain temperatures to launch hostilities against Carolingian Europe. Nevertheless, for three reasons, the evidence is too slight to sustain the case.

As before, the first reason involves the dendrochronological data itself, which includes temperature data only for the growing season. Just as with local warfare, most attacks documented in the AX, the AB, and the AF were

not launched during the growing season. Certainly, the attackers could gain more from attacking in autumn or winter because the harvest would be fully gathered and easily stolen. Also, the populace would be tired and thus weaker. Even when relying on the evidence across two summers, however, a few undocumented warm winters in inconvenient times would undermine the hypothesis presented. Once again, the effort to exclude context undermines the value of the conclusions.

The second reason hinges on the aggressions data. The first difficulty is the wide discrepancy in the annals regarding the number of attacks occurring in any year. A single example suffices to illustrate. In AD 859, the AX recorded zero attacks, the AB recorded six, and the AF recorded zero. What can be deduced from a rising or falling temperature when two annals state that no attacks occurred and one annal states that six occurred? Moreover, the fact that many Scandinavian aggressions were recorded and therefore much more evidence is available may, in fact, be a detriment to analysis as demonstrated by the examination of the AB. With almost annual attacks and constant temperature fluctuations, nothing of use could be discerned from a straight-forward comparison. Cropping away approximately half of the recorded information does not solve the problem because there were many more aggression years than just the twenty “multiple war” years, and

many of those years experienced rising temperatures.

Consequently, the contradictory information regarding the number of attacks combined with their apparent frequency makes any correlation even more tenuous.

But even if these two undermining reasons did not exist and the charts supported a truly firm correlation between Scandinavian aggressions and years of uncertain temperature, a third reason presents an even more powerful difficulty. On all the charts, the temperature fluctuates constantly throughout the ninth century presenting the question of why the Vikings chose one sequence of rising and falling temperatures as opposed to another. Why did the Northmen choose to come one year when the temperature dropped or had just dropped as opposed to another year when the same situation existed? That the climate seemed to present inviting circumstances over and over throughout the century suggests that something other than merely uncertainties or difficulties created by temperature fluctuations was motivating the Vikings. This survey posits that the something was, in fact, natural disasters.

4.4. Conclusion

Paleoclimatology and especially dendrochronology has laid the groundwork for enormous advances in understanding the climate in past times. Not only have dendrochronologists

provided information about broad climatic conditions, such as an overview of the effects of a volcano on the surrounding environment, but they have also been able to zero in on specific places such as Dorestad to demonstrate it was a thriving city in the eighth century. Through the careful, controlled examination of tree-ring data, dendrochronologists have tracked temperature, precipitation, and other environmental factors allowing them to map many climatic conditions experienced by the Vikings and the Carolingian Empire throughout the ninth century and at the beginning of the Viking Age.

But dendrochronological data has limitations. One limit is in proving the effect of climate on the human population. While dendrochronology can provide evidence of a potential for famine, it cannot show that a famine occurred. Absent archaeological evidence, human records are necessary to make the correlations.

A second limitation is in proving the cause of human activities. Seeking to establish a correlation between temperature and local warfare or Scandinavian aggressions implicitly seeks evidence of cause. However, the scientific data can only prove so much. The reasons for local warfare are inextricably related to political context, and while opposing factions might statistically appear more likely to resort to war when temperatures were normal or high, that does not prove

that temperature factored into the decision to engage in hostilities. Viking activity seems to be the area of inquiry most amenable to correlation with dendrochronological data. It seems logical that crossing bodies of water to attack foreign countries could be motivated or encouraged by climatic changes on either end.

Nevertheless, a correlation suggesting Scandinavian leaders took advantage of falling or uncertain temperatures cannot be supported. Dendrochronologists cannot know what happened in the winter so a few warm or cold winters could destroy the suggested correlation. Moreover, even if a correlation could be shown, dendrochronology provides no insight as to why the Northmen elected to attack during one uncertain season and not another.

These limitations, however, do not mean that the scientific data cannot be useful at all. The situation with Dorestad presents an excellent example. Dendrochronological data reveals two important facts about Dorestad—first that it was a thriving economic centre in the early ninth century and second that AD 834 was a wet year. Neither of these facts standing alone proves anything about Scandinavian aggression or natural disasters. However, when combined with the evidence of the annals, these two facts flesh out the story of what happened in Dorestad in AD 834 and why. In other words,

the dendrochronological data can be extremely useful as supporting contextual evidence when applied in individual cases.

The problem of scientific proof of severity, therefore, remained unresolved. Given that the human report had proven necessary to determine whether or not a natural disaster occurred, the natural next step was to return to that report and delve deeper, analysing the language of the annals themselves for clues about the severity of both the reported disasters and the reported aggressions.

Chapter 5. Language, Literature, and Tropes: A Biblical Intertextual Analysis to Examine the Impact of Natural Disasters

Investigating dendrochronology suggested that while its data could provide useful in evaluating a disaster's surrounding environment, it could neither provide information on the impact of the disaster itself nor help create an objective standard for severity. Could a subjective analysis of a disaster, however, provide some context on severity? Indeed, this might be all that is possible anyway because an event can be considered disastrous only if the people involved experienced it as such.¹ A subjective analysis, therefore, must rely on the main primary sources for the human report of that experience, namely the annals. At first glance this initial step might appear to doom the project from the beginning given the lack of explicit information in the annals. This return investigation, however, aimed to deepen the analysis by exploring within the bare reports and focusing on the particular words and phrases the annal writers chose to use as well as on the revealed cultural references, narratives, or tropes. To unpack the significance of word choice and references further required adjusting the surface-level,

¹ See Chapter 1, Section 2.1.4.2

modern perspective to a medieval one by answering the simple question: what would be the most common source of language, narratives, and tropes for the annal writers? The immediate answer, of course, is the Bible. The next step was to test the hypothetical usefulness of a subjective analysis by choosing a single annal on which to focus, the AB, and conducting an intertextual analysis of the report of a political event about which much historical information exists. With the potential usefulness proven in this context, analysing three different natural disasters reported in the AB—and two from other annals—led to the conclusion that indeed an intertextual analysis can provide some information about the severity of disasters on a case-by-case basis.

5.1 Adopting the Medieval Lens: Seeing with the Bible

The principles of classical rhetoric were important writing guides for early medieval authors.² The Carolingian nobility's culture, however, was fundamentally Christian and reflected scripture in its writings so that the two types of rhetoric became entwined within historiographic writing.³ During Charlemagne's

² Matthew Kempshall, *Rhetoric and the Writing of History: 400 –1500* (Manchester: Manchester University Press, 2011), 4-5.

³Kempshall, *Rhetoric and the Writing of History*, 4-5.

reign, one of his major political goals was to Christianise the Frankish people and to structure the Empire according to Christianity.⁴ His son Louis was perhaps even more Christian. When Louis took the throne, he earned the epithet “the Pious” by destroying Charlemagne’s collection of pagan texts.⁵ Though this Christian culture produced a range of written texts from hagiographies to poetry, of all these texts, the one most people would have known most intimately was the *Latin Vulgate*, the Latin Bible as translated by Saint Jerome.⁶

This is true not only because of the Bible’s primacy in religious rites and services, but also because education in general focused on teaching scripture and religious texts. In AD 789 Charlemagne decreed in *Admonitio generalis*:

Et ut scholae legentium puerorum fiant. Psalmos, notas, cantus, computum, grammaticam per singula monasteria vel episcopia et libros catholicos bene emendate [al. emendatos], quia sepe dum bene aliqui deum rogare cupiunt, sed per inemendatos libros male rogant.

[Let schools be established in every monastery and bishopric for boys to read psalms, notes, chant, *computus*, grammar, and well corrected catholic books,

⁴ McKitterick, *Charlemagne and the Formation of a European Identity*, 309.

⁵ Courtney Booker, *Past Convictions: The Penance of Louis the Pious and the Decline of the Carolingians* (Philadelphia, US: University of Pennsylvania Press, 2009), 9.

⁶ Cornelia Linde, “Twelfth-Century Notions of the Canon of the Bible,” *Reading the Bible in the Middle Ages*, 8; Richard Marsden, *The New Cambridge History of the Bible, Volume 2: From 600 to 1450* (Cambridge: Cambridge University Press, 2012), 8.

for often when someone desires to beseech God effectively, they ask poorly.]]⁷

Bishops took this directive seriously, establishing monastic schools and, in at least one case, facilitating attendance by prohibiting school priests from charging tuition.⁸ The monks who taught lived under the Benedictine rule, requiring that monks be literate.⁹ These clergy in turn stressed literacy to their own students, monks, and laymen.¹⁰ The first texts taught in these Carolingian schools were biblical psalms.¹¹ Thus, Carolingian nobles, taught to read by monks in Christian monasteries, were steeped in biblical theology and lore from their earliest years.

In their letters and handbooks, these Carolingian nobles demonstrate their Bible-focused education and world view when they advise other nobles with biblical sayings.¹² One of the most famous examples of this practice is the work of noblewoman Dhuoda. Charles the Bald took her son William

⁷ John Contreni, "Learning for God: Education in the Carolingian Age," *The Journal of Medieval Latin* 24 (2014): 102.

⁸ Contreni, "Learning from God," 105.

⁹ Contreni, "Learning from God," 92-93.

¹⁰ Contreni, 94.

¹¹ Contreni, 103.

¹² Jinty Nelson, "Lay Readers of the Bible in the Carolingian Ninth Century" in Nelson and Kempf, *Reading the Bible in the Middle Ages*, 43.

hostage during the civil war of AD 841-843.¹³ While William was imprisoned, she wrote him a handbook, the *Liber manualis*, outlining how to live a moral life and citing almost every book in the Bible.¹⁴ For example, when she advises him to be patient, she quotes Proverbs 16:32: “A patient man is better than a strong one. He who exercises great patience to control his spirit in all things is better than the conqueror of cities.”¹⁵

Thus, the message and language of the Bible permeated medieval thought and literate culture, and a ninth-century annal writer would be imbued with its words and phrases. Even today, biblical language and tropes permeate our culture. A simple example is the common statement that someone does not see the “writing on the wall,” which is a direct reference and quote from the story of Belshazzar’s feast as told in Daniel 5. Because of the primacy of the Bible in ninth-century thought, the annal authors can safely be assumed to have, consciously or unconsciously, drawn from biblical language as they recorded events. Thus, comparing the words they chose to describe natural disasters to similar words in the Bible and

¹³ Elizabeth van-Houts, *Medieval Memories: Men, Women and the Past, 700-1300* (New York: Routledge, 2001), 18.

¹⁴ Nelson, “Lay Readers,” 24.

¹⁵ Marcelle Thiebeaux, ed., and trans., *Dhuoda: Handbook for her Warrior Son: Liber Manualis* (New York: Cambridge University Press, 1998), 149, based on Pierre Riché, ed., Bernard de Vregille and Claude Mondésert, trans., *Dhuoda: Manuel pour mon Fils* (Paris: Editions du Cerf, 1975).

examining the meaning of those words in their biblical context may shed light on how the monks writing the annals intended their descriptions to be understood. But the importance of the Bible as a source for understanding the annals goes beyond simply comparing words.

As George Lakoff and Mark Johnson have pointed out, our conceptual framework is metaphorical.¹⁶ Because an “argument” is defined as a fight to win or lose, people involved in an argument are aggressive from the beginning. But a culture could define it as a mild discussion, or not define it at all, and thus would “argue” in a completely different way.¹⁷ Thus, with the Bible as a conceptual framework, biblical metaphors and narrative might affect even the content of an historian’s reportage. An example of this effect occurs in the work of three authors describing the beginning of the Carolingian dynasty over a decade after it occurred. In *The Continuations to Fredegar’s Chronicle*, the *Clausula de Unctione Pippini*, and the RFA, each author reports that Pippin the Short deposed the Merovingian king, Childeric III, and took the crown only after asking for and getting permission from the contemporary pope, Zachary, to become the king *de jure* to match his status as king

¹⁶ George Lakoff and Mark Johnson, *The Metaphors We Live By* (London: University of Chicago Press, 1980), 4.

¹⁷ Lakoff and Mark Johnson, *Metaphors We Live By*, 5-6.

de facto.¹⁸ In this narrative, because Pippin had the pope's permission, he also had God's permission, and his usurpation of the Merovingian king, otherwise potentially interpreted as politically dubious, was the act of a true Christian.

Yet, as McKitterick notes, no evidence exists in the hagiography of Zachary or his surviving papal letters that he approved Pippin the Short's usurpation.¹⁹ So why would these authors claim he had agreed? McKitterick suggests the motive might have originated in Pippin's later reign when he helped Zachary's successor, Pope Stephen II, by defeating the Lombards threatening Rome and thereby forging a special relationship with the pope.²⁰ In retrospect, therefore, it was politically advantageous to cast Pippin as a true Christian warrior from the beginning by justifying his original usurpation. Thus, the narrative of Christian piety might have superseded the narrative of worldly fact.²¹ Similarly, biblical narratives would be the metaphorical framework through which annal writers experienced and wrote about natural disasters and thus might reveal their understanding of the severity of the events.

¹⁸ Scholz, RFA, 38.

¹⁹ McKitterick, *History and Memory*, 143-144.

²⁰ McKitterick, *History and Memory*, 149.

²¹ McKitterick, *History and Memory*, 149-150.

Charlemagne's AD 789 decree illuminates an additional potential level of analysis when he emphasizes a second reason for studying religious texts. Not only was their content important to forming character and world view but also the way they were written provided guidance for "effectively" communicating—certainly with God and probably with other people. Thus, the Bible was not only the primary text undergirding the Carolingian nobility's understanding of the world, but it was also the primary model for effective rhetoric. And, in the view of ninth-century theologians, the Bible was both a factual and a figurative text.

The difference between factual and figurative language is readily evident in the Book of Exodus. In Late Antiquity, the Exodus itself was interpreted not just as the literal story of Moses defeating the Pharaoh and leading his people out of Egypt to Canaan, but also as a mythic story of creating a people. Richard Clifford observes that in the Bible, "Some psalms and Isaiah 40–55 so view [the Exodus] and describe it in mythic language."²² According to Clifford, the "process of creation in antiquity was imagined on the model of human activity or a process in nature. Often creation involved wills in conflict, typically a battle. Victory resulted in a new or restored

²² Richard J. Clifford, "The Exodus in the Christian Bible: The Case for "Figural" Reading," *Theological Studies* 63 (2002): 348.

world.”²³ Moses “created” his people when he asked them to flee Egypt and led them back to their homeland where his successors then created a new restored Israel. Figurative language is therefore part of the very foundation of the story told by the Bible.

This dual understanding of biblical language and narratives can be traced to the early Christians of the Roman Era. Fourth century author Athanasius denounced the Arians, a Gnostic sect, for holding that Christ was not the son of God but merely God’s “creature”. Athanasius laced together a number of seemingly disconnected Bible verses to argue that when combined and understood in juxtaposition to one another the verses show that Jesus was God.²⁴ Athanasius, therefore, suggested an understanding that biblical verses imply more than they directly state.

Five centuries later theologians of the Carolingian Renaissance comprehensively combined the writings of early Christian writers in an attempt to create a unified theology. Accordingly, famous authors such as John the Scot and Paschasius combined figurative language with literal language to explain Christianity in an accessible and convincing way,

²³ Clifford, “Exodus,” 348.

²⁴ Ephraim Radner, “Lectionary and the Figural Meaning of the Scriptures,” *Liturgy* 29, no. 4 (2014): 59.

basing much of their work on the example Bede used to combine the work of the Fathers.²⁵ As Beryl Smalley notes, “By the end of the ninth century a beginner could read almost any one of the biblical books with the help of a commentary pieced together from one or more of the Fathers.”²⁶ Nevertheless, problems arose when comparing Latin Fathers with Greek Fathers, who often disagreed on which biblical stories were historical versus allegorical.²⁷ The ninth-century theologians considered, discussed, and sorted through these different and sometimes contradictory Christian Fathers. This gave rise to a few notable debates, arguments written in tracts such as the predestination debate between Prudentius of Troyes and Hincmar of Rheims.²⁸ The writers of the annals were steeped in the dual nature of the Bible’s language, narratives, and tropes. Therefore, it is reasonable to conclude that when they recorded natural disasters, they would have employed this same literary technique and that a similar combinatory analysis might provide insight into their work.

²⁵ Beryl Smalley, *The Study of the Bible in the Middle Ages*, (Oxford, Clarendon Press, 1941), 28.

²⁶ Smalley, *Study of the Bible*, 25.

²⁷ Smalley, *Study of the Bible*, 27.

²⁸ For a discussion of this particular debate and how it started through treatises, see, for example, Brian J. Matz, “Augustine in the Predestination Controversy of the Ninth Century, Part I: The Double Predestinarians Gottschalk of Orbais and Ratramnus of Corbie,” *Augustinian Studies* 46, no. 2 (2015): 156.

Therefore, focusing on a medieval annal and comparing its language with that of the Bible could shed light on a disaster. If the words an author uses to describe a disaster are linked more firmly with certain biblical stories and tropes than others, a deeper understanding of a disaster's impact—perhaps even its severity—might be achieved. Testing this hypothesis first required choosing one annal for study.

5.2 Focusing on a Single Annal

Burrowing beneath the surface of a medieval text requires understanding not only the general medieval mindset but also the individual mindset of the specific author. Simply put, the analysis will stand on firmer ground if it is known when the text was written, where, why, and by whom. Unfortunately, problems abound with accounts recording the ninth century. For example, the RFA records events only until AD 829 and its authors are unknown.²⁹ In addition, although it is known that between AD 834 and AD 853, the AX was written at Lorsch Abbey and thereafter in Cologne, its origins are not known and the AX's single known author, Gerward, wrote for only a short time and little is known about him.³⁰ Similarly, though the focus

²⁹ See Chapter 3, section 2.

³⁰ Reuter, AF, 144.

of the authors of the AF seems to be on the succeeding East Frankish kings, suggesting that they were close to the king and knowledgeable about royal affairs, the authors themselves are unknown. Fortunately, there is one collection where it is known why, when, where, and by whom it was written, *The Annals of St Bertin* (AB).

5.2.1 The Provenance of The Annals of St Bertin

The AB were born from the RFA, which themselves began with Charlemagne's commission, probably around AD 795, of a yearly written record of the events of his reign.³¹ After Charlemagne's death in AD 814, the RFA were continued by the chaplains of the new emperor and king, Louis the Pious. Under the new king, however, their task became more complicated because Louis the Pious moved often and his court moved with him. Though Louis favoured both Ingelheim and Compiègne as winter homes, the annals' authors stayed at Louis' palace in Aachen. This meant the information recorded in the RFA was received through rumours, delayed messages, and reported eyewitness accounts rather than through direct knowledge.³²

³¹ McKitterick, *History and Memory*, 101-102.

³² Nelson, AB, 5.

The RFA continued in this manner until AD 829. While scholars cannot be certain why it ended, the AD 830 revolt against Louis the Pious by three of his sons was a likely cause. The reasons for the revolt are also not completely clear, but one reason was probably the AD 823 birth of Charles the Bald, a birth which upset the careful ordering of inheritance Louis had established in AD 817 among his older sons Lothar, Pippin, and Louis the German. To clear the matter, in AD 829, Louis the Pious allowed Charles the Bald his own kingdom by crowning him king of Alemannia, Alsace, Churrhaetia, and parts of Burgundy.³³ To do so, however, he sliced away part of Lothar's kingdom.³⁴ Authors recording history during that time report that the three older sons revolted because they were unhappy with this reordering. Some modern scholars find this explanation unconvincing.

Marios Costambeys, Matthew Innes, and Simon MacLean point to a series of major defeats in battles against non-Christians on the Carolingian frontier that disgraced prominent nobles in the courts of the older brothers. These three scholars argue that powerful nobles cannot be ignored if they lose face and that their power and influence over the sons

³³ Mayke De Jong, *The Penitential State: Authority and Atonement in the Age of Louis the Pious (814-840)* (Cambridge: Cambridge University Press, 2009), 41.

³⁴ Booker, *Past Convictions*, 9.

prompted the sons to revolt against their father.³⁵ Mayke de Jong, on the other hand, argues the revolt was prompted by Louis the Pious' appointment of Bernard of Septimania to be chamberlain at Louis' court. Bernard, a powerful noble, soon usurped Lothar's influence as co-emperor, essentially becoming Louis' second in command. According to De Jong, Lothar probably revolted in envy and his brothers joined him.³⁶

Regardless of the reason or reasons, the revolt was short-lived. Nevertheless, it must have created chaos in Louis' court as many court nobles chose to join, including Abbot Hilduin, the chaplain ruling over the royal chapel.³⁷ This surely put in disarray the nobles left in charge of Louis' chapel and writing the RFA. Therefore, it is unsurprising that the RFA's last yearly record is in AD 829.

With the demise of the RFA, however, was born the AB. In AD 830, the AB took over chronicling events in West Francia at the courts of Louis the Pious and his sons.³⁸ For its first five years, the AB authors and location of composition are unknown. Beginning in AD 835, however, this state of affairs changed.

³⁵ Costambeys, Innes, and MacLean, *Carolingian World*, 218.

³⁶ De Jong, *Penitential State*, 41-42.

³⁷ De Jong, *Penitential State*, 43.

³⁸ Nelson, AB, 5.

5.2.2 The Authors of The Annals of St Bertin

Unlike its predecessor the RFA, the identities of the authors of the AB after AD 835 are well known and have been investigated thoroughly. Prudentius of Troyes wrote from AD 835 to AD 861, writing from Troyes once he became bishop there in the mid-AD 840s. Hincmar of Rheims took over after Prudentius and wrote from his bishopric, Rheims, until his death in AD 882.³⁹ Though more information is available about the latter than the former, both men were well known in their time and gained favour once they became nobles within the Carolingian court.⁴⁰

Of the two authors, Prudentius is both the earlier and the lesser known. Facts about him are available directly only through an occasional comment or through contextual information in biographies of other, more well-documented figures. Hincmar, however, wrote specifically about Prudentius in a salute upon his death, saying Prudentius was a Spaniard originally named Galindo.⁴¹ Because of the Islamic conquest, Spain was in transition and had an ever-shifting border with the Carolingian Empire. Some Spanish Christians accepted Islam

³⁹ von Simson, AV, 53.

⁴⁰ Nelson, AB, 7-13.

⁴¹ Nelson, AB, 94.

but northern monastic communities did not, instead celebrating “martyrs” who walked into cities, proclaimed the divinity of Christ, and soon were executed for heresy.⁴² Prudentius avoided this fate by leaving Spain altogether although the date of his departure is unknown.

By the beginning of Louis the Pious’ reign, around AD 814, Prudentius must have been at the Carolingian court and must have had some influence there as revealed by a poem written by the scholar and poet Theoldulf of Orléans. In the poem, Theoldulf addressed Prudentius as his student and asked him to greet three “beginners” on his behalf when Prudentius joined Louis’s retinue in the royal court.⁴³ By the late AD 820s, two of these “beginners” had become significant nobles.⁴⁴ Walafrid Strabo (c. AD 808-849) wrote to Prudentius and addressed him as one of his teachers.⁴⁵ Abbot Lupus of Ferrières (c. AD 805-862) addressed Prudentius as

⁴² John Victor Tolan, *Medieval Christian Perceptions of Islam* (New York: Routledge, 1996), 95-96.

⁴³ Jared Wielfaert, “Prudentius of Troyes (d. 861) and the Reception of the Patristic Tradition in the Carolingian Era” (Ph.D. Diss. University of Toronto, 2015), 11. <https://tspace.library.utoronto.ca/handle/1807/71393>.

⁴⁴ Wielfaert, “Prudentius,” 19-20.

⁴⁵ Wielfaert, “Prudentius,” 11. Strabo is known mainly for his remarkable poetry. Courtney M. Booker, “A New Prologue of Walafrid Strabo,” *Viator* 36 (2005): 83-84.

friend and colleague.⁴⁶ In AD 835 Prudentius began writing the AB. Sometime in the mid-AD 840s, he became Bishop of Troyes, according to his hagiography, and he died in AD 861.⁴⁷ From these scattered references, Jared Wielfart concludes that Prudentius was probably born between AD 790 and AD 810.⁴⁸

Though these facts of his life are scarce, that Prudentius was a thinker and writer is clear not only from his writing of the AB, but also from the fact that throughout the AD 850s he was involved with Hincmar of Rheims in a substantial theological dispute on predestination, free will, and the necessity of divine grace, a topic upon which that they both wrote numerous tracts. The predestination controversy began when a significant monk, Gottschalk, began arguing that God predestines some men to salvation and some men to reprobation. Gottschalk called this “double predestination”. Matz outlines his belief thus:

(1) [E]ternal life was predestined for the elect, and,
(2) the elect were predestined to eternal life. And
God’s predestination to judge the reprobate caused
these two effects: (1) eternal punishment was

⁴⁶ Wielfaert, “Prudentius,” 11. Abbot Lupus of Ferrieres was an abbot and scholar known mostly through his surviving letters wherein he frequently searched for copies of books and more knowledge. Mariken Teeuwen, “Carolingian Scholarship on Classical Authors: Practices of Reading and Writing” in Erik Kwakkel, ed., *Manuscripts of the Latin Classics 800-1200* (Amsterdam: Leiden University Press, 2015), 29.

⁴⁷ “Saint Prudentius, Bishop of Troyes, Confessor,” in *Lives of the Fathers, Martyrs, and Principal Saints*, ed. Father Alban Butler, 1866, *CatholicSaints.Info*. (2 April 2013), accessed 26 July 2020. <https://catholicsaints.info/butlers-lives-of-the-saints-saint-prudentius-bishop-of-troyes-confessor/>.

⁴⁸ Wielfaert, “Prudentius,” 33.

predestined for the reprobate, and (2) the reprobate were predestined to eternal punishment.”⁴⁹

The issue within the controversy was not that the elect were granted eternal life and the reprobate would suffer eternal punishment. Instead, the issue was the seeming belief that God had already chosen the elect and reprobate.⁵⁰ This position denied free will and the possibility of redemption for the converted and sinners. Gottschalk was roundly condemned by many, especially allies of Charles the Bald. He was subsequently flogged and exiled.⁵¹

Prudentius, however, eventually defended Gottschalk. Prudentius agreed that humans have free will after Christ freed humanity. Nevertheless, he argued that, as translated by Gumerlock, “some were predestined to life by the gratuitous mercy of God before all ages, and some were predestined to punishment by an inscrutable judgment”.⁵² In contrast, Hincmar of Rheims denounced Gottschalk, arguing that Christ died for all humanity, not just an elect, and God does not damn a sinner

⁴⁹ Matz, “Augustine in the Predestination Controversy of the Ninth Century, Part I,” 156.

⁵⁰ Matz, “Augustine in the Predestination Controversy, Part I,” 158.

⁵¹ Celia Chazelle, *The Crucified God in the Carolingian Era: Theology and the Art of Christ's Passion* (Cambridge: Cambridge University Press, 2001), 167.

⁵² Francis X. Gumerlock, “The *Tractoria* of Prudentius of Troyes (d. 861),” *Kerux* 25, no .1 (2010): 9.

in advance.⁵³ Therefore Prudentius and Hincmar were theological foes. This confusion or debate lasted until Prudentius' death and may be what prompted Hincmar of Rheims to write an obituary of him.⁵⁴ Whether or not this is true, the debate was certainly the cause of political ramifications that in many ways exiled Prudentius from Charles the Bald and led the writer to begin making pointed comments in the annal. For example, in his records of AD 859, Prudentius noted—as a point of criticism—that Charles the Bald gave many monasteries to laymen.⁵⁵

Moreover, as a student of Theodulf of Orléans, Prudentius may have been heavily influenced by the views of Alcuin of York, especially regarding Scandinavian aggressions. Alcuin of York and Theodulf of Orléans created together the theology of the Franks, who thought of themselves as righteous Christians furthering Christ's standard, the *castra Dei*.⁵⁶ Alcuin's

⁵³ Brian J. Matz, "Augustine in the Predestination Controversy of the Ninth Century, Part II: The Single Predestinarians John Scotus Eriugena and Hincmar of Rheims," *Augustinian Studies* 47, no. 1 (2016): 30-31.

⁵⁴ Wierstra, "Prudentius," 170-71. To find a good account of this theological controversy, Wierstra suggests Francis X. Gumerlock and Victor Genke, eds. and trans., *Gottschalk and a Medieval Predestination Controversy. Texts translated from the Latin* (Milwaukee, US: Marquette University Press, 2009).

⁵⁵ Nelson, AB, 89-90.

⁵⁶ Mary Alberti, "Like the Army of God's Camp," 14-15. Theodulf ghost-wrote the *Opus Caroli regis contra synodum*, in which Charlemagne accused the Greeks of encouraging paganism. Alberti, "Like the Army of God's Camp," 14.

views, therefore, would likely have been familiar to Prudentius. Particularly relevant is Alcuin's brief consideration of the idea that the AD 793 attack on Lindisfarne was so catastrophic that the new Scandinavian aggressors were the Northern people, Gog and Magog, who would start the Apocalypse, according to Ezekiel 38:14-16 and Revelation 20:7.⁵⁷ Although Jesus said Satan would not be set free until the passing of a millennium, Alcuin could have shared the view of Augustine of Hippo, one of the fathers of Christianity, who considered the "millennium" in two ways and one was as an allegory. According to Augustine one interpretation of the Apocalypse was that it could occur "[during] the sixth thousand of years or sixth millennium (the latter part of which is now passing), as if during the sixth day."⁵⁸ Alcuin later moderated his view, deciding the new aggressions were punishment for sin and advising the monastery and King Ethelred of Northumbria to amend the sinful actions they must have committed, even though Alcuin was not quite sure what those sins were.⁵⁹

⁵⁷ Alberti, "Like the Army of God's Camp," 13.

⁵⁸ Philip Schaff, ed., *Nicene and Post-Nicene Fathers: Series I, Vol. 2* (Grand Rapids, US: Christian Classics Ethereal Library, 1886), 973.

⁵⁹ For his letter to Abbot Higbald of Lindisfarne, see Alcuin, *Epistolae Merovingici et Karolini Aevi: Tomus IV*, ed., Ernestus Duemmler (Berlin: MGH, 1895), 58-59. For the letter to Ethelred of Northumbria, see Alcuin, *Epistolae Merovingici et Karolini Aevi: Tomus IV*, 41-42.

Given that Prudentius was probably influenced by Alcuin, Prudentius may well have considered Scandinavian aggressions as Alcuin did, first as the beginning of the Apocalypse and then as punishment for unknown sin. This possibility is supported by his notable increase in reporting Scandinavian aggressions after he fell out of favour in AD 850, a reporting choice that could also be a criticism of Charles the Bald for sins, such as hubris, that brought God's wrath upon the Carolingians. Thus, Prudentius' background and his writings make clear that he had a personal agenda and that the agenda influenced his reporting in the AB.

Much more is known about Prudentius of Troyes' theological rival, Archbishop Hincmar of Rheims, the second author of the AB. He was a highly influential noble in the Carolingian world, a prolific writer, and an expert on theology and legal opinion.⁶⁰ For example, in the letter "*De quibus apud*" his condemnation of the pope's transference of a bishop from Nantes to Tours displayed a vast knowledge of legal and theological issues.⁶¹ Moreover, he recorded in exact detail events he found memorable and injected himself into many of

⁶⁰ Rachel Stone, "Introduction", in *Hincmar of Rheims: His Life and Works*, eds. Rachel Stone and Charles West (Manchester: Manchester University Press, 2015), 1-2.

⁶¹ Mary E. Sommar, "Hincmar of Reims and Canon Law on Episcopal Translations," *Catholic Historical Review* 88, no .3 (July 2002): 430.

his works, thus revealing, if indirectly, biographical information. Because of this, his past and positions are well-known.

Hincmar was born between AD 802 and AD 810 in what would become northern France. He studied theology at the Abbey of Saint-Denis under Abbot Hilduin, who later became the arch-chaplain of the imperial chapel. Young Hincmar joined the court with his mentor.⁶² His career there must have begun by at least AD 822 because forty years after the event, he recalled and detailed from a legal perspective a marital dispute he witnessed in that year.⁶³ From that beginning as a member of Abbot Hilduin's clergy, Hincmar's power and influence grew.

In AD 829 Louis the Pious named him to assist Hilduin in instituting the Benedictine Rule at Saint-Denis. Hincmar went further, making himself abide by the Benedictine rule.⁶⁴ As Janet Nelson said in Stone and West's biography, "This was a young man determined not just to talk the talk but to walk the walk."⁶⁵ Living under the Benedictine rule as not only a cleric but also a politician and transitioning between Louis the Pious' court and the churches would have been difficult, but Hincmar tried.

⁶² Janet Nelson, "Hincmar's Life," in Stone and West, *Hincmar of Rheims: His Life and Works*, 44.

⁶³ Nelson, "Hincmar's Life," 44.

⁶⁴ Nelson, "Hincmar's Life," 46.

⁶⁵ Nelson, "Hincmar's Life," 46.

In AD 830, when Lothar and his brothers revolted, Abbot Hilduin revolted with them and was later exiled. Hincmar probably followed his rebelling mentor yet according to Flodoard of Rheims, Hincmar was one of the central figures who helped Louis the Pious and Hilduin reach peaceful terms allowing Hilduin to return to Louis' court.⁶⁶ By AD 833, Hincmar must have become independent of Abbot Hilduin because when Lothar and his brothers revolted the second time, Hincmar seems to have remained loyal.⁶⁷ His loyalty to Louis the Pious and therefore his loyalty to the then eleven-year-old Charles the Bald would have lasting consequences.

When Louis the Pious died in AD 840, yet another civil war ensued, this time among the surviving brothers. Hincmar helped negotiate the AD 843 Treaty of Verdun that restored the peace by dividing the territory. Lothar gained the Middle Kingdom; Louis the German, East Francia; and Charles the Bald, West Francia.⁶⁸ Appointing a bishop over Rheims remained a thorny issue, however, because although most of the province of Rheims was in Charles the Bald's West Francian territory, some lay in Lothar's Middle Kingdom.

⁶⁶ Flodoard of Rheims, *Historia Remensis Ecclesiae*, ed., Martina Stratmann (Hannover: MGH, 1996), 191.

⁶⁷ Stone, "Introduction," in Stone and West, *Hincmar*, 4.

⁶⁸ Stone, "Introduction," 6.

Hincmar had helped Louis the Pious and Abbot Hilduin reconcile, had stayed loyal to Louis the Pious in AD 833, had helped negotiate the Treaty of Verdun, and was a strong supporter of Charles the Bald. Not surprisingly, with that history Charles the Bald appointed Hincmar as the archbishop of Rheims. From there, Hincmar's status grew as he remained heavily involved in politics and theology throughout the remainder of his life.⁶⁹

When writing the annals, Hincmar's style and personal agenda are evident. His penchant for detail meant he filled out events much more thoroughly than did Prudentius, in some cases outlining the terms of treaties and negotiations as if he were recording the treaty verbatim.⁷⁰ Moreover, he was not an outsider like Prudentius but had been involved in politics from the beginning of his career. As Janet Nelson writes, as "archbishop of Rheims he was also among the greatest magnates in Charles the Bald's kingdom".⁷¹ Thus, he was not only a significant theologian but also one of the most powerful men in West Francia and likely wanted to remain so.

⁶⁹ Stone, "Introduction," 3.

⁷⁰ An example of such detail is when Charles the Bald and Louis the German divided between themselves the kingdom of their nephew Lothar II after he died. Nelson, AB, 158-162.

⁷¹ Nelson, AB, 11.

Thus, among the dozens of authors of the various annals, both Prudentius and Hincmar are well-known in their time, and their personal views to a certain extent are discernible. Moreover, they wrote the AB in the tradition of the RFA about the same court and nobles and in a known context of political turmoil and intrigue. For all these reasons, the AB are the most useful annals from which to draw the test records for attempting an intertextual analysis.

5.3 Testing the Hypothesis: Examining the Use of Biblical Language and Narrative in the AB's Report of the Revolt of the Sons of Louis the Pious

That a relationship exists between the language, narratives, and tropes of the Bible and the language, narrative, and tropes of certain texts of the ninth century seems to be an almost indisputable proposition. Furthermore, the Christian outlook of the authors of the RFA clearly guided their report of the facts regarding Pippin's accession to the monarchy, suggesting that the annals were potentially as permeated by biblical references and narratives as any other text of the time. Thus the AB's report of a political event—the revolt of the sons of Louis the Pious—provides an excellent test of whether an intertextual analysis may provide more insight than the bare report.

When the RFA met its demise in the confusion brought on by the AD 830 revolt of the eldest sons of Louis the Pious, an unknown author took up the mantle and continued recording in the AB. Perhaps the court experienced a sense of calm after the revolt. If so, it was short-lived. Two years later, the three oldest sons revolted again.

The facts of the rebellion, as recorded by the AB, are that Lothar, Pippin, and Louis the German revolted against their father in AD 833 and succeeded in deposing him.⁷² The eldest son, Lothar, captured Louis the Pious and abused him, initially with his brothers' complicity. According to the AB, however, the two younger brothers, Pippin and Louis the German, rethought their ways in AD 834 and brought an army against Lothar.⁷³ Lothar fled, allowing bishops to set their father free. In the aftermath, Louis the Pious held a general assembly to welcome and forgive Pippin and Louis along with other faithful men.⁷⁴ During this assembly, Louis the Pious also "forgave" Lothar, but Lothar remained at large until he had negotiations with his father in the latter half of AD 834.⁷⁵

⁷² Nelson, AB, 27.

⁷³ Nelson, AB, 27-29.

⁷⁴ Nelson, AB, 29.

⁷⁵ Nelson, AB, 29.

In the simple statement of facts, the author's choice of specific words engages with basic concepts of Christian piety. In deciding to rescue their father, Louis the German asked his brother Pippin to "*ut reminiscens paterni amoris ac reverentiae una cum illo patrem*".⁷⁶ After Louis the Pious is freed, the AB author describes the way he welcomed his sons: "*Deinde filii eius Pippinus et Hildowicus cum ceteris fidelibus ad eum venientes, paterno animo gaudenter suscepti sunt.*"⁷⁷ Louis the Pious then granted the two sons more land to rule and proclaimed that the rebels, including his son Lothar, were forgiven. Two of the descriptive words resonate with several basic biblical tropes.

First, the word *father* connects immediately with the concept of God as a father to whom Christians owe filial duties, the very duty Louis the German exhorts Pippin to remember. The two brothers were serving their father, just as the Bible instructs Christians to serve *their* Father, God. It is also a call to obedience. Throughout the Bible, the virtue of obeying God the Father is emphasised, and *The Topical Concordance* among others has an exhaustive list of when and how this virtue is

⁷⁶ Waitz, AB, 7 (Emphasis added). "Remember his **father's** affection, and the **duty** he owed him." Nelson, AB, 28 (Emphasis added).

⁷⁷ Waitz, AB, 8 (Emphasis added). "Then his sons Pippin and Louis along with other faithful men came to him and were **joyfully** received by his **fatherly** heart." Nelson, AB, 28 (Emphasis added).

discussed within the Bible, from Jesus Christ's own obedience to the rewards of being obedient and more.⁷⁸ This story reflects the belief in the importance of this virtue, since the sons owed Louis the Pious obedience not only because he was their father, but also because he was the sovereign emperor of the Carolingian Empire. Similarly, God serves in the dual role of father and the Sovereign King of Man. By compounding the concepts of duty and obedience with those of father and king, the author echoes Deuteronomy 10:12: "And now, Israel, what doth the Lord thy God require of thee, but that thou fear the Lord thy God, and walk in his ways, and love him, and serve the Lord thy God, with all thy heart, and with all thy soul".⁷⁹ Thus, the revolt of the brothers takes on a Christian gloss perhaps suggesting that their crime was greater than the words themselves express.

Similarly, the author's choice of words glosses Louis the Pious' response to his sons' return. By describing the king's reception of them as joyful, the author echoes Luke 15:7 when Jesus tells his disciples, "I say to you, that even so there shall be joy in heaven upon one sinner that doth penance, more than

⁷⁸ "Obedience," *The Topical Concordance*, Public Domain, accessed 28 July 2020. <https://www.studylight.org/concordances/top/o/obedience.html>.

⁷⁹ Deuteronomy 10:12. "[E]t nunc Israhel quid Dominus Deus tuus petit a te nisi ut timeas Dominum Deum tuum et ambules in viis eius et diligas eum ac servias Domino Deo tuo in toto corde tuo et in tota anima tua".

upon ninety-nine just who need not penance.”⁸⁰ Moreover, the king acts the proper Christian role of loving father and loving king when he forgives the rebels just as Jesus commands.⁸¹ Thus by narrating the end of the revolt using these particular words, the author positions both the sons and the king in terms of the biblical tropes of the duty owed to God as father and king and the reciprocal guarantee from God of forgiveness and joy at repentance.

But the AB author engages Christian thought in far deeper ways than in his basic choice of words. This recounting and these words invoke not only basic biblical tropes but also the biblical parable of the prodigal son as told in Luke 15:11-32. In this parable, while one son remains faithful at home, the other son abandons his father, taking his inheritance with him. The unfaithful son descends into gluttony, becomes a gambler, and falls into poverty until, facing potential starvation in a famine, he returns to his father to ask if he can be his father’s servant. The father magnanimously welcomes his son back with joy. Thus, the author of the AB seems to shape the narrative of the rebellion using the parable of the prodigal son as a template by highlighting the repentance of two of the

⁸⁰ Luke 15:7. “[D]ico vobis quod ita gaudium erit in caelo super uno peccatore paenitentiam habente quam super nonaginta novem iustis qui non indigent poenitentia.”

⁸¹ Nelson, AB, 29.

“prodigal” sons as well as the joy and forgiveness extended to them by Louis the Pious. By referencing this parable, the author of the AB also references its dual meaning, not only the forgiveness and joy of an earthly father but also the forgiveness and joy God feels when a sinner repents and returns to him.⁸² Examining the AB report more closely, however, suggests that, as with the story of Pippin’s usurpation of the crown, what is left out may reveal a more complex truth.

First, the facts reported in the AB suggest the three rebellious sons may not have been united in their goals. Although all three colluded in the capture of Louis, Lothar alone held him.⁸³ When the other brothers switched their loyalty back to their father, Lothar, for an unspecified reason, could not hold his father hostage against his (now faithful) brothers.⁸⁴ Yet if Pippin and Louis the German were merely sending an army to free their father, Lothar could probably have thwarted them by threatening to kill Louis the Pious unless they withdrew. The fact that Lothar simply gave up his most valuable prisoner reveals that Lothar’s supporters were probably far from united

⁸² Nelson, AB, 26.

⁸³ Nelson, AB, 27.

⁸⁴ Nelson, AB, 28-29.

and, more importantly, that there was much more at stake here than the prodigal son gloss can openly state.⁸⁵

Indeed, the conclusion could be that this was a minor civil war between Lothar and his brothers. Lothar could possibly have rebelled because he was tired of being his father's "co-emperor" and wanted to seize control over the whole Empire. The author Nithard reports that once Lothar succeeded, however, Pippin and Louis the German learned in February AD 834 that he considered them inferior, which suggests they had to struggle with him to keep their own power.⁸⁶ Therefore Pippin and Louis the German possibly decided to look contrite and rescue Louis the Pious: once they themselves held him prisoner, he would have had to "forgive" them to be re-established as emperor.⁸⁷

Hence, Lothar's capture of his father made his father a pawn in the brothers' war for power. Because Pippin and Louis the German were united, they could build an army to free their father, an army Lothar could not repel because his supporters were disunited and Louis the Pious was still partially under Pippin and Louis the German's control.⁸⁸ Once Lothar was

⁸⁵ Nelson, AB, 29.

⁸⁶ Scholz, RFA, 134.

⁸⁷ Nelson, AB, 28-29.

⁸⁸ Nelson, AB, 28-29.

defeated, he remained at large because though Louis the Pious had forgiven him, Lothar knew his brothers were aware of his original intention, and he was unsure how they would treat him.⁸⁹ Thus, just as the parable of the prodigal son ends with no explanation of the faithful son's treatment of the returning son, the author of the AB brackets out that part of the tale of the AD 833 rebellion. In doing so, he tries to fashion a tale of fatherly forgiveness and joyful homecoming from a story of intrigue and power-mongering among brothers who used their father, the emperor, as a mere pawn.

Thus, this story's use of biblical words and its parallels with the parable of the prodigal son provide not only a moral lesson but also a clearer understanding of the AD 833 rebellion and its outcome. If biblical intertextual analysis can thus deepen understanding of an ostensibly political event, then the same technique applied to natural disasters should similarly deepen understanding beyond the simple words of the written reports.

⁸⁹ Nelson, AB, 29-30.

5.4. Interpreting the Records of Natural Disasters Using Biblical Language, Narratives, and Tropes

The annals' written reports of natural disasters are often terse. A sentence to fully describe a natural disaster is rare. Yet as demonstrated with the AD 833 rebellion, viewing these reports through the biblical lens offers the possibility of deepening an understanding of how the writers experienced the events. To test this possibility, the same intertextual methodology was applied to the reports of three natural disasters reported in the AB and then, to expand the analysis, to two disasters reported in other annals.

5.4.1 The AD 846 North Wind

When Prudentius began recording events of AD 846, his second sentence notes, "*Ventus aquilo per totam hiemem usque ad ipsa fere Maii mensis initia **ācerrimus** segetibus et vineis incumbit.*"⁹⁰ Though he detailed no negative results from this "*Ventus aquilo*," north wind, this wind can be classified as a natural disaster for two reasons. First, the simple fact that the author noted it indicates it was outside the ordinary. Second, as

⁹⁰ Waitz, AB, 33 (Emphasis added). "A **terribly fierce** north wind lashed the crops and vines during the whole winter almost up to the beginning of May." Nelson, AB, 62 (Emphasis added).

explained in Chapter 3, all events that could logically result in a natural disaster are included as natural disasters. A wind damaging crops and vines would logically compromise the harvest and potentially cause widespread hunger. But how severe was the wind? How much were the crops damaged? How widespread was the hunger? These are questions the basic words do not illuminate. Undertaking an intertextual analysis, however, suggests some answers, with the important word being the adjective “*ācerimus*”, that Nelson translates as “terribly fierce”.⁹¹ While this adjective does not appear particularly informative at first glance, examining it in its biblical context suggests the word may carry a connotation of heavenly retribution for earthly sins.

The Latin Bible uses forms of the root word “*ācer*” only five times in its male form and twice in its female form. Every time the male form is translated in the Douay-Rheims, it is translated as bitter and sour: in Wisdom 4:5, Wisdom 14:15, Jeremiah 31:29-30, and Ezekiel 18:2. Examining these

⁹¹Nelson’s definition is not precise. *Ācer*” is defined in *A Latin Dictionary* as “sharp, dazzling, stinging, pungent, fine, piercing”. Lewis and Short, *A Latin Dictionary* (Oxford: Clarendon Press, 1879), s.v. “*ācer*.” In *The Dictionary of Medieval Latin from British Sources*, it is defined as “1. sharp, jagged . . . painful, disagreeable . . . constricted, narrow 2. sour, acid”. R. E. Latham, D. R. Howlett, and R. K. Ashdowne, eds., *The Dictionary of Medieval Latin from British Sources* (London: British Academy, 1975-2013), s.v. “*ācer*.” In *The Oxford Latin Dictionary*, the definition when applied to wind and storm is “strong, high. . . wild, fierce.” P. G. W. Glare, ed., *The Oxford Latin Dictionary* (Oxford: Oxford University Press, 2012), s.v. “*ācer*.” In this translation, Nelson chose to intensify *ācer* (*rimus*) with the modern construction of “terribly” rather than translate *ācerimus* technically more accurately with words such as “fiercest” or “most fierce.”

references in chronological order shows that the word “*acer*” is associated with punishment from God.

In Wisdom 4:5, the wise King Solomon preaches that though the wicked may experience short-term gains, in the end they will fail. He makes this statement metaphorically, saying, “For the branches not being perfect, shall be broken, and their fruits shall be unprofitable, and **sour** to eat, and fit for nothing.”⁹² Thus the grapes are sour because of the sins of the wicked. Their sourness is part of God’s punishment.

In Wisdom 14:15, “a father being afflicted with **bitter** grief, made to himself the image of his son who was quickly taken away: and him who then had died as a man, he began now to worship as a god”.⁹³ In this case, the bitterness of the grief reveals the father worshipped his son more than he worshipped God. Though the bitterness is not itself a punishment from God, it brings punishment upon the father who now worships an idol instead of God.

The references in Jeremiah and Ezekiel both refer to the biblical adage that the sins of the fathers are visited upon the

⁹² Wisdom: 4:5 (Emphasis added). “*Confringentur rami inconsummati et fructus illorum inutilis et **acerbi** ad manducandum et ad nihilum apti.*” (Emphasis added).

⁹³ Wisdom 14:15 (Emphasis added). “***Acerbo** enim luctu dolens pater, cito sibi rapti filii fecit imaginem; et illum qui tunc quasi homo mortuus fuerat, nunc tamquam deum colere coepit, et constituit inter servos suos sacra et sacrificia.*” (Emphasis added).

sons. In Exodus 20:5, Moses reports that God said: "I am the Lord thy God, mighty, jealous, visiting the iniquity of the fathers upon the children, unto the third and fourth generation of them that hate me".⁹⁴ Referencing this proclamation, the prophet Jeremiah foresees a future time when this will not be so: "In those days they shall say no more: The fathers have eaten a sour grape, and the teeth of the children are set on edge. But every one shall die for his own iniquity: every man that shall eat the **sour** grape, his teeth shall be set on edge."⁹⁵ Later, the prophet Ezekiel proclaims that these predicted times have arrived:

And the word of the Lord came to me, saying: What is the meaning? That you use among you this parable as a proverb in the land of Israel, saying: The fathers have eaten **sour** grapes, and the teeth of the children are set on edge. As I live, saith the Lord God, this parable shall be no more to you a proverb in Israel. Behold all souls are mine: as the soul of the father, so also the soul of the son is mine: the soul that sinneth, the same shall die.⁹⁶

⁹⁴ Exodus 20:5. "*Non adorabis ea, neque coles: ego sum Dominus Deus tuus fortis, zelotes, visitans iniquitatem patrum in filios, in tertiam et quartam generationem eorum qui oderunt me*".

⁹⁵ Jeremiah 31:28-31 (Emphasis added). "[E]t sicut vigilavi super eos ut evellerem et demolirer et dissiparem et disperderem et affligerem sic vigilabo super eos ut aedificem et plantem ait Dominus in diebus illis non dicent ultra patres comederunt uvam **acerbam** et dentes filiorum obstipuerunt sed unusquisque in iniquitate sua morietur omnis homo qui comederit uvam acerbam obstupescunt dentes eius ecce dies veniunt dicit Dominus et feriam domui Israhel et domui Iuda foedus novum." (Emphasis added).

⁹⁶ Ezekiel 18: 2-4 (Emphasis added). "*In diebus illis non dicent ultra: Patres comederunt uvam **acerbam**, et dentes filiorum obstupuerunt. Sed unusquisque in iniquitate sua morietur: omnis homo qui comederit uvam acerbam, obstupescunt dentes ejus.*" (Emphasis added).

In the proverb as stated in Jeremiah and as referenced in Ezekiel, the sour taste of the grape is a metaphor for experiencing the consequences or punishment of sin. Thus, in earlier times when a father sinned/ate a sour grape, the child was punished/tasted the sourness in his own mouth. In later times, only the one who ate the sour grape/sinned experienced the consequences/punishment for that sin.

Thus, in the Bible the root word “*ācer*” is explicitly connected to the concept of God’s justice upon the deserving. That Prudentius chose this word to describe this wind may therefore suggest that it was sufficiently fierce to be seen as a judgment by an angry God upon a sinful population.

In addition, Prudentius’ notation that the wind was from the north may be significant. In ancient and medieval culture, the North is an ambiguous place; either defined as dark and evil, or as the seat of an austere, pure, civilization protected behind the north wind.⁹⁷ The north wind was supposed to cleanse the land and protect virtues.⁹⁸ Also, within the Bible, the books of Daniel, Ezekiel and Revelation all predicted that the North would be the source of the destruction of the Apocalypse. And although Alcuin had ultimately decided the “Northmen” were not this beginning, the North was indeed

⁹⁷ Peter Davidson. *The Idea of North*, (London: Reaktion Books, 2005), 25. <https://ebookcentral.proquest.com/lib/ed/detail.action?docID=449405>.

⁹⁸ Davidson, *The Idea of North*, 25-26.

cleansing the Carolingian Empire, through destructive aggressions and a northern wind.

That Prudentius believed such punishment to be real and merited is shown by his commentary on the events of AD 846. In that year, the Beneventans of Italy went to war with the pagan Saracens, and Scandinavian aggressors made a mess out of the Carolingian Empire.⁹⁹ Prudentius specifically called this mayhem a just punishment from God, saying, “[P]eccatis nostris divinae bonitatis aequitas nimium offensa taliter christianorum terras et regna attriverit”.¹⁰⁰ To add to the Christian misery physically, a famine occurred in Western Gaul in AD 845, killing thousands.¹⁰¹ Closer to home, although the Treaty of Verdun had been signed in AD 843 by Charles the Bald and two of his brothers, the fourth brother Pippin had died in AD 838 and his heir and nephew Pippin II was not a signatory of the treaty.¹⁰² Therefore, although the treaty assigned Aquitaine to Charles the Bald, Pippin II also claimed it as heir of the first Pippin. In AD 845, Charles the Bald defeated his nephew. The younger Pippin swore loyalty to Charles and in

⁹⁹ On the events of AD 845, see Nelson, AB, 60-62.

¹⁰⁰ Waitz, AB, 33. “God in his goodness and justice, so much offended by our sins, had thus worn down the lands and kingdoms of the Christians.” Nelson, AB, 61.

¹⁰¹ Nelson, AB, 61.

¹⁰² Nelson, AB, 38.

return received Aquitaine to rule, but only under Charles the Bald's command.¹⁰³ From the Christian perspective of Bishop Prudentius, this turmoil—aggressors, a famine, and internecine conflict—could well be punishment. Notably, he may have seen this as punishment for hubris demonstrated by some significant political figure. Since Prudentius was still an ally of Charles the Bald, the sinful hubris may have been that shown by Pippin II of Aquitaine in fighting his uncle.

Thus by using the word "*acerrimus*", Prudentius tapped into the biblical trope that God is almighty and renders justice upon those who deserve it. To be so punished by God was surely demoralizing and weakening. But to conclude that Prudentius' use of "*acerrimus*" suggests a wind sufficiently fierce to be experienced as God's wrath does not resolve the question of whether the wind and subsequent damage were severe enough to attract the interest of a Scandinavian aggressor inclined to exploit a natural disaster to his military advantage. Based on the evidence of the following year, however, it probably did. After this "terribly fierce north wind" swept over the Carolingian Empire in AD 846, in AD 847 Prudentius records an attack from the aggressors on the *emporium* of Dorestad. This was the first time since AD 839 he reported an attack specifically on Dorestad rather than simply

¹⁰³ Nelson, AB, 61.

on the surrounding region of Frisia.¹⁰⁴ The attack occurred during the late autumn or early winter, which would have been soon after the annual harvest. Since the poor harvest that would have resulted from the north wind of AD 846 would likely reverberate well into AD 847, this meant that whatever resulted from the north wind of AD 846 would likely reverberate well into AD 847, and so this meant that even if they had a bounteous harvest in AD 847, the people would be weaker. Thus, the severity of the north wind of AD 846 was likely at least one part of what created a ripe opportunity for an aggressor to exploit Dorestad's weakness and gain much more for the effort than might have been possible in other years.

5.4.2 The Plague of AD 858

In AD 857, the Carolingian Empire suffered a string of military defeats from Scandinavian aggressors.¹⁰⁵ Then in AD 858, Prudentius describes an earthquake (*terrae motus*) followed by a plague (*mortalitas*), writing, “[D]ominicae navitatis festo noctu et interdiu Mogontiae validus et creberrimus terrae motus efficitur, quem etiam **valida** hominum mortalitas insequitur.”¹⁰⁶

¹⁰⁴ Nelson, AB, 35.

¹⁰⁵ On AD 857, see Nelson, AB, 83-85.

Two subsequent records allow additional gloss on his description of these natural disasters. First, unusually for him, he describes in detail a strange tree and a wolf's appearance in a chapel.¹⁰⁷ His final relevant report is the capture and ransom of Abbot Louis of Saint-Denis.¹⁰⁸

Prudentius' descriptions of both the earthquake and plague are vivid, because the adjectives he uses for both are the appropriate forms of the root word "*validus*", thereby not only describing but also linking the two disasters.¹⁰⁹ The adverbial form of the word "*validus*", "*valde*", appears in the Bible 160 times and intensifies everything from God's "very" good first day (Genesis 1:31) to being "very" thirsty (Judges 4:19). In contrast, forms of the adjective "*validus*" are much scarcer, appearing only thirty-one times.

¹⁰⁶ Waitz, AB, 48. (Emphasis added). "On the very night of Christmas and on the following day, there was a violent and recurring earth-tremor at Mainz, and a **great** pestilence followed." Nelson, AB, 85 (Emphasis added). Underneath, Nelson comments that the AF date this "great" earthquake instead to 1 January, (Reuter, AF, 40), which is still within the short Christmas season.

¹⁰⁷ Waitz, AB, 48.

¹⁰⁸ Nelson, AB, 86.

¹⁰⁹ *A Latin Dictionary* translates "*validus*" as "strong, stout, able, powerful, robust, vigorous". Lewis and Short, *A Latin Dictionary*, s.v. "*validus*." *The Dictionary of Medieval Latin from British Sources* translates it as "physically powerful, strong . . . [or] . . . (of condition, state of affairs, event, or sim.) strong, powerful, intense." Latham et al., eds., *Dictionary of Medieval Latin from British Sources*, s.v. "*validus*." *The Oxford Latin Dictionary* defines it as "Physically powerful, robust, strong, sturdy, or similar. . . (of weapons, implements, etc), wielded with force or vigour. . . (of natural forces or similar) Powerful, vehement, intense." Glare, ed., *Oxford Latin Dictionary*, s.v. "*validus*."

These verses can be divided roughly into four groups. The first and smallest is the three verses specifically using a form of “*validus*” to refer to a strong force of nature.¹¹⁰ Nine verses use a form of the adjective in various, uncategorizable contexts—from referring to the gigantic size and strength of a people (Deuteronomy 2:10) to describing the intensity of Christ’s cries to God to save him from death (Hebrews 5:7).¹¹¹ Another group uses a form of the adjective to refer to the strength of an army, a fight, or other act of violence.¹¹²

The largest and most interesting group, however, is the fourth group that uses a form of the adjective to refer to strength or might associated with God. In Exodus 3:19, God’s hand alone has the might to rescue the Israelites from the Pharaoh. In Baruch 2:11, this same rescue is referenced as an example of the strength of God’s hand. In Ezekiel 20:34, God is angry with Israelites for disobeying him, and again, they face the wrath of His hand. In Job 30:22, Job wonders why he, a righteous man, is being dashed mightily by the strength of God.

¹¹⁰ In Matthew 14:30, Peter is walking on water at Jesus’ invitation when he sees strong wind and sinks in fear. Luke 15:14 refers to the famine from which the prodigal son fled to return home. Acts 27:18 describes the strong tempest that drove Paul’s ship off course. Interestingly, the flood described in Genesis Chapters 6-9 is not described with the word “*valida*” even though it is commonly known as the Great Flood.

¹¹¹ Deuteronomy 2:10, Wisdom 17:18, Proverbs 18:11, Proverbs 24:5, Sirach 11:6, Sirach 30:15, Isaiah 3:1, Jacob 3:4, and Hebrews 5:7.

¹¹² Judges 3:22, Judges 5:26; 2 Samuel 15:12, 2 Samuel 15:18, 2 Kings 11:18, 2 Kings 18:17, 1 Maccabees 4:7, 2 Maccabees 4:41, 2 Maccabees 11:14, 2 Maccabees 12:11, and 2 Maccabees 14:1.

In this same group is a series of verses that describe God acting with the strength of, or in conjunction with, a powerful natural phenomenon. Thus, in Nehemiah 9:11 and in Wisdom 18:5, he destroys the wicked with mighty waters. In Psalm 49:3, he appears with a mighty tempest around him. In Isaiah 28:2, the prophet proclaims: "Behold the Lord is mighty and strong, as a storm of hail: a destroying whirlwind, as the violence of many waters overflowing, and sent forth upon a spacious land."¹¹³ In this latter group, the might and strength of God is always associated with the problem of sin; either God exerts His strength on behalf of those who have not sinned or He asserts it against those who have. In either case, the result is that God's strength, as demonstrated in destructive acts, is punishment for sin. God's strength may be reflected in how the word has descended etymologically into English as the adjective "valid". In the 1570s, "valid" came into English from the Middle French word "*valide*", which itself had descended into Middle French from "*validus*". *The Oxford English Dictionary* defines a valid argument in part as one "against which no objection can fairly be brought".¹¹⁴ In other words,

¹¹³ "*Ecce validus et fortis Dominus sicut impetus grandinis; turbo confringens, sicut impetus aquarum multarum inundantium et emissarum super terram spatiosam.*"

¹¹⁴ Harper, *Online Etymology Dictionary*, s.v. "valid," accessed 15 Nov. 2019, https://www.etymonline.com/word/valid#etymonline_v_4614; OED

today a valid argument is one that cannot be resisted just as in the Early Middle Ages, one could not resist the strength of God. Given this meaning of the adjective “*validus*” in the biblical context, by choosing this adjective, Prudentius may well have been suggesting that the combination of the earthquake and plague was so severe the people needed to repent and call on God for aid.

An intertextual analysis, however, need not rely solely on the word “*valida*” because Prudentius describes the entire year in a way that contextualises the earthquake and plague as apocalyptic omens.¹¹⁵

The first clue he is depicting the two disasters as apocalyptic appears in the fact that he described both the earthquake and plague with the adjective “*Validus*.” In Later Medieval apocalyptic literature, earthquakes and plagues are often explicitly linked as signs of the impending Apocalypse.¹¹⁶

Online, s.v. “valid, adj. (and n.),” accessed 24 March 2019, <http://www.oed.com/view/Entry/221190?redirectedFrom=valid>.

¹¹⁵ This is not the first year in the AB that Prudentius portrays as possibly apocalyptic. His entries for AD 838 and AD 839 also contextualise the two years’ recorded events as possible apocalyptic signs. Nelson, AB, 38-48; Wielfaert, “Prudentius,” 88-94

¹¹⁶ Indeed, in Later Medieval apocalyptic literature, earthquakes and plagues are often explicitly linked as signs of the impending Apocalypse. For a discussion, see L. A. Smoller, “Of Earthquakes, Hail, Frogs, and Geography: Plague and the Investigation of the Apocalypse in the Later Middle Ages,” in *Last Things: Death and the Apocalypse in the Middle Ages*, eds. C. Walker Bynum and P. Freedman (Philadelphia: University of Pennsylvania Press, 2000), 168. Christian Rohr has pointed out that this association was not automatic, however, and that many saw natural disasters as part of everyday life. C. Rohr, “Man and Natural Disaster in the Late Middle Ages:

For example, while describing the advent of the apocalyptic Black Death, two Austrian authors describe the 1348 Carinthia earthquake as one of many signs of the plague's impending devastation.¹¹⁷ Prudentius' use of "*validus*" to describe both is therefore curious indeed.

The date of the Apocalypse was a hotly contested issue during the Early Middle Ages. According to the book of Daniel, the world would last 6000 years, and many had calculated the end of times to be around AD 800. At the end of the eighth century approached, Alcuin of York became convinced that apocalyptic prophecies were being fulfilled.¹¹⁸ This could have served as justification for Charlemagne to assume the title of emperor, and indeed he was crowned in AD 800.¹¹⁹

Although the world did not end as predicted, society still lived under the shadow of the prophecy and much agitation remained.¹²⁰ In fact, Haimo of Auxerre, a student of Alcuin and colleague of Prudentius, argued that all the prophesised events leading up to the Apocalypse had already occurred, and the

The Earthquake in Carinthia and Northern Italy on 25 January 1348 and its Perception," *Environment and History* 9 (2003): 138.

¹¹⁷ Smoller, 'Of Earthquakes, Hail, Frogs, and Geography,' 156-157.

¹¹⁸ James Palmer, *The Apocalypse in the Early Middle Ages* (Cambridge, Cambridge University Press, 2014), 138-140.

¹¹⁹ Palmer, *Apocalypse in the Early Middle Ages*, 139-140.

¹²⁰ Palmer, 160-161.

only event still needing to come to pass was the coming of the Antichrist.¹²¹

The prophesised events that would lead to the Apocalypse are described in, among other verses, Luke 21:10-11, where Luke reports the words of Jesus describing the end of days:

10 Then he said to them: Nation shall rise against nation, and kingdom against kingdom. 11 And there shall be great earthquakes in divers places, and pestilences, and famines, and terrors from heaven; and there shall be great signs.¹²²

The four horsemen of the Apocalypse described in Revelation follow a similar, though not identical, pattern. First will come the war and violence of the White Horseman, who goes forth to conquer (*ut vinceret*) (Revelation 6:2), and of the Red Horseman, who incites people to kill each other (*ut invicem se interficiant et datus est illi*) (Revelation 6:4). Next will come the Black Horseman bringing famine (Revelation 6:5-6) and finally the Pale Horseman bringing *Mors* (Revelation 6:8).

By AD 858, the pagan attacks and civil war of recent years in the Carolingian Empire could have been seen as both the first part of the prediction in Luke and as the terrors of the first two horsemen. Under the Carolingian theology created in

¹²¹ Palmer, 170.

¹²² "Tunc dicebat illis: Surget gens contra gentem, et regnum adversus regnum. Et terraemotus magni erunt per loca, et pestilentiae, et fames, terroresque de caelo, et signa magna erunt."

part by Prudentius' teacher Theodolf, the Carolingians were soldiers for God, advancing His word. To be repeatedly defeated by pagans was to be judged unworthy by God. This conclusion would be especially compelling for Prudentius, who was alienated from his king and saw him as sinful. Moreover Charles the Bald's constant conflict with Louis the German, the AD 857 rebellion of Pippin II of Aquitaine, and Louis the German's eventual takeover of West Francia could all be interpreted as the work of the Red Horseman.¹²³

Then, near or in the beginning of AD 858, two natural disasters came. The first one was a *validus* earthquake—precisely as foretold in Luke, occurring on Christmas Day. Immediately thereafter came a *valida* plague. Though the prophecy in Luke mentioned famine, and Prudentius does not record one that year, there had recently been a series of famines throughout the Empire and Europe as a whole spanning from AD 850-AD 853, and the plague, like all plagues, brought with it the Pale Horseman, death.¹²⁴ The only foretold events not yet experienced would have been the “great signs”.

But the signs were there. The first was the fact that the earthquake occurred on Christmas Day. Unlike in other entries, in this one Prudentius emphasised both the actual date and the

¹²³ Nelson, AB, 84, 88-89.

¹²⁴ Kurze, AF, 31-32; von Simson, AX, 18.

time, revealing that they held special significance. There were other potential signs as well. Immediately after reporting the plague, Prudentius detailed two extremely unusual events. The first was a tree washed up by the sea, a tree Prudentius felt was sufficiently unusual to merit his extended comment:

*[C]arente a foliis, sed loco frondium habentem ramusculos similitudine herbae partim latae sed longioris, loco vero foliorum quaedam triangula spetie, colore autem unguium humanorum vel ossium piscium, quae in eis tenuia sunt; et haec ita summitati earundem herbarum inhaerentia, acsi extrinsecus adposita viderentur, more eorum quae ex diversis metallis in ornamentis cingulorum vel hominum vel equestrium falerarum extrinsecus adfigi solent.*¹²⁵

Immediately after his note on the unusual tree, he reported a second unusual event.

*In pago Senonico in ecclesia sanctae Porcariae die dominico celebrante missas presbytero, lupus subito introiens plebemque adsistentem discurrendo perturbans, tandem inter feminas identidem faciens, disparuit.*¹²⁶

¹²⁵ Waitz, AB, 49. “[I]t had no leaves, but instead of boughs it had little tiny branches like blades of grass, thick-spread in places but longer, and instead of leaves it had things shaped like triangles and in colour like human nails or like fishbones, quite tiny and attached to the very tips of the grasslike branches as if they had been stuck on from outside, just like those little things made of various kinds of metals which are fixed on to sword-belts or on to the body-armour of men or horses by way of ornament.” Nelson, AB, 85-86.

¹²⁶ Waitz, AB, 49. “In the Sens district one Sunday in the church of Saint-Porcaria, while the priest was celebrating mass, a wolf suddenly came in and disturbed all the menfolk present by rushing about; then after doing the same thing among the womenfolk, it disappeared.” Nelson, AB, 85-86.

Next, after reporting on an Anglo-Saxon marriage and a “pirate” who had sworn loyalty to Charles, Prudentius reported the capture by Scandinavian aggressors of the Abbot Louis of Saint-Denis, grandson of Charlemagne.¹²⁷ The captors received a ransom so large it impoverished *churches* and eventually required the collective input of Charles the Bald’s entire empire.¹²⁸ Thus, this capture was not merely a political and economic crisis but also a religious one.

This whole series of events, with war, earthquake, plague, death, and great signs, could have been seen as a warning that the end of days might be coming. Prudentius’ entries, therefore, not only report on these events but also serve as a warning themselves, perhaps even enacting the predicted “great sign” by becoming a sign themselves. The earthquake and plague, therefore, become inseparable from the entire series of events and their severity rises to the level of a warning from God that the end of days may be coming.

The unanswered question from Prudentius’ description, of course, is whether the damage that the plague inflicted on

¹²⁷ Nelson, AB, 86.

¹²⁸ Nelson, AB, 86. One theory is that Abbot Louis was captured on Easter. Ferdinand Lot, “La grande invasion normande de 856-862,” *Bibliothèque de L’Ecole des Chartes* 69, no. 1 (1908): 49. Simon Coupland has argued instead that Abbot Louis was captured in AD 857 and released February or March AD 858. Simon Coupland, “Charles the Bald and the defence of the West Frankish kingdom against the Viking invasions, 840-877” (Ph.D. thesis, Cambridge University, 1987), 47-48. <https://doi.org/10.17863/CAM.20042>.

the Franks was severe enough for Scandinavian aggressors to exploit. While this can never be established with certainty, some signs do point in that direction. During the year of the plague, AD 858, Prudentius reported only three attacks by Scandinavian aggressors. In the following year, however, he noted twice that number, six, which is the most aggressions he had ever recorded. Why might more aggressions occur in a plague's aftermath? Perhaps because the Empire had been severely weakened by the plague and was still recovering?

5.4.3 The Famine of AD 869

Prudentius died in AD 861 and around AD 865, Hincmar of Rheims took up the reporting work.¹²⁹ In the first winter of AD 869, Hincmar wrote: "*Ipse autem ad Conadam vicum nimis incongruenter et pro qualitate temporis et pro **nimietate** famis perrexit; ubi quosdam Aquitanos obvios habui.*"¹³⁰ This entry focuses on the inconvenience suffered by Charles the Bald because of the weather and famine, describing the famine with the almost generic term "nimietate". In this case, a biblical

¹²⁹ Nelson, AB, 10.

¹³⁰ Waitz, AB, 98. (Emphasis added) "Charles [the Bald] then went to the township of Cosne [-sur-Loire] at an inconvenient time to travel since the weather was bad and there was a **very serious** famine, and met some of the Aquitanians there." Nelson, AB, 153 (Emphasis added).

intertextual analysis produces a different result from in the previous two analyses.

Several forms of “*nimietate*”, which Nelson translates as “serious”, appear in various Bible verses. “*Nimietate*” comes from the root word “*nimium*”.¹³¹ Unlike “*acer*” or “*validus*”, however, “*nimium*” does not connote devastation instead being mostly used as a mild intensifier. The adjective and its derivatives appear thirty-seven times throughout the Latin Vulgate in a multitude of different contexts. It describes, for example, a very angry person (Genesis 39:19), very old age (Genesis 48:10, Joshua 9:12), and a person becoming very drunk (Judith 13:4, Esther 1:10). It is used three times in the context of war, twice when Israel and Juda were victorious (1 Kings 20:13, 2 Chronicles 16:8) and once in describing the end of days (Daniel 11:11). The only time “*nimium*” describes anything resembling a natural disaster is in Job 24:19, when Job wonders why God allows so much to happen to him even though he is a righteous man. Similarly, the derivative “*nimio*”

¹³¹ *A Latin Dictionary* translates “*nimium*” as “beyond measure, excessive”. Lewis and Short, *A Latin Dictionary*, s.v. “*nimium*.” *The Dictionary of Medieval Latin from British Sources* translates it as “excessive, exceedingly great. . . [and] excessive things.” Latham et al., eds., *Dictionary of Medieval Latin from British Sources*, s.v. “*nimium*.” *The Oxford Latin Dictionary* translates “*nimium*” as “(with verbs) Too much, excessively, unduly. . . [and] (with adjectives or adverbs) too.” Glare, ed., *Oxford Latin Dictionary*, s.v. “*nimium*.”

describes fear five times (Genesis 45:3, I Samuel 31:4, I Chronicles 21:30, Esther 15:8, and Ezekiel 32:10); anger two times (Judith 5:2, Esther 1:12), and the sea once (Wisdom 19:7). This wide-ranging biblical use of *nimium* and any word derived from it suggests it was merely an intensifier for Hincmar with no special biblical undertones.

Similarly, this report seems to have no connection to a biblical narrative or trope. The political context of this report supports this interpretation. At the beginning of AD 869 before the yearly benchmark of Ash Wednesday, Charles the Bald was mired in a political crisis engendered by the insubordination of several important figures. First, Bishop Hincmar of Laon, nephew of Hincmar of Rheims, communicated with the pope independently of Charles' authority. When Charles and several bishops summoned Hincmar of Laon afterward and even sent armed men for him, Hincmar of Laon ignored the order.¹³² Charles had also planned to have a meeting with three significant men in the always contentious province of Aquitaine but for some unspecified reason the men did not appear at the meeting.¹³³ With Hincmar of Laon's defiance and the failure of the men to meet with him, Charles the Bald must have feared

¹³² Nelson, AB, 152-153.

¹³³ Nelson, AB, 153. Hincmar of Rheims calls two of the men Bernard then names the third man Bernard as well. Nelson can clarify the identity of only two of the three; they were Bernard of Gothia and Bernard of Toulouse.

an open rebellion. In the AB, when Hincmar of Rheims ends his account of Charles' acts before Ash Wednesday, he concludes that Charles the Bald "went back . . . anxious and having achieved nothing".¹³⁴

Thus the *nimius* famine is just one of many negative events in Hincmar's narrative of Charles' political failure. The political failure would have been more important for Hincmar than for Prudentius because of their different relationships to Charles the Bald, a fact which might raise doubts about Hincmar's downplaying of the famine. His minimalist description, however, is supported by the fact that the famine does not appear to have been severe or widespread enough to attract Scandinavian aggressors.

In AD 869, Hincmar recorded only one land-battle (in the Loire region), which the Scandinavian aggressor lost. Hincmar recorded no Scandinavian aggression whatsoever in AD 870.¹³⁵ The AF, the AX, and Regino also recorded no attacks in AD 870.¹³⁶ This lack of aggression seems to confirm that the famine was not large enough to be incorporated into a Scandinavian aggressor's military strategy.

¹³⁴ Nelson, AB, 153.

¹³⁵ On the land battle, see Nelson, AB, 163. On AD 870, see Nelson, AB, 165-172.

¹³⁶ Reuter, AF, 61-64; von Simson, AX, 28-29; MacLean, Regino, 162-164.

For AD 869, therefore, the intertextual analysis works in reverse. The use of “nimietate” as an intensifier along with the notable lack of aggressions implies that the famine was not severe or was too local to have a large impact.

5.4.4 Two Excerpts from Other Annals

Focusing on the AB allowed this test of intertextual analysis to extend to the personal agendas of the authors because they were known. This luxury is not available for the other annals. Nevertheless, to continue the experiment, two additional entries, one in the AX and one in the AF, were examined.

The author of the AX wrote of the spring of AD 838, “*et nimis ardor solis terram urebat*”, “and too much heat from the sun burned the land”.¹³⁷ As shown in the analysis for Hincmar’s AD 869 entry, the root word “nimium” is broadly used biblically as a simple intensifier suggesting either that the AX author thought the spring heat was notable but not severe or that the authority directing the author wanted to downplay the heat.¹³⁸ Yet, the author reports that Scandinavian aggressors attacked in AD 838 so these aggressors may have been taking advantage of the disasters.¹³⁹ On the other hand, the territory

¹³⁷ Von Simson, AX, 10. (Emphasis added, translation by author).

¹³⁸ von Simson, AX, 10.

¹³⁹ von Simson, AX, 10-14.

around the abbey of Xanten was not attacked again until AD 846, the year after the terribly fierce north wind discussed above. So while this “heat” may have provoked a single attack it does not seem to have done long term damage that would encourage sustained aggression.

In the AF, the author gloomily describes a series of troubles in AD 873. In a lengthy record, he first reports, “*Eodem anno facta est fames valida per universam Italiam et Germanicum*”.¹⁴⁰ He then reports a locust plague and blood from the sky, concluding that God must be punishing the people for sin.¹⁴¹ Through his use of the word **valida**, the AF author, like Prudentius earlier, may have been suggesting the famine was extremely severe. On the other hand, not knowing this author, he may have been trying to exaggerate the famine to exhort people against sin. Regardless of his intention, no Scandinavian aggression occurred until three years later in AD 876. Therefore, even if the famine was considered severe by those who experienced it—or by those who wanted to use it to exhort Christians to righteousness—it appears not to have been severe enough to attract the attention of the raiders.

¹⁴⁰ Kurze, AF, 79. “In the same year there was a great famine through the whole of Italy and Germany.” Reuter, AF, 71.

¹⁴¹ Kurze, AF, 79-80.

5.5 Conclusion

The Carolingian culture was a culture in which Christianity was not only the accepted religion but also the lens through which life and world events were interpreted. Thus, in his conquests, Charlemagne had a political agenda as well as a religious agenda to spread Christianity; a natural disaster or an attack by Scandinavian aggressors was not only a frightening event by itself but also evidence of divine wrath; and Christian symbolism seeped into the language, literature, and tropes used by annal authors to explain these events. Examining these descriptions in light of the Bible, therefore, provides a greater understanding of the events themselves. Like dendrochronology, however, this data cannot provide a firm foundation for creating an objective standard to measure severity and thus make a connection between natural disasters and Scandinavian aggression stronger than the basic correlation shown on the charts.

Yet both intertextual analysis and dendrochronological data can provide a wealth of information on the context of a disaster; and analysing this information on a case-by-case basis could help develop a clearer picture of the situation behind each event as well as of the event itself. And a clearer picture was exactly what was needed to strengthen the

connection and move this possible correlation—that Scandinavian aggressors militarily exploited natural disasters for political gain—to a probable one.

Accordingly, four cases showing a clear correlation between a natural disaster and an aggression were chosen and analysed in terms of their geographic and political context, the relevant situation of the climate, and the information that an intertextual analysis of their description might reveal. The question asked in each of these cases was simple: is it more likely than not—is it probable—that in each of these cases, Scandinavian aggressors militarily exploited the situation these natural disasters created? As the answer to this one question became clearer, more complex questions began to arise.

Chapter 6. Moving from Possible to Probable: Two Case Studies of Correlated Anomalies

The original, motivating inquiry of this study was to examine the impact of natural disasters in the Early Middle Ages. Definition and causation issues soon required narrowing to the question of political exploitation of natural disasters. Practical evidentiary concerns led to an even tighter focus on the Carolingian Empire in the ninth century. The natural next step was to examine the relationship between natural disasters and Scandinavian aggressions. Mining annals generated empirical data about natural disasters and Scandinavian aggressions as well as instances of local warfare and deaths of important people. The resulting charts suggested that a correlation did indeed exist and that Scandinavian aggressors may well have had a conscious strategy of exploiting populations weakened by natural disaster. The charts' usefulness, however, was limited because creating them required excising historical context from the data and leaving out location information. This correlation provided a tantalizing thread of possibility but lacked contextualizing support and therefore presented a significant challenge: how to move beyond possibility to probability? Turning to other methodologies seemed a promising approach to bolster the now-developed hypothesis that Scandinavian

aggressors exploited natural disasters as a conscious military strategy.

The first alternative methodology was dendrochronology and its base of scientific data. Initially, the data seemed unhelpful because it proved nothing about the effect of a disaster on human populations. On closer inspection, however, the data proved useful in other ways. For example, if the charts showed that an aggression took place at a specific time, the dendrochronological material could provide climatic context that during that year, certain regions in the Carolingian Empire were more vulnerable than usual and so were ripe for attack.

The second alternative methodology was language analysis, which offered the hope of developing a subjective and contextualised analysis of severity. Using this new approach showed that a case-by-case analysis of the language used to describe or discuss a natural disaster potentially helped understand how the writer interpreted the severity of the disaster. Like the charts and dendrochronology, however, it could go no further.

More importantly, however, taken together these sets of contextualising data could serve as the basis of a model to investigate individual events. Detailed case studies, therefore, appeared to be the analytical tool that could potentially move the hypothesis from possibility to probability. Applying a

methodology that analysed all the data for two very different natural disaster/Scandinavian aggression events proved that the hypothesis is indeed probable and also suggested that additional case studies might prove similarly revealing.

6.1 Developing the Methodology

The first question in conducting the case studies was simple: Which cases to study? The combined charts discussed in Chapter 3 and included in the Appendix herein record almost one hundred instances of Scandinavian aggression and over fifty natural disasters from AD 810 to AD 891. Clearly, decisions had to be made.

The first step in filtering was to identify cases where aggressions and natural disasters seem too closely correlated for mere coincidence. Some of these cases have only similar timelines; others have both similar timelines and similar locations. Still others have similar timelines and locations, plus some written evidence exists in the annals to corroborate a causal connection between the disaster and the aggression. These three types of cases were sorted into three categories delineated as “Statistical Anomalies”, “Correlated Anomalies”, and “Corroborated Anomalies”. Each category was then examined to explore which one would help model the correlated events with the most clarity.

The first category of cases, statistical anomalies, are cases in which the natural disaster and aggression have close enough timelines within the five-year span as outlined in Chapter 3 to raise the possibility that the aggressors took advantage of the disaster, but the only firm correlation that can be made between the two is the similar timelines. For example, in AD 856 and possibly continuing into AD 857, the Carolingian Empire suffered a human plague that killed “*magna pars hominum*”.¹ During AD 857, which would have been the plague’s aftermath, the AB recorded its second highest number of Scandinavian aggressions. Aggressors attacked Tours and Poitiers during the winter that began AD 857 but also attacked the Seine, Chartres, and Frisia in the autumn through the winter that ended the year. Thus attacks were scattered throughout West Francia and the north of Middle Francia.² The similar timelines and the fact that the attacks were not concentrated in a specific location raises the possibility that aggressors were exploiting the devastation of the plague all across the Empire.³ A second example is the attacks during AD 873. In AD 872, hail ruined the harvest and no aggressor struck. As the new year began, the winter was also harsh. In June, one aggressor

¹ Waitz, AB, 46. “[A] sizable part of the population.” Nelson, AB, 81.

² Nelson, AB, 83-85.

³ Nelson, AB, 83-85.

tried to strike West Francia. Both the lack of aggressions in AD 872 and the one in June are therefore interesting by themselves. Then, about mid-August, a locust plague hit the Carolingian Empire and caused a famine. After the famine, aggressors arrived in numbers, according to the AB, although they do not specify how many, and, according to the AB, Charles the Bald laid siege to Angers during or soon after this famine.⁴ All the attacks seem very closely correlated with the general shortage and devastation that would have been caused by the locust plague. Unfortunately, however, the annals do not provide specific information about the location of either the famine or the number of aggressions.

Do these statistical anomalies suggest that the aggressors took advantage of the disasters? Certainly. Indeed, this correlation between a natural disaster and aggression within a five-year timespan established the basis of this investigation. However, the locations of the natural disasters as well as the attacks are too dispersed and the immediate political situations are too ambiguous to support further examination. There is simply not enough data in the annals to create a clear model of the two correlated events and analyse further the probable factors involved that might have coalesced into the aggression. Moreover, many other cases have more

⁴ Nelson, AB, 183-185.

solid evidence of a connection because they include location data and more.

To investigate this possible correlation further, a second category of cases was created: correlated anomalies. In correlated anomalies the natural disasters and aggressions have correlated locations as well as correlated timelines. For example, for the first time since AD 859, in AD 863 and AD 864 Scandinavian aggressors returned to loot the Rhine shortly after it flooded.⁵ Again, in July AD 879, Scandinavian aggressors originating from the Great Heathen Army landed on the Scheldt after a cattle plague had infected the Carolingian Empire the previous autumn. Interestingly, the murrain especially infected the Rhine area just east of the Scheldt thus providing an opportune place and time to create a base and to plunder the area in its aftermath.⁶

Even though the connection is therefore stronger, however, the annal writers provided no specific evidence or commentary to connect these disasters and aggressions. Thus, although correlated anomalies strengthen the possibility that aggressors exploited natural disasters, there is not enough political data on each case to move beyond strong possibilities to probabilities.

⁵ Nelson, AB, 104-19; von Simson, AX, 20-22.

⁶ Reuter, AF, 85.

Corroborated Anomalies, the third category of cases, are cases where the natural disaster and aggression have similar timelines, happened in similar locations, and the annals provide corroborating evidence to connect them. A chart listing examples of some of these events in each of these categories appears below in Figure 6-1. (Enlarged in Appendix 2).

Figure 6-1: Chart of Examples of Scandinavian Aggressions and Disasters

Statistical Anomalies	Correlated Anomalies	Corroborated Anomalies
AD 810: Cattle Plague throughout empire/Raids on Frisia	AD 834: Flooding throughout Carolingian Empire /Sack of Dorestad	AD 886: Flood isolating tower under siege of Paris/Scandinavian aggressors capture them because of it.
AD 820: Ruined harvest and plague/Raids on Flanders, Seine, and Bouln	AD 838 Huge tide covers Frisia December/AD 839 Frisia	
AD 837-8: Windstorms first winter/Walcheren and Frisia	AD 843-844: Famine after war in Brittany/the first raids on Brittany	
AD 839-40: Harsh winter/Rouen spring-summer	AD 845: Cold winter and West Gaul Famine/Raids on Seine spring-summer, Aquitaine autumn	
AD 851: Harvest failure and famine of Sorbs/Frisia	AD 846-847 Cold north wind in Troyes/scattered attacks directly north in Frisia	
AD 852: Excessive heat and famine/Seine	AD 850: Rhine famine/Roric captures Dorestad	
AD 856-7: Human plague throughout /Five scattered attacks AD 857	AD 863-864: Rhine flooding/first Rhine lootings since AD 859	
AD 858-9: Human plague/Six scattered attacks AD 859	AD 869: Loire and Burgundy famine winter/battle between Abbot Hugh and Gauzlin with "Loire Northmen" later that year	
AD 863: Flooding and stormy winter/Frisia	AD 878-879: Murrain autumn AD 878 prominently on Rhine/Scandinavian aggressors landing on the Scheldt July AD 879	
AD 873: Locust plague and famine/Unclear number of aggressions and the siege of Angers	AD 880: Frozen Rhine and Main/Battle of Thimeon	

As the chart above illustrates, there is only one clear corroborated anomaly based solely on the charts. In the AD 886 siege of Paris, a flood in February isolated one of the remaining towers under siege, and the AV directly report that Scandinavians took advantage of the disaster to capture the tower.⁷ Such a straightforward story requires no further evidence to support the conclusion that the aggressors exploited the natural disaster to capture the tower. The capture did not require any previous intelligence or communications—

⁷ von Simson, AV, 59.

the siege was ongoing, the flood created an opening, and so the Scandinavians took advantage of it to seize the tower.

The challenge for the case studies, therefore, was to examine other events to determine whether available contextualizing evidence would support shifting them to the Corroborated Anomaly category. The correlated anomalies were already the most clearly aligned. Of the events in this category, the AD 834 raid on Dorestad and the AD 880 Battle of Thimeon had the closest correlation and the most background information and therefore became the first case studies.

The AD 834 raid on Dorestad is particularly interesting for study because although the RFA report two earlier sporadic raids on the Empire in AD 810 and AD 820, this AD 834 attack was the beginning of the continuous attacks upon the Carolingian Empire lasting throughout the rest of the ninth century. Thus, this attack was the true dawn of the Viking Age in Continental Europe.

Not only does this attack have special historical significance but also the study of it is supported by important contextualizing data. First, substantial archaeological evidence shows that Dorestad was a wealthy and significant economic power at the time. In fact, Dutch historians and scientists have

wistfully nicknamed it the “Dutch Troy”.⁸ To organise an attack against such a power must have required enormous forethought and effort to succeed to any meaningful degree, yet both the AB and AX report that the attack was so successful that Dorestad was sacked.⁹ Second, two contemporary authors recorded the attack—the unknown author of the AB and the author of the AX, Gerward, writing from Lorsch Abbey, far southeast of Dorestad but also on the Rhine. These authors provide much data on the raid’s political context. The origin of the raid can probably be traced to the conflicts detailed within the RFA between Louis the Pious and Danish leaders during the AD 820s.¹⁰ The contemporary conflicts within the Empire during the years immediately before and lasting through AD 834, including Danish/Frankish conflicts, are detailed in the AB. Finally, the weather conditions in the area around Dorestad, in particular the heavy flooding in AD 834, are not only reported in the two annals but also shown in the OWDA. Hence the historical significance and richness of available data combine to make the AD 834 raid of Dorestad a correlated anomaly that can be modelled and thus an apt choice for focused study.

⁸ Annemarieke Willemsen, “Welcome to Dorestad: A History of Searching and Finding the Dutch Troy,” in *Dorestad in an International Framework*, eds. Annemarieke Willemsen and Hanneke Kik, (Turnhout: Brepols, 2010), 7.

⁹ Waitz, AB, 9; von Simson, AX, 9.

¹⁰ Scholz, RFA, 106-25.

The second case study is an AD 880 battle between Louis the Younger and Scandinavian aggressors recently settled in a base on the Scheldt. The battle happened south of the base at Thimeon in what is now Belgium. It was fought during a winter that froze the Rhine. What makes this case interesting is that Louis was the party who might have taken advantage of a natural disaster when he led the attack and won the battle. Sources differ on the size and scale of his victory, with the AF claiming it was a spectacular victory and Regino claiming it was closer to a stalemate, but the data on the political context is extensive. The AB, AF, AV, Regino, and even the ASC all provide background information.¹¹

Unfortunately for Louis, his victory was not extensive enough for him to pursue and dislocate the new aggressors, whose appearance arguably marked a new phase in the conflicts between the Carolingians and Scandinavians. In the next few years, this new Scandinavian fleet would plunder the Scheldt and the Meuse extensively and, according to the ASC, were probably the same group that laid siege to Paris in AD 885-886.¹² Therefore, while this battle by itself is just one of the beginning battles in the wider conflicts that started this period, it

¹¹ Nelson, AB, 220; Reuter, AF, 88; von Simson, AX, 45-47; MacLean, Regino, 181; Swanton, AB, 76-77.

¹² Swanton, ASC, 80-81.

was a fight against new enemies who would eventually help fracture the Empire. As with the sacking of Dorestad, all this information combines to make the Battle of Thimeon, a correlated anomaly suitable for closer scrutiny. But how to approach these case studies through a common methodology that allowed all the individual details to be unearthed, synthesized, and modelled? This was the next problem to solve.

The charts by their nature had left out location data because this information was too singular to be charted. But in a case study, the context from this information can be considered. Therefore, each case study begins with a careful examination of the geographical location of the correlated natural disaster and aggression, focusing on relevant elements.

The charts by their nature also left out political context; again the data is too individual to be charted. A good example of the problem of political context is Roric's AD 850 capture of Dorestad. Roric was one of the more significant Scandinavian leaders involved with the Carolingian Empire, and though more information exists on him than on many other leaders, his political position as a Scandinavian leader before AD 850 is unknown. The speculated theory is that he was a nephew of the exiled king Heriold and therefore a powerful leader, but this

remains a theory.¹³ The AX, AB, and AF report in their notes on AD 850 that Roric and his brother (another Heriold) had been enlisted to guard Frisia and were then imprisoned by Lothar. Roric, however, escaped, and after a few years returned to capture Dorestad. Beyond this timeline of facts, nothing more about Roric's situation is known for sure.¹⁴ It seems obvious that Roric would have factored in the famine in his decision to take over a city that had been one of the wealthier ones on the Northwest European Continent—how could he not have? But he also had reason to be angry. How powerful was he before AD 850? What was his relationship with different Carolingian leaders before and after his attack on Dorestad and how would the attack affect it? Was he known to other Scandinavians and how would his emergence as a leader affect the existing relationships? Without firmer political context, examining this particular raid risks too much speculation. Exactly this contextual information, however, is available in the chosen case studies. Thus, the second factor examined is the contemporary political situation between the Carolingian and Scandinavian leaders as well as the relationship between the two peoples.

Third, to give a different context for these correlated anomalies, the climate data available in the OTC and OWDA

¹³ Simon Coupland, "Poachers to Gamekeepers," 90-91.

¹⁴ Nelson, AB, 69; Reuter, AF, 30; von Simson, AX, 17.

will be detailed. Though a deleterious climate in a certain year cannot by itself predict a weather-related natural disaster, it can support the understanding of a natural disaster reported in the annals by simply confirming the natural disaster or helping interpret its severity. Therefore, each case study will examine the temperature as revealed by the OTC and investigate whether the weather was unusually wet or dry as revealed by the OWDA. Sometimes such an investigation can give more context. Unfortunately, sometimes it cannot.

After exploring the geographical, political/historical, and climatic background of the event, each case study will then examine the natural disaster itself. The first attempt will be to assess what the disaster consisted of and its potential reach or impact based on external evidence. The investigation then shifts to examine the impact as understood by the annal writers. Sometimes the author's bare description is enough to provide understanding, such as the AF report that in AD 874 the combination of a plague with a famine killed a third of Gaul and Germany. Such clarity is rare, however, so the case studies will then explore the language of the description of the natural disaster and compare it with biblical literature. As shown in Chapter 5, sometimes this can reveal very clear information—such as Prudentius' acerbic use of “sour” grapes in AD 846 to

reveal he thought that year's wind was deserved divine wrath—but again, sometimes it does not.

Finally, each case study will focus in on the aggression. This final step will model the event by combining all the accounts—geographical, political, climatological, and intertextual—and then examining the military situation the disaster would have created for a military strategist considering whether to exploit it. Then it will be possible to explore whether the natural disaster would have indeed been a significant factor in the decision to attack.

As the original charts developed from the Carolingian annals reveal, instances of correlation between a natural disaster and an act of Scandinavian aggression abound across the ninth century, supporting the original hypothesis that the aggression was a political exploitation of the disaster. Despite the many tight correlations of time and place, however, the relationship can be seen only as a correlation in the absence of further information. On the other hand, with the additional information available in each of these four case studies, close analysis shifts the relationship from mere correlation to corroboration and moves the hypothesis from possible to probable.

6.2 The AD 834 Raid on Dorestad

In AD 834 parts of the Carolingian Empire suffered from extensive flooding. During the wet summer, Danish aggressors also raided the Empire, attacking the wealthy port of Dorestad and sacking it. This attack marks the dawn of the Viking Age proper in Continental Europe.

Though a few earlier minor raids had occurred earlier in the century, the raid of AD 834 could not be dismissed as minor. Dorestad was one of the most significant *emporía* within the Empire. Its location at a point on the Rhine where many rivers merged allowed it to dominate in commerce between large parts of the Empire and the surrounding kingdoms.¹⁵ The raid would have represented an alarming defeat for the Carolingian Empire.

The likelihood that the Empire's rivers were flooded around the same time Dorestad was raided points to the military exploitation of a natural disaster. Given the location provided by the annals, the raid could be considered a correlated anomaly without further data. To a powerful leader attempting to take advantage of the extensive flooding, Dorestad would have probably been a trapped jewel. The RFA

¹⁵ Willemsen, "Welcome to Dorestad" 7. Dorestad has been romantically referred to as the Dutch "Troy" because it suddenly disappeared after AD 864 even though it had been one of the most significant cities in the Empire until then. Willemsen, "Welcome to Dorestad," 7.

and AB recorded more than a decade of growing tensions between the Danes and the Empire before the raid as well, however, and the wealth of political data makes the raid an examinable correlated anomaly.

6.2.1 The Geographical and Economic Context of Dorestad

Dorestad was within the region of Frisia (See Figure 6-2 below), which had once been a kingdom itself before Charles Martel conquered it in the eighth century.¹⁶

Figure 6-2: Location of Frisia from Scholz, RFA, 98.



¹⁶ Scholz, RFA, 98, Map 8 (Colouring to highlight Frisia added); Alcuin. "Alcuin [sic] (735-804): *The Life of Willibrord, c.796.*" In *The Anglo-Saxon Missionaries in Germany, Being the Lives of SS. Willibrord, Boniface, Leoba and Lebuin together with the Hodoepericon of St. Willibald and a selection from the correspondence of St. Boniface*, translated by C. H. Talbot. London: Sheed and Ward, 1954. Fordham University Internet Medieval Source Book, 2000. <https://sourcebooks.fordham.edu/ba/sis/Alcuin-willibrord.asp>.

Bordering the Frankish province of Saxony, which in turn bordered Danish territory, Frisia was located on the Rhine-Meuse-Scheldt delta, directly south of the North Sea. It was therefore served by a number of tributary rivers branching off from the Rhine, and many of these waterways filled out into lakes and marshlands.¹⁷ The largest and most prominent lake was Lake Almere.¹⁸ Over time, these many lakes and rivers and especially Lake Almere combined to create the small bay now known as the Zuiderzee, or South Sea.¹⁹ Filled with marshland, rivers, and lakes, Frisia was vulnerable to flooding, and its prehistoric inhabitants are in fact famous for their activity between 500BC and AD 300 when they created artificial mounds, *terpens*, to protect themselves from floods.²⁰

In addition to these rivers and lakes, the coast of Frisia was buffeted by potentially dangerous storms from the North Sea. Indeed, both the AX and AB documented that a flooding tide on 26 December in AD 838 covered almost all of Frisia,

¹⁷ Egge Knol, "Frisia in Carolingian Times," in *Viking Trade and Settlement in Continental Western Europe*, ed Iben Skibsted Klaesoe (Copenhagen: Museum Tusculanum Press, 2010), 43.

¹⁸ Robert J. Hoeksema, "Three Stages in the History of Land Reclamation in the Netherlands," *Irrigation and Drainage* 56 (2007): 115.

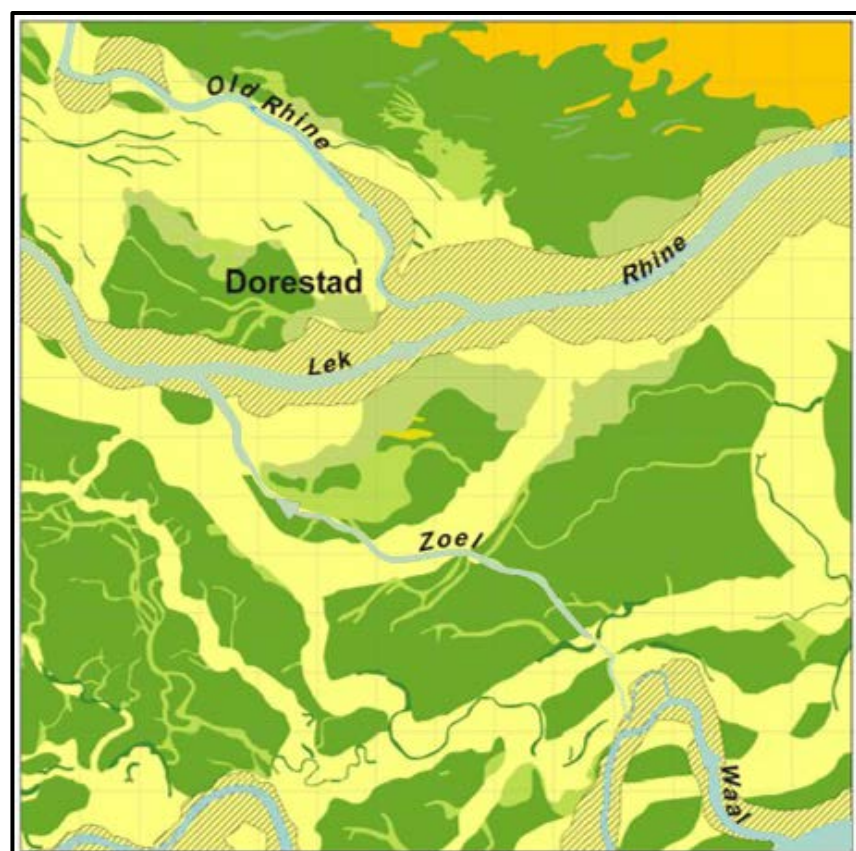
¹⁹ Knol, "Frisia in Carolingian Times," 54.

²⁰ Knol, "Frisia in Carolingian Times," 44.

and the author of the AB, Prudentius of Troyes, wrote that during this storm the region was reduced to dunes.²¹

Even so, the vulnerability of Frisia to storm and flood did not necessarily extend to its major *emporium*, Dorestad, located between eighty and one hundred kilometres inland from the North Sea along the Old Rhine at its confluence with the Lek and Zoel rivers, as shown in Figure 6-3 below.²²

Figure 6-3: Dorestad and surrounding rivers in Kosian et al., 2013, 15.



The former was a tributary river of the Rhine that reached to the Zeeland coast with the now-inactive Zoel

²¹ von Simson, AX,10; Waitz, AB,18.

²² Kosian et al., "The City and the River," 15, Figure 9 (Labels added).

providing a connection to the Waal River that in turn reaches into Germany.²³ Further connections with the Meuse River to the west and the Old Rhine to the north meant Dorestad was ideally placed as a hub of mercantile activity for Northern Europe.²⁴ Dorestad was also connected to regions deep within Central Europe because of the Rhine-Danube system as well as to the Mediterranean because of the Meuse River's connection with the Rhône.²⁵ Therefore it was one of the most powerful cities in the Carolingian Empire at the time of the attack. Dorestad also benefited from the fact that its particular stretch of the river was not particularly turbulent, and with a high natural levee protecting it from spring floods, the city could be considered relatively safe.²⁶ Moreover, as shown in Figure 6-4 below, because it was located on tidal plains, it had direct access to both the sea and the rivers Lek, Old Rhine, and Waal.²⁷

²³ Kosian et al., "The City and the River," 3-4.

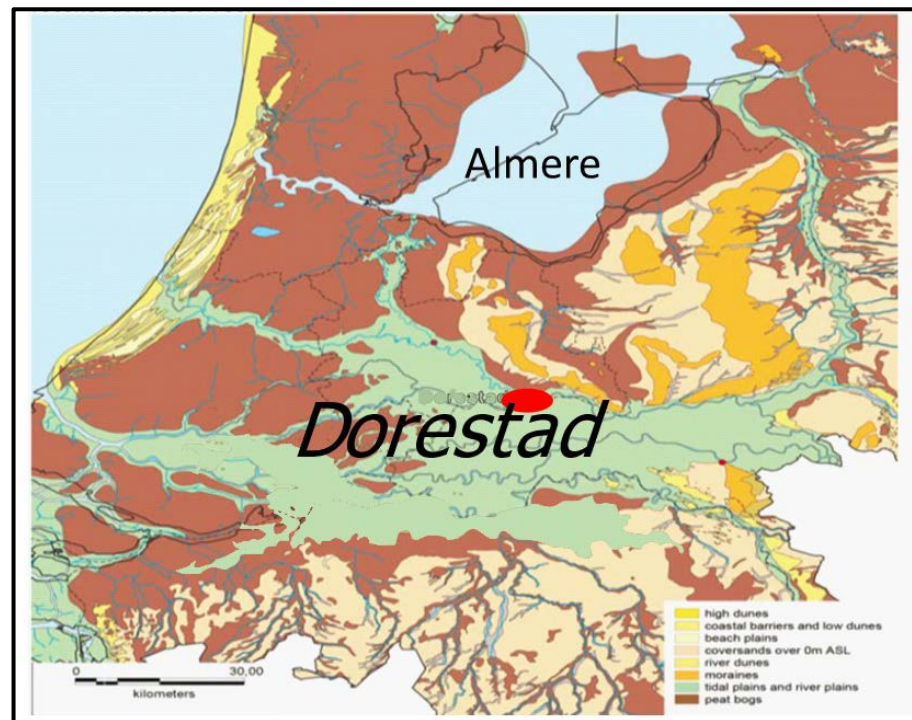
²⁴ Kosian et al., 3.

²⁵ Kosian et al., 3-4.

²⁶ Kosian et al., 1.

²⁷ Kosian et al., 9, Fig. 7 (Labels added).

Figure 6-4: Palaeographic reconstruction of Dorestad's position on the Old Rhine delta in AD 800 in Kosian et al., 2013, 9.



Indeed, every river route from the sea to Dorestad was bordered by peatland. As a wetland, peatland absorbs river flooding, so the area surrounding these routes would be relatively safe from recurrent flooding as well.²⁸ Therefore, navigating to Dorestad would not have been difficult. These factors combined to make Dorestad “perfect for trade”.²⁹

Its harbour eventually came to span about four miles, or six kilometres.³⁰ It was thus able to accommodate large

²⁸ Jiang Ming et al., “Flood mitigation benefit of wetland soil — A case study in Momoge National Nature Reserve in China,” *Ecological Economics* 61, nos. 2/3 (March 2007): 220.

²⁹ Kosian et al., “The City and the River,” 1.

³⁰ Annemarieke Willemsen, “Dorestad, a Medieval Metropolis,” in *From One Sea to Another. Trading Places in the European and Mediterranean Early*

numbers of merchants and ships and became a large city for its time.³¹ As Annemarieke Willemsen says:

Dorestad was, in fact, one large harbour: ships could moor over almost the full length of the town. This permitted the presence of a large number of ships and merchants, which allowed the town to grow into a kind of permanent annual fair, starting in spring and lasting the entire navigable season.³²

The city boomed from the AD 790s into the AD 830s.³³ By that time, the city had not only become an economic power but also had become significant for craft production and food.³⁴

According to Dagfrinn Skre, Scandinavian archaeologists “tend to regard Dorestad as the likely origin of most of the Frankish/Frisian trade of the 8th and early 9th century”.³⁵

Indeed, as Simon Coupland points out, the number of Dorestad-minted coins found in both Dorestad and in many other locations throughout Europe further proves its

Middle Ages, eds. S. Gelichi and R. Hodges (Turnhout, BE: Brepols, 2012), 68.

³¹ Willemsen, “Dorestad, a Medieval Metropolis,” 68.

³² Willemsen, “Dorestad, a Medieval Metropolis,” 70.

³³ Simon Coupland, “Boom and Bust at Ninth-Century Dorestad,” in *Dorestad in an International Framework. New Research on Centres of Trade and Coinage in Carolingian Times*, eds. A. Willemsen and H. Kik (Turnhout: Brepols, 2010), 98.

³⁴ W.A. van Es, “Dorestad Centred,” in *Medieval Archaeology in the Netherlands: Studies Presented to H. H. van Regteren Altena*, eds. Jan C. Besteman, J. M. Bos, and H. A. Heidinga (Maastricht, Netherlands: Van Gorcum, 1990), 163.

³⁵ Dagfrinn Skre, “From Dorestad to Kaupang: Frankish Traders and Settlers in a 9th Century Scandinavian Town,” *Dorestad in an International Framework*, 132.

significance in the Carolingian economy. The city clearly made one of the most significant imperial coins during the AD 820s and AD 830s.³⁶

Dendrochronological data also supports the city's economic importance. Rowin van Lanen, after examining different types of wood unearthed at the Dorestad site, postulated that a German-Rhineland trade network existed in Europe as early as the sixth century and continued into at least the ninth.³⁷ When examining a river barge and a dugout canoe dating to that time period, they found that neither boat was built from local timber, pointing indirectly to the existence of a vibrant long distance network.³⁸

Nevertheless, Dorestad's unique geography was not without negatives. Willemsen claims that with a harbour spanning the entire city, Dorestad was impossible to defend.³⁹ Focusing on the archaeological excavations of Dorestad, as shown in Figure 6-5 below, she notes that the extended harbour was comprised of an extremely long series of

³⁶ Coupland, "Boom and Bust at Ninth-Century Dorestad," 97-98.

³⁷ Jansma and van Lanen, "The Dendrochronology of Dorestad," 5.

³⁸ Jansma and van Lanen, "The Dendrochronology of Dorestad," 5.

³⁹ Willemsen, "Dorestad, a Medieval Metropolis," 70.

elongated jetties and that much of the city appears to *be in* water.⁴⁰

Figure 6-5: Artist's conception of Dorestad in AD 833 in Willemsen, 2010, 18.



Indeed, the excavations do not show any *obvious* military defences. The six kilometre stretch of land along a harbour and the string of elongated jetties appear to make every part of the city available to a raiding ship. Therefore, at first glance Dorestad seems extremely vulnerable to an attack.

To a military strategist, however, this might not necessarily be so. First, the flip side of that prospect is that Dorestad would also be extremely difficult to assault except

⁴⁰ Wim Euverman, 2009, Drawing for the Dorestad exhibition, in Willemsen, "Welcome to Dorestad," 18, fig.1; Annemarieke Willemsen, "Dorestad as a Fluvial Society," in *Maritime Societies of the Viking and Medieval World*, eds. James H. Barrett and Sarah Jane Gibbon (Leeds, UK: Maney, 2016), 110.

with a very large fleet of ships. Excavations of Scandinavian longships built during this time period have shown that a ship was unlikely to exceed thirty meters in length and would have had about seventy men.⁴¹ The marshy terrain around Dorestad would give them very few places to land, and so these thirty-metre ships would be trying to land in a harbour stretching more than six kilometres. Even a handful of ships, therefore, could attack only a fraction of the overall harbour, giving the rest of the city inhabitants not only more time to prepare and hide resources but also the opportunity to counterattack from behind by burning ships to prevent the raiding vessel's escape, a tactic employed in at least one other military situation during the first half of the Viking Age in AD 894 when the Anglo-Saxon king Alfred of Wessex burned the ships of Scandinavian aggressor Haesten, forcing him to surrender.⁴² Similarly, in Dorestad the destruction of the raiders' ships would prevent their retreat while the region was able to raise forces to counter them.

Moreover, the elongated jetties themselves could serve as a defence. Kosian, Abrahamse, van Lanen, and Weerts have speculated that the jetties were elongated because the Rhine was migrating away from Dorestad and the jetties were

⁴¹ Bill, "Viking Ships and the Sea," 170.

⁴² Swanton, ASC, 86.

elongated to keep them in deep water.⁴³ Whatever the reason, they would serve to divide the raiders. Clausewitz says in *On War* that the “tactical plan for attacking the first enemy units that make a stand must be aimed at turning their flanks” because “the key to success is always to split the enemy and isolate each part.”⁴⁴ The narrowness of and length of these jetties would give warriors disembarking from thirty metre ships little flexibility in outflanking infantry stationed between the jetties and the city itself. Therefore, a small force of men could prevent raiders from leaving the jetties, keeping them at bay.

Furthermore, Carolingian cavalry, infantry, and war carts were all required to have bows and quivers. This was so encouraged that cudgels were forbidden in favour of them.⁴⁵ Archers could have rained approaching ships from these long jetties and withdrawn behind infantry as a ship approached, the combination of archers and infantry making it difficult to disembark then attack. Accordingly, Dorestad might today seem open and vulnerable to attack—a potential treasure trove ripe for picking—but in actuality the combination of the marshy

⁴³ Kosian et al., “The City and the River,” 11.

⁴⁴ Clausewitz, *On War*, 560.

⁴⁵ Alfredus Boretius, ed., *Capitularia Regnum Francorum: Vol. 1* (Hannover: MGH, 1883). Regarding the cavalry order, see “Karoli ad Fulradum abbatus epistolam,” 168; for the infantry order, see “Capitulare Aquisgranense: 801-813,” 171; for the war carts order, see “Capitulare De Villis,” 89; and for the cudgels order, see “Capitulare Aquisgranense: 801-813,” 171.

terrain and elongated jetties may have actually made Dorestad akin to an unapproachable castle. Thus, the city could actually have been a daunting prospect for raiders, which could explain why it was unscathed until AD 834.

6.2.2 The Political Context of the Raid of AD 834

Whatever the reason Dorestad had been spared from previous attacks, in AD 834 its good fortune ended. The RFA include many notations about the Empire's relationship with the Danes thus providing much information about a political context that might have led a resourceful Danish noble or even king finally to attack Dorestad. This political situation probably begins at latest with Heriold's AD 819 invasion of Danish territory, an invasion sponsored and supported by Louis the Pious, and Louis' later attempted intrusions into Danish affairs in the years Heriold remained in power.

Louis began actively trying to influence the Danes in AD 819 when, "*iussu imperatoris*", on the emperor's order, Heriold invaded the Danes with Obodrite help.⁴⁶ Therefore, after Heriold gained power, any Dane rebelling against Heriold would have faced the dangerous prospect of also fighting Louis, one of the most powerful men in Europe. While this danger

⁴⁶ Kurze, RFA, 152; Scholz, RFA, 106.

might have been a factor in the decision of two of Godofrid's sons to join Heriold, Louis' sponsorship would have also forced Heriold to rely on his support to continue as a king, inevitably weakening Heriold. Through supporting Heriold, therefore, Louis would have gained partial control of the Danes.

Indeed, Louis' partial control of the Danes is illustrated by events of the next few years described in the RFA. These reports also suggest that Heriold enjoyed the support of few of his fellow Danes. In AD 821 the RFA simply state that the Danes were quiet, suggesting that the different Danish leaders were still readjusting to the different power relationships created by Heriold's invasion, including the power Louis had over Heriold.⁴⁷ The Danes do not appear to have been in a position to challenge Louis. The following year in AD 822, both Heriold and Godofrid's sons sent "legions", or "embassies", to Louis the Pious' general assembly in Frankfurt, where Louis discussed internal and international issues.⁴⁸ This report therefore implies that Heriold and the sons were all significant players in their own right, that their struggles continued, and that both Heriold and Godofrid's sons considered Louis to be a gatekeeper in their competitions for power.

⁴⁷ Scholz, RFA, 110.

⁴⁸ Kurze, RFA, 159; Scholz, RFA, 111-12.

By AD 823, whatever internal agreement held Heriold and two of Godofrid's sons together began to strain. That year, Heriold again asked Louis for help to avoid being dethroned.⁴⁹ In response, Louis decided to show the Danes how much real power and influence he held. Indeed, the RFA record he sent two Carolingian nobles—Counts Theothari and Hruodmund—to travel everywhere in the kingdom to “*causam diligentius explorandam*”, “carefully study the dispute”, and analyse the “*statum totius regni Nordmannorum*”, “the condition of the whole kingdom of the Norsemen”.⁵⁰ Both counts were experienced diplomats; Count Theothari even had previous diplomatic experience with the Danes in AD 811.⁵¹ The Frankish archbishop and Christian missionary Ebbo also became involved in the conflict.⁵² When the three nobles returned to Louis, they left Heriold as a king.⁵³

Though the power struggles continued, with Heriold as an allied king, Daniel Melleno argues, Louis decided “the Danes

⁴⁹ Scholz, RFA, 114.

⁵⁰ Kurze, RFA, 162-63; Scholz, RFA, 114.

⁵¹ Daniel Melleno, “Before They Were Vikings: Scandinavia and the Franks up to the Death of Louis the Pious,” (Ph.D. diss., University of California, Berkeley, 2014), 65, accessed 22 July 2020. <https://escholarship.org/uc/item/4qp148s0>.

⁵² Thomas F. X. Noble, “Carolingian Religion,” *Church History* 84, no.2 (2015): 291.

⁵³ Scholz, RFA, 114.

could now be treated as a subordinate people”.⁵⁴ Thus when in AD 825, Godofrid’s sons circumvented Heriold by sending an envoy directly to Louis to ask for peace—to stop interfering with their power struggles with Heriold, Louis evidently thought his response should demonstrate his power over the Danes again.⁵⁵ In AD 826, Heriold travelled to the Carolingian Empire—or to Louis—to be baptized before returning home.⁵⁶

Whether Heriold saw his baptism as a sincere religious act or a wise political move cannot be known. Christianity was marching through Europe as a uniting political and economic tool and was also being used by Carolingian rulers to help integrate and sometimes subdue their neighbours/rivals. Robert Ferguson describes converting to Christianity at the time as a way for all Europeans to create a common cultural identity. Many European leaders were accepting the cross.⁵⁷

Furthermore, archaeological finds show that the Scandinavian elite admired the Franks. Scandinavian aristocrats copied Frankish drinking habits and seemed to prefer to drink from glass beakers specifically imported from the

⁵⁴ Melleno, “Before They Were Vikings,” 66.

⁵⁵ Scholz, RFA, 118.

⁵⁶ Scholz, RFA, 119.

⁵⁷ Robert Ferguson, *The Hammer and the Cross: A New History of the Vikings* (London: Penguin, 2010), 88.

Frankish empire for ceremonies.⁵⁸ Moreover, finished burials reveal that Scandinavians sought out Frankish swords and armour.⁵⁹ Indeed, the infatuation seems to have been so profound that Norwegian scholars coined the phrase “Merovingian period” to describe the period leading into the Viking Age.⁶⁰ This institutional respect for high status Carolingian norms seems to have continued into the period of Scandinavian aggressions. Archaeological finds in England are rife with Carolingian metalwork, and native metalwork suggests Scandinavians were imitating Carolingian fashion.⁶¹ Though Scandinavian culture dominated the British islands, Scandinavian conquests of Carolingian territories had little impact on Carolingian culture.⁶² Instead, after gaining Carolingian territories, Scandinavian leaders at least nominally swore fealty to Carolingian rulers and assimilated into the Empire. One of the most famous examples was in AD 911 when the Seine Viking Rollo swore loyalty to Charles the

⁵⁸ John Callmer, “Scandinavia and the Continent in the Viking Age” in Brink, *The Viking World*, 443.

⁵⁹ Valerie Dawn Hampton, “Viking Age Arms and Armor Originating in the Frankish Kingdom,” *The Hilltop Review* 4, no. 2 (2011): 36.

⁶⁰ See, e.g., Stefan Brink’s use of the term in Stefan Brink, “Naming the Land,” in Brink, *The Viking World*, 62.

⁶¹ Gabor Thomas, “Carolingian Culture in the North Sea World: Rethinking the Cultural Dynamics of Personal Adornment in Viking-Age England,” *European Journal of Archaeology* 15, no. 3 (2012): 509-10.

⁶² Jesch, *The Viking Diaspora*, 27.

Simple and began creating the duchy of Normandy. Indeed, scholars mark this event as the end of the first half of the Viking Age.⁶³ Though Rollo's was the most significant, assimilation was not unusual. Simon Coupland notes that several prominent Scandinavian nobles—beginning with the Dane Halfdan in AD 807 through Rollo in AD 911—were commended and sworn into Frankish service as stewards of different territories.⁶⁴ Heriold might have therefore considered his baptism a canny political move. Christianity was spreading, the Danes admired the Franks, and a Danish noble's baptism was not unusual.

But Heriold's baptism was different. Heriold was a *rex*, not a noble, and the territory in question was his own. Moreover, Heriold left his own kingdom and travelled to the Carolingian Empire to receive the baptism, thus aligning himself with the Carolingians even more closely. This choice indicated that the culture and empire with which he was aligned had considerable influence over him. Because Heriold's baptism imitated that of a Danish steward of Carolingian territory, it would have made him look weaker.

From this perspective, the baptism seems a major mistake for both Louis and Heriold. One year later, their

⁶³ Coupland, "Poachers to Gamekeepers," 85.

⁶⁴ Coupland, "Poachers to Gamekeepers," 87.

mistake bore fruit when Godofrid's sons decided to take full control.

*"[R]eges Danorum. filii videlicet Godofridi, Herioldum de consortio regni eicientes Nordmannorum finibus excedere compulerunt."*⁶⁵

[T]he kings of the Danes, that is the sons of Godofrid, deprived Heriold of his share of the kingship and forced him to leave Nordmannia.⁶⁶

Heriold thus fled to the Carolingian Empire once again, this time, according to Adam of Bremen, as a "*supplex*," supplicant.⁶⁷ By AD 828, Louis and Godofrid's sons were set to enter negotiations about Heriold's status but, according to the RFA, the sons were attacked by Heriold before the negotiations began. This was ostensibly the reason the sons then attacked or retaliated against the Franks. Regardless of the catalyst, Godofrid's sons won the victory and cheekily told Louis he had to confirm changes to Heriold's status with them and could no longer make independent decisions on his own.⁶⁸ Heriold had no power anymore and would not gain it from the negotiations. To retain control over the Danes, Louis would have had to invade Danish territory. In essence, knowing that Louis might invade, the sons of Godofrid made a pre-emptive strike, blamed

⁶⁵ Kurze, RFA, 173.

⁶⁶ Scholz, RFA, 122.

⁶⁷ Bernhard Schmeidler, ed., *Magistri Adam Bremensis Gesta Bammaburgensis Ecclesiae Pontificum*, 3rd ed. (Hannover: MGH, 1917), 21.

⁶⁸ Scholz, RFA, 123.

it on Heriold, and won clearly enough that Louis did not try to invade afterwards. Having a king like Heriold as a guardian of the Danes would serve Louis well to influence Danish affairs but direct control of the Danes after an invasion would be an entirely different scenario. The RFA report that by AD 829, Louis had become skittish. After hearing a rumour that the sons of Godofrid were about to attack Saxony, Louis raised a defending army to counter them but disbanded it when the rumour proved false.⁶⁹ Thus, Louis became wary of the Danes and focused on the growing trouble within his own territories.

The RFA ends in AD 829, but the AB take up the reports of the Frankish/Danish relationship from AD 830 and show that the next four years witnessed trouble for Louis.⁷⁰ According to the AB, in AD 830, his sons Pippin and Lothar rebelled because Louis was planning a campaign in Brittany against the wishes of his people, who encouraged the sons to come and stop Louis.⁷¹ Whatever the reason, Pippin was only temporarily successful in deposing his father. By autumn, Louis had regained control, though it would not be permanent.⁷²

⁶⁹ Scholz, RFA, 124.

⁷⁰ Nelson, AB, 21.

⁷¹ Nelson, AB, 21-22.

⁷² Nelson, AB, 22.

In AD 831, the Persians under Caliph Amir al-Mamoun of Bagdad sought a treaty at Louis' yearly general assembly. Because the Persian Empire did not border the Carolingian Empire, it is unlikely this was a peace treaty and more likely that it was an alliance or an economic agreement. Nelson comments that al-Mamoun was then at war with the Byzantines and speculates "perhaps he hoped for Frankish help".⁷³ More importantly, a Danish contingent at the assembly sought "*eadem*", the "same request".⁷⁴ As with the Persians, this seems likely to have been an alliance or economic agreement.⁷⁵ In any case, the AB report drily that after the Danish envoys asked for the treaty, Louis confirmed it and the Danes returned home.⁷⁶

In AD 832, Louis faced another revolt, this time from his son Louis the German. Louis the German failed and his father forgave him, but this was another power struggle that further weakened Louis the Pious' standing.⁷⁷ Yet again, in AD 833, Louis the Pious faced a third revolt when three of his four sons—Lothar, Pippin, and Louis the German—united against him. This time, Louis the Pious' army deserted him, and Lothar

⁷³ Nelson, AB, 22, footnote 2.

⁷⁴ Kurze, AB, 3; Nelson, AB, 22.

⁷⁵ Nelson, AB, 23.

⁷⁶ Nelson, AB, 23.

⁷⁷ Nelson, AB, 24-25.

captured him then held him prisoner first in Soissons and second at Aachen.⁷⁸ Lothar then publicly humiliated Louis, forcing him to confess to many sins, promise a public penance for said sins, and finally relinquish royal authority, becoming a penitent instead of an emperor.⁷⁹

According to Nithard, however, in February AD 834, the sons' alliance broke apart when Pippin and Louis the German learned Lothar considered them inferiors now he was emperor.⁸⁰ When Pippin and Lothar faced off on opposite banks of the Seine around Paris, neither army could cross to engage the other because the Seine was flooded. Lothar then learned that his other brother, Louis the German, was also leading an army against him. Because Lothar was unable to engage Pippin and would be surrounded once Louis the German arrived, he fled, opening the way for Pippin and Louis the German to free their father.⁸¹ Though they also reinstated Louis as emperor on 1 March AD 834, Louis had to pay a price.⁸² He apparently not only "forgave" Pippin and Louis the German but also rewarded them with substantial power and

⁷⁸ Nelson, AB, 23, 26-28.

⁷⁹ Booker, *Past Convictions*, 16.

⁸⁰ Chapter 5, section 5.3.

⁸¹ Nelson, AB, 29.

⁸² Mayke de Jong, *The Penitential State*, 131.

territory, thus, at least at first, continuing to serve as emperor with their permission.⁸³

After this series of revolts, imprisonment and humiliation, and freedom only after a power contest among three of his sons, Louis would have been in an ambiguous power position. The Danes would have already been careful of Louis because he had attempted to subordinate them and in the process had increased tensions between the two peoples.⁸⁴ Moreover, after the Frankish unrest in AD 833-34, the Danes could no longer rely on whatever agreement they had made with Louis in AD 831. In this political situation, the jewel of Dorestad might have seemed sufficiently valuable to risk an already tenuous and strained relationship with an emperor of fragile powers.

6.2.3 The Weather of AD 834

The weather of the Northwest European Continent in AD 834 was substantially different in terms of both dryness and

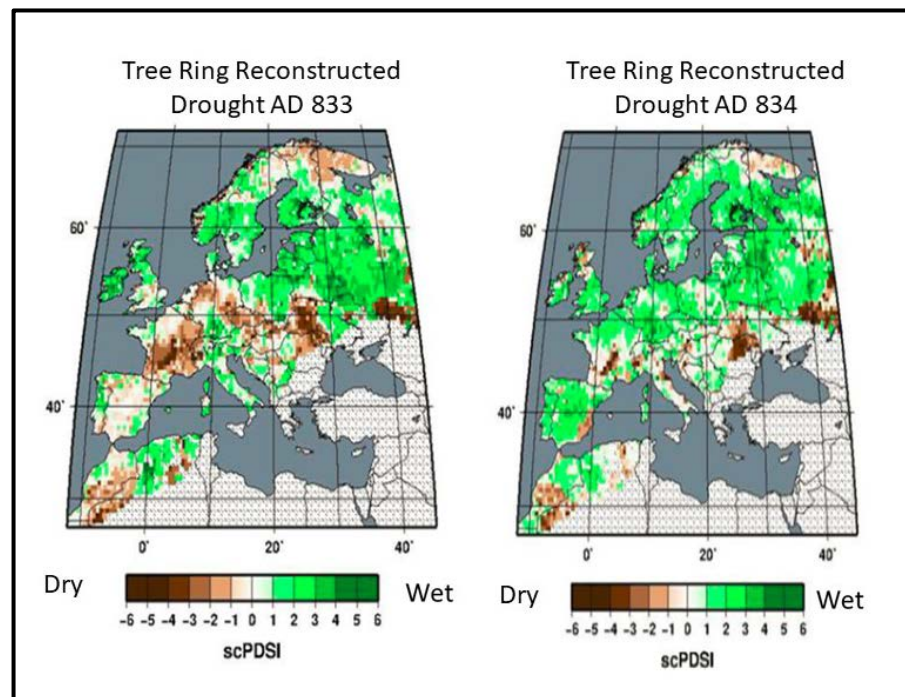
⁸³ The traditional view is that Louis the Pious lost power and never regained it. de Jong, 2-3. Many recent scholars reject this view because Louis the Pious was able to exile Lothar to Italy and re-establish an orderly empire with each son apparently content with his share. See, e.g., Janet Nelson, *Charles the Bald* (London: Longman Group UK, 1992), 93-102, and Costambeys, Innes, and MacLean, *Carolingian World*, 221. Regardless of this dispute, Louis the Pious would not have been in control of the kingdom in AD 834 as evidenced by the fact that he fought Lothar until August AD 834 and was not crowned emperor again until around 2 February AD 835, when all aristocrats finally swore loyalty to him. Nelson, AB, 32.

⁸⁴ Melleno, "Before They Were Vikings," 66.

temperature from the previous years. Extrapolation from tree ring data suggests that in the years between AD 827, when Heriold was expelled, and AD 833, the year before the attack on Dorestad, the average temperature was -1.76°C below the norm. AD 834's temperature was warmer but still low, at -1.04°C below the norm.⁸⁵

Even more significantly, the OWDA, as illustrated in Figure 6-6 below, shows that while in Scandinavia the summers of AD 833 and AD 834 do not look so different, in the Carolingian Empire was much wetter than in AD 833, and was in fact recovering from a drought.

Figure 6-6: The OWDA AD 833-834 in Cook et al., 2015, 1-9.



⁸⁵ Büntgen et al., OTC, 578-82.

The scientific data does not show the impact of these changes, but according to the AB and AX, the impact seems to have included long-term flooding that caused substantial difficulties and that lasted for most of the ensuing year.

6.2.4 The Floods of AD 834

Indeed, beginning with the AB, the author records that in AD 834 the Seine flooded with “[/]solita exuberatione,” “exceptionally high” waters, and that there was “*nam nimium ceterorum quoque fluminum inundatio et ultra alveos insueta progressio multis non parvum intulit impedimentum.*”⁸⁶ Since the Seine’s floods prevented a February clash between Pippin and Lothar, these floods must have begun at least by February. While the flooding is one of the first items discussed in the AB’s AD 834 notes, it is the last item discussed in the AX, which states as its last event, “*Eodem anno aquae inundaverunt valde super terram,*” “In this year water overflowed the land exceedingly.”⁸⁷ This contrast between the two annals implies not only that flooding had begun by February but also that it continued.

⁸⁶ Waitz, AB, 8, “[M]uch flooding of other rivers too and unheard-of bursting of their banks created great difficulties for many people.” Nelson, AB, 29.

⁸⁷ von Simson, AX, 9.

Focusing on the AB and AX's descriptive language individually, in combination, and in contrast with each other provides additional clues as to the size and immediate impact of the floods. Describing events with biblical figural language was common among Christian leaders at the time. For example, throughout his letters, the Christian theologian and diplomat Alcuin of York often described events in the figural language of spiritual nurture and referred to himself as a spiritual gardener.⁸⁸ In one example, when Alcuin wrote to Charlemagne urging him to lift tithes on unconverted Saxons, Alcuin describes faith as an "easy yoke" and equates teaching Christian theology to "feeding people milk".⁸⁹ Alcuin invoked spiritual nurture often to describe and explain evangelism, and he was one of the major figures who helped support the ever-growing Carolingian church.⁹⁰ Others would have adopted spiritual nurture as a theme as well.

Indeed, as discussed in Chapter 5, the authors of the annals used biblical terms and implicitly referenced their meaning and use in the Bible. Thus, the words the author of the AB uses to describe the Seine flooding and the context in which

⁸⁸ Kate Rambridge, "Alcuin's Narratives of Evangelism: The Life of St Willibrord and the Northumbrian Hagiographical Tradition," in *The Cross Goes North: Processes of Conversion in Northern Europe AD 300-1300*, ed. Martin Carver (Suffolk, UK: York Medieval Press, 2003), 376.

⁸⁹ Allott, *Alcuin of York: His Life and Letters*, no. 26, 72-73.

⁹⁰ Rambridge, "Alcuin's Narratives of Evangelism," 380-81.

he wrote reveals details. When reporting on the Seine flooding, he writes, “[N]am *nimum ceterorum quoque fluminum inundatio et ultra alveos insueta progressio multis non parvum intulit impedimentum.*”⁹¹ Nelson translates this sentence as: “[M]uch flooding of other rivers too and unheard-of bursting of their banks created great difficulties for many people.”⁹² Although the AB report that there were *multis*—many—floods, at first glance it does not seem to elaborate on how many there were, which rivers flooded, or their magnitude. Nor does the author appear to elaborate on what physical difficulties the floods created for people, simply stating that the floods created *impedimentum*. The adjective he uses, “*nimum*”, does not reveal as much as many other adjectives do since “*nimum*” is often used biblically as simply an intensifier. He does use one interesting word, though, “*inundatio*,” that might illuminate the impact of these floods. Indeed, “*inundatio*” might even connect AD 834’s flooding rivers with Noah’s flood.

“*Inundatio*” not only translates into “to flood” but also implies a great impact resulting from a flood. “*Inundatio*” is a form of the Latin verb “*inundō*”.⁹³ The first time a derivative of

⁹¹ Waitz, AB, 8 (Emphasis added).

⁹² Nelson, AB, 29.

⁹³ *Inundō* is defined as “to overflow, inundate, flood”. Charlton T. Lewis and Charles Short, *A Latin Dictionary* (Oxford: Clarendon Press, 1879), s.v. “*inundo*.”

“*inundō*” itself appears in the Latin Vulgate is, in fact, during a description of Noah’s Flood.⁹⁴

Genesis 7:6: *[E]ratque sescentorum annorum quando diluvii aquae **inundaverunt** super terram.*

Genesis 7:6: And he was six hundred years old, when the waters of the flood **overflowed** the earth.

Variants of the verb “*inundō*” appear three times in Genesis—in Genesis 7:6, Genesis 7:10, and Genesis 7:18. Each time, the Bible is describing the *diluvii* (flood) covering the world. And, indeed, the symbolism of the word “*inundō*” as connected to floods is already emphasized within the Bible when it is used later to describe overpowering force.⁹⁵ In the book of Isaiah Chapter 8:7-8, he warns Judah of its impending invasion by the king of Assyria by saying:

“[[B]ehold the Lord will bring upon them the waters of the river strong and many, the king of the Assyrians, and all his glory: and he shall come up over all his channels, and shall overflow all his banks/ And shall pass through Juda, overflowing, and going over shall reach even to the neck. And the stretching out of his wings shall fill the breadth of thy land, O Emmanuel.⁹⁶

⁹⁵ Biblegateway.com, “Biblia Sacra Vulgata Search, “inund”, accessed 17 November 2021, <https://www.biblegateway.com/quicksearch/?quicksearch=inund&version=VULGATE>.

⁹⁶ Isaiah 8:7-8. “[P]ropter hoc ecce Dominus adducet super eos aquas fluminis fortes et multas, regem Assyriorum, et omnem gloriam ejus, et ascendet super omnes rivus ejus, et fluet super universas ripas ejus/ et ibit per Judam, **inundans**, et transiens: usque ad collum veniet. Et erit extensio alarum ejus implens latitudinem terrae tuae, o Emmanuel!”

The English word “inundate” is an heir of “*inundo*”,⁹⁷ and the OED defines “inundate” as “1. transitive. To overspread with a flood of water; to overflow, flood,” or also “transferred and figurative. To fill with an overflowing abundance or superfluity; to overwhelm, ‘swamp’.”⁹⁸ Considering the facts that “*inundō*” was already used symbolically to represent force in the Bible, the word has been translated into “*inundate*”, and priests used spiritual metaphors to describe events, the AB’s use of the word might reveal not only that the Empire’s rivers flooded but also that these floods swamped the land.

The AB’s author could also have been likening the floods figuratively to Noah’s flood even further in the way he wrote the rest of the story about the standoff between Pippin and Lothar. The hubristic sinful Lothar, who captured and humiliated his father as well as deciding his brothers were inferior, was cut off from his family because of their conflict and also because of the flooding Seine. He fled, fearing the wrath of his father and brothers, just as all sinners were cut off from God during the Flood and suffered His wrath. With both the descriptive verb and the story of the conflict, therefore, the AB hint that the inundating floods were huge.

⁹⁷ Douglas Harper, *The Online Etymology Dictionary*, (2001-2019), s.v. “inundate,” accessed 18 February 2020, https://www.etymonline.com/word/inundate#etymonline_v_30094.

⁹⁸ OED Online. s.v. “inundate, v.,” accessed 17 March 2019, <http://www.oed.com/view/Entry/98846?redirectedFrom=inundate>.

Even as examining the annals individually provides implicit information, examining them in combination provides further insight as to the scale and extent of the floods. Although the “pro-Louis the Pious” tenor of the writing in the AB suggests the author was a member of Louis’ court, the identity of his sponsor is not certain. What can be inferred is that the anonymous author’s employers were gathered around Paris in February AD 834 and that, according to the AB, aside from a single visit Louis made to Aachen in the north, every city Louis or Lothar visited in AD 834 was in the western half of the Carolingian Empire.⁹⁹ The author’s focus was therefore mainly on rivers within West Francia. In contrast, the AX for AD 834 are known to have been written in Lorsch Abbey in East Francia, located in what is now Germany.¹⁰⁰ While Paris is on the Seine, Lorsch is on the Rhine, over 450 kilometres to the east. Combining the information of these two annals suggests that at a minimum the flooding of AD 834 affected rivers in an area spanning at least 450 kilometres and therefore that much of Eastern France and some of Western Germany suffered from flooding.

Contrasting the descriptions used by the authors of the two different annals also suggests that the scale of the flooding

⁹⁹ Nelson, AB, 28-31.

¹⁰⁰ Reuter, AF, 144.

was large. While the author of the AB graphically describes rivers bursting their banks, the author of the AX simply states, “*Eodem anno aquae inundaverunt valde super terram,*” at the end of its report on AD 834—which has led others to conclude simply that a Western German river overflowed at the end of the year.¹⁰¹ Though this description may seem restrained and possibly vague, it is actually almost a direct quote of Genesis 7:6, which is, again, the first biblical verse where a derivative of the verb “*inundo*” appears. The *Latin Vulgate* says, “[E]ratque sescentorum annorum quando diluvii **aquae inundaverunt super terram,**” a sentence translated by the Catholic *Douay-Rheims Bible* as, “[A]nd he was six hundred years old, when the waters of the flood overflowed the earth.” The AX’s description therefore again links these floods both to the conflict between Louis the Pious with his son Lothar and to God’s wrath on humanity with Noah’s Flood. Noah was 600 years old and wise just as Louis the Pious, the older emperor, was wise. Lothar and his supporters were unwise hubristic sinners. Because these unwise sinners briefly gained the upper hand in Carolingian familial affairs and humiliated Louis, God showed His wrath and punished the family’s Carolingian Empire with

¹⁰¹ Jan Buisman, *Duizend jaar weer, wind en water in de Lage Landen: Deel 1*, ed. A.F.V. van Engelen (Franeker, Netherlands: van Wijnen-Franeker, 2005), 200.

severe flooding. Thus, the AX's author could have understood the floods to be a message from God telling them to reform.

Indeed, further exploring the Flood's description not only helps connect the words of the author of the AX to this particular verse but also links these floods to the entire Flood story. The story of the flood itself, as reported in Genesis 7:11-24, describes water coming from "fountains of the great deep," both the sea and rivers, and from "the floodgates of heaven," rain. In the biblical story the rain fell for "forty days and forty nights." The waters "prevailed beyond measure upon the earth" and indeed "the water was fifteen cubits higher than the mountains it covered." This overwhelming Flood "prevailed upon the earth one hundred fifty days". Thus, when Noah faced the Flood, the water came from everywhere. Similarly, the author of the AX implied not only that rivers flooded but also that there was considerable rainfall and the sea might have even intruded on the land. In the case of these floods, this interpretation of the annal's description is supported by the scientific data. The OWDA's climate chart for AD 834 confirms physically that in at least the summer of AD 834, the whole Empire, including the Rhine, was indeed swamped.

Dorestad was located not merely on the Rhine delta but more importantly, within its tidal and river plains where both the high North Sea tide and the flooded Rhine river deposited mud.

Although Dorestad itself was protected by levees and might have remained dry, these floods would have surrounded Dorestad and isolated it, just as Noah had been trapped in an ark for many months. Under these circumstances, Dorestad would have been a sitting duck, vulnerable at last to a Scandinavian aggressor.¹⁰²

6.2.5 Modelling the AD 834 Raid on Dorestad

Thus the scene was set. The political tension and animosity between the Danes and the Franks had been building for more than a decade and Louis was in an unusually ambiguous power position. The weather in AD 834 was warmer and much wetter than it had been in the previous few years. With the flooding, it was an excellent time for raiders to finally inundate territories within the Empire.

The AB and the AX do not directly name the time of year the raid on Dorestad occurred. The AB, however, note the raid as occurring “*interim*”, “meanwhile”, in its description of the war between Louis the Pious and Lothar, a war which began

¹⁰² It is entirely possible that the low-lying territory surrounding Dorestad was flooded for months. Even with a protective levee system, modern technology, and a national emergency response, it took about forty-three days to pump out and drain New Orleans post-Katrina. Herbert Fredrickson et. al., *Environmental Consequences of the Failure of the New Orleans Levee System During Hurricane Katrina: Microbiological Analysis, Final Report* (Vicksburg, US: Environmental Laboratory U.S. Army Engineer Research and Development Center, 2007), 11.

sometime after April but ended before mid-August.¹⁰³

Similarly, when the AX note the raid, they document it as happening “*interim*”, “meanwhile”, just after discussing Louis and Lothar making peace terms.¹⁰⁴ Because the author of the AB says Louis the Pious had moved on from negotiations by around Martinmas, these peace terms would have been negotiated after mid-August but before 11 November.¹⁰⁵ So the Danish raid probably happened in that summer during the height of the “growing season”, where the OWDA shows there certainly was flooding. Even if it happened in autumn, the regions were probably still flooded and, at latest, the raid would have happened in the immediate aftermath of these floods.

When Clausewitz discusses the defence of swamps in *On War*, he observes that a swamp is difficult terrain for an army to attack because, for example, “[t]he attacker is confined to a relatively small number of access routes” and reinforced dikes can make the swamp impregnable.¹⁰⁶ Reversing his focus to the defending army, he notes that in the swamp “[a]ll flanks are equally covered by the difficulty of access, and new posts can always be set up so that any breach in the original

¹⁰³ Waitz, AB, 9; Nelson, AB, 30.

¹⁰⁴ von Simson, AX, 9.

¹⁰⁵ Nelson, AB, 31.

¹⁰⁶ Clausewitz, *On War*, 449-50.

line can be sealed off.”¹⁰⁷ Therefore, because an army attacking Dorestad would have to negotiate the swamps and peatland surrounding it, in all likelihood an attack would fail and the swamp would serve as protection for the city. On the other hand, with the additional floods surrounding the city, all of *Dorestad’s* access points, which would double as escape routes, would be closed. Not only would any army stationed in the city be unable to escape but also no assistance would be able to enter. Thus, the floods would have isolated the city. The defence offered by the length of the city itself and by the protruding jetties—perhaps now shortened by the flood—would have made Dorestad especially vulnerable to a fleet large enough to attack the city.¹⁰⁸

To a military strategist, therefore, it would have been an ideal situation in which to attack the city, and, indeed, during what was probably summer AD 834, the first raiders descended. The AB name them the *Danis*, Danes, and the AX call them *pagani*, or pagans. The AB gives a summary:

Interim etiam classis de Danis veniens in Frisiam, aliquam partem ex illa devastavit. Et inde per Vetus-Treiectionem ad emporium quod vocatur Dorestadus venientes, omnia diripuerunt. Homines autem quosdam

¹⁰⁷ Clausewitz, 450.

¹⁰⁸ Clausewitz, 560.

*occiderunt, quosdam captivos abduxerunt partemque eius igni cremaverunt.*¹⁰⁹

As shown above in Figure 6-4, the area of the Old Rhine delta between Lake Almere and Dorestad was threaded by a narrow river that was bordered by many peat bogs and passed through Utrecht. With the extensive flooding, the narrow river would likely have been wider than usual, but with the peat bog's absorption the river would have probably continued to be safe for travel. Thus, the Danes could have brought a fleet of ships without fear of hindrance from armies or other defenders who would have had to cross the flooded tidal plains surrounding Dorestad. Whoever these powerful Danes were and however many ships they brought, they succeeded in reaching Dorestad and sacking it.

Though the AX had been silent on Danish affairs throughout its history, the contemporary author began documenting them with this violent and successful attack. The author gives few details but was clearly terrified by it. After discussing the negotiations between Lothar and Louis the Pious, he comments that:

Interea, dum haec agerentur, intruerunt pagani in vicum nominatissimum Dorestatum eumque inmani crudelitate vastaverunt; et eo tempore regnum Francorum infra

¹⁰⁹ Waitz, AB, 9. "Meanwhile a fleet of Danes came to Frisia and laid waste a part of it. From there, they came by way of Utrecht to the emporium called Dorestad, and destroyed everything. They slaughtered some people, took others away captive, and burned the surrounding region." Nelson, AB, 30.

*semetipsum valde desolatum est.*¹¹⁰

Dorestad had narrowly escaped with its life, avoiding a complete destruction, and would survive. But the city would never be the same nor would the Carolingian Empire.

This attack in AD 834 was the true dawn of the “Viking Age” on Carolingian Europe because it was the first attack immediately followed up by more. For the next five years the recorded attacks on Carolingian Europe would *always* be on Frisia and Dorestad, with the AF later recording an additional raid on Antwerp in AD 836.¹¹¹ In AD 835 Dorestad was attacked, in AD 836 the attack was on Dorestad and Frisia, in AD 837 the attack was again on Dorestad and Frisia, and in AD 838 a fleet of Scandinavian ships was sunk in a storm presumably en route to a planned attack.¹¹² Who these first aggressors were cannot be known, but in AD 838, the Danish king, Horic I, sent an emissary to Louis the Pious. The emissary told Louis the Pious that Horic had hanged the raiders and wanted peace, but he then insulted Louis when he asked Louis to surrender Frisia and Obrodite territory to Horic. Louis was angry, as he should have been, because Horic was

¹¹⁰ von Simson, AX, 9. “Meanwhile, while this was taking place, pagans raided the town named Dorestad and wasted it with enormous cruelty, and from that time the kingdom of the Franks within itself was greatly desolate.” (Translation by author).

¹¹¹ Kurze, AF, 27.

¹¹² Nelson, AB, 33-47.

reinforcing the fact that Louis had been unable to fight back.¹¹³

This demand implied that Horic was an encourager, if not the leader, of the raids. Not surprisingly, in AD 839 Frisia was attacked again.¹¹⁴ Finally, in AD 850, the Scandinavian Roric conquered Dorestad, and through his conquest gained control of much of the Rhine's mouth, Frisia, and a key economic mode of the Carolingian Empire.¹¹⁵

This fall of Dorestad began with floods of AD 834. Tensions had been building between Danes and the Carolingians for at least a decade, pushing them towards war, Louis was weak, and then the floods surrounded the city, making it unusually vulnerable. These factors would have "pulled" the aggressors to the city, providing them an opportunity to attack one of the Carolingian Empire's most powerful cities with unusually low risk to themselves. They thus exploited the floods and, after this first attack would have softened Dorestad, they began to raid the Empire methodically. Contextual analysis thus shifts the raid on Dorestad from a correlated to a corroborated anomaly.

¹¹³ Nelson, AB, 40.

¹¹⁴ Nelson, AB, 33-47.

¹¹⁵ Reuter, AF, 30.

6.3 The AD 880 Battle on the Scheldt

Indeed, forty-six years after the Dorestad raid, aggressors were still attacking. According to the AB, AF, ASC, AV, and Regino, during the winter of AD 879-880, the son of Louis the German, Louis the Younger, attacked a raiding party from a new group of Scandinavian aggressors whose fleet had encamped on the Scheldt in Ghent. According to the ASC, these aggressors originated from the Great Heathen Army in what would become England but had split with them after the army's defeat at the Battle of Edington in AD 878. Instead of settling in Cirencester with the rest of the army, this group settled at Fulham on the Thames.¹¹⁶ Meanwhile, in autumn AD 878, a cattle plague temptingly tore through the Carolingian Empire and especially affected the Rhine.¹¹⁷ Then, in the plague's aftermath, half a year later in July AD 879, this splinter group of the Great Heathen Army came to the Scheldt, just west of the Rhine, and encamped their fleet at Ghent.¹¹⁸

Both Regino and the AV author note that Louis encountered some of these aggressors at Thimeon, immediately north of the Sambre. Regino adds that the

¹¹⁶ Swanton, ASC, 76-77.

¹¹⁷ Kurze, AF, 92.

¹¹⁸ Swanton, ASC, 76-77.

aggressors had been returning on foot and horseback to their fleet with their booty from raids.¹¹⁹ Louis won the ensuing battle, although at the cost of his illegitimate son Hugh and potentially many more men.¹²⁰

Each author reported the battle differently. The AF author revels in the victory, asserting that Louis killed more than 5,000 aggressors.¹²¹ In the AB, Hincmar of Rheims is more subdued. He casts the victory as lucky, soberly relating, “*Hludowicus in itinere Nortmannos, Domino opem ferente magnam partem ex illis occidit exercitus suus.*”¹²² The AV author is glum because this was only a party of aggressors returning to their fleet. Others had gone west, burned “*Tornacam civitatem et omnia monasteria supra Scaldum,*” and reached the Somme, a river some distance to the south of Ghent. Indeed, in the specific battle at Thimeon this author claims that Hugh, the illegitimate son of Louis, was killed by the *rex* of these Danes himself, Godefrid.¹²³

¹¹⁹ von Simson, AX, 46; Fridericus Kurze ed., *Reginonis Abbatis Prumiensis Chronicon Cum Continuatione Treverensi* (Hannover: MGH, 1890), 115.

¹²⁰ Kurze, AF, 94; Waitz, AB, 152; von Simson, AX, 46-47; Kurze, Regino, 115.

¹²¹ Reuter, AF, 88.

¹²² Waitz, AB, 152. “While on his way there [East Francia] Louis came upon some Northmen, and, with the Lord’s help, his army slew most of them.” Nelson, AB, 220.

¹²³ von Simson, AV, 46-47. “[T]he city of Tournai and all the monasteries along the river Scheldt”. Bivans, AV, 46.

Regardless of the details of the battle itself, the clash between Louis and the aggressors occurred during a winter in which major rivers had frozen. The AF states that both the Rhine and the Main had frozen and could be crossed on foot for much of the winter.¹²⁴ Given that the annals provide both a particular time and location, the battle easily falls into the category of correlated anomalies. But the political context of the battle is also well documented in several annals, shifting this particular battle to a corroborated anomaly with sufficient data to investigate whether the possibility of military exploitation of a natural disaster can be moved to a probability.

6.3.1 The Geographical Context: The Rhine, Main, Scheldt, and Sambre

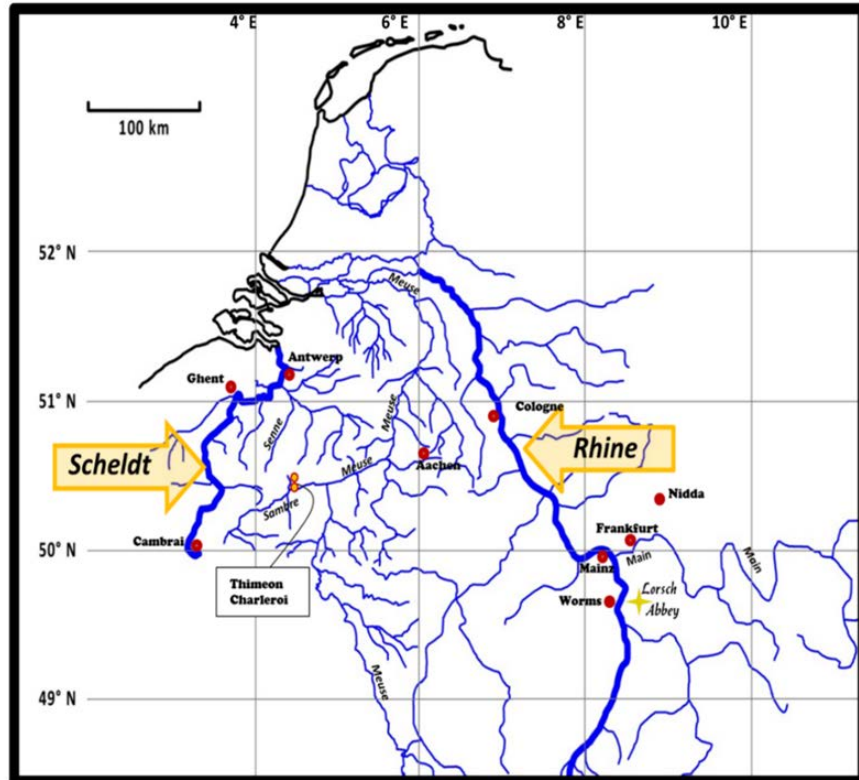
According to the annals, this battle was fought on the Sambre, immediately north of Thimeon, which was located near modern day Charleroi. The location is eighty kilometres directly south of the medieval port and trade hub of Antwerp, eighty-two kilometres southeast of Ghent where the Scandinavian fleet was based on the Scheldt River, and less than 322 kilometres west of the conjunction of the Rhine and the Main. This complex of rivers formed a network that not only facilitated communication and trade but also played a role in political and

¹²⁴ Kurze, AF, 88.

military affairs. The relative location of the rivers, as shown in Figure 6-7 below, and their contemporary roles are crucial to understanding the context of this battle and the potential impact of the brutal winter on Louis' decision to attack.¹²⁵

¹²⁵ This map, more accurately called a graphic, is based on two maps included in Dr. Jan Buisman's work *Duizend jaar weer, wind en water in de Lage Landen: Deel 1*. The first map appears on page 169 and shows the entire length of the Rhine River, including many named tributaries and distributaries. The second map appears on page 170 and shows a similarly detailed view of the Scheldt and the Meuse deltas. These two maps were combined to create a map showing the relationship of the Rhine and Scheldt. Because the original maps did not include a scale or latitude and longitude lines, these were added to locate more accurately various cities and towns important to this discussion. The original maps also did not indicate whether the river locations shown are the present locations or the 9th century locations. Clues point in both directions. The original maps do not include the present extensive web of canals. Moreover, the map shows the River Senne as extending fully into the area of Brussels whereas today the Senne has more-or-less been covered by the city and its environs. On the other hand, the original maps do not show the River Nidda, which was significant in the 9th century. These possible discrepancies, however, are unimportant because the intention is simply to offer a visual aid in understanding the relative—not precise—locales and separating distances of the rivers and towns relevant to this discussion.

Figure 6-7: *The Scheldt, Sambre, Rhine, and Main*



Though they originate in different locations, the Main connects with the Rhine to mark the eastern edge of the Rhine-Meuse-Scheldt delta, and the Scheldt marks its western edge.¹²⁶ The three rivers, therefore, share much of the same history and have similar climates. The Rhine, as shown in Figure 6-7, is a long major river. Originating in the Swiss Alps, it crosses much of Central and Northern Europe and empties into the North Sea via numerous distributaries.¹²⁷ The authors of its history point out that it is the *only* river that travels from the Alps to the North

¹²⁶ Klement Tockner, Urs Uehlinger, and Christopher T. Robinson, *Rivers of Europe* (London: Academic Press, 2009), 216.

¹²⁷ Tockner, Uehlinger, and Robinson, 201.

Sea.¹²⁸ This fact made the Rhine quite significant during prehistoric times for transporting goods and people.¹²⁹ During the Roman era it became an important trade route, necessitating the building and encouraging the growth of cities such as Mainz and Cologne.¹³⁰ When Charlemagne became emperor, the Rhine developed from a simple trade route into the central axis of the Carolingian Empire.¹³¹ Clearly, if the river was choked with ice, trade and communication would be seriously disrupted.

The River Main results from the confluence of the Red Main and White Main. The Red Main originates in the Franconian Jura mountains, and the White Main, in the Fichtelgebirge mountain range in eastern Bavaria.¹³² The two rivers meet in Upper Franconia at 51°N 11°E. The now-connected Main then travels erratically west, passing through Frankfurt before joining the Rhine around Mainz. The Main is a long tributary river used to transport cargo at least since the Roman Empire.¹³³ A frozen Main would indicate a very rough

¹²⁸ Tockner, Uehlinger, and Robinson, 205.

¹²⁹ Tockner, Uehlinger, and Robinson, 203.

¹³⁰ Tockner, Uehlinger, and Robinson, 203.

¹³¹ Tockner, Uehlinger, and Robinson, 200.

¹³² Tockner, Uehlinger, and Robinson, 238.

¹³³ Tockner, Uehlinger, and Robinson, 238.

winter with major negative implications for inland trade within the Carolingian Empire.

The Scheldt is not as large as either the Rhine or the Main. It meanders almost directly north through the Low Countries, becoming a navigable river around Cambrai before turning northeast through Ghent, travelling through Antwerp, and ending in the Rhine-Meuse-Scheldt delta. Despite its shorter length as compared to the Rhine, the mouth of the Scheldt could be considered one of the northern gateways to the Carolingian Empire because it flows through the central part of the Carolingian Empire and thus was militarily, politically, and economically significant throughout the ninth century and at the time of the AD 880 battle. It served as a political border between kingdoms twice. The AD 843 Treaty of Verdun established it as the border between West Francia and Middle Francia, as described in the AB:

*Hlotharius intra Renum et Scaldem in mare decurrentem, et rursus per Cameracensem, Hainaum, Lomensem, Castritium et eos comitatus qui Mosae citra contigui habentur usque ad Ararem Rodano influentem, et per deflexum Rodani in mare, cum comitatibus similiter sibi utrique ad-herentibus. Extra hos autem terminos Atrebates tantum Karoli fratris humanitate adeptus est.*¹³⁴

¹³⁴ Waitz, AB, 30. "Lothar got the lands between the Rhine and the Scheldt where it runs into the sea, and inland by way of Cambrai, Hainaut, the regions of Lomme and of Mézières and the counties which lie next to each other on the western side of the Meuse down as far as where the Saône runs into the Rhône, and down the Rhône to where it flows into the sea, likewise with the counties situated on both sides of it. Beyond these limits, though, all he got was Arras, and that was through the generosity of his brother Charles." Nelson, AB, 56.

The river was also the location of the medieval *emporium* of Antwerp, which the AF reports was the second city the Danes targeted in AD 836.¹³⁵ Antwerp had been a significant city for some time before the raid, even as early as the seventh century. Alcuin of York, in his hagiography of the Anglo-Saxon saint, St Willibrord, reports that Willibrord had first travelled to Antwerp in the AD 690s when he began to try to convert the Frisians.¹³⁶ By the ninth century, however, the importance of the port of Antwerp had even become more apparent. Written sources refer to the port as a *castrum* (settlement), *castellum* (stronghold), *civitas* (city), and archaeological excavations of imported goods indicate trade activity throughout the ninth century.¹³⁷

Accordingly, a Scandinavian fleet making camp on the Scheldt at Ghent, shortly upriver from Antwerp, would constitute a significant danger to both West and East Francia militarily and economically. Moreover, given that the AD 880 aggressors were veterans of the Great Heathen Army, it is probably highly

¹³⁵ Kurze, AF, 27.

¹³⁶ Alcuin, Alucin [sic] (735-804), *The Life of Willibrord, c.796*, trans. C.H. Talbot, Fordham University Internet Medieval Source Book, 2000), <https://sourcebooks.fordham.edu/basis/Alcuin-willbrord.asp>. Accessed 16 June 2018.

¹³⁷ Chris Loveluck and Dries Tys, "Coastal societies, exchange and identity along the Channel and southern North Sea shores of Europe, AD 600–1000," *Journal of Maritime Archaeology* 1, no. 2 (2006): 144-45.

significant that after the AD 836 raid on Antwerp, the city disappears from primary sources until the tenth century although archaeological evidence suggests that it was an active port throughout the ninth century. Dries Tys & Barbora Wouters observe this discrepancy might suggest that the Scandinavian fleet had taken complete control of the port, which would allow the later aggressors easy access to points upriver.¹³⁸

Indeed, the battle on the Sambre supports the possibility of easy access. Although the Sambre is not connected to the Scheldt, it is directly south of five Scheldt tributaries. Any of these tributaries could be used to reach Thimeon, located between the Senne and the Sambre. In this situation of serious threat to the Empire, the temptation to attack a party of aggressors surprised on the Sambre would have been compelling.

The political background of this battle, however, is not simply that these were new aggressors looting the Empire or that Antwerp was outside Frankish hands. Indeed, Louis the Younger's decision to attack the raiders at Thimeon during such a difficult winter goes much farther back, originating in

¹³⁸ Dries Tys and Barbora Wouters, "Antwerp (Belgium) – a 9th century Viking Town? From Early Medieval Trading Place to Ottonian Power Centre," in *New Aspects on Viking-age Urbanism c. AD 750-1100: Proceedings of the International Symposium at the Swedish History Museum, April 17–20th 2013*, eds. Lena Holmquist, Sven Kalmring, and Charlotte Hedenstierna-Jonson (Stockholm: Archaeological Research Laboratory, Stockholm University, 2016), 199.

Carolingian familial feuds over succession after the death of his grandfather, Louis the Pious, in AD 840.¹³⁹

6.3.2 The Political Context of AD 880

Charlemagne and then his son Louis the Pious reigned relatively peacefully until Lothar's first revolt in AD 830.¹⁴⁰ The sons who survived Louis' death—Charles the Bald, Louis the German, and Lothar—were not so lucky.¹⁴¹ Following their father's death, the sons had an open civil war on territory inheritance which theoretically ended with the Treaty of Verdun in AD 843. In the treaty, Lothar, the eldest son, received the territories in Middle Francia and the title of emperor; Louis the German received the territories in East Francia; Charles the Bald, the youngest son, took control of the territories in West Francia; and the Scheldt River became the border between West and Middle Francia.¹⁴²

Further complicating the conflicts, the three brother kings had disaffected, ambitious sons and nephews who were also competing for power, often allying with uncles or cousins.¹⁴³

¹³⁹ Reuter, AF, 18.

¹⁴⁰ Nelson, AB, 20.

¹⁴¹ Costambeys, Innes, and MacLean, *Carolingian World*, 387.

¹⁴² Nelson, AB, 56.

¹⁴³ Costambeys, Innes, and MacLean, *Carolingian World*, 387.

The territory each person inherited became the source of major conflicts. Thus, by AD 880, the Carolingian Empire had changed significantly from the fraught but relatively stable situation during the first raid in AD 834.

Lothar, the agreed-upon king of Middle Francia, had died in AD 855.¹⁴⁴ Before his death, he had already given Italy to his eldest son, Louis, in AD 844.¹⁴⁵ After Lothar's death, his second son, Lothar II, became ruler of Middle Francia (renamed Lotharingia after his death), and Lothar's youngest son, Charles, inherited Provence.¹⁴⁶ This situation not only upended the balance of power agreed upon in the Treaty of Verdun but also created three smaller kingdoms sandwiched between the larger, more powerful realms ruled by the uncles Louis the German and Charles the Bald. Lothar II, king of Lotharingia, successfully brokered peace as an ambassador to both of his uncles through the AD 860s.¹⁴⁷

Even so, Lothar II himself created a different type of succession controversy in the AD 860s. He had an illegitimate son Hugh (named just like the illegitimate son of Louis the Younger) through an early relationship with noblewoman

¹⁴⁴ Nelson, AB, 81.

¹⁴⁵ Nelson, AB, 57.

¹⁴⁶ Costambeys, Innes, and MacLean, *Carolingian World*, 394; Nelson, AB, 81.

¹⁴⁷ Costambeys, Innes, and MacLean, *Carolingian World*, 396.

Waldrada.¹⁴⁸ He nevertheless chose to marry a more significant noblewoman, Theutberga. The marriage gave him a better relationship with his brother Louis of Italy and more control over trade.¹⁴⁹ Theutberga did not have a child, however, and Lothar attempted to divorce her. It has been generally assumed that he did so to marry Waldrada and legitimize his son.¹⁵⁰ Nelson questions this assumption, however, because Lothar II and Theutberga had been married only two years so Theutberga had not been given much of a chance. Instead, Nelson notes the contemporary observation in the AX that Lothar II genuinely loved Waldrada.¹⁵¹ Whatever the reason for his divorce, Costambeys, Innes, and MacLean claim that the uncles Louis the German and Charles the Bald actively sought to keep Lothar II married to Theutberga to lessen Lothar's likelihood of having an heir, and this theory seems to be supported in the AB's records for AD 860, AD 861, AD 862, AD 863, AD 864, AD 866, and AD 867.¹⁵² Even so, Pope Hadrian II eventually approved Lothar's attempted divorce in AD 869, the first step toward making Hugh legitimate. Unfortunately, Lothar

¹⁴⁸ Stuart Airlie, "Private Bodies and the Body Politic in the Divorce Case of Lothar II," *Past & Present* 161, no.1 (1998): 8.

¹⁴⁹ Maclean, Regino, 139.

¹⁵⁰ Costambeys, Innes, and MacLean, *Carolingian World*, 397.

¹⁵¹ Nelson, *Charles the Bald*, 199.

¹⁵² Costambeys, Innes, and MacLean, *Carolingian World*, 399.

fell ill and died before the terms of the divorce and the inheritances that would have come from it could be spelled out. Consequently, Lothar left no legitimate heir.¹⁵³ Charles the Bald promptly took over Lotharingia and the Scheldt ceased to be a major border.¹⁵⁴ All of these issues came to the fore a decade later.

Meanwhile, in AD 876, the ruler of East Francia, Louis the German died and was succeeded by his son Louis the Younger. The ruler of West Francia (now combined with Lotharingia), Charles the Bald, died in the following year, AD 877, and was succeeded by his son Louis the Stammerer.¹⁵⁵ Louis the Stammerer ruled only two years, however, and died on 10 April 879.¹⁵⁶ Both of Louis the Stammerer's sons, Louis III and Carloman II, were minors in their teens, which left West Francia in disarray.¹⁵⁷

According to Hincmar, writing in the AB, West Francia came apart. First, Lothar's illegitimate son Hugh raised a revolt in Lotharingia seeking to recover the independence lost when

¹⁵³ Costambeys, Innes, and MacLean, 397.

¹⁵⁴ Costambeys, Innes, and MacLean, 397.

¹⁵⁵ For these deaths and successions, see Nelson, AB, 195, 201-02.

¹⁵⁶ Nelson, AB, 216.

¹⁵⁷ Simon MacLean, *Kingship and Politics in the Late Ninth Century: Charles the Fat and the End of the Carolingian Empire* (Cambridge: Cambridge University Press, 2009), xvii.

Charles the Bald took over the kingdom.¹⁵⁸ This revolt was put down with help from both the West and East Carolingians, apparently at a significant cost.¹⁵⁹ At the same time, Louis the Younger invaded West Francia with the support of leading nobles including Abbott Gauzlin of St-Germain-des-Prés (half-brother of one of Charlemagne's grandsons) and Count Conrad of Paris (son of Charles the Bald's uncle Rudolf).¹⁶⁰

Nonetheless, the teenaged sons Louis III and Carloman II also had substantial support. Their effective custodians— Abbots Hugh and Bosso as well as Theuderic, the Count of Autun who had been a chamberlain of Louis the Stammerer —sent negotiators who halted Louis the Younger's invasion and reached an agreement that gave the East Francian king Lotharungia in return for his allowing Louis III and Carloman II to rule West Francia.¹⁶¹ Louis the Younger agreed, retreated, and so once more the Scheldt became the border between West and East Francia.

In effect, Louis the Younger had increased the size of his kingdom but whether he had increased the size of his reputation and strength as a ruler remained questionable.

¹⁵⁸ Nelson, AB, 216-17.

¹⁵⁹ Nelson, AB, 221.

¹⁶⁰ Nelson, AB, 216-17. For Abbott Gauzlin's background, see Nelson, AB, 86, and for Count Conrad's, see Nelson, AB, 198.

¹⁶¹ Nelson, AB, 220.

Indeed, a pro-Louis the Younger argument is that the supporters of Louis III and Carloman II had warded off a full invasion only by conceding a large swathe of territory. But under another argument, the picture is less promising. Though Louis the Younger had been supported, his detractors could now paint him as weak because he had not fully invaded West Francia to govern it in the place of his immature nephews but instead had backed away from the challenge. He had accepted in return *only* Lotharingia, a rebellious territory. To fully assert himself as a leader, Louis the Younger needed a victory. Attacking “pagans” recently settled in Ghent—a faction that Carolingian authors routinely paint as a common enemy—would be an easy way to dispel any doubts and opposition. If the Rhine and Main were indeed frozen, other rivers such as the Scheldt would not be in a fine condition either, so it would be an opportune time to attack the recent settlers.

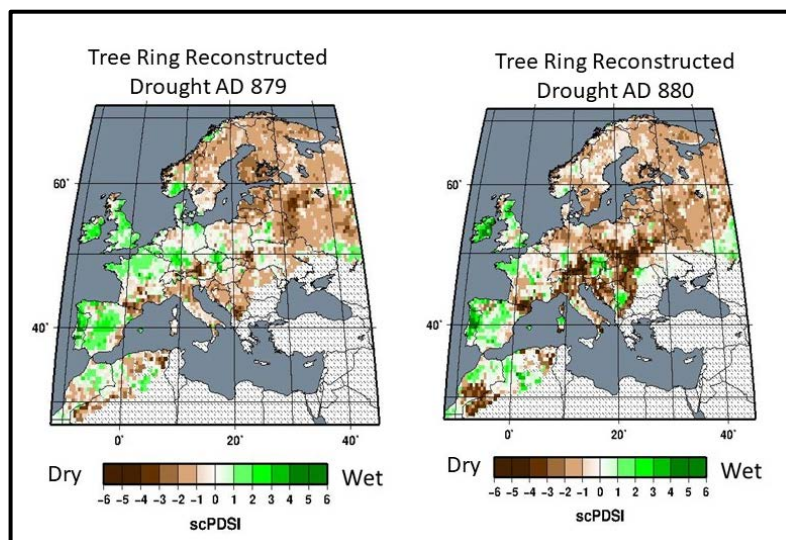
6.3.3 The Weather of AD 880

The political advantages of attacking the raiders who had travelled away from their base on the Scheldt are quite clear. The environmental data on the weather of AD 880, on the other hand, is neither clear nor particularly helpful in this case. Looking *solely* at the usual environmental data might suggest that Louis the Younger launched the assault not in an unusually

cold environment but in what might be considered normal or even favourable climatic conditions. According to the OTC, in AD 879, the average temperature was just below the norm at -0.03°C .¹⁶² In AD 880, the average temperature actually rose to $+0.56^{\circ}$ above the norm.¹⁶³

The OWDA does not provide many additional clues. In AD 879, England, from which the Scandinavian aggressors had originated, and the Northwest European Continent were slightly wetter than usual. Focusing on the area around the Scheldt confirms this observation. However, by AD 880, while England was stable, some parts of the Northwest European Continent had entered drought conditions, including the territory containing/surrounding the Scheldt. See Figure 6–8 below.

Figure 6-8: The OWDA AD 879-880 in Cook et al., 2015, 1-9.



¹⁶² Büntgen et al., OTC, 578-82.

¹⁶³ Büntgen et al., OTC, 578-82.

This scientific data, however, is not only inconclusive but also is unconnected to the winter. Whether or not the years were dry or wet during summer would have little impact on whether the rivers froze in winter. The relevant data for that question would normally be temperature. But the temperature data provided by dendrochronology is not useful for the simple reason that the battle in question occurred in the winter, and tree ring data records only temperature changes during the growing season—spring and summer. Importantly, the environmental record does not contradict the AF's testimony that the Rhine and Main had frozen. Instead, the inconclusive data reinforces the need for the direct evidence of the human experience.

6.3.4 The Winter of AD 879-880

Despite the failure of the environmental data to record a natural disaster in the winter of AD 879-880, such a disaster did occur as evidenced by the fact that both the Rhine and Maine were so severely frozen they could be crossed on foot. The author of the AF describes it in relative detail, writing, "*Hiems aspera et solito prolixior: nam Rhenus et Moenus fluvii glaciali rigore*

*constricti longo tempore se calcabiles praebuerunt.*¹⁶⁴

Developing a greater understanding of the severity of the winter entails again examining the biblical occurrences of the words used, subsequent events, and then the raw description itself.

Although examining the biblical language used to describe the floods of AD 834 was helpful in understanding that situation, in this case the author's choice of words is not as useful. The word the author uses to describe the winter as "hard" is "*aspera*", which comes from the root word "*asper*". "*Asper*" is generally defined as rough, inclement, hard. Words beginning with "*asper*" occur fifty-four times within the *Latin Vulgate*, but the word in its biblical context is used in a much different way than the usual synonyms.¹⁶⁵ The first two stories in which a version of "*asper*" is used in the Bible illustrate this point. This first story concerns a disagreement between Abraham and Sara, while the second story concerns a disagreement between Jacob and his father-in-law Laban. In the first story, when Sara saw Ishmael laughing at her son Isaac, she confronted Abraham, asking him to cast out Ishmael and his mother. God told Abraham not to let Sara's desire seem

¹⁶⁴ Kurze, AF, 94. "The winter was hard and longer than usual: the Rhine and Main were frozen in the great cold and could be crossed on foot for a long time." Reuter, AF, 88.

¹⁶⁵ Biblegateway.com, "Biblia Sacra Vulgata Search, asper," accessed 22 October 2017, https://www.biblegateway.com/quicksearch/?quicksearch=asper&qs_version=VULGATE.

“*asperum*” (harsh, unkind) because God promised to have Ishmael begin a great nation (Genesis 21:12). In the second story, Jacob fell out of favour with his father-in-law Laban and ran away from him as God instructed him to do. Laban gave chase, however, and eventually caught up with Jacob. As the confrontation between Laban and Jacob neared, God told Laban in a dream to “[t]ake heed that thou not speak anything *aspere* (harshly) against Jacob” (Genesis 31:24). In effect, therefore, the precedent set in the *Latin Vulgate* with the different types of the root word “*asperum*” begins with God telling different people not to take confrontations too seriously, a use that has translated into English where “aspersions” are “the action of casting damaging imputations, false and injurious charges, or unjust insinuations; calumny, defamation.”¹⁶⁶ Examining the biblical use of the author’s descriptive word for the winter of AD 880 is therefore not useful to measure the magnitude and scope of this winter. However, the raw description of the winter as well as comparisons with similar winters that froze the Rhine is strong evidence that indeed the winter was severe.

First, the bare fact that the Rhine froze enough to be crossed on foot proves the winter was extreme.

¹⁶⁶ OED Online, s.v. “Aspersion, *n.*”, accessed 01 April 2019, <http://www.oed.com/view/Entry/11623?redirectedFrom=aspersion>.

shown by scientific studies of more recent Rhine freezes. In the last 230 years, the Rhine has frozen so severely that people could walk on it only fourteen times, with the last such freeze occurring in the winter of AD 1962-1963. In each instance, the Rhine was frozen for at least one month—typically January or February—with the longest recorded freeze being from December AD 1844 to March AD 1845.¹⁶⁷ The scientist Frank Sirocko suggests that these freezes are due to weak sunspot activity, as fewer sunspots lower the temperature, leading to colder winters, and indeed there was weaker sunspot activity in AD 880 according to the charts of the scientist S. K. Solanki. Sunspot activity had begun declining from AD 865 to AD 875, but then took a steep fall between AD 875 through AD 885, with the decline reaching its nadir in AD 895.¹⁶⁸

The freezing of the Rhine in AD 880 likely followed the pattern of freezing documented in more recent times. Sirocko notes that in times of the weak sunspot activity which he proposes contributes to Rhine freezes, the excessive cold

¹⁶⁷ Frank Sirocko, Heiko Brunck, and Stephan Pfahl, "Solar influence on winter severity in central Europe," *Geophysical Research Letters* 39 (2012), L16704.

¹⁶⁸ S.K. Solanki et al., "An unusually active Sun during recent decades compared to the previous 11,000 years," *Nature* 431, no. 7012 (2004): 1084-1087. Dataset Reference: S.K Solanki, et al., "11,000 Year Sunspot Number Reconstruction," IGBP PAGES/World Data Center for Paleoclimatology Data Contribution Series #2005-015 (2005). NOAA/NGDC Paleoclimatology Program, Boulder CO, USA, ftp://ftp.ncdc.noaa.gov/pub/data/paleo/climate_forcing/solar_variability/solanki2004-ssn.txt, accessed 17 June 2018.

affects specific areas of the world. The weak sunspot activity creates a northern flow of cold air from the Arctic and Scandinavia. The cold air's centre concentrates in the southeast of England and the northwest of Europe, the northeast of what was then West Francia and the exact area in which the Scheldt flows from Cambrai through Ghent, Antwerp, and into the Rhine-Meuse-Scheldt delta.¹⁶⁹ The cold would have therefore extended especially into the site where the battle occurred, where the Scheldt, Meuse, and tributary rivers such as the Sambre are located. Even if the Scheldt itself did not entirely freeze, it and its surrounding terrain was most likely in a quite ambiguous state with ice, the danger of frostbite and other similar issues. The cold likely also affected the tributaries of the Scheldt and Meuse in the area around Ghent and Thimeon, leaving the local population more exposed and quite vulnerable to attack, and indeed, these new raiders might have taken advantage of this because they were able to successfully loot inland areas as far south as the Somme.

All these factors considered together confirm that the hard and unusually long winter of AD 879-880 would have a substantial impact on the affected peoples. Conversely and paradoxically, however, the same situation would also make the

¹⁶⁹ Sirocko et al., "Solar influence on winter severity in central Europe," L16704.

raiders more exposed to an attack. The Scandinavians who had established a base on the Scheldt would be at the centre of the cooling and so were vulnerable to the very military tactic they had previously followed.

6.3.5 The Battle of AD 880

Louis the Younger's attack on the party of raiders is confirmed in all the annals. The AB, AF, AV, and Regino all time the battle as occurring during Louis' return from West Francia.

Interestingly, they all cast it as unplanned and opportunistic, noting that Louis was "marching home" quite close to where the Scandinavian fleet was established.¹⁷⁰ Of the four, only Hincmar of Rheims, author of the AB, and the AF author seem satisfied with the victory. Regino seems unhappy that Louis the Younger was not able to gain a better victory, and the AV notes as its main detail that Louis' son Hugh died in the battle.¹⁷¹

In contrast, the author of the AF is exuberant about the victory, asserting that Louis routed the aggressors. He claims that Louis decided to engage them only as he was returning home after gaining Lotharingia and that in the ensuing battle more than five thousand Scandinavians were killed, just adding

¹⁷⁰ Nelson, AB, 220.

¹⁷¹ MacLean, Regino, 181; von Simson, AV, 47; Nelson, AB, 220.

the death of Louis' son Hugh as an additional detail.¹⁷² This account, however, likely overstates the extent of Louis the Younger's victory and understates the cost of the victory.

The stated number of Scandinavian casualties seems unrealistically high. As previously noted, current excavations in Torksey, Lincolnshire, of the Great Heathen Army's camp during the AD 872-873 winter have led to an estimate that this army numbered at most 5,000 individuals at that time.¹⁷³ By AD 874, the leader Halfdan, satisfied with his victory, settled with his followers in Northumbria. The followers of another aggressor, Guthrum, decided to invade East Anglia.¹⁷⁴ This split reduced the size of the Great Heathen Army from whatever its maximum had been. Four years later and two years before Louis the Younger's battle, Guthrum's segment of the army was defeated in the Battle of Edington by Alfred of Wessex.¹⁷⁵ According to the ASC, Guthrum accepted the defeat and in AD 879 or AD 880 settled in East Anglia.¹⁷⁶ The army splintered again and some fraction of it came to the Scheldt. In the AD 880 Battle of Thimeon, Louis the Younger did not attack even

¹⁷² Reuter, AF, 88.

¹⁷³ Chapter 2, section 2.2

¹⁷⁴ J.D. Richards, "Pagans and Christians at the Frontier," in Carver, *The Cross Goes North*, 393.

¹⁷⁵ Swanton, ASC, 77.

¹⁷⁶ Swanton, ASC, 77.

this entire Scandinavian fleet in Ghent but instead a subset of them who had travelled to the area between the Senne and the Sambre's swing north. Thus, the group that Louis defeated represented only a fraction of those at the Ghent base, which in turn was a fraction of Guthrum's army, which was a fraction of the Great Heathen Army, which has been estimated at its largest to have had 5000 men.

Furthermore, Louis himself also likely suffered many losses from the victory. The main indication that Louis suffered many casualties is the loss of his son Hugh. Regino outlines the situation further when he reports that Louis the Younger first thought that Hugh had survived the battle but had been captured.¹⁷⁷ If that was the case, Hugh's no-doubt-substantial retinue had likely been overwhelmed by these Scandinavian aggressors. Indeed, the reason the AF celebrated Louis the Younger's victory to such an extraordinary length could be precisely because it was so hard won. Louis did not pursue these aggressors to Ghent.

These various accounts together suggest that the force of men Louis attacked was not small, that he happened upon them, and that he chose to attack even though he had little time to prepare—all of which further suggests that Louis had the option to avoid a battle that ultimately proved sufficiently

¹⁷⁷ MacLean, Regino, 181.

debilitating that he did not pursue his victory and follow the survivors (which he at first believed included his son) to Ghent. This raises the question of why he chose to engage. There is a political, a tactical, and even an economic explanation.

The political explanation is relatively straightforward. Louis' need to assert himself to counter the image that he was a weak leader would have pushed him to look towards a battle with a common pagan enemy, and the prospect of a conveniently located battle with stacked odds against a common pagan enemy would no doubt be tempting.

The second explanation is tactical. Regino records that the aggressors were returning on foot and on horseback to their fleet in Ghent following a raid.¹⁷⁸ The AB, AF, AV, and Regino all describe the battle as an unexpected one, as if he came on them by surprise but was able to win it.¹⁷⁹ According to Regino, Louis attacked immediately when he found these aggressors returning to Ghent and so probably attacked before they were ready.¹⁸⁰ But that also gave him little time to prepare for the battle himself.

The military strategist Carl von Clausewitz is decidedly mixed on the tactical advantages given by surprise. He believes

¹⁷⁸ MacLean, Regino, 181.

¹⁷⁹ Nelson, AB, 220; von Simson, AV, 46-47; MacLean, Regino, 181.

¹⁸⁰ MacLean, Regino, 181.

there are advantages: the speed and secrecy of surprise can help, and indeed a battle depends upon it.¹⁸¹ Moreover, the psychological benefits of a successful surprise attack are enormous in confusing an enemy.¹⁸² However, it is rare that a surprise attack can “be outstandingly successful”.¹⁸³ As Clausewitz carefully points out at the beginning of *On War*, in discussing friction, “A[n army] is made up of individuals, the least important of whom may chance to delay things or somehow make them go wrong.”¹⁸⁴ In a quickly prepared surprise attack, therefore, these frictions often prevent its full success, and the cases where a surprise attack led to a resounding victory are few.¹⁸⁵

Even so, a battle’s success depends entirely on chance.¹⁸⁶ In illustrating this fact, interestingly, Clausewitz uses the *weather*:

Fog can prevent the enemy from being seen in time, a gun from firing when it should, a report from reaching the commanding officer. Rain can prevent a battalion from arriving, make another late by keeping it not three but eight hours on the march, ruin a cavalry charge by bogging the horses down in mud, etc.¹⁸⁷

¹⁸¹ Clausewitz, *On War*, 198.

¹⁸² Clausewitz, 201.

¹⁸³ Clausewitz, 198.

¹⁸⁴ Clausewitz, 119.

¹⁸⁵ Clausewitz, 198-199.

¹⁸⁶ Clausewitz, 120.

¹⁸⁷ Clausewitz, 120.

Where these aggressors were returning from is not known, but it was south of the Thimeon battlefield. They would have been tired and would have found it difficult to retreat in ice. Thus, with a surprise attack on these aggressors, Louis could take advantage of their vulnerability created by the frozen rivers and extreme cold exactly as the Scandinavian aggressors took advantage of his own people's vulnerability after other natural disasters. Though the surprise attack was probably smaller than the AF reports and costly, it was a tactical victory nonetheless.

The third economic explanation is tied to the winter itself. The freezing of the Rhine and the Main must have affected communication and functions of state. Trade would have been impaired, and with the severity of the winter, the shortages and even the harvest failure the AF recorded were foreseeable. With both inland trading and agriculture thus encumbered, Louis would have wanted to stimulate as much commerce as possible to avert the larger crisis of a possible widespread famine. Overseas trade in particular had the potential to prevent or limit the damage the winter would bring to East Francia. The Scandinavian fleet based upriver from Antwerp at Ghent meant they effectively controlled trade from Antwerp to the rest of the Carolingian Empire. If Louis could dislocate the Scandinavian fleet, he could free trade to and from the port and help his

kingdom weather the potential famine. In the end, of course, Louis did not pursue his victory. But the importance of Antwerp is highlighted by the fact that later in the year Louis III, one of the two teenaged kings of West Francia, ordered an attack on the Scandinavian fleet's base in Ghent. Unfortunately for Louis III, the noble who led the assault was soundly defeated.¹⁸⁸

The attack of Louis the Younger on the Scandinavian aggressors encamped on the Scheldt in the winter of AD 879-880, therefore, fits the model of attacks analysed in the previous case study. In this case, the full story begins with a cattle plague that swept through the Carolingian Empire in AD 878, probably during autumn. The affected area had less than a year's respite before a splinter group of Scandinavian aggressors from the Great Heathen Army arrived on the Scheldt in July AD 879 and established a base at Ghent. Even as the Carolingians contended among themselves to determine who was to rule West Francia, these new aggressors began raiding as far south as the Somme and the Sambre. Thus, just as in the previous case study in which the Danes had a political and economic motive for raiding Dorestad, Louis had a political motivation for a military attack on the aggressors as well as an economic incentive to open Antwerp. But the vulnerability of his enemy resulting from the impact of the winter was likely the

¹⁸⁸ von Simson, AV, 48.

determining factor in his decision to attack at that time and in that place.

There are two obvious differences, however, between this confrontation and the raid on Dorestad. The first is that although this confrontation was apparently unplanned, the Scandinavians must have known a Carolingian battle was possible. The frozen rivers and extreme cold operated to the aggressors' advantage by disabling or weakening the communities they raided, but the fact of their own vulnerabilities in the cold, especially after these tiring raids, with frostbite and other effects, would be clear. This suggests that the opportunity of raiding when the victims were at such a disadvantage was too good to pass up. More importantly, it suggests that these Scandinavians felt little threat from the Carolingian military.

While the Irish had contained Scandinavian aggressors through several victories in the AD 840s, and while Alfred of Wessex had fought aggressors to a standstill in what is now England, the Carolingians had not come up with an effective military strategy themselves. They had instead attempted to solve the issue practically through bribery. Louis the Pious was the first to use this method. The AF reports that to stop the raids on Dorestad Louis the Pious simply paid one of these raiders, a Dane named Heriold, and his brother Roric, to guard

Frisia.¹⁸⁹ To stave off attacks in AD 845, Charles the Bald paid his first ransom, an amount that satisfied aggressors enough to leave.¹⁹⁰ In AD 858, a Scandinavian aggressor captured a grandson of Charlemagne, Abbot Louis of St Denis, demanded an extraordinarily large ransom, and received it.¹⁹¹ And, indeed, even with this defeat, this Scheldt splinter group was rewarded for their attack a few years later when Charles the Fat besieged them at the siege of Asselt in AD 882. Though the AF reports that Charles won, he nevertheless negotiated with their leader to guard the territories Roric had once guarded.¹⁹² All this suggests that a Scandinavian aggressor had little to fear militarily from the Carolingian Empire.

A second difference is that in this case it was the Carolingians who took advantage of the natural disaster, which raises the question of whether this military tactic might have been standard practice with the Carolingians just as it was probably standard with raiding Scandinavian aggressors. The data showed no discernible correlation between local warfare and natural disasters and, to a certain extent, this lack of correlation is logical given the strong possibility that a natural

¹⁸⁹ Reuter, AF, 30.

¹⁹⁰ Nelson, AB, 65-66, 86.

¹⁹¹ Nelson, AB, 86.

¹⁹² Reuter, AF, 91.

disaster that affected one part of the kingdom would affect another. Nevertheless, it remains possible that the Carolingians may have used a similar military tactic and, indeed, such exploitation could have been a tactic in other conflicts throughout the Early Middle Ages as well, a possibility which merits further study.

These two differences, however, serve to strengthen the general hypothesis that natural disasters were politically exploited by the Scandinavian aggressors. The Scandinavians appear to have arrived in the Scheldt area on the coattails of a cattle plague and then to have taken advantage of the extremely cold winter to raid beyond their established camp. That Louis the Younger turned the tables and attacked the Scandinavians when they were subsequently disadvantaged by the frozen rivers suggests that this battle tactic was not unprecedented. Thus, the events leading up to and including the AD 880 battle reveal two instances in which one group probably—not merely possibly—took military advantage of the weakness created in another group by a natural disaster.

6.4 Conclusion

Thus, these two case studies—the first of which came at the outset of the Viking Age in Carolingian Europe and the second of which occurred well into it—are filled with evidence that this

military tactic was a probable impact of natural disasters. In the first, Scandinavian aggressors attacked Dorestad when tension between the Danes and the suddenly powerless Louis the Pious had been extreme for more than a decade and the jewel of Dorestad was conveniently and completely alone. How could they not have? In the second, Louis the Younger out of nowhere attacked aggressors based on the Scheldt after he had just compromised on West Francia, and the Scandinavians were likely weak, specifically because of a natural disaster. Thus, a case study of these two correlated anomalies allows them to join the Siege of Paris, as corroborated anomalies.

Both these cases, however, could be readily analysed. Not only is there abundant data on the geographical and political context behind the two attacks, but there are also clear indications of the volatility of the climate and the severity of each disaster. Was it possible that the same methodology could also establish a firmer connection between an attack and disaster in a situation supported by less evidence? What about a statistical anomaly? This challenge was the next step.

Chapter 7. Expanding the Investigation: Two Statistical Anomaly Studies

The general inference of probability raised by the major events in AD 834 and AD 880 suggested the question of whether it is possible to bring the same level of certainty to other cases in which the evidence is less complete—for example, in the two groups of sporadic raids that occurred before the Viking Age had properly begun in Carolingian Europe, the Danish raids on Frisia in AD 810 and the three attempted raids in AD 820? Applying the same methodology to these statistical anomalies revealed that, indeed, Scandinavian aggressors probably also tactically exploited these natural disasters for a military advantage.

7.1 The AD 810 Raids on Frisia

Focusing first on the earlier AD 810 raids showed that a case study of these raids required a more nuanced examination than in the previous two case studies. While the annals report both Scandinavian aggressions and natural disasters in AD 810, making the raids a statistical anomaly, the location data is not so precise. Whereas Dorestad and Thimeon are specific and

exact locations, Frisia is a region and the annals do not specify exactly where within it the attacks occurred.

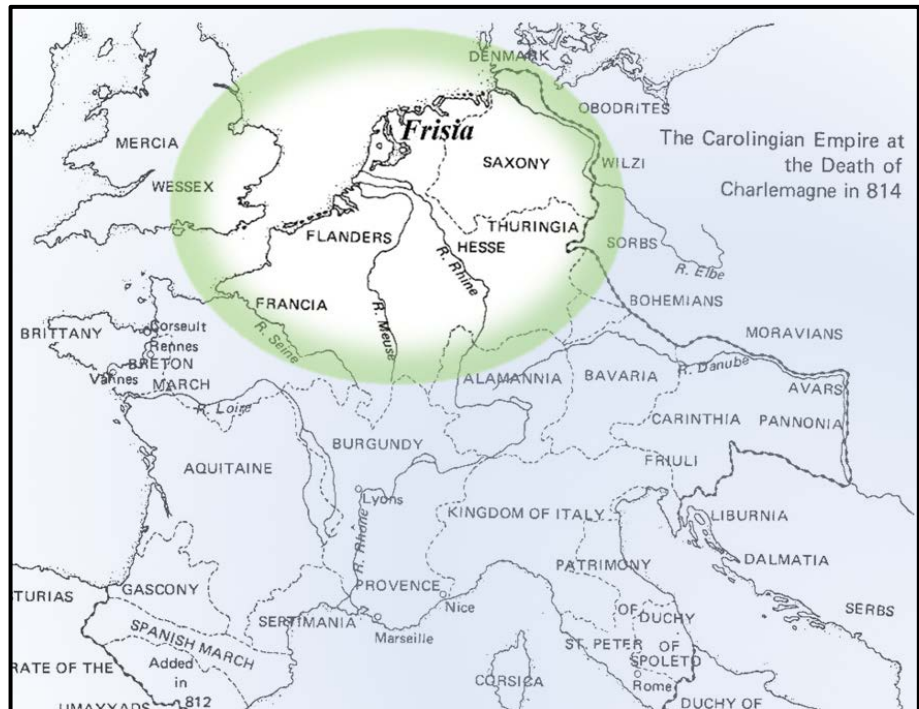
The Frisian raids in AD 810, however, were not one among many aggressions scattered throughout the Empire. They occurred only in Frisia, sufficiently limiting the location to justify a continued examination. In addition, the nature of the natural disasters somewhat ameliorated the imprecision of location data by its own lack of precision. The first disaster was a pestilential winter combined with a human plague; the second, a cattle plague. Both disasters affected the entire Empire. Moreover, whether or not the cattle plague specifically struck Frisia may be unimportant because the RFA report that it struck and halted Charlemagne's army.¹ The raids also had a complicated and well-documented political history following several years of growing tensions between the Franks and the Danes, namely, the conflict between Charlemagne and the Danish king Godofrid spurred by Charlemagne's activities in Saxony. All these reasons suggested that despite the difficulties, a careful analysis could nevertheless prove informative.

¹ Scholz, RFA, 92.

7.1.1 The Geographical and Political Context of AD 810

Charles Martel, Charlemagne's grandfather, had taken full control of Frisia by AD 734.² When Charlemagne himself took control of Saxony to the east in AD 804, the Empire created a continuous sphere of influence on the Northwest European Continent stretching all the way up to the Jutland peninsula and the border of Denmark, as shown in Figure 7-1 below.³

Figure 7-1: The Carolingian Empire with Saxony and the extended coast highlighted in Scholz, 1970, 98.



But the political impetus for the attacks on Frisia would not seem primarily to have been a question of territory given the political situation that had been developing between the Danes

² von Simson, *Annales Mettenses Priores*, 29.

³ Scholz, RFA, 98, Map 8 (Frisia highlighting added).

and the Carolingian Empire over Saxony. Charlemagne first attempted to take control of Saxony in AD 772.⁴ The pagan Saxons, however, do not appear to have wanted to join his Empire. The first rebellion came as soon as the next year, in AD 773.⁵ For decades afterwards, Saxony was a discontented border territory between the Franks and Danes and a constant thorn in Charlemagne's side. Moreover, as the rebellions continued, Danes occasionally offered aid to the Saxon rebels.⁶ They offered the leader Widukind refuge at least twice, the first being in AD 777 after Charlemagne had called a general assembly; the second in AD 782, in the wake of a massacre of Saxons at Verdun.⁷

The Saxon rebellions became regular. In the last decade of the eighth century, uprisings occurred annually from AD 793 to AD 796. After a short break in AD 797, they began again in AD 798 and AD 799. In the first decade of the ninth century, the uprisings began anew in AD 802.⁸ Charlemagne put down each rebellion ruthlessly, and in AD 804, he determined to solve the

⁴ Daniel Melleno, "Between borders: Franks, Danes, and Obodrites in the trans-Elben world up to 827," *Early Medieval Europe* 25, no. 3 (2017): 360.

⁵ Scholz, RFA, 50.

⁶ Ingrid Rembold, *Conquest and Christianization: Saxony and the Carolingian World, 772–888*, (Cambridge: Cambridge University Press, 2018), 42.

⁷ Scholz, RFA, 55, 61.

⁸ Scholz, RFA, 72-78.

Saxon problem once and for all.⁹ He entered Saxony and exiled all the Saxons east of the Elbe as well as those from a region the AX refers to as Winodis, an area beginning east of the Weser River and ending close to the city of Verdun.¹⁰ Einhard says that Charlemagne exiled 10,000 people, separating them and sending them to different regions throughout the Empire.¹¹

Nevertheless, the RFA suggests that after this expulsion, Danes once more offered shelter to Saxon rebels. After its report noting Charlemagne's actions in Saxony, the RFA states that Charlemagne and the king of the Danes, Godofrid, were to meet to discuss "*per fugis*", "refugees."¹² Exactly why Charlemagne wanted to do this is not explained. Perhaps the refugees were politically powerful, or perhaps Charlemagne wanted to exact vengeance for more than thirty years of war. Godofrid, however, had an ambiguous position from which to negotiate not only because Charlemagne was powerful but also because he must have also faced the possibility of unrest among his own men whether he kept or released the refugees.

⁹ Einhard, *Life of Charlemagne*, trans. S. E. Turner (New York: Harper and Brothers, 1880; Fordham University Internet History Sourcebook, 1996), <https://sourcebooks.fordham.edu/source/einhard1.asp>, accessed 15 June 2019.

¹⁰ von Simson, AX, 3.

¹¹ Einhard, *Einhardi Vita Karoli Magna*, 10.

¹² Kurze, RFA, 119; Scholz, RFA, 83.

Keeping these fugitives gave Godofrid more leverage against Charlemagne but it also put him in danger of a very capable military leader's wrath. Not surprisingly, Godofrid was said to be "*territus*," which Scholz translates as "wary", and in the end decided not to meet with Charlemagne personally but to send envoys.¹³

What made the situation between Charlemagne and Godofrid even more tense was that Charlemagne had chosen to repopulate Saxony by inviting the neighbouring Slavic tribe, the Obodrites, to resettle there. The Obodrites were not ruled by the Empire directly, but they had pledged loyalty. As the author of the RFA states while describing a war in AD 798, "*Nam Abodriti auxiliares Francorum semper fuerunt, ex quo semel ab eis in societatem recepti sunt.*"¹⁴ No doubt this settlement of Obodrites on the Danes' border would have been disquieting.

¹³ Kurze, RFA, 119; Scholz, RFA, 83.

¹⁴ Kurze, RFA, 105. "The Obodrites have always aided the Franks, ever since the Franks accepted them as their allies." Scholz, RFA, 76. A more precise translation would be "For the Obodrites were always allies/assistants [auxiliares] of the Franks, ever since they were received by them in alliance [in societatem]." (Translation by author). Within the Roman army, the auxilia played an essential part. The auxilia were originally conceived of as nominally independent foreign allies [socii] to the Roman legions during the Social War, officially incorporated into the army in the Augustine Period, and at one point, they made up more than half of the Roman Army. Their status as non-citizens became increasingly unimportant over time and when the Constitutio Antoniniana declared all freemen were citizens in 212, any distinction between an auxilia and a legionary soldier disappeared. Ian Haynes, *Blood of the Provinces: The Roman Auxilia and the Making of Provincial Society from Augustus to the Severans* (Oxford: Oxford University Press, 2013), 1-13, 87.

In AD 808, four years after Charlemagne's purge of Saxony, Godofrid invaded the Obodrites' homeland with the help of another Slavic tribe, the Wilzi, who were the traditional enemies of the Obodrites.¹⁵ Godofrid was victorious, capturing two-thirds of the Obodrites' territory.¹⁶ In so doing, Godofrid expanded his border around Saxony and directly challenged Charlemagne, which risked provoking war.

For this reason, Godofrid's attack can be seen as a message of strength and defiance. Moreover, Godofrid might have intended to instigate unrest in the resettled Obodrites, either to bring them home and thus depopulate Saxony making it more vulnerable to attack or to encourage them to rebel against Charlemagne. Whatever the intent, the message does not seem to have been convincing.

The RFA reports that Charlemagne responded to this invasion by sending his son Charles to guard the borders of Saxony.¹⁷ Because the borders of Saxony are also the borders of Danish territory, Godofrid's actions essentially brought the forces of Charlemagne to his doorstep. In AD 809, Godofrid tried but failed to make a peace with Charlemagne by claiming

¹⁵ Melleno, "Between borders," 363.

¹⁶ Scholz, RFA, 88.

¹⁷ Scholz, RFA, 88.

that the Obodites had provoked him.¹⁸ Instead, later that year, much of what Godofrid had conquered was freed when the Obodrites attacked the Wilzi in retaliation.¹⁹ Consequently, instead of peace, Godofrid faced the real possibility of war, and indeed, the RFA reports that at the time of the AD 810 Danish attack on Frisia, Charlemagne was in Aachen planning a campaign.²⁰ By the time Charlemagne had gathered his forces to combat the raids in Frisia, however, he learned that the Wilzi had invaded Saxony.²¹ With both the attack on Frisia and the invasion of Saxony, Charlemagne abandoned his plan to attack Danish territory. Godofrid was assassinated a short time later.²²

The Danish attack on Frisia, therefore, occurred in the politically charged context of border disputes and campaigns of territorial acquisition. Charlemagne's actions had put the Danish king Godofrid in a perilous position as the two rulers jockeyed for power. While the prospect of a real war loomed between the Danes and the Carolingian Empire, a Danish leader with the independent resources to launch an attack

¹⁸ Scholz, RFA, 88.

¹⁹ Scholz, RFA, 90.

²⁰ Scholz, RFA, 91.

²¹ Scholz, RFA, 92.

²² Scholz, RFA, 92.

successfully struck Frisia. Whoever this aggressor was, he was aided by a very convenient situation: not only had a plague struck the Empire a few years before but at the time it was also being devastated by a cattle murrain.

7.1.2 The Weather of AD 810

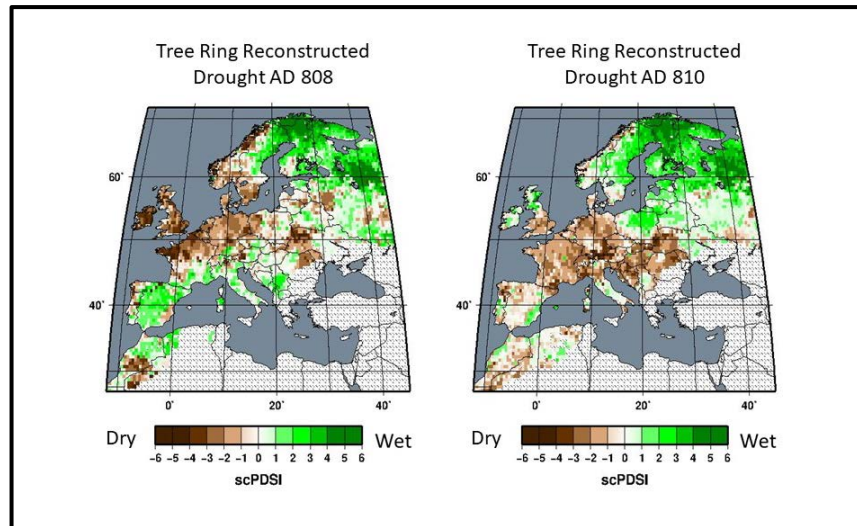
With Charlemagne's superior power, the political tension between the two peoples would not alone have been likely to precipitate this type of raid. An analysis of climatic factors suggests that the environment may have played a role. Indeed, throughout the three years between Godofrid's invasion of the Obrodite territory until the Danish raids on Frisia, environmental conditions on the Northwest European Continent were poor. Temperatures were below the norm and the area suffered from drought conditions.

According to the OTC, the temperature hovered below the norm for several years, with the most recent peak being in AD 807 when it nevertheless stayed below the norm, -0.75°C . In AD 808, the temperature descended again to -0.92°C , and in AD 809 plunged to -1.32°C . In AD 810, it rose but only reached -0.38°C .²³ Therefore, in AD 810, the temperature was recovering from a large plunge and the temperatures were not

²³ Büntgen et al., OTC, 578-82.

in a favourable range. Moreover, as shown in Figure 7-2 below, in AD 808 and AD 810, the Northwest European Continent, including not only the Carolingian Empire but Scandinavia as well, experienced drought conditions.

Figure 7-2: OWDA in AD 808 and AD 810 in Cook et al., 2015, 1-9.



Both the lower temperatures and the drought conditions would have created a challenge for crops, harvests might well have been reduced, and the Northwest European Continent would have been more vulnerable to a natural disaster, particularly one related to reduced nutrition. And indeed, two came—in AD 808 a human plague and in AD 810 a cattle plague.

7.1.3 First Natural Disaster: Pestilential Winter of AD 808

Both the RFA and the AX take specific note of the winter that started AD 808. According to the RFA, "*Hiemps mollissima ac*

*pestilens fuit in illo tempore.*²⁴ According to the AX, “*Eodem anno hiemps mollissima ac pestilens erat.*”²⁵ Thus, while neither author describes the disease or diseases that afflicted the Carolingian population during that winter, they both confirm that the winter would have caused much suffering and probably death. But there is a slight language difference that might be informative. “*Fuit*” and “*erat*” are different cases of the verb “*sum*,” “*was*.” “*Fuit*” is a perfect active indicative and “*erat*” is an imperfect active indicative.

By choosing the perfect active indicative the authors of the RFA may have been indicating that the unhealthy winter was completely over. There was an unhealthy, diseased, or pestilential winter and that was it. In contrast, by using the imperfect active indicative tense, the authors of the AX may have been indicating that this unhealthy winter was continuing and thus might have had much more impact than the RFA suggests. Two reasons may underlie this difference in perspective.

First, the authors of the RFA may not have wanted to reveal that much damage happened. These annals were, after all, most likely written at Charlemagne’s court in Aachen and

²⁴ Kurze, RFA, 125 (Emphasis added). “The winter **was** extremely mild and **unhealthy** at that time.” Scholz, RFA, 88 (Emphasis added).

²⁵ von Simson, AX, 3 (Emphasis added). “That same year the winter **was** extremely mild and **pestilential**.” Translation by author.

existed to promote his agenda and record his achievements. A detrimental plague would not promote the image of a successful reign. On the other hand, location is key in many natural disasters, so it is also possible the authors downplayed the unhealthy winter simply because Aachen was farther away from the places that experienced the largest impact—in this case, perhaps, Frisia.

The agenda of the AX was different as evidenced by where they were written. From AD 832 to AD 852 they were written in Lorsch Abbey, in Lorsch in what is now Germany, and from AD 852 through AD 873, in Cologne also in what is now Germany. Both locations appear to have been independent of the contemporary royal courts of Louis the Pious and Louis the German.²⁶ Thus the author would have had little reason to minimize events to maximize Charlemagne's reputation. The AX could have also been located closer to the winter than was Aachen. In any case, the winter of AD 808 caused problems significant enough to be recorded in both annals. Then in AD 810, the Empire's vulnerability increased with a cattle plague.

²⁶ Reuter, AF, 144.

7.1.4 Second Natural Disaster: The Cattle Plague of AD 810

Cattle were an essential resource in an early medieval society. In many societies they seem to have been the main unit of wealth. In Scandinavia, as Dagfrinn Skre observes, the word for moveable wealth in Old Norse became “*fe*” a word also defined as “cattle”.²⁷ Archaeological excavations of Dorestad have confirmed cattle were one of the most significant domestic livestock. Archaeologists have found 3649 cattle remains, as compared to 833 sheep and 680 pigs. The sheep and pig remains together constituted just a fraction of cattle remains.²⁸

As well as being economically significant, cattle, of course, are also an important source of protein through meat and dairy products. Indeed, Phillip Slavin suggests that the cattle plague during the Great Famine of the fourteenth century and the resulting scarcity of protein might have made the upcoming Black Death more lethal.²⁹ The cattle population did not fully recover until at least the late 1330s, and every person affected by this protein shortage would have been increasingly vulnerable to disease and mental illness, especially children.

²⁷ Dagfrinn Skre, “Money and trade in Viking-Age Scandinavia,” in *Economies, Monetisation and Society In The West Slavic Lands 800–1200 AD, Wolińskie Spotkania Mediewistyczne II*, eds. Mateusz Bogucki and Marian Rębkowski (Szczecin, Poland: IAE PAN, 2013), 79.

²⁸ Terry O’Connor, “Livestock and deadstock in early medieval Europe from the North Sea to the Baltic,” *Environmental Archaeology* 15, no.1 (2010): 7.

²⁹ Slavin, “Great Bovine Pestilence” 1263.

Thus, the generation that grew up in the years during the Great Famine and Cattle Plague, but before the Black Death, were especially frail and less able to resist the disease.³⁰ The same would have been true in the ninth century.

Indeed, in their reports on AD 810, both the RFA and AX underline the importance of cattle. In describing the year's events, the AX author neglects the Frisian attack entirely and dedicates the most detail to the cattle plague of AD 810, writing that a "*magna mortalitas boum et aliorum animalium erat in ipso anno*".³¹ The RFA begins its description of the cattle plague by focusing on its effect on the army Charlemagne raised to fight against the Danish attack in Frisia. The annals record that Charlemagne was unable to feed his army because the cattle "*omnes usque ad unum perirent*".³² The author expands on this, noting, "*[O]mnes imperatori subiectas provincias illius generis animalium mortalitas inmanissime grassata est*".³³

³⁰ Phillip Slavin, *Experiencing Famine in Fourteenth Century Britain* (Turnhout, Belgium; Brepols Publishing, 2019), 363.

³¹ von Simson, AX, 4 (Emphasis added). "A **great** plague of cattle and other animals was during this same year." Translated by author.

³² Kurze, RFA, 132 (Emphasis added). "**All** [the cattle] perished to the last head." Scholz, RFA, 92 (Emphasis added).

³³ Kurze, RFA, 132 (Emphasis added). "[I]n **all** the provinces subject to the emperor the mortality of this kind of animal ran high". Scholz, RFA, 92 (Emphasis added).

Neither the AX nor the RFA specify the season in which this cattle plague occurred. It was underway by the time the Danes attacked Frisia as evidenced by the fact that the RFA describe it as causing rationing trouble for Charlemagne. But it may have begun much earlier. Dr. Timothy Newfield, a renowned scholar of environmental history, combines these two reports with four other sources—the *Annales Sancti Emmerammi Maiores*, the *Annales Laurissenses Minores*, the anonymous *Poeta Saxo*, and the *Chronicon Moissiacense*—to argue that the cattle murrain started in AD 809.³⁴ He identifies the plague as probably an earlier form of the modern and contagious plague rinderpest, which does not affect humans.³⁵ If that is the case, Newfield says, the plague would have lasted until it “burnt itself out.”³⁶ The plague would have devastated the Empire.

Thus, unlike the conflicting reports on the earlier pestilential winter, both the AX and the RFA agree that the

³⁴ Timothy Newfield, “A Great Carolingian Panzootic,” 201. For specific references in the other sources, see *Scriptorium*: Vol. 1, (Hannover: MGH, 1826), specifically *Annales Sancti Emmerammi Maiores*, 93; *Annales Laurissenses Minores*, 121; *Poeta Saxo*, 263-64; *Chronicon Moissiacense*, in *Scriptorium*: Vol 1, ed. Georg Heinrich Pertz (Hannover: MGH, 1826), 308-09.

³⁵ Newfield, “A Great Carolingian Panzootic, 205;; Neal Nathanson, “Chapter 1 - The Human Toll of Viral Diseases: Past Plagues and Pending Pandemics,” in *Viral Pathogenesis (Third Edition)*, edited by Michael G. Katze, Marcus J. Korth, G. Lynn Law, and Neal Nathanson, 12 (London: Academic Press, 2016.), 12.

³⁶ Newfield, “A Great Carolingian Panzootic, 205.

cattle plague was severe. Its impact can be assessed not only by comparing it to the fourteenth century rinderpest plague but also by comparing the authors' word choices with similar words used in the Bible.

7.1.5 The Impact of the Cattle Plague

Studies make clear the devastating impact of rinderpest in later periods. Newfield identifies rinderpest as the most likely disease to have caused the cattle mortality during the Great Famine of 1316 through 1322.³⁷ Phillip Slavin examined manorial records written in England and Wales during the Great Famine. These well-documented records indicate that when the first wave of rinderpest hit England and Wales in 1319, 62.25 % of the cattle population was exterminated.³⁸ If the cattle plague in AD 810 was a form of rinderpest, it too would have created a huge mortality rate on Charlemagne's cattle population and made the Empire vulnerable.

Moreover, the authors of the two annals did not underplay this plague. The AX described it as *magna*, or

³⁷ Timothy Newfield, "A cattle panzootic in early fourteenth-century Europe," *Agricultural History Review* 2, no. 57 (2009): 158.

³⁸ See Chapter 1, section 3.2 for references.

magnus.³⁹ Words beginning with “*magn*” appear often in the Bible, but the only time it is used as a descriptor for a natural disaster is in descriptions of the end times.⁴⁰ Jesus describes great earthquakes, pestilences, and famines in Luke 21:11, saying that “*terraemotus **magni** erunt per loca et pestilentiae et fames terroresque de caelo et signa **magna** erunt*”.⁴¹

Revelation 8:11-12, which describes a “great” star called Wormwood falling from the sky upon a third of the rivers and poisoning them, says:

*Et tertius angelus tuba cecinit et cecidit de caelo stella **magna** ardens tamquam facula et cecidit in tertiam partem fluminum et in fontes aquarum/ et nomen stellae dicitur Absinthius et facta est tertia pars aquarum in absinthium et multi hominum mortui sunt de aquis quia amarae factae sunt.*⁴²

Revelation is filled with *magnus* events. Of the 221 times a “*magn*” derivative occurs in the *Latin Vulgate*’s New Testament,

³⁹ *A Dictionary of Medieval Latin Sources* defines “*magnus*” simply as “great” or “large”. *A Latin Dictionary* also defines it as “great” or “large”. In *The Oxford Latin Dictionary*, it is “Great in size or extent, big, vast”.

⁴⁰ The only other time “*magn*” describes a natural disaster is when it describes Joseph’s famine in Genesis 47:20, but the famine is described as *magnitudine*, a derivative of “*magnitudo*”.

⁴¹ “And there shall be **great** earthquakes in divers places, and pestilences, and famines, and terrors from heaven; and there shall be great signs.” Luke 21:11 (Emphasis added).

⁴² “And the third angel sounded the trumpet, and a **great** star fell from heaven, burning as it were a torch, and it fell on the third part of the rivers, and upon the fountains of waters: And the name of the star is called Wormwood. And the third part of the waters became wormwood; and many men died of the waters, because they were made bitter. Revelation 8:10-11 (Emphasis added).

seventy-seven are found in Revelation, or more than a third.⁴³ Although these are not superlatives such as “maior” or “maximus”, out of the 163 derivatives of “major” in the Bible, none appear in Revelation, and out of the eighty-five derivatives of “maximus” in the Bible, only one appears in Revelation.⁴⁴ It is thus reasonable to conclude that the author of the AX was probably at least slightly influenced by the prevalence of “magnus” in Revelation’s descriptions of end times when he chose it to describe the cattle plague, thus suggesting a comparison of the impact of the cattle plague with the enormities of end time disasters.

The author of the RFA, on the other hand, described the plague by repeatedly using the word “*omnes*”, the nominative/vocative/accusative plural of the adjective “*omnis*”. It is used all throughout the Bible, and has descended into English with words like “omniscient”, “omnipresent”, and “omnipotent”. Thus, the adjective ties into the biblical trope that God is the creator and ruler of everything. While “*omnis*” might be significant, since God is all-powerful and controls everything,

⁴³ Biblegateway.com, “Biblia Sacra Vulgata Search, Magn,” accessed 11 July 2017, https://www.biblegateway.com/quicksearch/?qs_version=VULGATE&quicksearch=magn&begin=73&end=73.

⁴⁴ Biblegateway.com, “Biblia Sacra Vulgata Search, “Major,” accessed 15 November 2021, <https://www.biblegateway.com/quicksearch/?quicksearch=major&version=VULGATE>; Biblegateway.com, “Biblia Sacra Vulgata Search, “Maxim,” accessed 26 October 2021, https://www.biblegateway.com/quicksearch/?qs_version=VULGATE&quicksearch=maxim&startnumber=1.

the RFA gives a description that renders a further analysis of it to judge severity unnecessary. Instead, the RFA states that **all** cattle died to the point that Charlemagne could not sustain his army and so the plague, which may have been going on for a year already, created an opportune time to attack.

Thus, when the author of the AX uses the word “*magnus*” to connote the horrors of end times and the author of the RFA says that it crippled Charlemagne’s army, they imply that the cattle plague’s death toll was vast. The devastation it would have caused may have given the advantage to a hostile military strategist.

7.1.6 Modelling the AD 810 Raids on Frisia

To a military strategist, the fact that the Empire was recovering from one natural disaster and already suffering another would have probably been a major factor in a decision to attack. Frisia could offer little resistance with the difficulties resulting from both a recent devastating disease-ridden winter and the malnutrition due to the cattle plague. Furthermore, the cattle plague meant that Charlemagne could not create a supply line to provide for his army. Moreover, as Clausewitz says, the goal in every battle is for one army to pick apart different segments of the other army, isolate them, and then destroy them

individually, and the two disasters would have isolated Frisia from the rest of the Empire.⁴⁵

Accordingly, the stage was set. The Franks and the Danes had been headed towards a confrontation for many years. As northern continental Europe suffered from drought conditions, the pestilential winter of AD 808 was followed, possibly as early as late AD 809, by a cattle plague with a potentially serious impact on all levels of Carolingian society. This combination of misfortunes was long-lived so the news of the Empire's difficulties may have pulled the Scandinavians out as the news spread. Moreover, Charlemagne was mired in preparation for a war against the Danes, a war that he had been pushing towards for many years. The combination of these push/pull factors made the time for attack ripe—both for the plunder and to prevent any war Charlemagne might still have in mind.

Godofrid himself certainly had ample reason to attack. Charlemagne was a strong power with an apparently insatiable desire to expand his Empire. He had treated the independently minded Saxons brutally. He had sent his son to guard the Saxon/Danish/Obrodite border. Charlemagne seemed poised to take over Danish territory, and Godofrid would likely have known that Charlemagne was raising an army to attack him.

⁴⁵ See Chapter 6, section 1.6.

Then, Godofrid received a boon in the form of a cattle plague infecting Charlemagne's Empire and stymying his efforts. Though the pestilential winter, human plague, and cattle plague may have all affected Danish territory as well, the cattle plague in particular would have shifted the military advantage to the Danes if they chose to attack—as they usually did—by sea, thus escaping the burden of land-based supply lines.

And indeed, in AD 810, Charlemagne:

[A]ccepit classem ducentarum navium de Nordmannia Frisiam appulisse totasque Frisiaco litori adiacentes insulas esse vastatas iamque exercitum illum in continenti esse ternaque proelia cum Frisonibus commisisse Danosque victores tributum victis inposuisse et vectigalis nomine centum libras argenti a Frisonibus iam esse solutas.⁴⁶

Thus, despite the need for a more nuanced examination, all the evidence combines to suggest that a high ranking Danish leader took advantage of the military opportunity caused by the two disasters that had affected the Empire to attack Frisia, immediately west of Saxony. Though Godofrid himself was “*domi esse*” during the raids, his grievances against Charlemagne provided him sufficient reasons to sponsor an ally or at a minimum to look the other way.⁴⁷ And the attack was

⁴⁶ Kurze, RFA, 131. “[Charlemagne] [r]eceived the news that a fleet of 200 ships from Denmark had landed in Frisia, that all the islands off the coast of Frisia had been ravaged, that the army had already landed and fought three battles against the Frisians, that the victorious Danes had imposed a tribute on the vanquished. . . [and] that already one hundred pounds of silver had been paid by the Frisians.” Scholz, RFA, 91-92.

⁴⁷ Kurze, RFA, 131.

successful, in part because Charlemagne was unable to supply the army he was trying to gather. Even after Godofrid's assassination, Charlemagne never attempted to touch the Danes again. Thus, once again a close analysis moves the hypothesis from possible to probable, and this statistical anomaly becomes a corroborated anomaly.

7.2 The Raids of AD 820: Flanders, Seine, and Aquitaine

The second series of recorded attacks on the Carolingian Empire by plundering Scandinavian ships occurred in AD 820. According to the RFA, an aggressor attempted unsuccessfully to raid Flanders and the Seine delta but finally in Aquitaine successfully raided a village where the modern town of Bouin is located.⁴⁸ See Figure 7-3 below.⁴⁹

⁴⁸ Scholz, RFA, 107-108.

⁴⁹ Scholz, RFA, 98, Map 8 (Coloration and red stars added).

Figure 7-3: The three locations of the AD 820 raids as indicated by red stars in Scholz, 1970, 98.



These aggressions happened while the Carolingian Empire was suffering from two simultaneous natural disasters: persistent rain that ruined the harvest and a plague.⁵⁰

Again, however, shifting the connection between the disasters and the raids from possible to probable required a more nuanced examination than did the AD 834 raid on Dorestad and the AD 880 Battle of Thimeon. Although the timelines of the natural disasters and the attacks coincide, making them a statistical anomaly, the raids occurred in three regions in very different locations and there are few specific recorded details. To complicate the analysis, these raids also have a briefer political history than did the AD 810 raids on Frisia.

⁵⁰ Scholz, RFA, 108.

As with the situation in AD 810, however, the lack of specific location data is ameliorated by the fact that the two natural disasters do not appear to have affected only a specific region but instead the entire Empire. Also, these three raids were unique attacks that did have an observable political history behind them. These two facts justified further study.

7.2.1 The Political Context of the AD 820 Raids

In the opening decade of the ninth century, Charlemagne had been considering a war against the Danes but was thwarted by the cattle plague and the AD 810 raids. Then Godofrid, seemingly Charlemagne's primary antagonist, was assassinated. The political situation of the AD 820 raids follows on from this assassination. After the assassination, Godofrid's nephew Hemming became the king of the Danes and made peace with Charlemagne in AD 811.⁵¹ Hemming died early in AD 812, however, and the death of Godofrid and Hemming in such a short time span set up a Danish conflict of succession.⁵²

After Hemming's death, the RFA report, the first two contenders for power were Sigifrid, also Godofrid's nephew, and Anulo, nephew of one Heriold.⁵³ While the annals do not

⁵¹ Scholz, RFA, 93.

⁵² Scholz, RFA, 94.

⁵³ Scholz, RFA, 94.

specify who this senior Heriold was, he may have been the king before Godofrid. In that case, Hemming would have been the head of the family that assumed power with Godofrid while this senior Heriold's family would have been a rival one that had been in power before Godofrid. With Hemming's death, this rival family, under the control of Anulo, seems to have been trying to regain power. In any case, supporters of Sigifrid and Anulo could not agree on which of them should become king. They fought a battle in which both contenders were killed. Anulo's family, however, was victorious so his two brothers, Reginfrid and a junior Heriold, became the Danish kings in AD 812.⁵⁴ Godofrid's family accepted the second Heriold and Reginfrid as their kings by necessity, but the conflict was not finished.⁵⁵

In addition to nephews, King Godofrid had sons, and in AD 813, while Heriold and Reginfrid were subduing a region in the south of Norway, the sons revolted and took power, forcing Heriold and Reginfrid into exile.⁵⁶ Heriold and Reginfrid tried to regain control in AD 814, but Godofrid's sons won. Reginfrid was killed in battle, Heriold fled to the Carolingian Empire, and Louis the Pious, now sole leader of the Empire after

⁵⁴ Scholz, RFA, 94.

⁵⁵ Kurze, RFA, 136.

⁵⁶ Scholz, RFA, 96.

Charlemagne's death in that same year, decided to enter the power struggle by pledging to give the exiled king Heriold military support so he could retake the Danes.⁵⁷

By supporting Heriold, Louis made the already unstable political situation among the Danes even more volatile. The military support Louis could provide was substantial so the possibility that Heriold could recapture the Danes was real. Danish leaders, therefore, were caught in a dangerous situation. If they supported Godofrid's sons, they might lose power in the future if Heriold's reconquest succeeded. On the other hand, if they did not support Godofrid's sons, they were in danger of losing power immediately. Not only would Danish leaders be uncertain where they should place their loyalties, but Godofrid's sons would also be in doubt of whether they actually led the Danes. Moreover, as previously discussed, Louis would have significant influence over Heriold both militarily and diplomatically because Heriold would have had to provide a quid pro quo—most likely in the form of an alliance with the Empire—and support from the Empire could evaporate if Heriold did not honour the alliance.

In AD 815, the RFA reports, Louis' promise of military support materialized when he ordered the Saxons and Obodrites to help Heriold and they marched into Danish

⁵⁷ Scholz, RFA, 97-99.

territory. Godofrid's sons did not fight but "hid" their army on a nearby island.⁵⁸ Hence, the Saxons and Obodrites looted a few places then marched out.⁵⁹

This show of power without actual conquest would have muddied the situation even more. For Heriold, it emphasized that he needed Carolingian support but that Carolingian support came only on Carolingian terms. Godofrid's sons would not know whether Heriold was a real threat. Danish leaders would not be certain who was the greatest threat—the sons, Heriold, or Louis the Pious.

Louis the Pious allowed Heriold to stay in Saxony and harass the Danes for a few more years, although Heriold did not succeed in taking over the Danes. In AD 817, Godofrid's sons sent an embassy to Louis the Pious asking him to stop Heriold's being a nuisance to the Danes. Louis ignored their request and instead gave Heriold more men.⁶⁰ Finally, in AD 819, "Harioldusquoque issu imperatoris ad navessuas per Abodritos reductus in patriam quasi regnum ibi accepturus navigavit."⁶¹ This time, Heriold succeeded.⁶²

⁵⁸ Scholz, RFA, 99.

⁵⁹ Scholz, RFA, 99.

⁶⁰ Scholz, RFA, 102.

⁶¹ Kurze, RFA, 152. "On the emperor's order Heriold was taken to his ships by the Obodrites and sailed back to his homeland to take over the kingdom." Scholz, RFA, 106.

⁶² Scholz, RFA, 106.

As noted before, the power struggle between the two families that lasted well into the AD 820s was probably a major factor in the decision to sack Dorestad and illustrates that Louis the Pious attempted to take advantage of the Danes' power struggles to take away their de facto independence. With Louis directing the reconquest of the Danes in fact and the memory of their father's assassination still fresh, Godofrid's sons knew they were in danger because leading a revolt against Heriold had become defiance of Louis. Yet Heriold would be forever weak, and indeed, he always was.

Most significantly, however, this confused power situation affected less powerful Danish leaders who had supported Godofrid's sons. With the overthrow of these sons, these leaders would have been expelled or exiled and would seek to re-state themselves outside their original homeland and to acquire new wealth. Although Louis the Pious decisively lost the power struggle after Godofrid's sons exiled Heriold in AD 826 perhaps even to a certain extent bringing the Viking Age on himself, as of AD 820 he was temporarily victorious.

Coincidentally, since the AD 793 beginning of the Viking Age in England and Ireland, the Irish kingdoms had suffered repeated attacks, and Ireland might have even been the island most frequently attacked, but in AD 820, the AU report no

Scandinavian aggressions in Ireland.⁶³ In contrast, the RFA report three attempts on the Carolingian Empire by an aggressor leading a fleet of thirteen ships.⁶⁴ What would cause a raider with thirteen ships to decide to try to raid the Empire of the strong and canny Louis the Pious? The desire for vengeance after Louis' sponsorship of Heriold might be one motive, but it probably was not the only one. The natural conditions within the Empire might have provided a stronger motivation.

7.2.2 The Weather of AD 820

The AD 820 attacks happened when the Carolingian Empire was cool, with the temperature -0.47°C below the norm according to the OTC.⁶⁵ Moreover, according to the OWDA, precipitation was high in both the Carolingian Empire and Scandinavia, as shown in Figure 7-4 below.⁶⁶

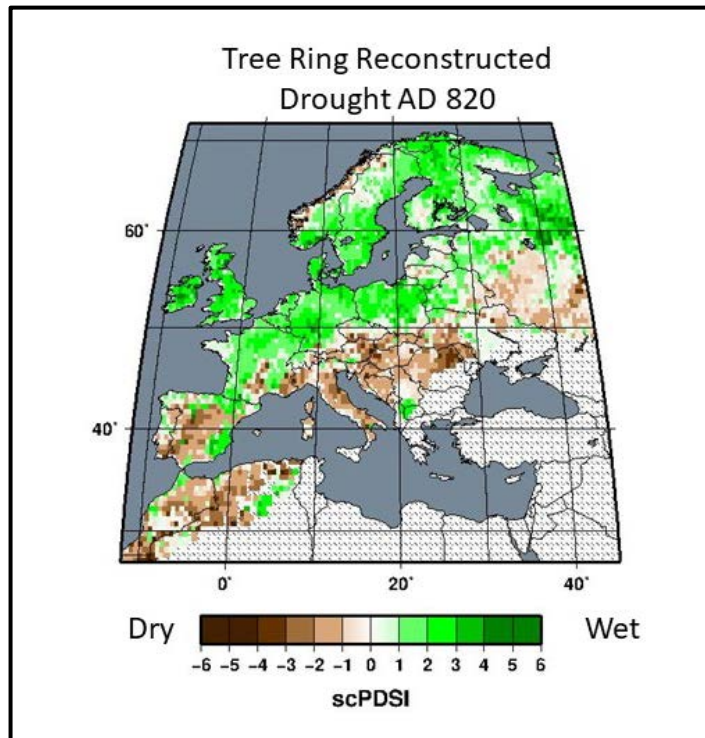
⁶³ Bambury and Beechinor, AU, 277-78.

⁶⁴ Scholz, RFA, 107.

⁶⁵ Büntgen et al., OTC, 578-82.

⁶⁶ Cook et al., OWDA, 1-9.

Figure 7-4: OWDA AD 820 in Cook et al., 2015, 1-9.



Indeed, according to the RFA, there was “*iuges pluvias,*” too much rain, as well as “*aerem nimio humore,*” too much humidity.⁶⁷ These conditions likely led to the two natural disasters, a ruined harvest possibly resulting from the excessive rain, and a plague affecting both humans and animals.

7.2.3 The Natural Disasters

The author of the RFA describes the disasters of this year in detail:

⁶⁷ Kurze, RFA, 108; Scholz, RFA, 108.

*Hoc anno propter **iuges** pluvias et aerem **nimio** humore resolutum **magna** incommode **contigerunt**. Nam et hominum et boum pestilentia tam **inmane** longe lateque grassata est, ut vix ulla pars totius regni Francorum ab hac peste immunis atque intacta posset inveniri. Frumenta quoque et legumina imbrium adsiduitate corrupta vel colligi non poterant vel collecta computrescebant. Vinum etiam, cuius parvus proventus eodem anno fuit, propter caloris inopiam acerbum et insuave fiebat. In quibusdam vero locis de inundatione fluminum aquis in plano stagnantibus autumnalis satio ita impedita est, ut penitus nihil frugum ante vernin temperiem seminaretur.⁶⁸*

In the original Latin, the author begins his descriptions of these two disasters by stating that *Hoc anno*, “in this year,” disasters *contigerunt*.⁶⁹ “*Contigerunt*” is a third-person plural perfect active indicative derivation of the verb “contignare”.⁷⁰ The fact that the author introduced the disasters in the perfect past tense suggests that he or whoever sponsored him intended to say that these disasters began and ended in that year, AD 820.

⁶⁸ Kurze, RFA, 54 (Emphasis added). “In this year **great** disasters occurred on account of **continued** rain and the **excessive** humidity. A pestilence affecting both men and cattle raged far and wide so that hardly any part of the Frankish Kingdom could be found immune to this plague or untouched by it. Grain and vegetables were rotting away in the persistent rains or could not be gathered, or, when gathered, were spoilt. Little wine was produced this year, and what little there was turned tart and sour since there was not enough warm weather. In some places water from the flooded rivers did not run off from low-lying areas, and this flooding prevented seeding in the fall, so that almost no grain was sown before the warm spring season.” Scholz, RFA, 108 (Emphasis added).

⁶⁹ Kurze, RFA, 154.

⁷⁰ *A Latin Dictionary* defines “*contigno*” as “to touch on all sides . . . to touch, take hold of, seize.” *The Oxford Latin Dictionary* defines it not only as “To come into physical contact with, touch,” but also as “To affect with a disease or other misfortune, infect; to affect with a moral pollution, contaminate.” As of this writing, *A Dictionary of Medieval Latin from British Sources* did not contain a definition.

Nevertheless, even had the disasters ended, the author describes their combined impact with the word “*magna*”.⁷¹ As discussed earlier, one-third of the times a derivative of “*magnus*” is used in the New Testament it is in Revelation and the only time a form of “*magna*” describes a natural disaster in biblical language is when biblical characters discuss what will happen during the end of the world. Thus, the author of the RFA indirectly analogized the biblical disasters to the double disaster of the harvest failure and plague of AD 820.

The Failed Harvest. The first disaster described in detail in the RFA, the harvest failure from too much rain (*iuges pluvias*) and too much humidity (*aerem nimio humore*), was a direct result of the environmental conditions shown in the OTC and OWDA.⁷² The author is quite detailed about how the weather conditions affected the harvest. Flooding rivers prevented the timely sowing of seed. The rain made grain and vegetables rot and spoil, people could hardly gather what did not spoil, and when they did, the gathered grain and vegetables then rotted.⁷³ Furthermore, Adrian Verhust notes that in the Carolingian economy, the most important foods were grain products: “In

⁷¹ Kurze, RFA, 154.

⁷² Scholz, RFA, 108; Kurze, RFA, 154.

⁷³ Scholz, RFA, 108.

spite of the importance of the sylvo-pastoral element . . . in the early medieval economy and food supply there is no doubt that grain production in the Carolingian period . . . had become more important than cattle raising or other forms of agrarian economy.”⁷⁴ Hence, though the RFA author does not specifically mention it, the disaster from the ruined harvest would have created food shortages throughout the Empire.

In addition, other impacts would logically follow. During the ninth century in the Carolingian Empire, the instrument that milled cereal crops into flour was the watermill.⁷⁵ River floods would interfere with watermill rotations, which in turn would impair the harvest’s preparation even after people gathered crops that had not yet rotted or spoiled. Moreover, the cereal crops that produced grain—such as spelt, wheat, rye, oak, and barley—served as food for both humans and animals so their lack would also create food shortages for livestock, weakening the livestock and hindering their use in dairy products and meat.⁷⁶ Thus, the vulnerability load on the people within the Carolingian Empire would significantly increase.

The words used to describe the ruined harvest may also shed light on the damage the food shortages caused, with the

⁷⁴ Verhulst, *Carolingian Economy*, 64.

⁷⁵ Verhulst, *Carolingian Economy*, 68.

⁷⁶ Verhulst, *Carolingian Economy*, 61.

first curious adjective being “*iuges*”, “continuing”, which is a derivative of the adjective “*iugis*”, also spelled as “*jugis*”.⁷⁷ There are ten derivations in the Bible of “*jugis*” beginning with “*juge*” and one with “*iugi*”.⁷⁸ Though both *A Latin Dictionary* and *The Oxford Latin Dictionary* reference flowing water in their definitions, in the Bible the derivations of “*iugis*” are often associated with sacrifices, especially with their frequency, with eight of these “*iugis*” derivations concerning how to make a sacrifice and the necessity of their regularity.⁷⁹ Three examples occur in Numbers 28:6, Ezekiel 46:14, and Daniel 8:11.

Numbers 28:6: It is the **continual holocaust** which you offered in mount Sinai or a most sweet, odour of a **sacrifice** by fire to the Lord.

Ezekiel 46:14: And he shall offer the **sacrifice** for it morning by morning, the sixth part of an ephi: and the third part of a hin of oil be mingled with the fine flour: a sacrifice to the Lord by ordinance **continual** and everlasting.

Daniel 8:11: And it was magnified even to the prince of the strength: and it took away from him the **continual sacrifice**, and cast down the place of his sanctuary

⁷⁷ *A Dictionary of Medieval Latin from British Sources* defines “*jugis*” as “continuing without intermission, constant, continual.” *A Latin Dictionary* defines it as “adj., continual, perpetual.” *The Oxford Latin Dictionary* definition is, “Continuing without intermission, constant, continual.”

⁷⁸ Biblegateway.com, “Biblia Sacra Vulgata Search, “*juge*,” accessed 3 May 2019, <https://www.biblegateway.com/quicksearch/?quicksearch=juge&version=VULGATE&resultspp=25>; Biblegateway.com, “Biblia Sacra Vulgata Search, “*iugi*,” accessed 3 May 2019, https://www.biblegateway.com/quicksearch/?qs_version=VULGATE&quicksearch=iugi&startnumber=26.

⁷⁹ Biblegateway.com, “Biblia Sacra Vulgata Search, “*juge*,” accessed 3 May 2019. <https://www.biblegateway.com/quicksearch/?quicksearch=juge&version=VULGATE&resultspp=25>.

The RFA's description of the rainfall and its persistence thereby seems uncannily to fit the continuous rain, as it connects the rain to the unending, regular need for sacrifices, their frequency, to the concept of sacrifice itself, and therefore to human suffering. In effect, therefore, the author may have interpreted the continuous rainfall as indicating that God was demanding sacrifices from the Carolingian people. With his use of the perfect past tense, he may have also seen that God's demands had been met. Thus, both his factual description of the harvest failure in AD 820 and the adjectives and words he used leave little doubt that it had a severe impact on the Carolingian people.

The Plague of AD 820. When the author of the RFA records the AD 820 plague, he writes, "*Nam et hominum et boum pestilentia tam **inmane** longe lateque grassata est, ut vix ulla pars **totius** regni Francorum ab hac peste immunis atque intacta posset inveniri.*"⁸⁰ He provides no further information on the exact nature of this plague. Newfield includes it in his

⁸⁰ Kurze, RFA, 154 (Emphasis added). "A[**n enormous**] pestilence affecting both men and cattle raged far and wide so that hardly any part of the [**total**] Frankish Kingdom could be found immune to this plague or untouched by it." Scholz, RFA, 108 (Emphasis added). It is probable that a combination of disease and hunger often worked together to create the conditions for these crises, with human and animal populations susceptible to different threats. Tim Newfield, "The contours of disease and hunger in Carolingian and early Ottonian Europe (c.750-c.950 CE)," (PhD. Thesis, McGill University, 2010), 386-89, 406-7.

discussions of the cattle plague of AD 810, which implies that he is positing that there were two different diseases at the same time: one affecting animals and the other affecting humans.⁸¹ This is certainly possible because some diseases such as pneumonia can affect both humans and animals. In fact scholars speculate that when the AU refers to the disease “*scamach*”, it is referring to some form of pneumonia that affects both animals and humans.⁸² Whatever constituted the plague of AD 820, from his bare description the author of the RFA seems to indicate that the plague left no one untouched. From this, it is clear the plague was enormous.

In this instance, the author also used the adjective *inmane*. “*Inmane*” is a derivative of the adjective “*immanis*”.⁸³ The Bible has only one derivation of “*inmanis*”, in Tobit 6:2.⁸⁴ Tobit 6 tells a story in which a huge, *inmanis*, fish was about to

⁸¹ Newfield, “A great Carolingian panzootic,” 200.

⁸² Crawford, “Disease and Illness in Medieval Ireland,” 212. Pneumonia is named as an animal’s disease in, e.g., *The Merck Veterinary Manual* (Kenilworth, NJ: Merck Manuals, 2016), <https://www.merckvetmanual.com/>, accessed 22 July 2020.

⁸³ *A Dictionary of Medieval Latin from British Sources* defines “*immanis*” as “savage, brutal . . . wild, untamed . . . appalling, shocking.” *A Latin Dictionary* defines it as “immense, huge, vast . . . frightful, inhuman, fierce, savage, wild.” *The Oxford Latin Dictionary* definition is “Savage, brutal . . . [f]rightful in aspect or appearance . . . [o]f enormous size, vast, tremendous.”

⁸⁴ Biblegateway.com, “Biblia Sacra Vulgata Search inman,” accessed 20 August 2017, https://www.biblegateway.com/quicksearch/?quicksearch=inman&qv_version=VULGATE.

devour Tobit, but with the help of an angel, Tobit kills and fillets the fish, leaving out some remains to ward off devils.

Before it burned out, however, like an enormous fish this enormous plague affected everywhere and everyone. In describing it, the RFA author uses the adjective “*totius*”, an adjective synonymous with “*omnes*”, “all”. The word is a derivative of the adjective “*tōtus*”.⁸⁵ There are fewer derivatives of a word beginning with “*tot*” in the Bible than there are derivatives of “*omnius*”, with 288 words beginning with “*tot*”.⁸⁶ In contrast, 5109 words begin with “*omn*”.⁸⁷ While a derivative of “*tōtus*” is rarer in the Bible, however, like “*omn*”, it still references the same trope, in reinforcing the totality of God and creation, as indeed shown in how it is translated today into words such as the noun “totality”: “The quality of being total; entirety”.⁸⁸ It is also illustrated in adjectives like “total”, which can be defined as “[c]omplete in extent or degree; absolute,

⁸⁵ *The Dictionary of Medieval Latin from British Sources* defines “*tōtus*” as, “[E]ntire, whole, all,” and then specifically adds “in every part, everywhere, throughout.” *A Latin Dictionary* defines “*tōtus*” as “the whole, entire, total.” *The Oxford Latin Dictionary* defines “*tōtus*” as “The whole of, all” and again specifically refers to “Every part of, the whole of, in its entirety.”

⁸⁶ Biblegateway.com, “Biblia Sacra Vulgata Search, tot,” accessed 20 August 2017, https://www.biblegateway.com/quicksearch/?quicksearch=tot&qs_version=VULGATE.

⁸⁷ Biblegateway.com, “Biblia Sacra Vulgata Search, omn,” accessed 20 August 2017, https://www.biblegateway.com/quicksearch/?quicksearch=omn&qs_version=VULGATE.

⁸⁸ OED Online, s.v. “totality, *n.*”, accessed 5 May 2019, <https://www.oed.com/view/Entry/203797?redirectedFrom=totality>.

utter”.⁸⁹ The plague affected the total, “*totius*”, Carolingian Empire and affected the total, “*totius*”, people. Therefore, in referencing the totality of the Empire, it inadvertently reinforces what the author says in his description of the plague as a whole, in that nothing was immune to the disease. Since this followed the perpetual rainfall and failed harvest the Empire would have been especially vulnerable to attack.

7.2.4 Modelling the AD 820 Raids

In AD 820, as the Danes were reshuffling politically, the plague was raging throughout the Empire and the harvest was failing. Either of these disasters would make an ideal situation for a military strategist to launch a major attack on the Empire because both disasters would not only isolate the targets but would also make it nearly impossible for Louis the Pious to create a supply line to fight either the fleet itself or to invade the land of whoever sponsored the fleet. The RFA, however, does not report these raids as major attacks on the Empire but as merely a fleet of thirteen ships conducting three quick separate hit-and-run raids.

⁸⁹ OED Online, s.v. “total, *adj. and n.*”, accessed 5 May 2019, <http://www.oed.com/view/Entry/203792?rskey=cYBU1N&result=1&isAdvanced=false>.

The RFA's understanding of the nature of these attacks, however, is subject to doubt. First, given the RFA's agenda, these could have been major attacks by a large army which the RFA wanted to minimise by reporting only the unadorned fact of thirteen ships without providing clues as to how large the ships were or how many men the fleet carried. Second, even if they were only three separate raids, they could serve another significant purpose for a military strategist.

Preliminarily, it is important to note that Heriold did *not* ultimately win the power struggle between him and Godofrid's sons despite Louis' no-doubt substantial military support. Instead, he was dethroned and exiled. When an army loses a battle, Clausewitz says that "its morale is broken even more than its physical strength . . . [and it is necessary to] . . . keep the morale as high as possible".⁹⁰ How to keep the spirits of defeated warriors high enough to keep fighting, especially against a man as powerful as Louis the Pious? Maybe through an audacious attempt to strike back, however ineffective the raid would ultimately prove to be. In *On War*, Clausewitz devotes an entire chapter to the importance of boldness to a military strategist. He says that a bold strategy could be a mistake, but even so, "it is a laudable error. . . . Happy the army

⁹⁰ Clausewitz, *On War*, 271.

where ill-timed boldness occurs frequently.”⁹¹ These daring raids after Louis’ blow on the Danes, therefore, could have served to keep defeated warriors happy and to help them fight again.

Moreover, these raiders could have been taking advantage of the disarray caused by the two disasters with the specific intention of giving Louis a warning because, interestingly, they were not afraid to bypass Frisia, one of the closest regions to Danish territory, and instead struck farther south into Flanders. This might have been in part because a fleet of only thirteen ships would have difficulty attacking a region with a river delta as large as the Rhine’s. However, again, the RFA gives no indication of the size of the longships or the number of men onboard, and the fact that they had the confidence and ability to ignore Frisia would have been part of the message. Scandinavian navigators at the time primarily navigated through memorising then observing coastal topography, so they preferred to hug the coast and would have probably been visible.⁹² Thus, in passing by the ripe target of Frisia, these ships were not just attempting to raid but were also demonstrating they were confident and able to raid far from

⁹¹ Clausewitz, *On War*, 190.

⁹² Bill, “Viking Ships and the Sea,” 178-79; Pamela White, *Exploration in the World of the Middle Ages: 500-1500*, John S. Bowman and Maurice Isserman eds., (New York: Facts on File Inc, 2005), 60-2.

their home. And, as evidenced by later events, defeated warriors, whether these or others, *did* recover and Louis began to fear them.⁹³

Therefore, in autumn, during or soon after the harvest failure, a Danish aggressor seems to have struck out on his own. He dared to strike the Empire itself three times in three distinct areas. Indeed, this AD 820 aggressor was bold in how far west he strayed. According to the RFA, he was not particularly successful in his first two attempts. About the first on Flanders, the RFA report:

*[D]e Nordmannia vero tredecim piraticae naves egressae primo in Flandrensi litore praedari molientes ab his, qui in praesidio erant, repulsae sunt; ubi tamen ab eis propter custodum incuriam aliquot casae viles incensae et parvus pecoris numerus abactus est.*⁹⁴

Notably, Flanders is also home to the city of Antwerp, the second city raided by Scandinavian aggressors in AD 836.⁹⁵ After Flanders, this AD 820 aggressor strayed farther west to the Seine. As the RFA report, “*In ostio Sequanae similia temptantes resistantibus sibi litoris custodibus, quinque*

⁹³ Scholz, RFA, 124.

⁹⁴ Kurze, RFA, 153. “From the land of the Norsemen, on the other hand, thirteen pirate vessels set out and tried to plunder the shores of Flanders, but were repelled by guards. But because of the carelessness of the defenders, some wretched huts were burned down and a small number of cattle taken away.” Scholz, RFA, 107-08.

⁹⁵ Kurze, RFA, 27.

*suorum interfectis irritae e recesserunt.*⁹⁶ Later, of course, the mouth of the Seine was the third region struck by aggressors in AD 841 when another aggressor sacked Rouen.⁹⁷ Finally, this AD 820 aggressor strayed as far west as the Atlantic Ocean, targeting a village in Aquitaine, and as the RFA report, “*Tandem in Aquitanico litore prosperis usae successibus vico quodam, qui vocatur Buyn, ad integrum depopulato cum ingenti praeda ad propria reversae sunt.*”⁹⁸ Indeed, the Loire is where Nantes is located, though Nantes itself was in Brittany, and is the fifth region struck in AD 843.⁹⁹ Thus, whoever led this successful raid would have regained fame and power at home, wherever home had become.

These three attacks constituted the second attempt the RFA record to raid the Carolingian Empire and were a foreshadowing of the raids to come throughout the coming century—perhaps even their locations. Like the ones in AD 810, they occurred during or immediately following natural disasters. Also, like the ones in AD 810, the evidence of political context,

⁹⁶ Kurze, RFA, 153-154. “When the Norsemen made similar attempts on the mouth of the river Seine, the coast guards fought back and the pirates retreated empty-handed after losing five men.” Scholz, RFA, 108.

⁹⁷ Nelson, AB, 50.

⁹⁸ Kurze, RFA, 154. “Finally on the coast of Aquitaine they met with success, thoroughly plundered a village by the name of Bouin [on the southern mouth of the Loire] and then returned home with enormous booty.” Scholz, RFA, 108.

⁹⁹ Nelson, AB, 55-56.

environmental conditions, the nature of the disasters themselves, and the specific situation of the raids combine to suggest that it is probable that the aggressors took military advantage of the weakness created by the natural disasters to choose the time and location of their attacks.

7.3 Conclusion

Once again, as with the raid of Dorestad and the Battle of Thimeon, a case study of these two sets of raids provides a broader understanding of the reported events. In all four cases, the political situation between the Carolingians and Scandinavians created a dangerous setting. In all four cases, a natural disaster created a weakness that would have given an aggressor a significant military advantage. Therefore, in each of these unique military situations, it is not merely possible but probable that the aggressor took advantage of these weaknesses in deciding where and when to attack. Accordingly, on a revised chart of the categories, these four cases all become corroborated anomalies, as shown in Figure 7-5 below. (Enlarged in Appendix 2).

Figure 7-5: Revised Chart of Examples of Scandinavian Aggressions and Disasters

Statistical Anomalies	Correlated Anomalies	Corroborated Anomalies
AD 837-8: Windstorms first winter/Walcheren and Frisia	AD 838 Huge tide covers Frisia December/AD 839 Frisia	AD 810: Cattle Plague throughout empire/Raids on Frisia
AD 839-40: Harsh winter/Rouen spring-summer	AD 843-844: Famine after war in Brittany/the first raids on Brittany	AD 820: Ruined harvest and plague/Raids on Flanders, Seine, and Bouin
AD 851: Harvest failure and famine of Sorbs/Frisia	AD 845: Cold winter and West Gaul Famine/Raids on Seine spring-summer, Aquitaine autumn	AD 834: Flooding throughout Carolingian Empire/Sack of Dorestad
AD 852: Excessive heat and famine/Seine	AD 846-847 Cold north wind in Troyes/scattered attacks directly north in Frisia	AD 880: Frozen Rhine and Main/Battle of Thimeon
AD 856-7: Human plague throughout /Five scattered attacks AD 857	AD 850: Rhine famine/Roric captures Dorestad	AD 886: Flood isolating tower under siege of Paris/Scandinavian aggressors capture them because of it.
AD 858-9: Human plague/Six scattered attacks AD 859	AD 863-864: Rhine flooding/first Rhine lootings since AD 859	
AD 863: Flooding and stormy winter/Frisia	AD 869: Loire and Burgundy famine winter/battle between Abbot Hugh and Gauzlin with "Loire Northmen" later that year	
AD 873: Locust plague and famine/Unclear number of aggressions and the siege of Angers	AD 878-879: Murrain autumn AD 878 prominently on Rhine/Scandinavian aggressors landing on the Scheldt July AD 879	

Moreover, with each of these case studies providing a firm link between a natural disaster and an attack, the further possibility exists that the many statistical and correlated anomalies categorised above but for which too little information exists to support further investigation might also be examples of Scandinavian aggressors exploiting a natural disaster in an attack and, therefore, that a natural disaster's exploitation might have been a well-established tactic in Scandinavian—and perhaps Carolingian—warfare.

Thus, one response to natural disasters in the Early Middle Ages was that Vikings exploited them to their military advantage in conducting raids on the Carolingian Empire. This response itself raises several additional questions and points to the possibility that this military tactic of the Vikings may have been part of a much larger strategy.

Chapter 8. Natural Disasters and the Pull of the Carolingian Empire

The analytical stages of this study begin with a re-evaluation of both sides of the central correlation equation: natural disasters and Scandinavian aggressions. In both cases, this required a shift in perspective. For natural disasters, the shift was from seeing natural disasters through a modern perspective as an event defined in nature to seeing them through a medieval perspective as an event defined by human experience. As discussed in Chapter One, reconceptualising natural disasters allowed the development of a working definition that limited the parameters of the investigation so that objective conclusions could be drawn from the data. For Scandinavian aggression, the shift was from viewing the aggressors as choosing their targets based on possible available booty to viewing them as choosing their targets based on their relative ability to defend. Thus, the causal relationship between natural disasters and Scandinavian aggression suggests a shift from seeing the aggressors as merely pushed out of their homelands to seeing them as actively pulled to specific locations. This approach contrasts sharply with most current scholarship, which focuses

on raids as prompted by a desire for certain resources but does not help explain why certain resource-rich locations were bypassed or why some of the earliest raids seem to have included the establishment of bases. Re-examining where and when the attacks occurred in the Carolingian Empire suggests that Scandinavian aggressions were not a series of raids that accidentally escalated then evolved into settlement but were instead at least roughly planned based on a set of criteria which can be deduced from the discovered data. These patterns indicate that the raids were a tactical feature of an overall strategic plan that may have been as bold as dominating the rivers of the Carolingian Empire and that opens an entirely new insight into the beginnings of the Viking Age.

8.1 Surveying Current Scholarship on Causes of the Viking Age

Most current scholarship does not ask why these Scandinavian aggressors went where they went but asks why they ventured out of their homelands in the first place. The hypothetical reasons for the exodus are hotly contested. Many theories have been advanced, but over the past few years these theories have coalesced into three major strands, all of which focus on the different raiders' social standing. The first strand, advanced by James Barrett and Ben Raffield, is that the need of young

men for bridal wealth was the major driver to begin these raids.¹ Other scholars such as Søren Sindbæk contend that the main driver was economic, with the introduction of Islamic silver into the north-western European market and the resulting rush to obtain it.² Finally, Stephen Ashby argues that the quest for social status may have been the primary motivator.³ Each of these three major strands raises important points but none is finally satisfactory.

Before advocating his own “bride price” theory, James Barrett helpfully discusses several other causation theories, all of which he discards one by one as inadequate.⁴ Two popular theories he categorizes not as causes but as necessary preconditions. The first he terms technological determinism, which relies on “inevitability” and theorises that the increase in Scandinavian activity resulted from the fact that Vikings had more advanced ships and used more successful sailing practices than other cultures. He points out, however, that ships had been a common means of transport for centuries and that

¹ Irene Baug et al., “The Beginning of the Viking Age in the West,” *Journal of Maritime Archaeology* 14, no. 1 (2019): 44; J. H. Barrett, “What Caused the Viking Age?” *Antiquity* 82, no. 317 (2008): 680; Ben Raffield, Neil Price, and Mark Collard, “Male-biased operational sex ratios and the Viking phenomenon. An evolutionary anthropological perspective on late Iron Age Scandinavian raiding,” *Evolution and Human Behavior* 38 (2017): 322.

² Baug et al., “Beginning of the Viking Age in the West,” 44.

³ Stephen Ashby, “What Really Caused the Viking Age? The Social Content of Raiding and Exploration,” *Archaeological Dialogues* 22, no. 1 (2015): 93.

⁴ Barrett, “What Caused the Viking Age?” 680.

the Vikings' eventual invasions were smaller than those of their Anglo-Saxon predecessors. Thus, technology alone cannot explain why these Scandinavian aggressors began their raids, although it does help explain their success.⁵

Barrett also contests the idea that ideological determinism can be considered a cause. He accepts that Scandinavian religious beliefs emphasized fate and the ultimate destruction of all creation. Nevertheless, he points out that a pagan warrior culture holding honour and fate as significant beliefs was not uniquely Scandinavian. Noting that the raids were dangerous, even deadly, for numerous warriors, he argues instead that this ideological mind-set may have been a necessary precondition to convince the leaders of these young men to undertake these often-fatal raids.⁶

Barrett then addresses several other factors that theoretically could be causes. Environmentally, one he discusses is the idea of climatic determinism. Climatic determinism is grounded in the idea that the Medieval Climate Anomaly created favourable conditions for settlement in Iceland and then Greenland.⁷ Barrett concedes that, indeed, the

⁵ Barrett, "What Caused the Viking Age?" 673.

⁶ Barrett, 680.

⁷ This period was first labelled the "Medieval Warm Epoch" by H Lamb in 1965. H.H. Lamb, "The early medieval warm epoch and its sequel", *Palaeogeography, Palaeoclimatology, Palaeoecology* 1 (1965): 13–37. However, Scott Stine pointed out in 1994 that the climate anomalies during

environment may have been warmer, but the question of when the Medieval Warming Period began is open, and the Vikings' most successful settlement in Iceland was established when the Viking Age was well in progress.⁸ Thus even assuming dates could be settled and the warming period did coincide with the settlement of Iceland, it explains nothing about the initial raids that began the Viking Age.

Another theory he describes as demographic determinism, a theory based on the idea that a population boom occurred at the end of the first millennium. Barrett disposes of this theory by citing evidence that even as the Viking Age began, the settled population in parts of Scandinavia was clearing forest and creating new settlements in their own homeland, suggesting there was plenty of room at home for whatever population increase occurred.⁹ Moreover, another scholar, Bjørn Myhre, notes there is no indication a population boom occurred in Norway because previously deserted farms were not repopulated.¹⁰

this time period did not involve *only* temperature and suggested another label, like such as the Medieval Climatic Anomaly, and this is now favoured. Scott Stine, "Extreme and persistent drought in California and Patagonia during mediaeval time," *Nature* Vol 369, no. 6481 (1994): 549.

⁸ Barrett, 678.

⁹ Barrett, 674.

¹⁰ Bjørn Myhre, "The Early Viking Age in Norway," *Acta Archaeologica* 71, no.1 (2000): 36-37.

Passing over for now Barrett's discussion of economic reasons leaves his views of political determinism and religion. Barrett is less dismissive of theories of political determinism. He agrees that political manoeuvres amongst the Danes might have ousted many Scandinavian leaders.¹¹ As Scandinavian kingdoms descended into violence, these disruptions would have increased and put minor leaders in danger of losing their significance within the larger Scandinavian world.¹² Consequently, these leaders may have turned to conquest.¹³ This may have, indeed, been a factor as the Viking Age continued, and Alan Macniven argues specifically that this may have been a reason Scandinavian leaders and their people migrated to the Hebrides.¹⁴ Thus, because of these elites' loss in status, the first raids became invasions and finally migrations.

Barrett briefly touches on a further theory—that the raids began as a heathen reaction to the spread of Christianity, with Bjørn Myhre theorising the raids were a final clash between the Germanic pagan north and the Christian south.¹⁵ According to

¹¹ Barrett, "What Caused the Viking Age?" 673.

¹² A. Macniven, "Modelling Viking Migration to the Inner Hebrides," *Journal of the North Atlantic* 2013, no. sp4 (2013):14.

¹³ Macniven, "Modelling Viking Migration," 13.

¹⁴ Macniven, "Modelling Viking Migration," 13.

¹⁵ Barrett, "What Caused the Viking Age?" 679-80; Myhre, "The Early Viking Age in Norway," 44.

the RFA, though, the only people who were still seriously resisting the Carolingian Empire's attempt to spread Christianity by AD 793 were the Saxons; most societies were accepting it willingly.¹⁶

Having dismissed all these theories, Barrett makes his own, more specific deterministic argument: Scandinavian political discord, which led to a wide variety of different leaders seeking new wealth and power, in combination with what he calls the "marriage imperative" began the Viking Age. To be able to marry, a groom had to pay a "bride price," which was some form of wealth such as money or property, to a woman's family. Barrett argues that since female infanticide would have been accepted in a culture that extolled the warrior male, there would have been a demographic imbalance between men and women.¹⁷ He then explains that according to the Youth Bulge theory warfare is often correlated to an excess number of young men, that this excess would mean there were not enough status roles for men to assume, and therefore that an excellent way to obtain the bride price would be through raiding.¹⁸ He claims that displaced elites would have had access not only to a willing crew imbued with a fatalistic, war-

¹⁶ Scholz, RFA, 71.

¹⁷ Barrett, "What Caused the Viking Age?" 677.

¹⁸ Barrett, 676-77.

glorifying ethos but also to the most modern ships and sailing techniques available. Barrett argues that this combination rather than any single factor is the most likely explanation of the beginning of the Viking Age.¹⁹

Even as Barrett pointed out the flaws in other views, his own position has flaws. Although political discord was rampant throughout the Viking Age, there is clear evidence that not all displaced Scandinavians took to raiding. As previously discussed, the exiled Danish king Heriold sought the help of Louis the Pious in retaking Danish territory after he fled to the Empire in AD 814.²⁰ As a man of the highest status, Heriold's actions show that Scandinavian leaders were not afraid of accepting help. Moreover, as Jesch notes, the evidence of a gender imbalance with men outnumbering women is disputed.²¹ She adds that linguistic and genetic evidence shows that many raiders did not return to Scandinavia to marry but settled in the places they raided and imported their own culture.²² Seeking wealth to pay a bride price, therefore, seems an insufficient explanation even for the beginning of the Scandinavian exodus.

¹⁹ Barrett, 680-81.

²⁰ Scholz, RFA, 97-99.

²¹ Jesch, *Viking Diaspora*, 107-109.

²² Jesch, *Viking Diaspora*, 108-109.

The second major strand of argument espoused by Søren Sindbæk and others considers the new importance of silver so significant that it might have been the driver to push the Viking Age into motion. During the seventh and eighth century, silver was scarce but in the late eighth century, Arabic dirhams began to be introduced in the Northern European market.²³ Silver grew in importance throughout the Viking Age not only for currency, but also for use in ritual.²⁴ It was valuable to North Europeans and Vikings both socially and monetarily, especially as portable wealth in long-distance exchanges.²⁵ Sindbæk notes these long distance exchanges could, indeed, be for durable wealth in marriage negotiations since, unlike land or cattle, silver would remain.²⁶ Whatever the case, this sudden influx of durable wealth, silver, might have both facilitated and driven such exchanges.²⁷

²³ Søren M Sindbæk, "Silver Economies and Social Ties, Long-Distance Interaction, Long-Term Investments – and why the Viking Age Happened," in *Silver Economies, Monetisation and Society in Scandinavia, AD 800-1100*, eds. James Graham-Campbell, Søren M Sindbæk and Gareth Williams (Aarhus, DK: Aarhus University Press, 2011), 48.

²⁴ Jane Kershaw, "Introduction: Economy, Currency, and Value in the Viking Age," in *Silver, Butter, Cloth: Monetary and Social Economies in the Viking Age*, eds. Jane Kershaw et al. (Oxford: Oxford Scholarship Online, 2019), 3. <https://oxford.universitypressscholarship.com/view/10.1093/oso/9780198827986.001.0001/oso-9780198827986-chapter-1/>.

²⁵ Sindbæk, "Silver Economies," 41-42.

²⁶ Sindbæk, "Silver Economies," 56.

²⁷ Sindbæk, "Silver Economies," 58-59.

Indeed, silver was important. But—returning to Barrett’s discussion of economic determinism—as Barrett had argued earlier a theory based upon a rush for silver discounts the fact that while the Viking raids may have been a benefit to the Scandinavian economy as silver became a more important commodity within the wider European market, the first targets of Viking raids were rural monasteries, not economic centres, and while these monasteries had some silver, they were not major sources.²⁸ Only much later did Viking attacks extend to urban areas, where the allegedly sought-after silver would have been more available. Thus, Barrett’s argument suggests that changes within the European economy cannot explain the emergence of Viking attacks.²⁹

In the third strand, Stephen Ashby shifts focus away from wider cultural pressures and changes to the ambitions of the first individual group leaders. Ashby observes that most theories about the beginnings of the Viking Age focus on macro theories instead of on the social status achieved by an individual Scandinavian aggressor who engaged in piracy. Ashby concedes the growing importance of silver in the economy and acknowledges that the targets of Scandinavian

²⁸ Dagfinn Skre “Towns and Markets, Kings and Central Places in South-western Scandinavia c. ad 800–950,” in *Kaupang in Skiringssal*, ed. Dagfinn Skre (Oslo, NO: Aarhus University Press, 2007), 449.

²⁹ Barrett, “What Caused the Viking Age?” 677-678.

raids in the beginning of the Viking Age were monasteries, which were weak militarily but held silver.³⁰ He notes, however, that aggressors did not steal just silver, and the evidence does not suggest that silver from monasteries was melted down and cast into new coin or other tradeable items.³¹ Ashby points to the work of social anthropologist Mary Helms which demonstrates that people gain a certain fame when they visit, explore, and occasionally attack unfamiliar lands or cultures and return with unique goods.³² In a still-pagan Scandinavia, among these rare goods would probably be Christian monastic “treasure”, and the distribution of furnished Scandinavian graves demonstrates they were treasure.³³ Those who gained treasure would also gain glory because they had dared attack the monasteries of powerful kingdoms, and the elite would want to follow.³⁴ These raids would have therefore instigated a “snowball effect” as more powerful aggressors began to attack as well—attacks that would eventually lead to conquests.³⁵ The first raids of monasteries at the end of the eighth century,

³⁰ Ashby, “What Really Caused the Viking Age?” 91-93.

³¹ Ashby, 93.

³² Ashby, 93.

³³ Ashby, 95-96.

³⁴ Ashby, 94.

³⁵ Ashby, 101.

therefore, spiralled into the Viking Age as the Scandinavian aggressors became more powerful members of the nobility who were more capable of attacking more significant places. Ultimately these raids evolved into conquest and settlement.³⁶

No doubt each of these strands of argument expresses some truth about the beginning of the Viking Age. All these theories, however, refer to what Barrett has described as the push side of a push/pull question. When discussing political determinism, he categorizes theories as applying either to “internal push” factors or “external pull” factors.³⁷ Thus, internal push factors are reasons that caused the Vikings to leave, such as centralization of power in the Scandinavian homelands. External pull factors are reasons that drew them out. In his review of theories about the rise of the Viking Age, Barrett finds only a single potential “pull” factor to discuss, namely the alleged political weakness of the kingdoms raided and then invaded by the Vikings. Barrett dismisses this factor as factually unsupported because the earliest raids were on the strong kingdoms of Mercia and the Carolingian Empire. He adds that while the situation in Ireland and Scotland was different because their political organizations consisted of chiefdoms, they did not present a “softer target” than

³⁶ Ashby, 101.

³⁷ Barrett, “What Caused the Viking Age?” 678.

neighbouring Scandinavian kingdoms because at the time they were organized similarly.³⁸

The three current strands of thought can be viewed through a similar push/pull lens. Thus, in each of the three major strands discussed here, the theory rests on a contention that the Vikings left home to find a needed or desired resource—bride wealth, silver, or treasure and social status.³⁹ But each of these theories is also essentially deterministic, suggesting that factors outside the individual will were the motivating force. This resulting lack of agency suggests a kind of victimhood in which the aggressors were cast onto the seas by wide-ranging factors beyond their control. To a certain extent, this is probably true. Nevertheless, it is also true for all human action, and for this reason if no other, these deterministic theories are not fully satisfactory. Moreover, while all of them offer reasons an individual might have chosen to undertake a raid once or even twice, they do not offer much explanation for why those same men decided not to go home with their booty but stayed in the foreign lands. Ashby mentions the spiralling concept—that after the first raids, subsequent

³⁸ Barrett, 678.

³⁹ Stephen Lewis has recently added that another resource Viking raiders may have been searching for was salt, especially in Aquitaine. Stephen M. Lewis, "Vikings in Aquitaine and their connections, ninth to early eleventh centuries," (PhD Thesis, Normandie Université, 2021), 77, accessed 14 January 2022, <https://tel.archives-ouvertes.fr/tel-03339358>.

raiders were more and more powerful and more and more aggressive, all the way up to conquest. Barrett and Macniven both argue that ousted leaders seeking new homes began raiding that evolved into migration. But there are lines between raiding and conquest and migration, and “resource hungry” theories do not offer a compelling explanation for the crossing of those lines.

In sum, a scholarship that focuses only on why the Vikings left their homelands fails to imagine the Scandinavian aggressor not merely as one who leaves but more importantly as one who goes. In other words, switching perspective and asking not why the Vikings left Scandinavia but instead why the Vikings went to certain locations is necessary to develop new insights about the beginnings of the Viking Age.

8.2 Determining the Viking Criteria for Choosing a Target

Thus, the analytical perspective must be reversed to focus on the *targets* of each of these raids and the commonalities these destinations shared. One obvious commonality in the Carolingian Empire is that until at least the AD 843 attack on Nantes, most subsequent targets were the exact same targets as the first sporadic raids in AD 810 and AD 820. But the more

precise criteria for a target can be summed up as one weakened by a natural disaster and located on a river estuary.

8.2.1 Natural Disasters

The first probable criterion of the Scandinavian aggressors has already been demonstrated. They repeatedly make the tactical choice to attack when the local population was more vulnerable because of a natural disaster. Data collected in the RFA, AX, AB, and AF confirms the correlation. Other annals support the evidence for this tactic even without a full charting. The *Chronicon Moissiacense*, which end in AD 818 and so went unstudied, records an additional raid late in AD 813. The *Chronicon* reports that Louis the Pious was crowned emperor in September AD 813. Sometime after this and immediately before Godofrid's sons defeated Heriold, a Danish leader raided Frisia.⁴⁰ The *Chronicon* does not record a natural disaster in late AD 813 but cross-referencing with other sources reveals unfavourable natural conditions. According to the OWDA, the summer of AD 813 had been unusually wet.⁴¹ The AX further report a harsh winter from the end of AD 813 into AD 814, during the time this raid would have occurred.⁴² Therefore,

⁴⁰ *Chronicon Moissiacense*, 280; 310-311.

⁴¹ Cook et. al., OWDA, 1-9.

⁴² von Simson, AX, 4.

Frisia, already prone to flooding, recently wet, and likely severely cold, would have been unusually vulnerable. While this by itself proves nothing and an attack would be difficult to achieve within the short timeframe, consistent with the natural disaster/aggression pattern revealed in other annals, an aggressor attacked.

If this happened once or twice, it would be coincidence, but natural disasters were not annual and all the early attacks on the Carolingian Empire follow this pattern. Vikings struck Frisia in AD 810 when the natural conditions were grim with below-norm temperatures, drought conditions, and a cattle plague that crippled Charlemagne's supply line. In AD 820, they attacked Flanders, the mouth of the Seine, and Bouin on the Loire during a failed harvest and human/bovine plague, both of which would have weakened a people's will to fight even though in this case they were only successful on Bouin.⁴³ And they sacked Dorestad in AD 834 during or shortly after massive flooding in the city and surrounding region had isolated Dorestad and left it a sitting duck. Thus, in each of these early raids, aggressors attacked a new territory weakened by a natural disaster. Moreover, these initial raids were the beginning of a pattern that continued with repeated sallies

⁴³ Chapter 7, section 1.

against these particular areas, the four major areas targeted over time in the Carolingian Empire.

After the AD 834 raid following massive flooding, Dorestad suffered annual raids by Scandinavian aggressors. Meanwhile, in AD 836, aggressors also targeted Antwerp.⁴⁴ As shown by the OWDA's map of AD 834 in Figure 6-6, Chapter 6, the area around Antwerp had almost certainly been affected by the AD 834 floods. In AD 835, the OWDA shows that the weather around Antwerp became arid.⁴⁵ In AD 836, the conditions normalised but after two years of climatic instability, the area around Antwerp would have been in recovery and an aggressor would have had much to exploit.⁴⁶ Consistent with the pattern, an aggressor then raided Antwerp.

In AD 841, twenty-one years after their first attack, aggressors again began to strike the Seine and its port, Rouen. Once more, this was soon after poor weather conditions around the territory and a natural disaster. Much of the Empire had been in drought conditions since AD 838, and the drought conditions around the Seine delta were extreme.⁴⁷ The Empire had suffered from a hard winter in AD 839 through AD 840. In

⁴⁴ Kurze, AF, 27.

⁴⁵ Cook et al., OWDA, 1-9.

⁴⁶ Cook et al., OWDA, 1-9.

⁴⁷ Cook et al., OWDA, 1-9.

AD 840 through AD 841, the drought conditions worsened, specifically in Brittany, but also reached into the territory surrounding the Seine estuary.⁴⁸ These conditions would have made the region especially vulnerable to attack.⁴⁹ Again, an aggressor then exploited this in the spring or early summer of AD 841 when he attacked Rouen.

In AD 843, the raid was seemingly on Nantes. Again, the region was unusually vulnerable, with the OWDA showing that the territory surrounding Nantes was likely in extreme drought conditions.⁵⁰ Then, to add to the region's vulnerability, it suffered from a famine caused by a rebellion.⁵¹ Thus, again, the natural conditions were grim, it was an excellent time to attack, and so an aggressor acted.

In each case, the tactic appears to have been to conduct a first raid after a natural disaster had made the area especially vulnerable and then to continue to raid a city or a region methodically, a tactic that has already been theorised to have been a softening-up strategy.⁵² Dorestad and Frisia suffered

⁴⁸ Cook et al., OWDA, 1-9.

⁴⁹ Nelson, AB, 50.

⁵⁰ Cook et al., OWDA, 1-9.

⁵¹ Nelson, AB, 55-56.

⁵² Mary Valante, "The Economics of Organizing 9th Century Viking Raids (Paper given at the *Fourth Annual Appalachian Spring Conference in World History and Economics*, Boone, NC, 2009), accessed 13 October 2019, <https://www.medievalists.net/2012/01/the-economics-of-organizing-9th-century-viking-raids/>.

annual attacks after the initial raids. After the AD 836 raid on Antwerp, the city remained absent from Carolingian annals until the tenth century.⁵³ Settlements on both the Seine and Loire were plundered almost annually after the first attack as well. Thus, the earliest raids, all conveniently tactically exploiting natural disasters, served as the thin edge of a wedge driven into the same crack over and over.

But why the same areas over and over? Ted Cowan has compared these wealthy targets to “drive-in banks” since they were rebuilt almost annually and thus a constant source of wealth.⁵⁴ And, indeed, they were probably a consistent source of wealth. This misses one point, though—if, indeed, the goal was mainly wealth, why did they *pass* other wealthy targets along the way? Why did they raid Rouen before Quentovic?⁵⁵ Or the Seine before the Somme?⁵⁶ While the locations they attacked are important, the locations they chose not to attack are equally important. Why not raid other cities or areas also conveniently weakened by natural disaster? Examining the data

⁵³ Tys and Wouters, “Antwerp (Belgium) – a 9th century Viking Town?” 199.

⁵⁴ Edward J Cowan, “The Vikings in Galway: A Review Of The Evidence,” in *Galloway: Land and Lordship*, eds. Richard D. Oram and Geoffrey P. Stell eds, *Galloway: Land and Lordship* (Edinburgh, UK: Scottish Society for Northern Studies, 1991), 66-67.

⁵⁵ For more on Quentovic, see Chapter 8, section 2.2.

⁵⁶ The first mention of Scandinavians on the Somme is in AD 859, where they plundered the monastery of St-Valery and the city of Amiens. Nelson, AB, 89-90.

from the perspective of the Scandinavian decision maker indicates that at least one additional criterion governed the choice: The target must be on a river estuary. This is not insignificant. Given the strategic importance of rivers in warfare, the fact the targets were river estuaries flips on its head the current understanding of the Viking Age in Carolingian Europe. Scandinavian aggressors do not disappear from the records of Carolingian Europe so early because the Carolingians unilaterally drove them out. Though in some cases, such as Brittany, the Scandinavian invaders were indeed defeated, in other cases such as in Normandy, Dorestad, and the territory around Antwerp, the reason they disappear is instead because they chose to assimilate—after they won.⁵⁷

8.2.2 River Estuaries

That the chosen targets were river estuaries is disguised by the way the annals describe the targets as being, for example, Frisia, Flanders, the Seine, and Aquitaine. When being more specific, the annals note attacks upon or capture of cities such as Dorestad, Antwerp, Rouen, Bouin, and Nantes. This approach is logical: as nobles within the Carolingian Empire, the annal writers would map the targets in terms of the political divisions of their culture.

⁵⁷ Fanning and Bachrach, *The Annals of Flodoard*, 30-32.

This political mapping has led many scholars to conclude that the intent of these aggressors was to raid cities and collect their wealth, for example when Barrett focuses on the acquisition of bridal wealth, Sindbæk on silver, and Ashby on the social capital of exotic treasure. This viewpoint is also reinforced by the fact that the people who recorded the raids were trying to denigrate their attackers by calling them heathens or pirates. Relying on the political mapping of these annals and taking the descriptions of the Vikings at face value, however, is a mistake in perspective that does not reveal any clear pattern supporting any of the above hypotheses. That mapping suggests only that the aggressors at the beginning of the Viking Age were moving westwards, perhaps testing how far they could go in the powerful Carolingian Empire with overtly malicious intents. More importantly, mapping the targets politically does not explain why other cities and areas were bypassed even though they too were rich in the desired resources and also made vulnerable by natural disasters.

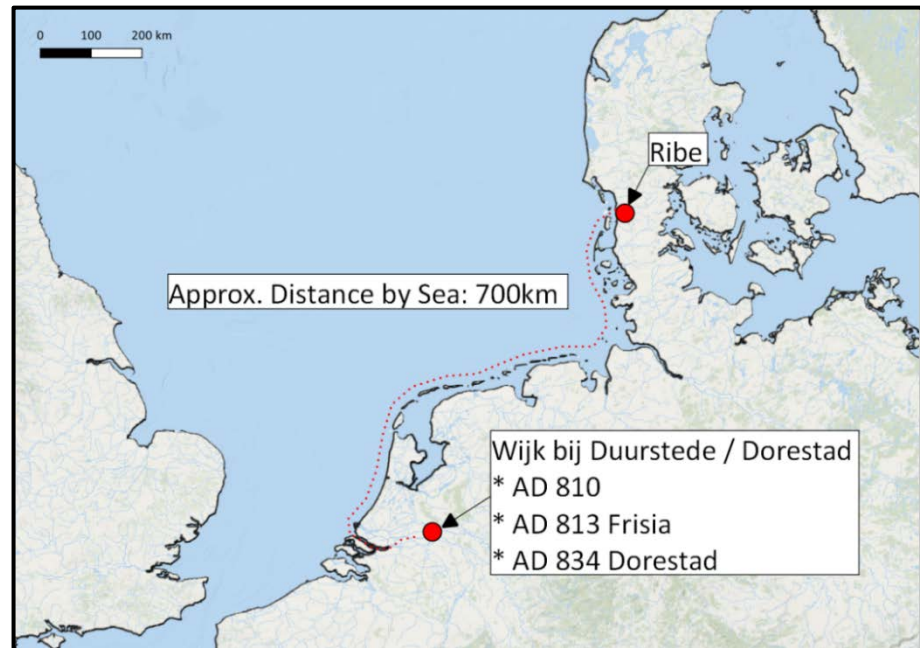
On the other hand, mapping the targets geographically and measuring the intervening distances reveals an extraordinarily clear, unambiguous, pattern. Creating useful maps, however, presents two immediate problems. First, it is not known and probably can never be known from which port or ports the aggressors sailed. Chris Cooijmans has even

theorised that the Vikings may have established multiple outposts on the Frankish coast to overwinter much earlier than these first raids, in which case there might not be a single place from which they travelled. This remains a theory, however, until confirmed by archaeology, and the important point here is the relative distances between the targets.⁵⁸ Therefore, the Danish port of Ribe on the west coast of Jutland served as the hypothetical launch-point since it was already a port in the Viking Age.⁵⁹ Secondly, it is impossible to know exactly what route the longships took except that it is likely they hugged the coast, a coast which would have been somewhat different at the time. Using Google Earth, however, provided a rough calculation of kilometres. And again, because the important point is relative distances, this was sufficient for comparison. Thus, as Figure 8-1 below shows, it is approximately 700 kilometres from Ribe to medieval Dorestad, which was located in Frisia and was also the first Carolingian city sacked.

⁵⁸ Cooijmans, *Monarchs and Hydrarchs*, 109-110.

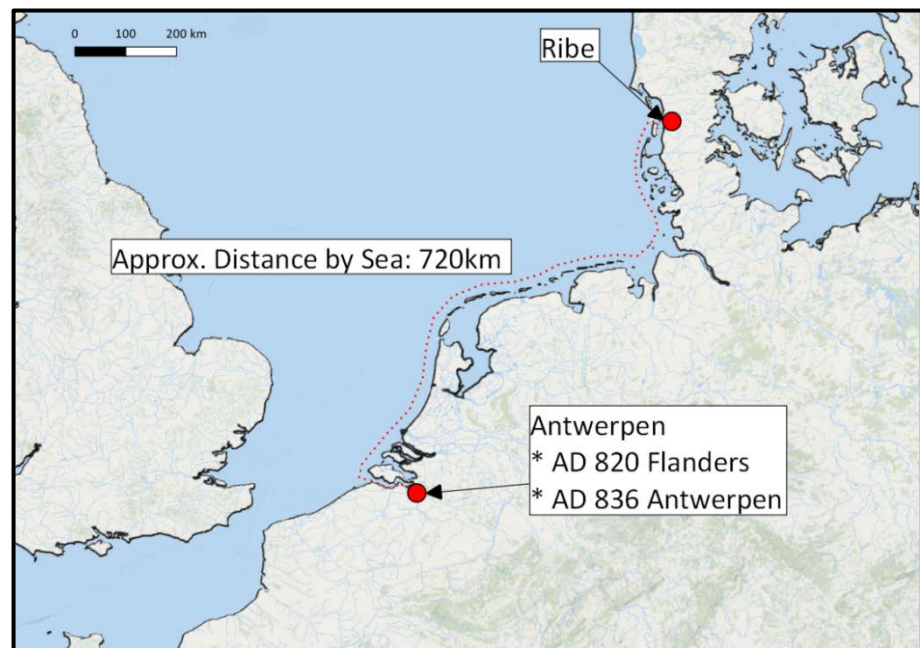
⁵⁹ Søren Michael Sindbæk, "Networks and nodal points: the emergence of towns in early Viking Age Scandinavia," *Antiquity* 81, no. 311 (2007): 121.

Figure 8-1: Distance to Dorestad



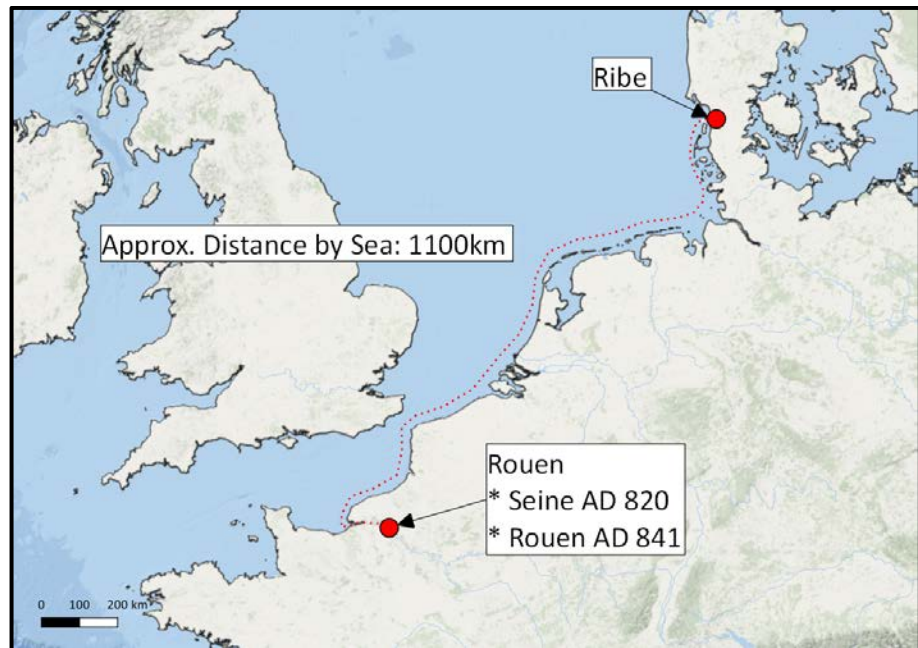
As raids continued on Dorestad and Frisia, the aggressors expanded westward in AD 836 by raiding Antwerp, which, as shown in Figure 8-2 below, would have been only twenty kilometres farther than the raid on Dorestad.

Figure 8-2: Distance to Antwerp



In AD 841, as shown in Figure 8-3 below, a Scandinavian aggressor raided Rouen after travelling even farther west—380 kilometres beyond Antwerp and 1100 kilometres from Ribe.

Figure 8-3: Distance to Rouen



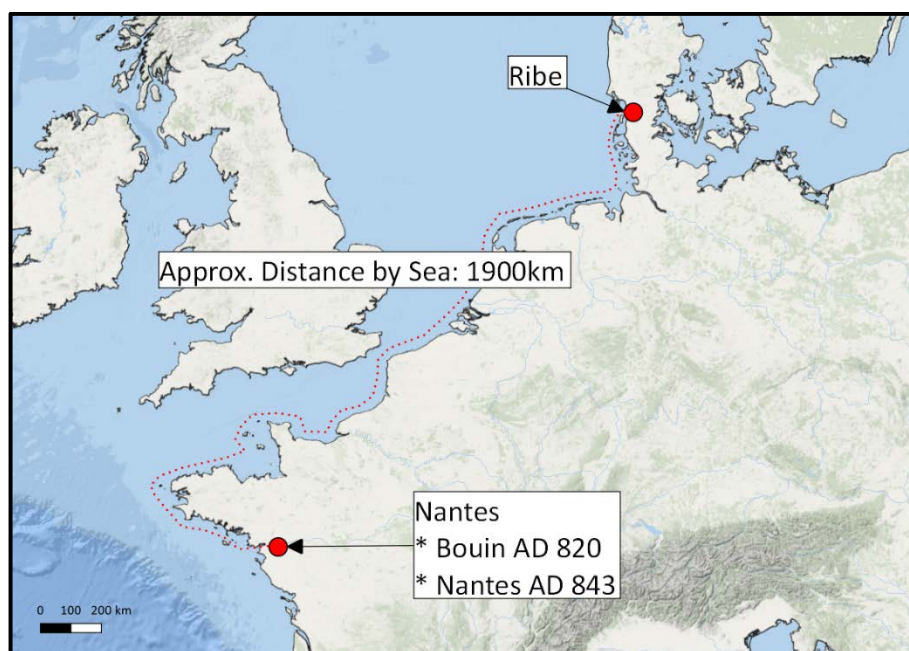
Moreover, the 380 kilometres of territory these coast-hugging ships bypassed was not empty. One wealthy city they would have passed was Quentovic, which served as both a trading centre and a connection with the Anglo-Saxon kingdoms, but for some reason they sailed passed it that year and waited until AD 842 to hit it.⁶⁰

In AD 843, an aggressor's fleet continued farther west through the Channel and along the Atlantic coast to raid

⁶⁰ Nelson, AB, 53.

Nantes. As shown in Figure 8-4 below, Nantes is 700 kilometres from Rouen and 1900 kilometres from Ribe.

Figure 8-4: Distance to Nantes

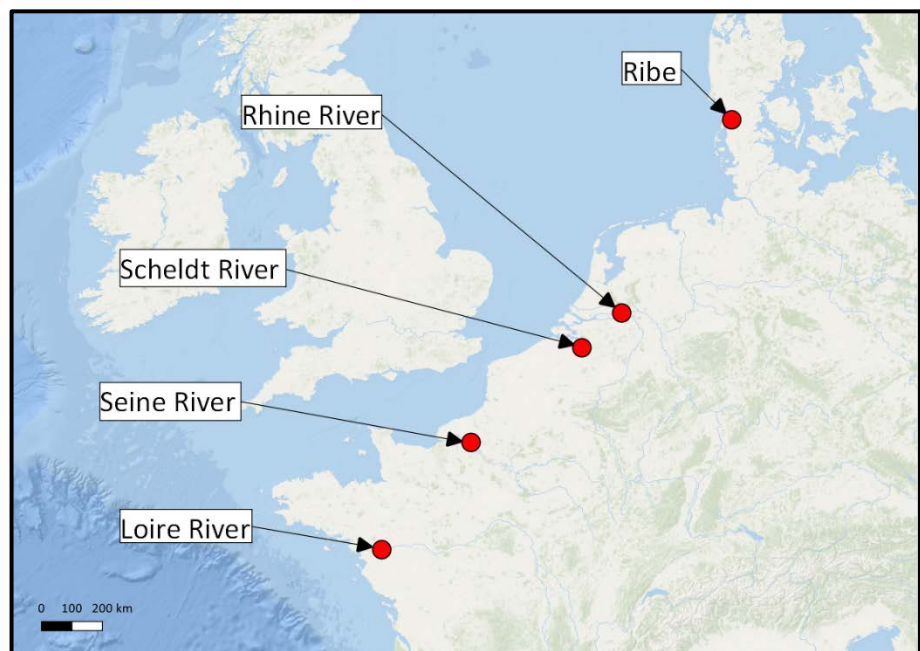


Importantly, to reach Nantes, unless there were intermediate outposts this aggressor would have had to sail all the way around Brittany, ignoring around 800 kilometres of the coast. Like the neglected territory between Antwerp and Rouen, the Breton coast was not deserted. In fact, in the tenth century, Scandinavian aggressors would unsuccessfully try to conquer and settle it just as Rollo had done in what became upper Normandy.⁶¹ But in AD 843, the aggressor chose to sail all the way around the Breton coast and plunder Nantes.

⁶¹Jean Renaud "The Duchy of Normandy" in Brink, *The Viking World*, 453-454.

Thus, the aggressors made the choice to sail hundreds of kilometres bypassing swaths of coastal towns, cities, and monasteries to attack—according to the annals—Dorestad, Antwerp, Rouen, and Nantes. Why these four cities? Because, as shown in Figure 8-5 below, each of them was at or near the mouth of the estuary of a major economically important *river*.

Figure 8-5: Rivers Targeted



Thus, the aggressors were not focusing on whether a location was in Frisia or Flanders, but on the regions' rivers. This is especially highlighted by the fact that the areas first targeted in the early raids were the same areas that suffered repeated attacks and each of these areas is the estuary of a major Carolingian river. The AD 810 and AD 813 raids are described in the RFA and the *Chronicon* as being in "Frisia". Dorestad, first sacked in AD 834, is in Frisia but more specifically it is also

on the *Rhine* at the confluence of the Waal, Lek, and Old Rhine. In AD 820, according to the RFA, thirteen ships first travelled to “Flanders”.⁶² Antwerp, attacked in AD 836, is in Flanders. More specifically, it is on the *Scheldt's estuary*. The RFA describe the next destination of these ships as the mouth of the Seine.⁶³ Rouen, sacked in AD 841, is on the *Seine estuary*, less than sixty kilometres inland. The final destination of the AD 820 raiders was Bouin.⁶⁴ The RFA note that this village was in Aquitaine but fail to state that it was also on the southern half of the Loire delta. Nantes, sacked in AD 843, is on the northern half, only forty-three kilometres north of Bouin.

Moreover, every river targeted in these first raids was a major one. The Rhine was not only one of the largest rivers in Europe, but it was also one of the most important for trade and communications within the Empire.⁶⁵ The Scheldt was similarly important, both for trade and as a political border.⁶⁶ On the Seine, Rouen, like Dorestad, minted coins.⁶⁷ Neil Price has called the Loire “one of the great arterial rivers into Francia,”

⁶² Scholz, RFA, 107.

⁶³ Scholz, RFA, 108.

⁶⁴ Scholz, RFA, 108.

⁶⁵ Chapter 6, section 2.

⁶⁶ Chapter 6, section 2.

⁶⁷ Simon Coupland, “Carolingian Single Finds and the Economy of the Early Ninth Century,” *The Numismatic Chronicle* 170 (2010): 298.

and regular dredging of the Loire has produced numerous historical artefacts, including coins.⁶⁸ Neglected Brittany has no river of equal significance.

Thus, shifting focus to examine the commonalities among the four major targeted areas of the Carolingian Empire reveals that the primary criterion for a target was that it was located on the estuary of a major river. When such a target was weakened by natural disaster, the Vikings struck. But why would the Vikings choose river estuaries? The logical explanation may lead to a rethinking of the reasons for the Viking Age.

8.2.3 Why River Estuaries?

The Viking focus on rivers is not surprising given that their mode of transportation was the longship. Longships were mobile and had a very shallow draft, allowing them to move quickly along shallow waterways or land on a beach.⁶⁹ Troops could enter the fray under adverse conditions with minimal disadvantages. Gareth Williams calls a raid the “Viking park

⁶⁸ Neil Price, “The Viking Conquest of Brittany,” in Brink, *The Viking World*, 458; Coupland, “Carolingian Single Finds,” 292.

⁶⁹ Per Werenskiold, “The Most Sophisticated and Successful High-Speed Ships for Their Time,” in *11th International Conference on Fast Sea Transportation: Honolulu, Hawaii, USA, 26-29 September 2011*, ed. Todd J. Peltzer (Alexandria, VA, US: American Society of Naval Engineers, 2011), 872.

and run approach” in that a longship could sail into a hostile situation, exploit it, and escape before local forces could be gathered.⁷⁰ Also, of course, many cities and monasteries were located on rivers. So if the longships were looking for booty, logically they would attack cities and monasteries along a river. Once again, however, these obvious advantages do not explain why the same areas were attacked over and over. Simon Coupland’s work offers a clue.

In addition to the rise of silver, a second major economic development was the adoption in various parts of Scandinavia of a mixed bullion/coin economy.⁷¹ Theoretically, therefore, portable wealth such as silver, bullion, and coin acquired through ransacking and ransom of cities and monasteries would have made its way back to the Scandinavian homelands. Simon Coupland notes, however, that during the time of these Carolingian raids, few portable Frankish coins returned to Scandinavia. In fact, he has found only five ninth-century Scandinavian coin hoards containing two or more Frankish

⁷⁰ Gareth Williams, “Raiding and Warfare,” in Brink, *The Viking World*, 197.

⁷¹ Dagfrinn Skre, “Viking Age Economic Transformations: The West-Scandinavian Case,” in *Viking-Age Transformations: Trade, Craft and Resources in Western Scandinavia*, eds. Zanette T. Glørstad and Kjetil Loftsgarden (Oxford: Routledge, 2017), 3.

coins.⁷² He believes those coins seem to have been gained from pillage, but finds surprising the fact that:

As Viking incursions increased [in the ninth century], and booty was taken in the form of goods, captives, and precious metals, including thousands of pounds of silver in tributes, we would expect a rise in the number of Carolingian coins turning up in Scandinavia. Instead, there is a marked decline, with few coins in hoards and hardly any single finds.⁷³

Coupland concludes that the Carolingian coins must have stayed in Carolingian Europe with the warbands.⁷⁴

This absence is unsurprising, however, given the evidence of the maps showing distances. With specific river estuaries targeted so carefully and consistently, it is clear that the raids were not merely a collection of disparate “pushed” tactical raids in search of resources. Instead, they were the first “pulled” strategic sallies in a series of planned invasions of the Carolingian Empire with the intent—and result—not just of taking home treasure but of taking a home and settling. Thus, the coins remained with the settlers. The significance of river estuaries, therefore, lies also in their importance from a military strategist’s perspective.

⁷² Simon Coupland, “Raiders, traders, worshippers and settlers: the Continental perspective,” in *Silver Economies, Monetisation and Society in Scandinavia, AD 800-1100*, eds James Graham-Campbell, Søren M Sindbæk, and Gareth Williams (Aarhus, DK: Aarhus University Press, 2011), 113.

⁷³ Coupland, “Raiders, traders, worshippers and settlers,” 114-116.

⁷⁴ Coupland, “Raiders, traders, worshippers and settlers,” 125-26.

A river, especially one on a coast, is one of the most advantageous positions in war, partly because a river itself is a natural fortification. As Clausewitz explains in *On War*, “If an army takes up a position a mile away from a coastline or a major river . . . the enemy will have no room to make a strategic turning movement” so that an army positioned on a river is difficult to dislodge.⁷⁵ Thus establishing a camp at the mouth of a river provides a virtually unassailable toe-hold into a territory. At each of the four major rivers targeted in the initial raids, this is exactly what the Scandinavian aggressors accomplished.

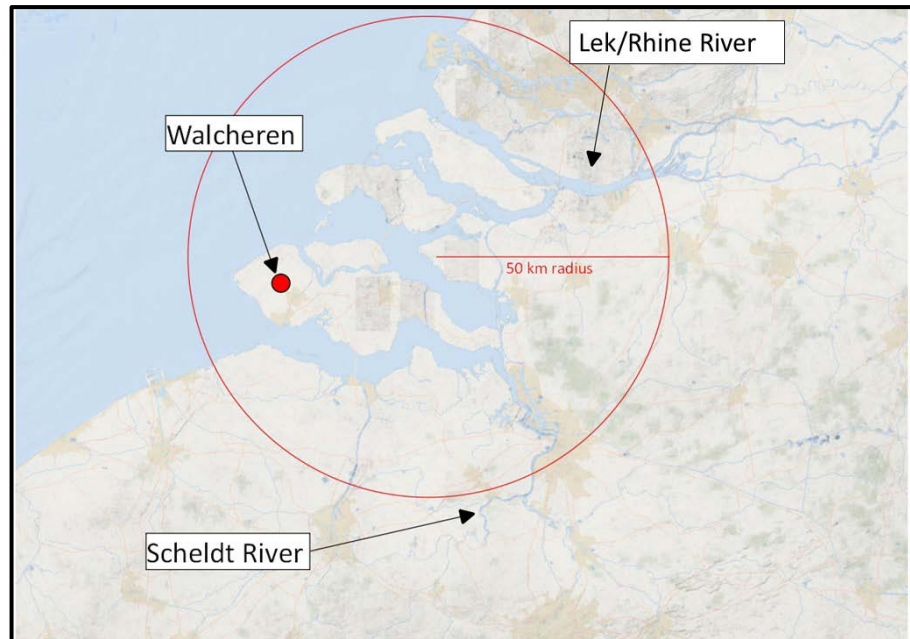
The Rhine and the Scheldt were the first to fall. After the early raids on Frisia following famine and plague and the first sacking of Dorestad after massive flooding, in AD 841 as the raids on Dorestad and its surrounding territory continued, Lothar granted a leader named Harald the island of Walcheren, currently on the mouth of the Scheldt, as well as “*aliaque vicina loca*,” surrounding territory. According to the AF, Harald had held Dorestad, which was on the Rhine, since before Louis the Pious died in AD 840. Therefore, this “surrounding territory” might well have included Dorestad and reached to the Rhine.⁷⁶ Figure 8-6 below shows the current location of Walcheren. (Its

⁷⁵ Clausewitz, *On War*, 299.

⁷⁶ Waitz, AB, 26; Reuter, AF, 30.

precise AD 841 location is not known). The circle indicates an area within approximately fifty kilometres of this island, a distance that a longship could easily travel in a day in calm weather, according to current research.⁷⁷

Figure 8-6: The Island of Walcheren on the Lek and Scheldt estuaries.



This area within this circle contains Antwerp, but also includes the mouths of the Scheldt and Lek, a river that becomes part of the Rhine specifically at *Dorestad*. (See Figure 6-3, Chapter 6 for more details). Thus, though the amount of territory Harald and Roric had taken alone made them powerful, a base on the island of Walcheren at the mouths of the Scheldt, Lek, and Waal would have been almost impossible for an approaching army to dislodge. Though Lothar apparently changed his mind

⁷⁷ Werenskiold, "The Most Sophisticated and Successful High-Speed Ships for Their Time," 876.

later and tried to imprison Harald and his brother Roric, Roric escaped and in AD 850 retook Dorestad by force, “*et [Lothar] alios comitatus largitur*”.⁷⁸ Though the AB do not specify exactly which counties Lothar granted Roric, by AD 855 Roric along with another Dane, named Godefrid, held control over most of “Frisia”.⁷⁹ Chris Cooijmans suggests Roric’s power even extended north to Lake Almere and south to the mouth of what becomes the Lek, as shown below in Figure 8-7.⁸⁰

Figure 8-7: “Proposed Extent of Roric’s Territory” based in Cooijmans, 2020, 76



⁷⁸ Waitz, AB, 38; Reuter, AF, 31. “[G]ranted him [Dorestad] and other counties”. Nelson, AB, 69.

⁷⁹ Waitz, AB, 46.

⁸⁰ Cooijmans, *Monarchs and Hydrarchs*, 176, fig. VI.7.

This would mean he controlled *every entrance to the Rhine*, the most important river in the Carolingian Empire.⁸¹ In any case, once Roric retook his territory on the Rhine, Lothar could not fight him and when Roric died by AD 882, he was still ensconced on the Rhine, while Antwerp on the Scheldt, only slightly southwest of the mouth that becomes the Lek, continued to be absent from Carolingian annals.⁸²

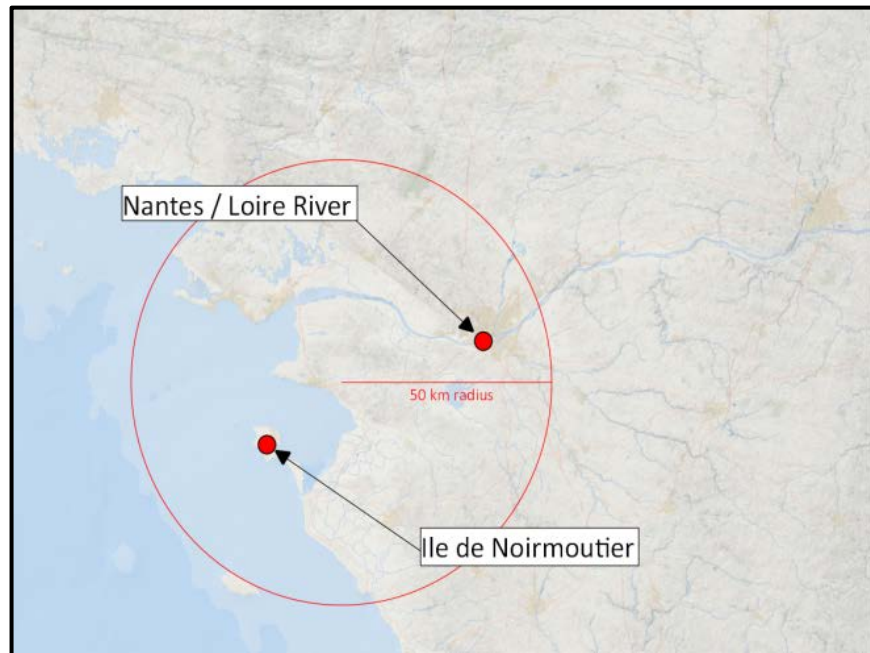
On the Loire and Seine, much less is known about exactly when aggressors won control of the two rivers' (much smaller) deltas. However, in AD 843, after the area suffered from a famine, the first fleet that attacked Nantes on the Loire established a settlement at an island slightly south of the mouth of the Loire that Nelson says was probably the Ile de Noirmoutier. Whether or not this base was indeed new, as Figure 8-8 below shows, the position of the island would make an attacking army's approach extremely difficult.⁸³

⁸¹ For a more detailed discussion of the importance of the Rhine, see Chapter 6, section 3.

⁸² Nelson, AB, 225.

⁸³ These raiders, the *Westfaldingi*, were Norwegian, and probably travelled to Aquitaine via Ireland. Lewis, "Vikings in Aquitaine and their connections," 58; Simon Coupland, "The Vikings in Francia and Anglo-Saxon England to 911," in *The New Cambridge Medieval History Volume 2: c.700–c.900*, ed. Rosamond McKitterick (Cambridge, 1995), 190.

Figure 8-8: Ile de Noirmoutier and the Loire



Particularly interesting, however, is the fact that these aggressors brought households and settled there for the winter in “*velut perpetuis sedibus statuerunt*”.⁸⁴ Almost invulnerable to attack, the aggressors were perfectly placed to continue to harass and gain more control of the river. And, indeed, in AD 853, they sacked Tours over 200 kilometres upriver, indicating that by that time they had probably taken complete control of the Loire’s mouth.⁸⁵

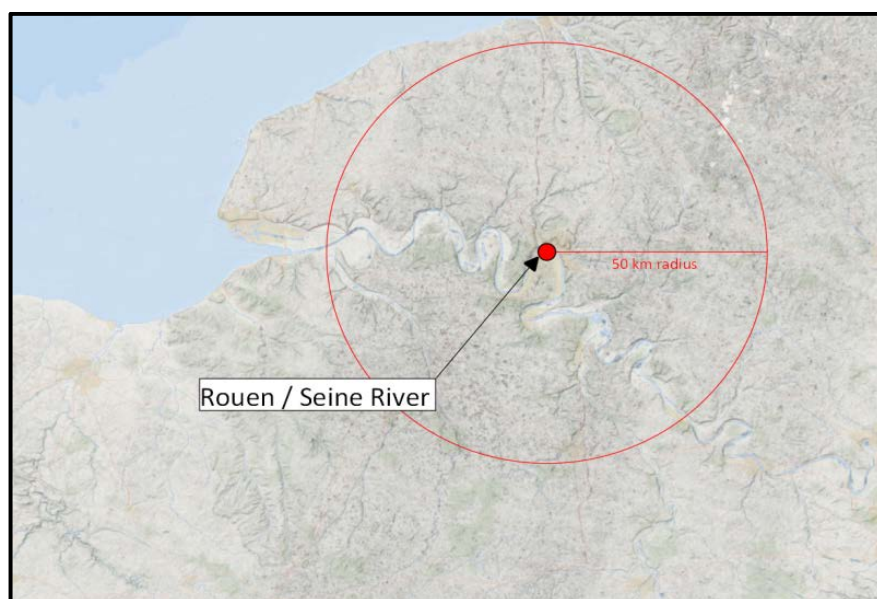
At the same time, aggressors were solidifying their complete control of the Seine’s delta. In AD 841, they took advantage of adverse weather conditions to sack Rouen. As

⁸⁴ Waitz, AB, 29; “Something like a permanent settlement”. Nelson, AB, 55-56.

⁸⁵ Nelson, AB, 77.

Figure 8-9 below shows, Rouen is strategically located on the Seine.

Figure 8-9: Rouen and the Seine



In AD 845, they attacked Rouen again then went on to Paris.⁸⁶ By AD 852-853, the aggressors had advanced upriver, probably to Jeufosse, halfway between Rouen and Paris, where they were secure enough to establish a base.⁸⁷ Charles the Bald attempted to blockade them but was unsuccessful and was eventually forced to strike a deal with an aggressor named Godefrid and let other aggressors winter on the Seine until March and plunder “*absque ulla formidine*”, without any fear.⁸⁸

⁸⁶ Nelson, AB, 60.

⁸⁷ Nelson, AB, 75.

⁸⁸ Waitz, AB, 42.

Thus within forty-five years of the first raid on the Carolingian Empire, Scandinavian aggressors had taken advantage of the weather to establish formidable bases at the mouths of the Rhine, the Scheldt, the Seine, and the Loire, and with the aggressors in such an advantageous position on each river's delta, the Franks had been unable to dislodge them. The prism of military theory suggests therefore that the repeated attacks against the same sites were not tactical raids for a resource but strategic assaults in a more long-term military campaign to establish permanent bases on these specific river deltas.

Establishing an impregnable base, however, was only the first step toward a larger goal. Again, being on a river was critical. In *On War*, Clausewitz discusses the importance of roads as an essential link between an advancing army and a base. A road should be wide, easy to travel, have some protection with garrisons, and should never be cut off.⁸⁹ Once Viking bases were established, the rivers became the roads along which their armies travelled with their clinker-built longships. Able to operate smoothly on wide rivers, these longships could often outmanoeuvre a Carolingian army attempting to attack them as when Charles the Bald attempted to blockade the Scandinavian aggressors on the Seine in AD

⁸⁹ Clausewitz, *On War*, 345-46.

852-853. The Carolingian ships were rivercraft with too deep a draught to land, and were captured and crushed.⁹⁰ Thus, having quick, safe travel and communication between the base and the advancing army not only allowed the Scandinavian aggressors to partially control the economic and communications networks of the rivers but it also strengthened their position locally on their nearly unassailable bases as well as over the Empire as a whole.

Because, indeed, it seems that their position over the Empire as a whole was the ultimate military goal. In a further discussion on the significance of rivers in warfare, Clausewitz discusses their importance in defence and control:

Nowhere can a fortress serve so many purposes or play so many parts as when it is located on a great river. Here it can assure a safe crossing at any time, prevent the enemy from crossing within a radius of several miles, command river traffic, shelter ships, close roads and bridges, and make it possible to defend the river indirectly—that is, by holding a position on the enemy's bank. It is clear that this versatile influence greatly facilitates the defense of a river and must rank as one of its essential elements.⁹¹

Each of these river bases, therefore, allowed the Scandinavian aggressors to occupy their estuaries and to travel far upriver to control more and more of the Carolingian Empire's territory.

⁹⁰ Simon Coupland, "The Carolingian Army and the Struggle against the Vikings," *Viator* 35 (2004): 63.

⁹¹ Clausewitz, *On War*, 399.

Just as the Rhine and the Scheldt were the first estuaries secured by the Scandinavian aggressors, this was also the area where the aggressors first secured official control of a Carolingian city. After receiving the “gift” of Walcheren and surrounding areas from Lothar and then being imprisoned as a traitor, Roric returned through the Rhine in AD 850 and retook the city.⁹² The AF report:

*[E]t cum a Hluthario principe sine periculo suorum non posset expelli, cum consilio senatus legatis mediantibus in fidem receptus est ea condicione, ut tributis ceterisque negotiis ad regis aerarium pertinentibus fideliter inserviret et piraticis Danorum incursionibus obviando resisteret.*⁹³

Thus, because Dorestad would have been an effective point of control on many more rivers than just the Rhine, Roric essentially returned stronger than ever with full power over the rivers he was “guarding” and eventually gained control of most of “Fresiae,” Frisia.⁹⁴ Thus, Roric became one of the most powerful men in the Empire.

On the Scheldt, after the AD 836 “raid”, archaeological evidence shows that Antwerp remained a busy port though the Carolingian annals never mention it again in the ninth century.

⁹² Kurze, AF, 39.

⁹³ Kurze, AF, 39. “Because the emperor Lothar was unable to drive him out without danger to his own men, Roric was received back into fealty on the advice of his counsellors and through mediators on condition that he would faithfully handle the taxes and other matters pertaining to the royal fisc, and would resist the piratical attacks of the Danes.” Reuter, AF, 30.

⁹⁴ Waitz, AB, 46.

Thus, while it cannot be known for certain that Antwerp was held by Scandinavians, it seems likely it was at least controlled by them. With Roric in Dorestad, Walcheren established as a Viking base on the mouth of the Scheldt, and by AD 879, a branch of the Great Heathen Army encamped at Ghent less than 100 kilometres upriver of Antwerp, Scandinavian aggressors would have been able to control who or what came and went to Antwerp.⁹⁵ This alongside their longships' mobility, would mean they would have been able to control the river as a whole. The original raids on Frisia would thus appear to be the first steps in an ultimately successful strategy to gain control of the north-western coast of the Carolingian Empire.

The strategy was similarly successful on the Seine. The mouth of the Seine was attacked in AD 820 after a plague and failed harvest, then Rouen was sacked in AD 841 after a major drought. Within ten years, they were able to settle on Jeufosse unrestrictedly. The ASC says that Rollo took over the army on the Seine in AD 876, and "ruled fifty years".⁹⁶ J. le Maho argues that Rollo soon began creating trade centres up and down the Seine, indicating that the Seine Vikings were actively

⁹⁵ Chapter 6, section 2.

⁹⁶ Swanton, ASC, 74.

controlling the river.⁹⁷ Then, after the Siege of Chartres in AD 911, according to Dudo Charles the Simple not only gave Rollo his daughter Gisela but also the city of Rouen and its immediate surrounding territory in return for his baptism and fidelity in the Treaty of St Clair-sur-Epte, territory which would eventually expand to become the duchy of Normandy.⁹⁸ Therefore, in AD 911, while, *prima facie*, Charles the Simple was *granting* what is now upper Normandy to Rollo, he was actually *surrendering* it. He was acknowledging Rollo as one of the most powerful men in what remained of the Carolingian Empire.

Rouen and the surrounding territory was a valuable prize. Topography alone suggests it could be easily fortified and would have reinforced the Scandinavian aggressors' control over the Seine delta.⁹⁹ With control secured, heavy settlement occurred, specifically around the port of Rouen, as shown in Figure 8-10 below.¹⁰⁰

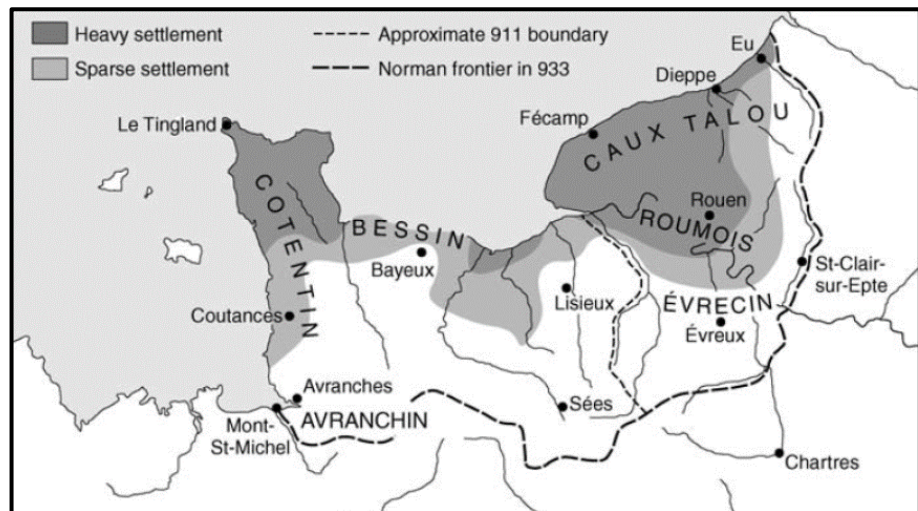
⁹⁷ Lesley Abrams, "Early Normandy," in *Anglo-Norman Studies 35: Proceedings of the Battle Conference 2012*, David Bates ed., 45-64. (Woodbridge, UK: Boydell and Brewer, 2013), 47

⁹⁸ Lifshitz, "*Dudo of St. Quentin's Gesta Normannorum*," accessed 22 May 2019, http://the-orb.arlima.net/orb_done/dudo/dudindex.html.

⁹⁹ Abrams, "Early Normandy," 48.

¹⁰⁰ Jean Renaud, "The Duchy of Normandy" in Brink, *The Viking World*, 453, Figure 33.1.1.

Figure 8-10: Successive borders of Normandy and Scandinavian place-name distribution. Renaud, 2012, 453.



Rouen also began minting its own coins, and Lesley Abrams posits the Normans were probably melting foreign coins into their own.¹⁰¹ These coins have been found in “northern England, the Hebrides, Denmark, and Russia,” showing that the Normans had Scandinavian allies and that Normandy remained connected to the wider Scandinavian world.¹⁰² Yet as Abrams notes, there is little evidence in Normandy of the mixed coin/bullion economy found in the Scandinavian homelands.¹⁰³ And though the fact that all these settlements retained a pan-Scandinavian cultural identity has recently led to the theory that these settlements formed a “diaspora”, Abrams notes that Normandy seems “the odd one

¹⁰¹ Abrams, “Early Normandy,” 47-48.

¹⁰² Abrams, 47-48.

¹⁰³ Abrams, 47.

out” because although place-names and coins show that Normandy was connected, few artefacts of a Scandinavian culture have been found.¹⁰⁴

Interestingly, a mirror version of this phenomenon found in archaeological investigations of Carolingian coins in Scandinavia adds another piece to the puzzle of “Why river estuaries?”¹⁰⁵ As discussed in Chapter 3, the Viking world was heavily connected through trade at the beginning, from Staraya Ladoga to Kaupang to Hedeby to Dorestad and farther.¹⁰⁶ Furthermore, once Scandinavian raids began on Carolingian Europe, one of the most common methods Carolingian kings used to ward off these raiders was through ransom. Therefore, there should be some evidence of Carolingian money whether through trade or plunder coming back to Scandinavia in the ninth century after these raids. Charles the Bald paid his first ransom in AD 845, after all.

Current archaeology in Scandinavia, however, does not support this conclusion. When explaining the mystery in his analysis of Carolingian coins in Scandinavia, Ildar Garipzanov begins by explaining that 125 Carolingian coins have been

¹⁰⁴ Abrams, 46-47.

¹⁰⁵ This mystery has already been referenced in Chapter 3, Section 3.5 and Chapter 8, Section 2.3.

¹⁰⁶ See Chapter 3, Section 3.5.

found in archaeological sites in Northern Germany, Denmark, Sweden, and Norway.¹⁰⁷ Of those, interestingly, eighty-four were minted in Louis the Pious' reign between AD 822 and AD 840, which would have been the same time that Scandinavian raiders were beginning to raid the northwest coast of the Carolingian Empire.¹⁰⁸ However, only eighteen coins have been found minted after AD 840, and only one of those, found in Sweden, was minted after AD 864.¹⁰⁹ For context, the raid that marks the beginning of continuous raids on the Seine was in AD 841.¹¹⁰ Of those eighteen, only six were found in Denmark and Norway, and the rest were found in Sweden and Northern Germany.¹¹¹ Therefore, paradoxically, as the raids were increasing in size, strength, and number, and the descendants of Louis the Pious began attempting anything at all to combat them, Carolingian coins returning to Scandinavia decreased then vanished. Why? Perhaps because the Scandinavians were successfully settling in the Carolingian Empire.

¹⁰⁷ Ildar H. Garipzanov, "Carolingian Coins in Early Viking Age Scandinavia (c.754-c.900): Chronological Distribution and Regional Patterns," 68. *Nordisk Numismatisk Årsskrift* (2003-2005): 68.

¹⁰⁸ Garipzanov, "Carolingian Coins in Early Viking Age Scandinavia," 68.

¹⁰⁹ Garipzanov, "Carolingian Coins in Early Viking Age Scandinavia," 68.

¹¹⁰ See Chapter 8, section 2.2 for more context.

¹¹¹ Garipzanov, "Carolingian Coins in Early Viking Age Scandinavia," 68.

All this evidence combined, therefore, does not suggest these particular Vikings were tactically seeking resources, whether it was a bridal price, the new Islamic silver, or the social status that came from the capture of exotic treasure. They were too independent and powerful. Instead, this evidence, again, suggests that although the Normans might have remained connected, they were strategically attempting to become a power in their own right and had been attempting to do so from the beginning. The same goal holds for the aggressors who controlled the Loire, those who eventually tried to take control of Brittany, and aggressors who took control of other rivers. Because they controlled traffic on these rivers, they had far more power than is immediately observable. Thus, viewing the decisions of the Vikings in Carolingian Europe under the light of military theory suggests that they intended to settle on and control particular rivers and thus potentially militarily dominate the Empire as a whole.

8.2.4. Following the Pattern Across the Viking Expansion

Parallel evidence for this identical, river-focused military strategy and ultimate goal can be found in cursory maps of Viking settlements within the Baltics, Ireland, and Scotland. Indeed, in *From Pictland to Alba*, Alex Woolf has already questioned the assumption that the early Viking attacks on the

Anglo-Saxon and Irish kingdoms were hit-and-run piratical raids. He notes that the *Historia Regum Anglorum* does not describe the raid on Lindisfarne as a hit-and-run raid, but instead as more akin to an unsuccessful invasion of Northumbria that included the sacking of Lindisfarne.¹¹² He also notes that although the first attack the Irish annals record in AD 795, an attack on the generalised “islands of Britain,” has been traditionally interpreted as many small-scale hit-and-run raids on different British isles, the Irish annals do not usually use such generalisations to describe such raids.¹¹³ This generalisation, however, does resemble an entry in the *Chronicon Scotorum* in AD 941, that notes an Irish king leading a fleet to invade the “islands of Alba” or the Hebrides. Therefore, this entry in AD 795 might actually be describing a large-scale Viking attack beginning on the Hebrides and continuing into Dal Riata.¹¹⁴ That the Vikings attacking the Baltics or the islands of Britain may have had a broader goal is supported by a similar river analysis.

In the Baltics, as previously discussed in Chapter Two, the Vikings first attempted to control the Vistula, a main artery of the Amber Way, with the settlements of Kaup and Truso,

¹¹² Woolf, *Pictland to Alba*, 43-46.

¹¹³ Woolf, *Pictland to Alba*, 45.

¹¹⁴ Woolf, *Pictland to Alba*, 45-46.

which were on the Vistula itself, and the settlement of Grobina, which was on a lagoon and thus would have served as a waypoint.¹¹⁵ If these settlements had lasted, the Vikings would have dominated this important trade route.¹¹⁶ On the Eastern Way, Lake Ladoga is also the mouth of the Volkhov River, the Eastern Way's entrance into Russia.¹¹⁷ Scandinavian control of the city of Staraya Ladoga thus gave them control of at least the Volkhov and therefore of the northern half of the Eastern Way. On the lower half of the Eastern and Daugava Way, Kyiv on the Dnieper River was an important waypoint for anyone travelling to the Black Sea or Constantinople. By controlling Kyiv the Vikings controlled the last half of both the Eastern and Daugava Way.¹¹⁸ See Figure 8-11 below.¹¹⁹

¹¹⁵ See Chapter 2.2.3.

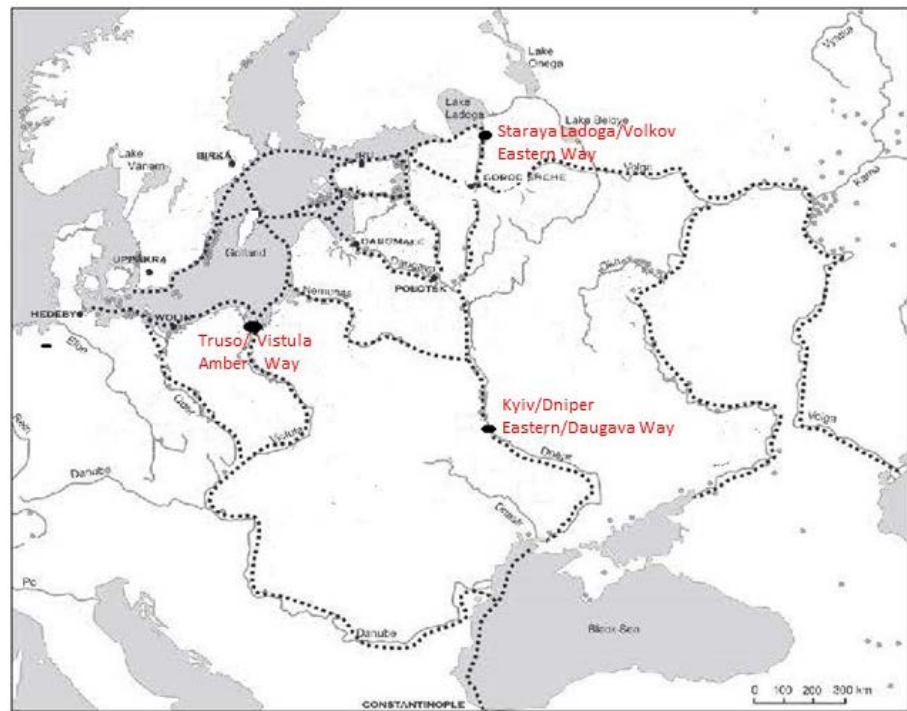
¹¹⁶ Mägi, *Viking Eastern Baltic*, 31. Also see Map 4.

¹¹⁷ Mägi, *Viking Eastern Baltic*, 31. See Map 4.

¹¹⁸ Mägi, *Viking Eastern Baltic*, 31. See Map 4.

¹¹⁹ From Mägi, *Viking Eastern Baltic*, 31, Map 4. (Labels Added).

Figure:8-11: Key Strategic Points in the Baltic in Mägi, 2019, 31



Thus, as in the Carolingian Empire, Viking settlement patterns suggest a goal to control the waterways and economy of the Baltics and possibly the entire region as well.

In Ireland, the locations of these *longphorts* fit into this theorised military strategy and ultimate goal as well. Although as per Alex Wilson the *longphorts* that grew into Norse towns would have given them easy access to the sea, their locations and fortifications noted by Patrick Wallace were also important strategically.¹²⁰ Located on river estuaries, the *longphorts* gave the Norse control not only over many entrances into Ireland, but also over the trade on these rivers and helped them dominate

¹²⁰ See Chapter 2, section 2.3.

the river as a whole. See Figure 8-12 below in which the names of the forts have been struck out to highlight the names of the rivers.¹²¹

Figure 8-12: The Rivers of Ninth-Century Viking *Longphorts* in Downham, “Vikings’ settlements in Ireland before 1014,” 7.



Since the Norse failed in Ireland to expand far inland, the fact they retained control of international trade well into the twelfth century, long after their military power had waned, shows how successful this strategy proved to be.

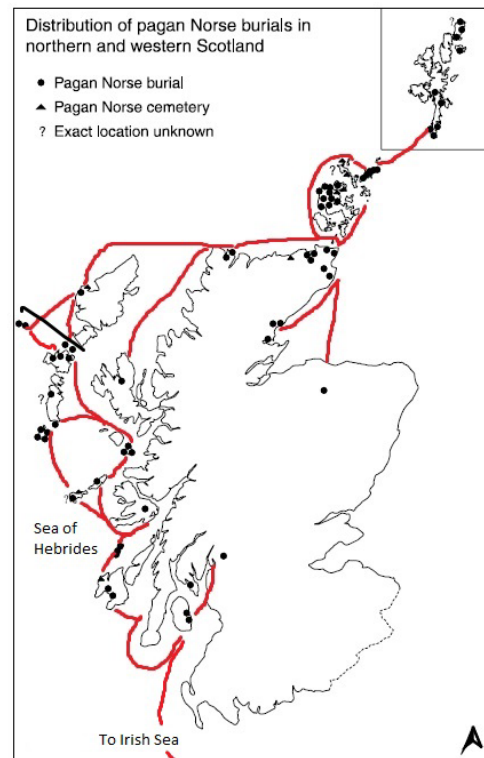
In Scotland the evidence is anything but clear, but interestingly, according to the map of Viking burials in Barrett's

¹²¹ Clare Downham, "Vikings' settlements in Ireland before 1014," 7. From Clare Downham, "Britain and Scandinavian Ireland: the dynasty of Iê'varr and Pan-Insular Politics to 1014," PhD Thesis, University of Cambridge, 2003. https://www.academia.edu/25550686/Vikings_settlements_in_Ireland_before1014. (Labels added).

article “The Norse in Scotland,” these burials form a distinct pattern of waypoints for any ships travelling from Scandinavia through the sea of Hebrides towards the Irish Sea:

See Figure 8-13 below.¹²²

Figure 8-13: Pagan Viking burials in Scotland in Barrett, 2008, 417



Although in this case the burials do not seem to support a “river-based” strategy, they do show quite starkly that the the Vikings had clear control of the Sea of Hebrides and the Irish Sea, and so would have dominated the area between Scotland and Ireland as a whole.¹²³

¹²² Barrett, “Norse in Scotland,” 417, figure 30.3. (Labels added). Barrett cites T. Simpson after James Graham-Campbell and Colleen Batey, *Vikings in Scotland: an Archaeological Survey* (Edinburgh, U.K.; Edinburgh University Press, 1998), 115, fig. 7.1.

¹²³ For more on settlement patterns with Scotland, see Chapter 2, section 2.2.3.

In addition to this parallel in terms of the location of river bases, the trend of mysteriously missing artefacts is echoed to a lesser extent in the archaeological excavations of insular artefacts. In Kaupang, Norway, although archaeologists have been able to uncover many Islamic dirhams, not only have they been unable to find one Carolingian coin minted after the reign of Louis the Pious, but they have also been unable to uncover many Anglo-Saxon coins, and all these coins were minted sometime between AD 798 and AD 821 under the reign of Coenwulf of Mercia.¹²⁴ Archaeological excavations in Trøndelag, Norway, tell a similar story.¹²⁵ Although the ASC do not record any raids on what is now England between AD 794 and AD 832, the royal diplomas of Mercia and the raids recorded in the Irish kingdoms imply that the attacks must have been fierce.¹²⁶ These early unrecorded raids are reflected in the Trøndelag excavations, where archaeologists have found numerous Anglo-Saxon and Irish artefacts made in the first half of the ninth century. In contrast, they have found far fewer artefacts made in the second half, the time when the Great Heathen Army was invading England and Ívarr's dynasty was

¹²⁴ See Chapter 3, Section 3.5; Blackburn, "Coin Finds," 69-70.

¹²⁵ See Heen-Pettersen, "Insular artefacts from Viking Age burials from mid Norway," 1-38.

¹²⁶ See Chapter 2, Section 2.1.2.

entrenching itself in Dublin. In many locations, by the tenth century even these have vanished.¹²⁷ Thus, for many Vikings, by this time Trøndelag was no longer home.

Therefore, the settlement patterns in Carolingian Europe, the Baltics, and Ireland parallel each other, with each settlement coincidentally placed in a strategically astute position to dominate rivers and control trade. The patterns of Carolingian and Anglo-Saxon artefacts in Scandinavia parallel each other as well, with Carolingian coins, so numerous during Louis the Pious' reign, coincidentally vanishing from all archaeological excavations in Scandinavia at the same time the raids on Carolingian Europe became common, just as so many insular artefacts, numerous during the first half of the ninth century, coincidentally decline then vanish from many archaeological excavations at the same time that the Anglo-Saxon and Irish kingdoms were being invaded. This implies the various Scandinavian aggressors had similar strategies and similar goals.

This is not to suggest, however, that the various Scandinavian aggressors were united or got together and agreed on this approach. Instead, it seems more likely that each location attracted a different group. The hydrarchy theory

¹²⁷ Heen-Pettersen, "Insular artefacts from Viking Age burials from mid Norway," 30.

advanced by Neil Price and Chris Coijmans supports this concept in some ways with one important adjustment. This new theory on the Scandinavian men who began conducting these raids holds that they were some form of pirate gangs who started off as local farmers.¹²⁸ Price uses the metaphor of a Greek “hydra”: when one hydra head was cut off, several more heads grew in its place.¹²⁹ Focusing on Viking bases established at the Seine, Loire, and Somme, Price argues that if a ship was destroyed, the society continued unabated.¹³⁰ Price suggests that these were therefore independent communities, not just militaries.¹³¹

In many ways, Price’s model fits what happened as the Viking Age progressed. Indeed, the leadership was fluid. For example, in AD 884, the aggressors on the Scheldt and Meuse split smoothly with some returning to the Anglo-Saxon kingdoms; the community, however, continued.¹³² The problem with the hydrarchy theory, however, is that it begins in the assumption that the Vikings were basically pirates. Price

¹²⁸ Neil Price, “Ship-Men and Slaughter-Wolves: Pirate Politics in the Viking Age,” in *Persistent Piracy: Maritime Violence and State-Formation in Global Historical Perspective*, eds. Stefan Eklöf Amirell and Leos Müller (London: Macmillan, 2014), 57.

¹²⁹ Price, “Ship-Men and Slaughter-Wolves,” 56.

¹³⁰ Price, 56.

¹³¹ Price, 59.

¹³² Swanton, ASC, 79.

acknowledges that the images of these armies are somewhat created by their victims.¹³³ Furthermore, military theory demonstrates that piracy was far from the whole story.

Indeed, returning to Barrett's class distinction between elites and crew is helpful. Clearly the tactics and strategy apparent in the Carolingian Empire could not have been led by local farmers.¹³⁴ And while minor chiefs surely joined the raids as the ninth century continued and perhaps even contributed to the bulk of raids, it is unlikely they began them. Receiving the information that these disasters had taken place in these carefully chosen targets and then being able to respond quickly would take many resources, resources Jan Bill notes were scarce.¹³⁵ Launching at short notice required longships already built and preferably loaded with supplies as well as a capable crew immediately on hand. These upfront resource and readiness requirements do not suggest farmers or even minor chiefs and certainly do not support the idea of a sudden or random decision to raid. Moreover, the distances travelled between the first few targets, from the raids in AD 810 throughout at least AD 843, suggest a skill level and planning that does not fit with a pattern of aggressors intent only on

¹³³ Price, 57.

¹³⁴ Price, 57.

¹³⁵ Bill, "Viking Ships and the Sea," 170-71.

plunder. With each voyage, these men had the resources and ability to sail past wealthy settlements, target major rivers, and succeed.

It is true that these armies formed into independent “hydra” communities separate from other Scandinavian groups over time. And, as Price indicates, each of these Viking bases or armies operated throughout the ninth century and into the tenth before each was swallowed up into society and began to both exert political leverage and convert to Christianity. From this evidence, Price contends that Viking piracy on the Carolingian Empire ended as they became established powers.¹³⁶

The assumption, however, that the early raids on Carolingian Europe beginning in AD 810 were mere piracy is highly questionable. The settlement patterns on Carolingian river estuaries fit into a clear pattern: as demonstrated by the settlement patterns in Carolingian Europe, as in the Baltics, Ireland, demonstrate a conscious military strategy in every kingdom or territory, and this would have taken many resources to achieve. Using this strategy, Scandinavian aggressors dominated the Baltics, created their own kingdom in Ireland, and fought the Anglo-Saxons for more than two centuries. The Anglo-Saxons, in response, united into England; the

¹³⁶ Price, “Ship-Men and Slaughter-Wolves,” 64.

Carolingian Empire fell apart. So how did the Carolingians survive and defeat the Vikings?

The simplest answer is that they did not, but the Empire's structure and the fact that it was already falling apart have hidden this fact. Indeed Woolf, in his discussion of Northumbria, has observed that there is evidence that the Great Heathen Army that invaded England might have been a *portion* of Roric's army that had first invaded Frisia.¹³⁷ If so, this means that Roric was far more powerful than the more-famous Halfdan or Guthrum. Nevertheless, the Scandinavian aggressors who took control of the rivers of Carolingian Europe chose to swear allegiance to their nominal kings instead of officially establishing their own kingdoms. Since the Vikings did not call themselves kings, Carolingian authors were excused from considering them to be kings and so could focus on the fraternal rivalry that would eventually tear the Empire apart.

All of this evidence together demonstrates that by the time Vikings began attacking Carolingian Europe they were probably not pirates, and this alongside the questions surrounding Lindisfarne as well as the eerily similar raiding and settlement patterns between the Carolingian bases, Baltic colonies, and Irish *longphorts* reinforce the fact that they may never have been. Although gaining wealth or social status

¹³⁷ Woolf, *Pictland to Alba*, 71-72.

would be beneficial, especially for the crew, surprisingly little of it returned to Scandinavia and the commonalties and qualities of the targeted terrain imply that the leaders of the Scandinavian aggressors were not focused on wealth, but instead were ultimately seeking power and control. Although this strategy seems not to have worked in Brittany and Aquitaine, it was extraordinarily successful elsewhere, allowing the Scandinavians to create their own domains within the Empire and throughout Europe as a whole.

8.3 Revisiting the Pull Concept

Rethinking the evidence thus opens a new perspective on the origins of the Viking Age. Though examining this new perspective in depth is beyond the scope of this study, it seems clear that the Scandinavian aggressors were acting not merely in response to factors that may have tempted them to leave their homes but also in response to factors that pulled them to specific locations.

Barrett rejected the concept of a pull, particularly toward the Carolingian Empire, because, according to him, the Empire and Mercia, another early target, were “strong”. Rejecting this concept out-of-hand allowed him to focus only on “push” theories. But Barrett’s rejection fails to consider the political

conditions within the Empire and neither defines nor examines the concept of strength.

A thorough examination of the political conditions of the Empire at the time reveals that some of the earliest Danes probably took advantage of natural disasters to begin raiding the Carolingian Empire despite its alleged strength, either to signal the Empire not to interfere in its own political situations or to retaliate for this interference. The similar patterns in the situations and locations of these Scandinavian attacks are simply too convenient. In AD 810, Charlemagne's relations with the Danes were so tense he was considering war, but a cattle plague crippled his army's supply line and the raid in Frisia wiped out any momentum he would have had. In AD 813, the Danes were involved in a power struggle, but the situation in the Empire was also unstable since Louis the Pious had just been crowned and the Empire was suffering a hard winter. The raid, again, would have been a clear signal to the Empire to stay out of its business. In AD 820, Louis' pick Heriold had just gained control of the Danes, but two disasters impaired the Empire's ability to defend itself, and Heriold's enemies needed to survive. The post-flood AD 834 sacking of Dorestad came after Godofrid's sons expelled Heriold and while Louis the Pious was in an ambiguous power position, so ambiguous that by AD 838, Horic could insult Louis the Pious, sending an

emissary to report he had hanged the AD 834 raiders and wanted peace—together with Frisia and the Obodrites.¹³⁸ None of this shows Carolingian strength.

Moreover, the concept of strength must include the ability to effectively respond to attack and, unlike the Anglo-Saxons and the Irish, the Carolingian Empire repeatedly failed this test. The first attack was while the Empire was unusually weak: Charlemagne could not advance when the cattle plague destroyed his supply line. But in the raids that followed, the Empire continued to be unable to respond effectively. Thus, when Louis the Pious or Lothar first recruited Roric and Harald, specifically described by the AB as a former aggressor, to “protect” Dorestad, Roric and Harald won a *de facto* victory.¹³⁹ Later when Roric retook Dorestad, the AF report that Lothar could not drive him out “without danger to [Lothar’s] men”, suggesting that Roric was decidedly stronger militarily than Lothar.¹⁴⁰ Indeed, as noted above, he might have been so strong that only a portion of his men nearly conquered Anglo-Saxon England.

Matters were no better with Charles the Bald. Simon Coupland notes that the three defence tactics employed by

¹³⁸ Nelson, AB, 40.

¹³⁹ Nelson, AB, 51.

¹⁴⁰ Reuter, AF, 30.

Charles the Bald included the “fortification of bridges, the payment of tributes and the hiring of Viking leaders as mercenaries”.¹⁴¹ Taking these tactics in reverse order, it is clear that mercenaries did not always remain loyal. For example, the AB report that an AD 860 agreement to attack Scandinavians on the Seine made between Charles the Bald and Danes on the Somme was based on “empty promises”, suggesting that the Somme Danes did not uphold their end of the bargain.¹⁴² The AB also report as a “trick” the conversion to Christianity of a Scandinavian aggressor named Weland, sworn in by Charles the Bald in AD 862, again suggesting a deal that fell through.¹⁴³ And while Roric and Rollo swore allegiance, it was only after they won control over a significant amount of territory. Tribute, Coupland says, was an “effective but expensive expedient” but it did not halt the continuing attacks.¹⁴⁴ In fact, an argument could probably be made it encouraged them just as any successful blackmail encourages repeated demands for money. Thus, out of the three tactics

¹⁴¹ Simon Coupland, “The Carolingian Army and the Struggle against the Vikings,” 50.

¹⁴² Nelson, AB, 92.

¹⁴³ Nelson, AB, 111.

¹⁴⁴ Simon Coupland, “The Fortified Bridges of Charles the Bald,” *Journal of Medieval History* 17, no.1 (1991): 1.

Coupland names, only fortified bridges are not *de facto* defeats. Again, this does not suggest a strong Carolingian Empire.

A modern proverb holds, “Generals always prepare to fight the last war.”¹⁴⁵ Many modern examples of this proverb exist. For example, all sides in WWI began fighting the war using the closed formations proven successful in the Napoleonic Wars but unsuited for the machine gun. And again, the Allies in WWII were fully prepared to fight a lengthy war of attrition with tanks as imitations of defensive pillboxes and cavalry, but unprepared for the quick overwhelming military strike of the German Blitzkrieg.¹⁴⁶ In an even clearer example, in the Vietnam War, the United States military did everything it needed to do *tactically* and *logistically* to win almost every clear battle.¹⁴⁷ It did not win *strategically*, however, despite its superior military technology and success in many battles because it was unprepared for the tactic of guerrilla warfare. Becoming too involved in attempting to overcome this

¹⁴⁵ Charles Clay Doyle, Wolfgang Mieder, and Fred R. Shapiro, *The Dictionary of Modern Proverbs* (New Haven: Yale University Press, 2012), 94.

¹⁴⁶ Chuck Werchado, “A Century Later: The Analytic Lessons of World War I,” *Phalanx* 47, no. 3 (September 2014): 26; Sean McKnight, “The Fall of France 1940—Blitzkrieg in the West,” in *The Hutchison Atlas of WWII Battle Plans: Before and After*, ed, Stephen Badsey (New York: Helicon, 2000), 19-20.

¹⁴⁷ Harry G. Summers, *On Strategy: Critical Analysis of the Vietnam War. Kindle Edition* (New York: Random House, 1995), loc. 120-126.

unexpected tactic, it lost its strategic focus on protecting South Vietnam as a nation and thus the overall war.¹⁴⁸

Despite their reputed strength, the Carolingians played the role of the generals of the proverb and failed to develop an effective defence against the Vikings' militarily astute strategy. Certainly, the Scandinavian aggressors themselves also suffered many defeats and were often forced to retreat to their island bases. In fact, Coupland argues that the Carolingian army matched the Vikings and the idea that the Vikings were more able than the Carolingians is a misconception. He notes many Carolingian victories then opines, "This list of triumphs over Viking armies would also undoubtedly be longer were it not for the raiders' frequent avoidance of battle."¹⁴⁹ But one reason the Carolingians were unable to engage the aggressors was likely the inability of their men to assault the Viking camps, tactically placed in the ideal military situation of a river estuary.¹⁵⁰ Moreover, the argument that the Carolingians were ready for the Vikings is based on a fundamental error. As exemplified by the draconian measures Charlemagne took to subdue Saxony, a war is not won through winning battles but

¹⁴⁸ Summers, *On Strategy*, loc. 1584-1615.

¹⁴⁹ Coupland, "The Carolingian Army and the Struggle against the Vikings," 67.

¹⁵⁰ Coupland, "The Carolingian Army and the Struggle against the Vikings," 70.

through exploiting these victories to break a people's will to fight. Therefore, each battle must always be viewed within the wider context of the strategy behind a full-scale military campaign. The strategy of the Viking's military campaign was to exert control over the major waterways of the Carolingian Empire. In that campaign, the Carolingians lost.

Thus, while the tactics with which wars have been fought have changed over the past millennium, what a war is has not, and the same was true here. Even the Carolingians' many individual victories failed to stop a wider military campaign with an overall strategy focused from the beginning on attacking the Empire's most significant river deltas and their ports and gaining control. The aggressors started with the Rhine, migrated to the Scheldt, then went farther west into the Loire and the Seine where Charles the Bald was prepared to fight with rivercraft but woefully unprepared for the longship. And so the Vikings continued to succeed.

Thus, an accurate assessment of "pull" factors cannot end with the simple statement that the Carolingian Empire was strong. That these aggressors were able to raid successfully at all against such a seemingly powerful Empire must itself have been a major pull factor. In the four raids from AD 810 through AD 834, the aggressors discovered the successful tactic of carefully choosing the times and place to target—after a natural

disaster had devastated a major river's estuary. That they could continue to harass and at least partially control these river mouths and that the Carolingians could not fight back would have continued to pull them and to bolster confidence in the overall strategic goal of dominating the rivers and thus major parts of the Empire. Not every Scandinavian aggressor won, but every ransom paid and every mercenary hired constituted a success. Although only the Seine Vikings won so much control that a region was named after them, in the first half of the Viking Age, from AD 793 through AD 911, victory would have had a sweet taste that pulled the winners again and again to take another sip.

8.4 Conclusion

Thus, this inquiry into the impact of natural disasters in the Early Middle Ages leads to rethinking the beginning of the Viking Age. Examining how Scandinavian aggressors tactically exploited natural disasters and how they targeted certain territories reveals that—at least in the Carolingian Empire—these aggressors selected their destinations carefully. They searched for targets on economically powerful rivers and struck first when those targets were most vulnerable, during or immediately after natural disasters. Following their actions through time shows that their ultimate goal was to gain control

over a river estuary, control of which could—and did in
Dorestad and Normandy—make them powerful leaders in the
Carolingian Empire.

CONCLUSION

The eruption of Vesuvius in AD 79, the Dust Cloud of AD 536, the Black Death of 1347-1349, Hurricane Katrina in 2005, and many more events illustrate that natural disasters punctuate the course of history. But what was the impact of these natural disasters in the Early Middle Ages? In order to consider this question, it was essential to rethink the concept of natural disasters as well as to narrow the scope of the inquiry—in time to the beginning of the Viking Age, in location to the Carolingian Empire, and in type to the possibility of military exploitation by Viking aggressors. Within these parameters, the data uncovered in annals and supported by dendrochronology and intertextual analysis not only suggested that indeed Viking aggressors took military advantage of natural disasters but also provided very strong evidence of why the Viking Age began when it did.

A brief review. This survey began by asking how pre-modern societies dealt with natural disasters. To answer this question first required defining the key terms. The most important term, “natural disaster”, is a late medieval construct that required re-definition for an early medieval context. It soon became clear

that in addition to high-profile short-term events, the concept should be extended to include disasters long in development such as a failed harvest, which could have an equally devastating impact on a human population, and that one could not impose the modern expectation of an international or national response because an affected community had to cope without such resources. The starting point for this exercise, the definition developed by *The Asian Natural Disaster Reduction Center*, was therefore modified to define a natural disaster as an “event originating from natural sources that seriously disrupts a society, causes widespread losses, and exceeds the society’s ability to cope immediately”.

Workable constraints for the term “impact” were also needed to prevent ambiguity. While some have included in “impact” almost every type of event that occurs decades after or continents away from a natural disaster, such expansive inclusion creates a substantial potential for both intervening causes and attenuated results. As illustrated by examples like Hurricane Katrina, the Vesuvius eruption, and the Black Death, the farther one goes in time and distance from the disaster, the less definable the impact becomes. In addition, attempting to tie a wide variety of types of impact to a natural disaster dilutes the meaning of the concept. For example, when Keys argues that the AD 536 Dust Cloud helped create the Justinian Plague and

was exploited by Slavic tribes to invade Byzantine territory despite multiple intervening causes and the failure of contemporary authors such as Procopius and Cassiodorus to ascribe any issues to the Dust Cloud, it is difficult to categorize the cloud as a disaster, let alone a cause of these later events.¹ Put differently, because according to Keys the Dust Cloud “impacted” everything, its specific “impact” in any particular situation cannot be determined. To avoid these complications, the definition of impact was tightened in three ways. First, the impact must be in the immediate area or where a larger disaster would logically reach. Second, the impact must occur within five years of the disaster. Third, the only impact to be examined would be political exploitation because that would be the most obvious and most likely to be recorded.

One conspicuous example of a natural disaster followed by a possible exploitation appears in the ASC's AD 793 entry recording a Scandinavian raid on Lindisfarne immediately following a famine in surrounding Northumbria.² This entry raises the possibility that the raiders were exploiting the weaknesses caused by malnourishment. Thus, the disaster and raid presented a thread to follow within the clearly delineated definition of “natural disaster” and the limitations on the concept

¹ Keys, *Catastrophe*, 34; Chapter 1, section 1.3.

² Swanton, ASC, 54-56.

of impact. Accordingly, the potential correlation between natural disasters and the possible exploitation by raiding or intimidating aggressors became the focus of this investigation.

The next issue was determining the most useful type of evidence to research. Because natural disasters were defined in terms of the human experience, contemporary writings generally appeared potentially useful. However, only the annals proved actually useful because they noted events as they occurred in time, allowing data on raids to be correlated with data on natural disasters. Not all annals were amenable to study, however. Only certain detailed annals written in the Carolingian Empire proved to be most free of historiographic issues and to provide precisely the type of information necessary.

With these definitions and limitations determined, the RFA, AX, AB, and AF were mined to create a dataset of natural disasters and events such as important deaths and local wars as well as Scandinavian aggressions. Once coded and charted, the data on the charts revealed a strong correlation between the frequency of natural disasters and the frequency of aggressions throughout the annals, especially within the AB. The thread revealed in the Lindisfarne attack's entry thus seemed strengthened by a more extensive examination of the annals. But the question of severity remained. Was it possible

to examine a natural disaster's severity to discover whether it was harsh enough to be exploited?

A likely source of answers seemed to be the data provided by climate science, particularly the science of dendrochronology. Two studies provided the most relevant information, the OWDA for precipitation and the OTC for temperature. The inevitable conclusion, however, was that because a natural disaster is defined by human experience, the scientific data cannot alone give the determinative data on the severity of impact. Nonetheless, dendrochronological data did provide valuable supporting evidence and was thus a useful tool in other ways.

Could the necessary human perspective be gleaned directly from the annals themselves? Because the charts did not focus on the individual events, the charts were put aside to focus on specific reports. Sometimes the descriptions alone were enough to determine severity, such as the AF report in AD 874, "*Hoc anno fame et pestilentia per universam Galliam et Germaniam grassantibus pene tertia pars humani generis consumpta est.*"³ More often, this was not enough. Relying on the fact that the Carolingian nobility's culture was thoroughly Christian, an intertextual biblical analysis was developed to

³ Kurze, AF, 83. "[T]hrough the hunger and pestilence which raged through the whole of Gaul and Germany, nearly a third of the population was destroyed." Reuter, AF, 75.

explore the author's descriptive language by comparing it with biblical stories and aphorisms and studying which biblical stories would use the specific adjectives, verbs, and other words the author used to describe a disaster. This methodology, applied on a case-by case basis, provided a subjective measure of the author's view of the disaster's severity.

All these analytical approaches came together to support the hypothesis that Scandinavian aggressors possibly exploited natural disasters. But was it probable they did so? Could the causation connection be shown to be tighter than an overlap on charts? To examine this question, a series of case studies modelled the context of a natural disaster and the possibly exploitative aggression. First, the disasters and corresponding aggressions were divided into three categories: "statistical anomalies" where the two events had a correlated timeline but there was little further material information to link them, "correlated anomalies" where the natural disaster and the aggression had a correlated location and timeline but again there was little additional information, and "corroborated anomalies"—of which there was only one—where both time and location correlated and there was also sufficient information in the annals to corroborate the causal connection. Two correlated anomalies became the first case studies. Analysis of

the AD 834 raid on Dorestad and the AD 880 battle at Thimeon was straightforward because of the specificity of information on the natural disaster, the raid, and the political context.

Expanding the analysis to two statistical anomalies, the AD 810 and AD 820 raids, tested the hypothesis by presenting a slightly different analytical problem in that the location factor did not neatly coincide and the historical evidence was less complete. Close analysis obviated the first issue because the disasters affected broad swathes of the Empire and the raids occurred within the affected areas. Furthermore, though there was less historical information, enough existed to develop a sense of political context. But the fact that a closer examination of these cases supported a causal connection suggested that if sufficient evidence existed, many more statistical and correlated anomalies would prove to be corroborated. All this leads to the comfortable conclusion that one way natural disasters were politically exploited during the Early Middle Ages was by Scandinavian aggressors who took advantage of weakened populations to plunder and raid.

This conclusion diverges from current scholarship on the reasons for the beginning of the Viking Age, scholarship which tends to focus on why the Vikings left their homelands and often finds the explanation in the desire for a resource. The findings of this study suggest that rather than being mostly

resource-hungry pirates, the Viking aggressors—certainly by the time they began raiding the Carolingian Empire—were actively deciding to attack certain places based not merely on the availability of resources but also on their inability to withstand attack. Moreover, the aggressors were making the decision to strike some weakened targets but not others. Switching perspective and asking not why the Vikings left but why they went where they went reveals that in the Carolingian Empire, the aggressors attacked populations weakened by natural disaster and located on river estuaries. The military importance of river bases highlights the possibility that these aggressors were operating according to a strategic military objective of controlling the rivers—and thus the communications and economy—of the Empire. In sum, rather than being unsophisticated or uninformed pirates, the Vikings constituted a collective of strategically savvy invaders seeking not merely booty but power. Thus, this study found that the moments of vulnerability caused by natural disasters and seized upon by the Scandinavian aggressors provide one key to understanding how and why the Viking Age began in Carolingian Europe. Nevertheless, as with any study, this one has opened as many questions as it has answered.

Further Questions. Moving forward along the path established in this study, a first step in a subsequent investigation exploring

the correlation between natural disasters and Scandinavian aggression in the Carolingian Empire would be to explore other Carolingian annals. The RFA, AX, AB, and AF all show a pattern of Scandinavian aggressors carefully choosing to raid a territory during or soon after a natural disaster and then continuing until they attempted to take control of it. Investigating other annals might provide further information about the pattern revealed in these four annals. The AV and Regino of Prüm have been used here to garner more information on aggressions already noted in the annals examined, but they should be studied independently as well. If necessary, cross-referencing among annals and scientific records could fill in blanks in any individual annal's records. For example, the *Chronicon Moissiacense* an annal not studied in depth, reported an attack on Frisia in AD 813. Cross-referencing with other annals and scientific information revealed a natural disaster not recorded in the *Chronicon* and thus confirmed that the raid fit within the pattern of a Scandinavian aggressor exploiting a natural disaster to raid the Rhine. Studying other annals might also reveal additional territories in the Carolingian Empire subjected to the same strategy and offer a clearer picture of how and when this particular tactic ended. Finally, it might be possible to move beyond the annals to other written sources chronicling the time, especially if the data from the

annals is maintained as the framework within which the information from other sources is conceptualized.

Another step along the same path would be to study additional scientific data. An especially interesting perspective could be gained if the data from other climate proxies such as solar radiation, volcanic ice cores, speleothems, and others could be combined with dendrochronological data to create a multi-proxy climate model of the weather within ninth-century continental Europe. If and when a model is created, it would allow some insight into the state of Europe during winter. Keeping in mind that scientific data alone cannot reveal a natural disaster because of the human experience component of the definition, more information on the climate that correlated with the disasters and attacks reported upon within the annals would nevertheless be extremely helpful.

Other useful paths of study follow on this one. First would be investigating whether the same correlation between natural disasters and Scandinavian raids exists in other areas. Historiographical issues in the ASC and the Irish annals seriously complicate an investigation based on these sources but perhaps these difficulties could be overcome or other sources developed. Moreover, the Scandinavian aggressors attacked and raided many other lands. Does this correlation exist there as well?

But a slightly different approach might be less fraught with difficulty. If the territories these Scandinavian aggressors first raided in the Carolingian Empire were carefully chosen, were the territories in the other kingdoms they harassed and settled in also carefully chosen? A cursory glance at the evidence already points in this direction, but it should be examined more in depth. After the AD 793 raid on Lindisfarne's monastery, Alcuin of York wrote that he was going to Charlemagne himself for help in negotiations with this aggressor. That likely means that this aggressor, like the aggressors who later attacked the Carolingian Empire, was a powerful person. The historiographical issues in the ASC and the Irish annals would not hinder an investigation of an overall Viking strategy in which the areas harassed were mapped and the terrain studied. Were the territories they chose to harass similar geographically? Functionally? As Clausewitz observed, controlling rivers means controlling many other functions as well, and Gillian Fellows-Jensen has specifically argued that Scandinavian aggressors attacked monasteries in Normandy to hinder diplomatic and legal functions because monasteries held written documents.⁴ Investigating the Irish kingdoms with their

⁴ Gillian Fellows-Jensen, "Extermination or Economic Exploitation?" in *Cultural Contacts in the North Atlantic Ocean Region: The Evidence of Names*, eds. Peder Gammeltoft, Carole Hough, and Doreen Waugh (Lerwick, Scotland: Scottish Place-Name Society, 2005), 112-113.

detailed annals might be especially productive, both because the annals are detailed and because these aggressors harassed smaller communities in different locations and might have harassed different types of terrain. Although the methods by which these Irish monasteries received their information is still ambiguous, Nicholas Evans argues it is doubtful they received their news by chance. Instead, he contends there were “webs of contacts through which they obtained their material”.⁵ An investigation of these annals would need to be far more precise and detailed, but it would still be the first step in investigating whether these other territories presented the same “pull” factor as did specific territories in Carolingian Europe.

Yet another avenue of study would be expanding the investigation to other aggressors. Did other societies also militarily exploit natural disasters? This study, for example, touched on this question with its data collection about Local Warfare, defined as “wars with other peoples . . . wars between the different kingdoms within the Carolingian Empire . . . [and] every rebellion undertaken”.⁶ Though this study found no

⁵ Nicholas Evans, “News Recording and Cultural Connections Between Early Medieval Ireland and Northern Britain,” in *Traversing the Inner Seas: Contacts and Continuity in and around Scotland, the Hebrides, and the North of Ireland*, ed. Christian Coijmans, assoc. eds., Alan Macniven and John R. Baldwin (Edinburgh: The Scottish Society for Northern Studies, 2017), 140-141.

⁶ Chapter 3, section 2.

correlation, this could be because wars against both neighbouring and distant enemies were grouped together into one category. Would the evidence reveal something different if it focused, say, only on distant enemies, those experiencing conditions different from the ones of the attackers? Or if it focused on defensive manoeuvres such as when the Carolingians exploited a natural disaster for military advantage against Scandinavian aggressors in the Battle at Thimeon. Or is it possible the Vikings were singularly equipped to take advantage of this tactic? An army suffered from the conditions of the terrain it was marching on. In the cold winter of AD 880, Louis the Younger's army felt the cold as much as did the Scandinavians. A cattle plague that devastated an army's supply line halted it, as it immobilised Charlemagne in AD 810. In contrast, longships darted in and out of extreme conditions and were basically their own supply line because they packed much of their supplies before they travelled.⁷ So would taking advantage of natural disasters be an effective tactic for a marching army and thus for other societies?

In conclusion. The list of possible additional avenues of study could go on. But if the basic technique undertaken by this study is to be followed, that technique may be described most

⁷ Williams, "Raiding and Warfare," 97.

succinctly as reversing perspectives. In other words, what this study has done that is different from other studies is to reverse perspectives on two key points. First, it shifted the focus in defining natural disasters away from the climatic event itself to the experience of the people who were impacted. Secondly, it shifted focus away from reasons the Vikings may have left their homelands to the reasons they chose certain targets. These two shifts, building upon one another, allowed a greater understanding not only of how natural disasters affected people of the Early Middle Ages but also of how they were used in the Carolingian Empire by Scandinavian aggressors to initiate the era now known as the Viking Age.

Appendix 1: Estimating Seasons in Chapter 3

The Calendar for the Charts

This uses the calendar proposed by Dmitri Starostine in his article,

“. . .*in die festivitatis*: Gift-giving, Power and the Calendar in the Carolingian Kingdoms,*” *Early Medieval Europe* Vol. 14, No. 4 (2006), pp. 465-486.
from pp. 478-480.

The Methodology to Determine Seasons

If the author gives the dates of recorded events, the events are recorded with that date. If not, the last date before the event is recorded that year as well as the first date after the event is recorded are found. Then a date is cautiously estimated by counting the number of paragraphs and events in between those two dates. If no dates are available, the number of paragraphs and events within the entire year are counted, a presumptive estimate as to what season the event occurred is made based on this data or judged undeterminable.

How the Charts Were Made

The charts were made using five-year periods to picture when the pictured event was recorded. This means that there is necessarily some uncertainty: if the event happened early within this five-year period, a recovery was well underway. If the event happened late within this five-year period, a recovery was less likely to be proceeding. This coding recognises this uncertainty, but as Viking attack based on this could happen at any time, an approximate chart of attacks can be used to see if they relate.

Another aspect of these charts, since they are relative, is that if the coding cannot decide exactly the season, the *first* season the event happened is used within the chart.

In The Royal Frankish Annals

Natural Disasters

- 763: A hard winter [winter]
- 773: A drought affecting Charlemagne's army (post-Easter pre-Saxon treaty [summer])
- 784: Floods affecting an invasion of Saxony (post-Easter continuing into winter [begin summer or autumn])
- 791: A horse plague that killed Charlemagne's army (post-winter, post-deliberation [summer-autumn])
- 801: A significant earthquake that destroyed some Italian cities. The Rhine was also affected. (30 April, post-Easter [spring])
- 801: A plague (recorded immediately after earthquake pre-summer mention [spring])
- 803: An earthquake [winter]
- 808: An "unhealthy" winter [winter]
- 810: Cattle plague throughout empire (while Charlemagne was preparing to fight Danes in Frisia pre-October [summer])
- 811: Very cold winter that closed roads [winter]
- 820: Little warm weather (throughout)
- 820: Rain that destroyed harvest (seasons [summer-autumn])
- 820: A cattle and human plague (throughout)
- 820: Flooding (monks say fall [autumn])
- 821: Rain prevented sowing (monks say fall [autumn])
- 821: A long, extremely cold winter [winter]
- 823: An earthquake in Aachen (cannot determine)
- 823: Hailstorms destroyed much produce (growing season [summer-autumn])
- 823: A plague (post-hailstorms [autumn-winter])
- 824: Extremely cold winter [winter]
- 824: Famine occurring (pre-autumn [winter-])
- 829: Earthquake during Lent

Scandinavian aggression

- 808: A Danish/Frankish war over defecting Slavic territory (808 [post-Easter pre-winter with time to build a bridge and substantial fortifications after war [summer])
- 809: The Franks took back THEIR Slavic lands with the permission of the Danish king (immediately pre-November [autumn])
- 810: Danes plunder Frisia (Charlemagne still at Aachen [winter])

- 812: Danish conflict over kingship (¶1 [winter])
- 813: Another war over kingship [¶3/5 [summer])
- 814: Another war over kingship (last entry [autumn-winter])
- 815: Louis helps exiled Danish king after war (post-May ¶1 [summer])

- 819: Louis helps exiled Danish king fully conquer Denmark (late entry [autumn])
- 820: Vikings attempt to raid Flanders (¶5/7 [autumn])
- 820: attempt the Seine (¶5/7 [autumn])
- 820: succeed in Aquitaine (¶5/7 [autumn])

- 828: Danes attack Franks on border of Nordmannia (around June [summer])

Important Deaths

- 741: Charles Martel (only event noted briefly [unknown])
- 768: Pippin the Short (24 September [autumn])
- 771: Charlemagne's brother Carloman (4 December [winter])
- 783: Queen Hildegard, mother of Louis the Pious (30 April, night before Pentecost [spring])
- 795: Pope Hadrian (first sentence [winter])

- 810: Charlemagne's son Pepin (8 July [summer])
- 810: Godofrid, King of the Danes (Charlemagne while informed his son had died [summer])

- 811: Charlemagne's son Charles (4 December [winter])

- 812: Hemming, next Danish king (first sentence [winter])
- 814: Charlemagne (28 January [winter])

- 816: Pope Leo III (25 May [summer])
- 817: Pope Stephen IV (25 January [winter])

- 824: Pope Paschal I (during long winter [winter])

- 827: Pope Eugenius II (August [summer])

Local War

- 741: Martel's youngest son, Grifo, rebels (nearly entire entry [unknown])
- 742: Martel's sons Carloman and Pippin the Short fought with the Aquitainians (nearly entire entry [unknown])
- 742: Carloman attacked Alamania (nearly entire entry [unknown])
- 743: Bavaria (nearly entire entry [unknown])
- 743: Saxony (nearly entire entry [unknown])
- 744: Saxony (nearly entire entry [unknown])

- 748: Pippin, now the only son in charge, Bavaria (nearly entire entry [unknown])

- 753: Saxony (nearly entire entry [unknown])
- 755: Lombards (nearly entire entry [unknown])

- 756: Lombards (nearly entire entry [unknown])
- 758: Saxony (nearly entire entry [unknown])
- 760: Aquitaine (nearly entire entry [unknown])

- 761: defeated revolt by Aquitaine (nearly entire entry [unknown])
- 762: Aquitaine (nearly entire entry [unknown])
- 763: Aquitaine (nearly entire entry [unknown])

- 766: Aquitaine (nearly entire entry [unknown])
- 767: Aquitaine (winter-summer)
- 767: Aquitaine (summer-autumn)
- 768: Aquitaine (winter-autumn)
- 769: Charlemagne now. Aquitaine (nearly entire entry [unknown])

- 772: Saxony (post Easter pre-drought [spring-summer])
- 773: Lombards (post winter #1 to winter #2 [spring-winter])
- 773: Saxons (invasion by Saxons ~ Easter + Charlemagne did not respond immediately [winter-winter])
- 774: Italy (pre-Easter [winter])

- 774: Saxons (post-Easter pre-Italy [spring-autumn])
775: Italy (¶6/7, post-Saxony pre-Christmas [autumn-winter])
- 776: Italy (pre-Easter [winter])
776: Saxon revolt [post Easter [spring-winter])
778: Spain (one of two events... both wars [unknown])
778: Saxon revolt (one of two events... both wars [unknown])
779: Saxony (nearly entire entry [unknown])
780: Saxony (nearly entire entry [unknown])
- 782: Saxony (nearly entire entry [unknown])
783: Saxony (post April 30 [spring-winter])
784: Saxony (post Easter pre-winter #2 [spring-autumn])
784: Saxony (specifically fought in [winter])
785: Saxony (starting winter #1 ending winter #2 [year])
- 786: Brittany (pre-winter #2 [winter-autumn])
787: Benvento (pre-Easter [winter])
787: Bavaria (post-Easter, ¶5/6 [autumn])
788: The conquered Benventans (Frankish Duke) vs Greeks (post-Easter, ¶2/5 [summer])
788: Avars vs. Italy (post-Easter, ¶2/5 [summer])
788: Bavaria vs Avars (¶3/5 [autumn])
788: Huns attack (¶3/5 [autumn])
789: Slavs [post-Easter, [spring-winter])
- 791: Avars (post-Easter, during horse plague [spring-autumn])
793: Pannonia (autumn mentioned first [autumn])
793: Saxony ([autumn])
793: Septemania ([autumn])
794: Saxony (post-Easter, next year mentions previous summer [spring-summer])
795: Saxony (nearly entire entry [unknown])
- 796: Pannonia (¶5/5 pre-Christmas [autumn-winter])
796: Saxony (¶5/5 pre-Christmas [autumn-winter])
798: Nordliuli (starting Easter, negotiations 799 [spring-winter])
798: Saxony (reported at same time, negotiations 799 [spring-winter])
799: Saxony (around “the major litanies” [spring-summer—look this up when home])
799: The Avars (reported at the same time as Brittany [spring-summer?])
799: Brittany (around Saxony (spring-summer?))
800: Benventans (months given [summer-winter])

- 801: Benventans (around Easter [winter-spring])
- 801: Spain (summer [summer])
- 801: Italy (reported during Spain [summer])
- 802: Italy (reported between a date during summer and mention of summer [summer])
- 802: Saxony (mention of summer [summer])
- 803: Pannonia (¶3/3, right before a return in December [autumn-winter])
- 804: Saxony (summer [summer])
- 805: Bohemia (son returned to father after he got the job done in July [¶3/3 [spring-summer])

- 806: Sorbs (command given shortly post-Easter and returned in same ¶ [spring-summer])
- 806: Bohemia (immediately reported after, 4¶/7 [summer-autumn])
- 806: Corsica (¶5/7 [summer-autumn])
- 806: Spain (¶5/7 [summer-autumn])
- 807: Corsica (reported after August date [summer/autumn])
- 809: Frankish/Greek war (monks say winter [winter])
- 809: Spain (reporting pre-Easter ¶2/9 [winter])
- 809: Italy by Greeks (pre-Easter [winter])
- 809: Corsica (during Easter [spring])
- 810: Corsica (around embassy arriving in winter [winter-spring])
- 810: Italy (at the same time [winter-spring])
- 810: Slavic invasion (he heard of these during summer (summer-autumn))

- 811: Liones (post-Danish peace in spring and finished [spring-autumn])
- 811: Pannonia (post-Danish peace in spring and finished [spring-autumn])
- 811: Brittany (post-Danish peace in spring and finished [spring-autumn])
- 812: Corsica (post-winter at Aachen, ¶2/8 [spring-summer])
- 812: Slavs (¶6/8 [autumn])
- 813: Moors go after Italian cities near Corsica (¶4/5, post spring [autumn])
- 813: And Nice, Southern France (¶4/5, post-spring [autumn])
- 815: invade Norse lands to restore king (began May [summer])
- 815: Revolt in Italy (final ¶ [winter])
- 815: Spain (August-September reported immediately after [summer])

- 816: Slavic Sorbs (post winter pre-May mention [spring])
- 816: Basque revolt (post winter pre-May mention [spring])

- 817: Slavic revolt (post-Maundy Thursday, ¶/78 [autumn])
- 818: Brittany (post-Easter, 8 July mentioned later [spring-summer])
- 819: Pannonia (post-July, didn't end [summer-winter])
- 819: Gascony (same time [summer-autumn])
- 820: Pannonia (post-winter, achieved victory [spring-autumn])
- 820: Spain (same time [spring-autumn])

- 821: Pannonia (ordered for that summer [summer])
- 821: Spain (ordered for summer [summer])
- 822: Pannonia (post-August [autumn])
- 822: Spain (post-August [autumn])
- 822: Brittany (post-fall equinox [autumn-winter])
- 824: Brittany (monks say autumn [autumn])

- 827: Spain (first sentence, continued throughout [year])
- 827: Bulgars vs Pannonia (item immediately pre-August [summer])
- 828: Spain (ordered sons [winter-summer])
- 828: Corsica attacks Africa (post-summer, pre-Martinmas [autumn])

In The Annals of Xanten

Natural Disasters

- 803: An earthquake in Aachen (only entry [unknown]).

- 808: A plague (same sentence as winter noted [winter-spring])
- 810: Murrain (second to last in list summer-autumn)
- 810: Harsh winter ([winter])

- 813: Severe winter (winter)

- 821: Severe winter (winter)

- 834: Severe floods (ending sentence [winter])

- 837: Many windstorms (sentence 1 [winter])
- 838: Very stormy winter ([winter])
- 838: Heat (post February [spring])
- 838: Earthquake (immediately post-heat [spring/summer])
- 838: Fiery dragons (immediately post-dragons [summer/autumn])

- 839: Huge windstorm (January [winter])
 839: Huge tide (pre-April [winter-spring])
- 845: Two earthquakes in Worms (Palm Sunday and Easter [winter])
- 850: Great flooding (season named [winter])
 850: Intense heat (season named [summer])
- 852: Excessive Heat (item 2/3 [spring-summer])
 852: A famine followed [item 3/3 [summer-autumn])
 853: A great famine in Saxony (item 1/1 [year/undetermined])
- 857: A great plague (item 1/1 [year/undetermined])
 858: Two earthquakes felt in Worms and Mainz (1 January [winter])
 860: A very long winter ([winter])
- 863: Stormy winter ([winter])
 864: Great flood [item 1/5 [winter])
- 868: Terrible famine (season named [autumn])
 868: A plague (season named [autumn])
 868: An earthquake [season named [autumn])
 869: Great floods (March [winter/spring])
 869: Famine great in Burgundy and "France (post-summer [autumn])
- 872: Hailstorms ruin harvest ([summer])
 873: Wet, flooding winter, especially on the Rhine, killed ([winter]).
 873: Locust plague (post-August [late summer-autumn])

Scandinavian aggression

- 834: Attack Dorestad (second to last sentence [winter])
 835: Dorestad and Frisia (c. February [winter])
- 836: Invade the lands of the Christians (c. February [winter])
 837: Take out Walicrum, take away slaves (last sentence in list)
 838: Heretical depravity rose (yearlong)
- 845: Vikings hit Frisia, lost (post-record of record of Easter item 2/4 [spring-summer])
 845: Vikings hit Charles the Bald's kingdom, receive tribute (item 2/4 [spring-summer])

- 847: Vikings sail up the Rhine (item 2/2 [winter])
- 846: Vikings hit east and west Frisia [item 1/2 [winter-spring]]
- 848: Vikings ravage Christians (item 2/3 [summer-autumn])
- 849: Vikings ravage Christians (item 2/2 [summer-winter])
- 850: Roric gains Dorestad (item 6/7, post-famine [autumn-early winter])

- 852: "The steel of the heathen glistened" (item 1/3 pre-heat [winter])
- 854: Inflicted evils on Christians, sacked Tours [only item [undetermined]]

- 857: Invaded Christians (two items, both about Vikings [undetermined])

- 862: Dissension among the kings pleased the Vikings.
- 864: The Vikings ravage the Rhine (item 2/5 [winter-spring])

- 866: Vikings go after Frisia (pre-summer [winter-spring])
- 866: After summer, Vikings go after France ([autumn-winter])
- 867: War between Charles the Bald and Vikings (last item reported [autumn-winter])
- 868: Vikings go after Frisia (autumn)
- 869: Charles the Bald vs Vikings (autumn-early winter)

- 871: Vikings raid France (item 6/7 [autumn-early winter])
- 873: Vikings ravage France and Frisia after blinding (autumn/early winter)

Important Deaths

- 810: Charlemagne's son Pippin dies (item 1/4, [pre-summer])
- 814: Charlemagne dies (during severe winter)
- 840: Louis the Pious dies (July [summer])
- 844: Pope Gregory dies (item 1 [winter])
- 846: Pope Sergius dies (AB says 27 January [winter])
- 869: Pope Nicholas (end [winter])
- 870: Lothar II (unclear)

- 872: Pope Hadrian (item 5/5 [winter])

Local War

- 804: Charlemagne exiled the Saxons (only entry [unknown])
- 808: Charlemagne's son Charles beats a revolt (sentence 2/2 [unknown])
- 816: Louis vs Slavs (1/2 parts of the sentence [unknown])
- 817: Louis fights against the Lombards (yearlong)
- 831: Louis fights a rebellion by Pippin (October [autumn])
- 832: Louis fights a rebellion by Louis the German (post-summer [autumn])
- 833: Louis the Pious is captured ([summer])
- 834: Louis v. Lothar (throughout)
- 835: Louis and Piipin (c. February [winter])
- 840: Brothers go to war after Louis dies (late summer-winter)
- 841: War continues between the kids (yearlong)
- 842: The civil war continues (year)
- 844: Charles the Bald faces a rebellion in Aquitaine (sentence 2 [winter-spring])
- 844: Louis the German has to clean up as well (eodem tempore [winter-spring])
- 846: Saracens ravaged Rome (item 2/3 [summer-autumn])
- 849: Louis the German sent an army against the Bohemians, lost [item 1 of 2 [winter-summer])
- 850: The Moors ravage the coast of Italy (item 5/7, post-famine [summer-winter])
- 855: Son of Louis the German went to Aquitaine (only item [undetermined])
- 859: Louis the German had invaded West Francia, but hadn't achieved much (only entry [undetermined])
- 860: Kings held a secret conference and decided to kill people around them
- 863: Lothar II led an army against the German in Mainz (item 2/3, right before winter mentioned [autumn])
- 864: Lothar II moves against a rebellion in Saxony [item 3/5 [summer-autumn])
- 864: Louis the German also has a rebellion (year)
- 865: Lothar II invades Rome (only thing discussed [year/undetermined])

- 869: Louis the Younger rebels against the German (autumn)
- 869: Conflicts in Italy (autumn-early winter)
- 870: Louis vs. Rastiz (too unclear).

- 871: Louis vs Charles over Lothar II's territory (item 1/7 [winter]).
- 871: The Pope vs some bishops (item 2/7 [winter])
- 871: Carloman vs. Rastiz (item 4/7 [summer-autumn])
- 871: Conflict in Italy with the Benevetans (item 7/7 [late autumn-winter])
- 872: Carloman vs the Slavs (item 1/5 [winter])
- 872: Franks against Margos (reported after ruined harvest [autumn-early winter])
- 872: Carloman wastes the land (again [autumn])
- 873: Louis and Charles still at odds (pre-winter report [winter])
- 873: Charles blinds his son Carloman over (summer)

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Natural Disasters

- 834: Great flooding (between Christmas and 28 February ([winter])

- 839: Great flooding (26 December [winter])
- 838-839: A harsh winter ([winter])
- 839-840: Harsh winter ([winter])

- 842: Earthquake in Western Gaul (c. Christmas [winter])
- 843: A famine caused by warfare (¶ 1 [winter])
- 845: A hard winter [winter]
- 845: A terrible famine (post-March [spring-summer])

- 846: A terrible wind in Western Gaul (to May [winter-spring])
- 846: Legions of wolves (same ¶ as wind [winter-spring])
- 846: Much flooding in Autun (May [spring/summer])
- 849: Earthquake in Aachen (17 February [winter])

- 855-856: Cold, dry winter ([winter])
- 856: Plague (second sentence [winter])
- 858: An earthquake on Christmas (25 December [winter])
- 858: A serious plague (noted immediately after earthquake [winter])
- 859-860: A cold winter (November to April [winter-spring])

- 865: Vikings who had sacked St Denis got diseases (after 18 August [autumn-early winter])
- 868: Famine in Berry early in the year (¶ 1 and almost definitely before 3 March [winter])
- 869: Famine (before 16 February [winter])
- 873: Locust plague everywhere (¶ 8/11 [summer])
- 873-874: Hard winter (winter)
- 874: Poor harvest (post-long summer [autumn])

Scandinavian aggression

- 834: Dorestad (between 5 April and mid-August [summer])
- 835: Dorestad (June [summer])
- 837: Frisia (September or November [autumn])
- 838: Dorestad (late May-June [late spring-summer])
- 839: Frisia (unrelated paragraph others, but last date given is September [autumn])
- 841: Sacked Rouen (¶ 3/6. ¶ 1 has Lent and ¶ 4 has June. [spring or early summer])
- 842: Plundered Quentovic around the same time as negotiations between Lothar and his brothers begin (April-October [spring or summer])
- 843: Sacked Nantes (¶ 2/4, after war that caused famine [summer])
- 844: Attacked Brittany (¶ 5/9 after several battles/wars [autumn])
- 844: Plundered from the Garonne river (last entry [late autumn-early winter])
- 845: Plundered the Seine throughout the year (starting March [spring-early winter])
- 845: Attacked the Elbe (¶ 3/9, next item noted is a famine [spring])
- 845: Gained a Slavic city (¶ 3/9 [spring])
- 845: Attacked Aquitaine (¶ 7/9 [autumn])
- 846: Frisia. (¶ 1 [winter])
- 847: Brittany (¶ 3/10 reported before Pope Sergius' death in January [winter])
- 847: Aquitaine (¶ 8/10 [late autumn-early winter])
- 847: Laid siege to Bordeaux (¶ 8/10 [late autumn-early winter])
- 847: Dorestad (¶ /8/10 [late autumn-early winter])

- 848: Melle (¶3/4 and Melle's riches [autumn])
- 849: Aquitaine (during/shortly after June [summer])
- 850: Frisia (yearly report ends entry with a Viking given Dorestad [autumn])

- 851: Frisia (¶ 3/7 post extensive negotiations between brothers [summer])
- 851: Rouen (¶ 3/7 [summer])
- 852: Frisia (¶ 1 [winter])
- 852: Seine (last paragraph [late-autumn-early winter])
- 853: Won blockade on the Seine and freely ravaged (left March [winter])
- 853: Loire (July [summer])
- 853: Sacked Tours (8 November [autumn])
- 854: Plundered the Loire to try to reach Orleans (¶ 3/6 [summer])
- 854: Frisia (¶ 3/6 [summer])
- 854: Burned Angers (final sentence of yearly report [winter])
- 855: Aquitaine (all year)

- 856: Sacked Orleans (18 April [spring])
- 856: Plundered up the Seine (mid-August [summer])
- 856: Burned Paris (28 December [winter])
- 857: Sacked Tours (¶ 1/ 6 [winter])
- 857: Sacked Portiers (¶ 2/6 [winter])
- 857: Plundered the Seine (¶ 4/6 [autumn])
- 857: Frisia (¶ 4/6 [autumn])
- 857: Attacked Chartres (¶ 6/6 [late autumn-early winter])
- 858: Seine Vikings captured significant noble Abbot Louis of St Denis (¶ 4/12, when the month of May comes in ¶ 7/12 [winter])
- 858: Attacked Saxony (¶ 8/12, month of July reported in ¶ 11 [summer])
- 858: Charles attacked Seine Vikings (July [summer])
- 859: Plundered Seine (¶ 1/12 [winter])
- 859: Plundered from the Rhône after travel around Spain (¶ 3/12, next date recorded 6 August [length of voyage—summer])
- 859: Attacked St-Valery sur Somme (¶ 7/12 [autumn])
- 859: Amiens (¶ 7/12 [autumn])
- 859: Rhine (¶ 7/12 [autumn])
- 859: Seine Vikings attacked Noyon (¶ 8/12 [autumn])
- 860: Rhône Vikings went as far as Valence (May [summer])
- 860: Rhône Vikings attacked Italy (¶ 6/9 has June, ¶ 8/9 [autumn])

- 861: Seine Vikings burned Paris (January [winter])
- 861: Vikings attacked Thérouanne (at the same time [winter])

- 862: Seine Vikings plundered towards Meaux, but made peace and departed (before Spring Equinox [winter])
- 862: Vikings went after Germany (¶13/16, ¶11 is 15 August, ¶14 is 17 September [autumn])
- 863: Frisia (January [winter])
- 863: Burned Portiers (after 25 October, final ¶ [winter])
- 864: Battles in Aquitaine (¶1/22 [winter])
- 864: Looted the Rhine (¶2/22, ¶3/22 has June [starting spring])
- 864: Loire Vikings lost a battle against the Count of Anjou (last ¶ during/after November [winter])
- 865: Loire Vikings looted the Loire and burned Orleans (at the same time negotiations between the Pope and Charles were proceeding immediately after Christmas [winter])
- 865: Loire Vikings burned Portiers (after 15 August [late summer-autumn])
- 865: Charles met Seine Vikings (after mid-September [autumn])
- 865: Vikings plundered the monastery of St Denis [18 October [autumn])
- 865: Vikings attacked le Mans (around the same time [autumn])

- 866: Loire Vikings attack Neustria (29 December [winter])
- 866: Vikings plundered the Seine (almost immediately noted after first attack [winter])
- 866: Vikings moved up the Seine (June [summer])
- 866: Vikings attacked le Mans (post-29 September [autumn])
- 868: Portiers attacked Vikings, win (between mid-August and 1 December [late autumn-early winter])
- 869: Small battle between two nobles and Loire Vikings, Vikings lost (late September-early October [autumn])

- 871: Two nobles attacked Vikings on the Loire (August or September [summer or autumn])
- 873: Charles besieged them at Angers, wins (August-September [summer-autumn])
- 876: Vikings plundered the Seine (6 September [autumn])
- 876: Charles put defensive squadrons to guard the Seine (around Christmas [winter])
- 879: Vikings plundered the Loire and attacked (30 November [winter])
- 880: Battle between Louis the Younger and Vikings (¶ 1 and pre-3 April [winter])

- 881: Louis III versus the Vikings (all year)
- 882: Charles the Fat besieged a fortress (after September [autumn])

882: Carloman fought them (starting September [autumn])

Important Deaths

838: The Pious' Pippin (13 December [winter])

840: Louis the Pious (26 June [summer])

843: Duke of Nantes (right before Viking attack [winter])

844: Pope Gregory IV (¶2 [winter])

847: Pope Sergius II (27 January [winter])

851: The Breton Nominoë (first sentence [winter])

852: Abd al-Rahman (¶5/6 [winter])

855: Leo IV (August [summer])

855: Lothar (29 September [autumn])

858: King Æthelwulf of the West Saxons (coincides in ¶3 with Viking attack ¶4 [winter])

858: Pope Benedict III (May-July [summer])

863: King Charles of Provence, son of Lothar I (¶2 and Lothar II and Louis of Italy have a standoff because of it [winter])

866: Son of Charles the Bald, of Aquitaine (29 September [autumn])

867: Pope Nicholas I (13 November [winter])

869: Lothar II, Lothar I son (8 August [summer])

869: Charles the Balds wife Ermentrude (6 October [autumn])

871: Pope Hadrian [soon before 14 December [winter]]

873: A negotiating Viking, Rodulf (coincides with Charles besieging Toulouse [summer])

874: The Breton Salomon (noted in ¶ after recorded poor harvest, next date and last paragraph mentions December [autumn])

875: Louis of Italy (Charles the Bald learns about this in August [summer])

875: Another wife of Charles the Bald, Emma (soon after Christmas [winter])

876: Louis the German (29 August [summer])

877: Charles the Bald (6 October [autumn])

879: Charles' heir, Louis the Stammerer (10 April [spring])

- 882: Louis the Younger, the German's heir (late March-early April [spring])
- 882: Louis III, one of Louis the Stammerer's heirs (August [summer])

Local War

- 831-5: Civil War throughout seasons
- 837: Breton revolt (Viking attack same time [autumn])
- 838: Saracen pirates Marseilles (between May and mid-August [summer])
- 839: Invades Slavic territory, Sorbs, Obrodites (before September, after May [summer])
- 836-840: Throughout, civil war
- 841-845: Civil War throughout
- 841: Bretons begin to revolt (¶1/6, summer Viking attack [winter])
- 844: Invading the Slavs (During meeting in October [autumn])
- 845: Saracens vs. Benevetens (After famine, before Northmen ravage everywhere [spring])
- 846: Saracens attack Rome (beginning August [summer-winter])
- 846: Slavs (post-August [autumn-early winter])
- 847: Saracens vs Bevevento (post-Boudeaux [late autumn-early winter])
- 847: Slavs (throughout)
- 848: Civil war between Charles and Pippin II (repeated post-Melle [autumn])
- 848: Greek pirates Marseilles (¶3/4 [autumn])
- 848: Slavs (¶1/4, during Bourdeaux siege [winter])
- 848: Saracens vs Lothar (¶1 [winter])
- 849: Breton revolt (reported throughout)
- 850: Saracens ravage (¶1/2, second sentence [winter])
- 851: Louis vs Slavs (¶6/7 [autumn-early winter])
- 852: Moors take Barcelona (¶1, [winter])
- 852: Charles beats Pippin II (¶3/6 [spring-summer])
- 852: Lothar's Louis vs Moors (¶4/6 [summer-autumn])
- 853: Slavs and Bulgars vs the German (post 8 November [winter])
- 854: Aquitaine rebels (begins during Lent [winter])
- 855: Frequent Slavic revolts (throughout)
- 856: War with Slavs (before 18 April [winter-spring])

- 856: Saracens vs Naples (last ¶ [winter])
- 857: Aquitaine rebels (¶2/6 [winter-spring])
- 858: With help, Louis takes over West Francia (12 November [winter])
- 859: Charles takes it back (reported before Lent mentioned [winter])
- 860: Louis of Italy faces revolt (post 1 June, ¶7/9 [summer-autumn])

- 861: Disputes between the German and the Bald, all factions (throughout)
- 862: Louis the Stammerer revolted (¶6/16, June ¶9 [winter-spring])
- 862: The German invades the Slavic Wends unsuccessfully (¶ 13/16, post 15 August [autumn-winter])
- 862: The Hungarians invade the German (¶13/16, post 15 August [autumn-winter])
- 862: The German crushes a revolt by his son Carloman (¶16/16 [winter])
- 863: Hunfrid of Gothia grabs Toulouse [just post-Easter, June mentioned paragraphs later [spring]]
- 864: Lothar II sacked Rome (pre-Easter [winter])
- 865: The German beat the Wends (war throughout)

- 866: The German vs the Saracens (pre-June, ¶5/19 [winter])
- 866: A revolt by Louis the Younger (September or October [autumn])
- 867: Charles moves to quell Breton revolt (army assembles by 25 August [summer-autumn])
- 867: Louis the Younger vs Obrodites (reported immediately after above [autumn-winter])
- 868: Charles invades Berry (¶1, pre-Palm Sunday [winter])
- 869: Louis still fighting the Wends (throughout)
- 869: Louis of Italy vs the Saracens (post August, bishop dies in campaign 19 September [autumn])
- 870: two of the Germans' sons revolt (post 10 August, pre-9 October [summer-autumn])
- 870: Carloman revolts against Charles the Bald (post 9 October [beginning autumn])
- 870: Charles the Bald suppresses a guy named Gerald (last ¶ siege starts [winter])

- 871: Louis continues fighting the Wends (throughout)
- 871: Louis of Italy faces a revolt, defeated it (August or September [summer or autumn])
- 873: Charles finally defeats Carloman (next month mentioned February [winter])

- 874: Bretons rebel (reported immediately after dry summer [summer-autumn])
- 875: A war between the German and the Bald about Italy (begins September [summer-autumn])
- 875: the Bald's magnates revolt aided by the German [Christmas mentioned [winter]]

- 876: Constant war with Wends (throughout)
- 876: War between the Bald and Louis the Younger (6 October [autumn])
- 877: Louis the Stammerer gains control of West Francia after the Bald's death (post-death, pre-30 November [autumn-winter])
- 878: Louis (Stammerer) has to settle a dispute between nobles (post Easter pre-1 September [summer])
- 879: Louis III and Carloman faced a huge revolt aided by all rivals (between 10 April and 30 November [spring-winter])
- 880: Louis III and Carloman defeat a revolt by Hugh, one of Lothar II's sons (post-mid-June pre-some time in July [summer])
- 880: The two kings go to defeat revolt by noble Boso in Burgundy (starting July [summer-winter])
- 882: Finally Carloman defeats Boso (Carloman receives news in September [summer or autumn])

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Natural Disasters

- 838: Earthquake in the Rhineland (18 January [winter])

- 850: Famine (inflated prices [autumn]).

- 851: Famine of the Sorbs (Post a harvest failure [beginning autumn])
- 855: Twenty Earthquakes in Mainz (first event within ¶1/4 [winter])
- 855: Terrible storms (second event within ¶1/4 [winter])

- 858: Serious earthquake (1 January [winter])
- 859: Earthquakes around Mainz (author says [year])
- 859-860: Extreme winter that hurt crops ([winter])

- 867: Earthquake (9 October [autumn])
868: Flooding that damaged crops (unrelated ¶, but harvest calendar [summer])
868: Famine (author says followed flooding [autumn])
870: Extreme heat (between June and August [summer])
870: Earthquake (between June and August [summer])
870: Murrain (between June and 26 September [summer])
- 872: Storms destroyed harvest (the monks say summer [summer])
872: Earthquake (1 December [winter])
873: Locust plague (author mentions harvest calendar [summer])
873: Famine (because of it [autumn-winter])
873-874: Severe winter ([winter])
874: Famine (author suggests [year])
874: Plague (author suggests [year])
- 877: Eye-fever (author suggests [year])
878: Murrain (c. October [autumn])
879-880: An extremely cold winter [winter]
880: Harvest failure (harvest calendar [summer])
- 881: Cold winter that killed animals ([winter])
881: Earthquake (30 December [winter])
882: Plague in Bavaria (post 26 July and Asselt siege [autumn])
883: A landslide blocked the Adige (¶ 5/6, post-June (autumn))
- 886: Sudden cold (February [winter])
886: Flooding (February [winter])
886: Flooding ruined crops around the Rhine (July [summer])
886-887: Severe winter ([winter])
887: Murrain (same winter sentence [winter])
889: Whooping Cough (author says beginning [winter])
889: Plague (same as above [winter])
889: Famine (same ¶ as above [winter])
889: Storms destroyed crops (harvest failure [summer])
- 893-894: Severe cold winter [winter]
895: Famine for three years begins in Bavaria (first sentence [winter])
895: Earthquakes throughout West Francia (¶6/10, ¶ 9/10's season July [spring])
- 896: Flooding (delayed an army's march from 895 [winter])
896: Murrain (also obstacle for army [winter])

Scandinavian aggression

- 845: Vikings ravage Seine (first [winter])
- 845: Vikings attack Frisia (first [winter])
- 845: Vikings attack Saxony (first [winter])

- 847: Vikings attack Dorestad (¶2/3, next date given 21 April [winter or spring])
- 850: Vikings attack Dorestad (¶1/3, [in this year] famine in ¶3, livestock manure needed in harvest [spring-summer])
- 850: Vikings attack the Seine (attack ¶2/3, [in this year] famine ¶3 [spring])

- 853: Vikings attack Tours from the Loire (¶1/4, pre-date of 27 March [winter])

- 858: Charles fought the Vikings on the Loire (mid-August [summer])

- 867: Fighting on the Loire (¶3/4, 9 October given ¶4/4 [summer-autumn])

- 873: Northmen raided Frisia (June [summer])

- 876: Vikings attack Frisia (between 28 March and 28 August [spring or summer])
- 880: King Louis attacks Vikings settled on the River Schelt (¶1, pre-Easter [winter])
- 880: Battles in Saxony (¶2 before Easter [winter])
- 880: Plundered Gaul and includes Frisia (post-mid-August [autumn])
- 880: Louis attacks fortress in Nimwegen and fails (because earlier plundering [winter])

- 881: Vikings fight a war with Louis III on the Northern Francian coasts (post 23 April [spring-summer])
- 882: Vikings on North Francian coast to Moselle-Rhine (continuing war [winter])
- 882: Burn down Trier (5 April [winter or spring])
- 882: Charles begins the Siege of Asselt (post-May [summer])
- 882: Vikings burn down Deventer in Frisia (post-Asselt [autumn])
- 883: Vikings raid Rhine (¶6/6 [autumn or winter])
- 884: Vikings try to invade Saxony (next date is 2 February [winter])

- 884: Charles sends men to fight them on "Frontier (May [summer])
- 884: Raid Frisia, are beaten (¶5/6 post May [autumn])
- 884: Step up attacks on West Francia after Carloman is killed (both ¶6/6 [autumn-winter])
- 885: Invade Hesbaye, but were driven out (they planned on wintering [winter])
- 885: War in Saxony (immediately post-May [summer])

- 886: Vain attempt to besiege Vikings near Paris (9 February-1 May [winter-summer])
- 886: Charles fights the Viking around Paris (post 27 March and pre-July [spring-summer])
- 886: Charles the Fat fights Vikings, loses (army marches in July [summer])
- 887: Vikings plunder as far as Rheims (post-Arnulf revolt [autumn-winter])

- 891: Some Vikings invade West Francia but are defeated (post-mid-August [autumn])

Important Deaths

- 838: Pippin (November [autumn or winter])
- 840: Louis the Pious (29 June [summer])

- 844: Pope Gregory IV (¶2/3 [spring-autumn])

- 855: King Lothar (29 September [autumn])

- 858: Zistibor, leader of Sorbs loyal to Louis (post-mid-August and pre-wintering [autumn])

- 869: Lothar II (July [summer])
- 869: Pope Nicholas I (post-May [summer, autumn, or winter])

- 875: Louis of Italy (August [summer])

- 876: Louis the German (28 August [summer])
- 877: Charles the Bald (summer [summer])
- 879: Charles the Bald's heir Louis the Stammerer (the day before Easter, 11 April [winter])
- 880: The German's heir, Carloman of Bavaria (22 March [winter])

- 882: Louis the German's heir Louis the Younger (20 January [winter])

- 882: Pope John (pre-Easter [winter])
- 884: Carloman II, one of the Stammerer's heirs, is killed (while hunting [autumn])
- 885: Godafrid the Northman (May [spring or summer])
- 885: Pope Hadrian (while travelling to the Fat and shortly before Charles the Fat travelled through Mainz to Worms [autumn])

- 886: Abbot Hugh, one of Gaul's main generals against the Vikings (during vain siege [winter or spring])
- 886: Abbot Gauzlin, one of Gaul's main generals against the Vikings (during vain siege [winter or spring])
- 888: Charles the Fat (13 January [winter])

- 894: Zwentibald, leader of the Moravians and a frequent opponent of the Carolingians (post-Easter, general assembly, and pre-autumn mention [summer])

- 896: Pope Formosus (Easter, 4 April [spring])
- 900: King Arnulf (first sentence [winter])

Local War

- 838: German's rebellion continues in autumn ([autumn])
- 839: Pious vs. Saxons (post-Christmas pre-Lent [winter])
- 840: German continues (post-Easter pre-Ascension [spring])

- 841: Civil war breaks out among brothers and nephew part of the year (confrontations pre-25 June [winter-summer])
- 842: Civil War (issues unresolved throughout [year])
- 843: Charles vs nephew Aquitaine (¶1/3 [winter-spring])
- 843: Moors take Benvento (¶3/3 [autumn-winter])
- 844: Charles vs Pippin II (7 June [summer])
- 844: German beats Abrodites (post 7 June, ¶3/4 [summer-autumn])
- 845: Charles vs Bretons (Epiphany next ¶ [winter])

- 846: German vs Moravian Slavs (beginning mid-August [summer-autumn])
- 846: Moors in Italy (same time [summer-autumn])
- 848: Louis the Younger vs Bohemians (beginning mid-August [summer-autumn])
- 849: Bohemians rebel (only ¶ ([unknown]))

- 851: German vs Serbs (post famine, failed harvest and calendar [summer])

- 851: Pippin II is given to Charles (next event recorded [autumn])
- 855: German vs Slavs (recorded between the dates 20 September and 16 October [autumn])

- 856: Louis beats the Daleminzi (beginning in August [summer-autumn])
- 857: Bohemians (post-Lent and pre-1 October [spring-summer])
- 858: Louis vs Charles (post-deliberation mid-August [autumn])
- 858: Sorb revolt (post-Charles [autumn-winter])

- 861: Carloman, Louis' eldest son, Carinthians and the Pannonian march under his control (post-27 April and Louis suspected rebellion [summer-winter])
- 862: German vs. Abrodites (only ¶ (unknown))
- 864: German vs. Raditz in August (siege August [summer])

- 866: Younger vs. German (beginning some time before November [winter-autumn])
- 869: Sorbs (pre-July [winter-spring])
- 869: Ratziz nephew (beginning August [summer-autumn])
- 869: Ratziz himself (beginning August [summer-autumn])
- 869: Charles invades Lothar's former kingdom ("at the same time" [summer-autumn])

- 871: Louis the Younger and Charles the Fat revolt (pre-1 February [winter])
- 871: A fight with the Moravian Slavs (pre-May [winter-spring])
- 871: Carloman attacked by traitor Zwentibald (c. June [summer])
- 871: Bohemians (c. October [autumn-winter])
- 872: Moravian Slavs (May [spring or summer])
- 872: Zwentibald [pre-summer mention [summer])
- 874: Sorbs and neighbours revolt (pre-February dated [winter])
- 875: War between Louis and Charles over Italy (during/post August [summer-autumn])

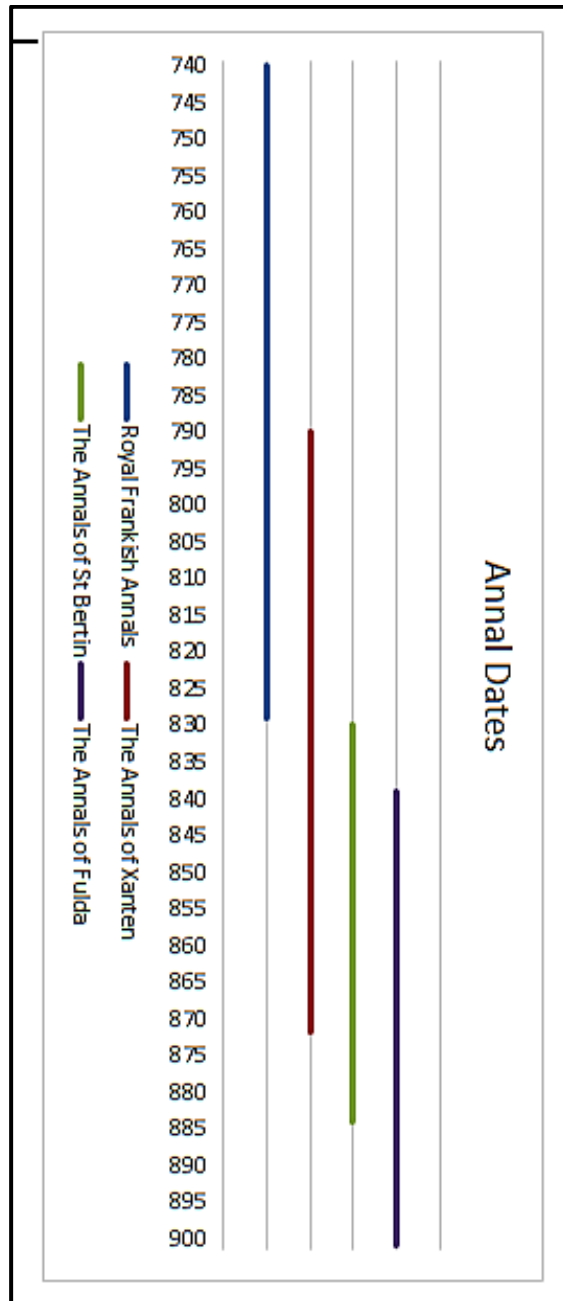
- 876: War between the Younger and the Bald (8 October [autumn])
- 877: Rebellion of the Slavs (pre-Lent [winter])
- 877: Sparring around Italy (begins in summer [summer])
- 879: A near collapse of Western Francia-between heirs of the Stammerer and rivals (yearlong

- 880: Daleminzi the Bohemians, and the Sorbs try to invade because of the Northmen's victory in Saxony (post-Easter pre-August [spring-summer])
- 880: Louis was still trying to gain control of all Francia (beginning August [summer-winter])
- 881: Rebellion by Lothar II's son Hugh, Hugh took control of Burgundy (post-Easter [spring-onward])
- 883: The two dukes of Thuringia war (¶2/6 [winter-spring])
- 887: Arnulf revolts against Charles the Fat (post Easter pre-Charles' death [spring-autumn])
- 889: Arnulf sends an army against the Abrodites (post May pre-winter [summer-autumn])
- 892: Arnulf and Hungarians war in Moravia (July [summer])
- 894: Arnulf invades Italy (pre-Easter [winter])
- 894: Moravians try to invade King Rudolf of Burgundy (post Easter pre-autumn [spring-summer])
- 894: Hungarians invade Pannonia (post Easter pre-autumn [spring-summer])
- 895: Hungarians invade the Bulgars (¶8 and next ¶ is July [spring/summer])
- 896: Invasion of Italy (pre-Easter [winter])
- 896: Bulgars vs Byzantines (post-Easter [summer-autumn])
- 898: Arnulf intercedes in a Bohemian civil war (only ¶ [unknown])
- 899: Arnulf's men invade Moravian Slavs (author says [winter])
- 899: Second invasion of Moravia (post-June [summer-winter])
- 900: Civil War within the kingdom (entire entry after Arnulf's death [unknown])
- 900: Another invasion of Moravia by Bavarian Franks (entire entry after Arnulf's death [unknown])
- 900: Hungarians invade Italy (whole entry after Arnulf's death [unknown])
- 900: Hungarians travel back by successfully invading Pannonia (whole entry after Arnulf's death [unknown])
- 900: Hungarians invade Bavaria but lose (whole entry after Arnulf's death [unknown])
- 901: Hungarians invade Carinthia (pre-Easter [winter])
- 901: Hungarians invade Moravia (pre-Easter [winter])

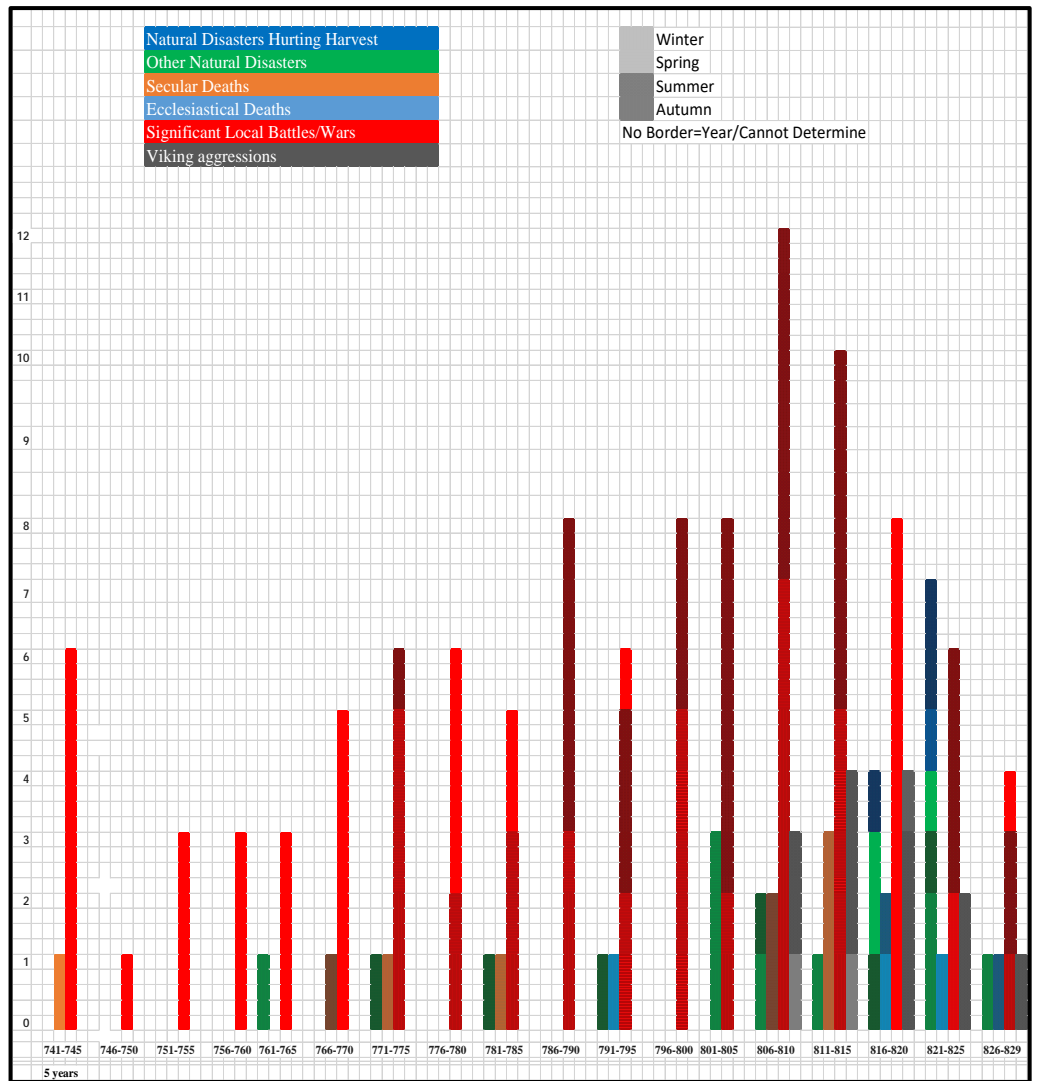
Appendix 2: All Created Charts

Chapter 3

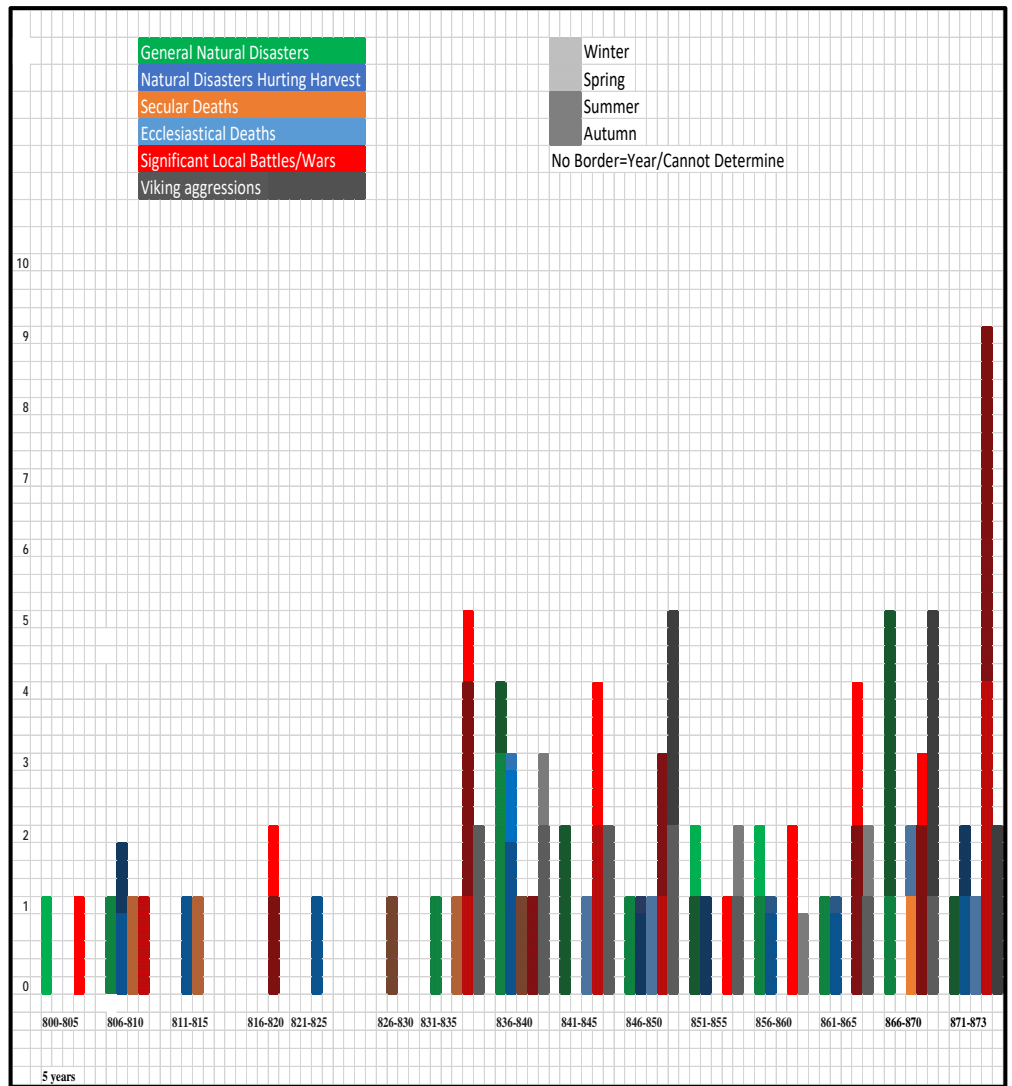
Annals and their Timelines



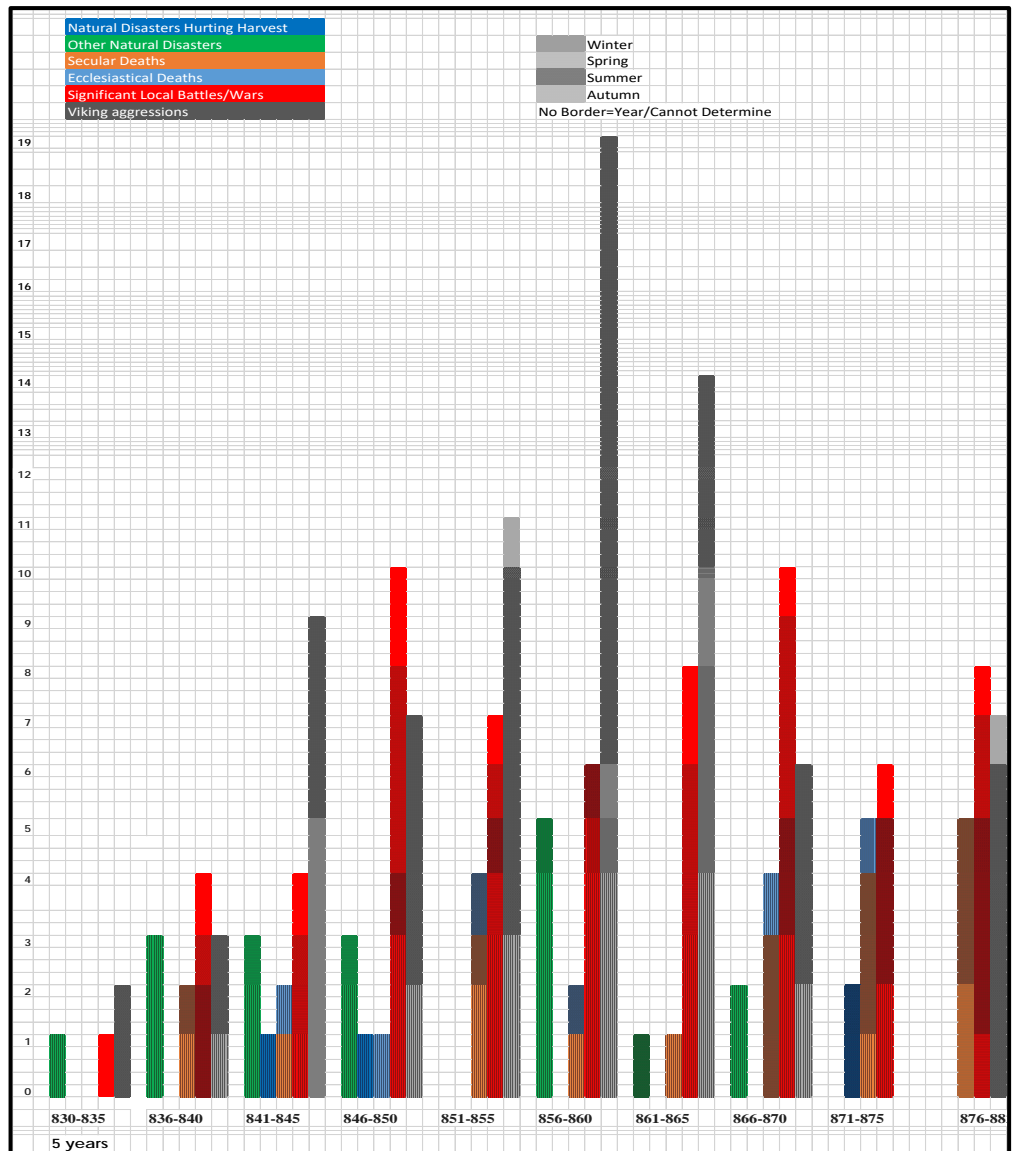
RFA Natural Disasters/Aggressions



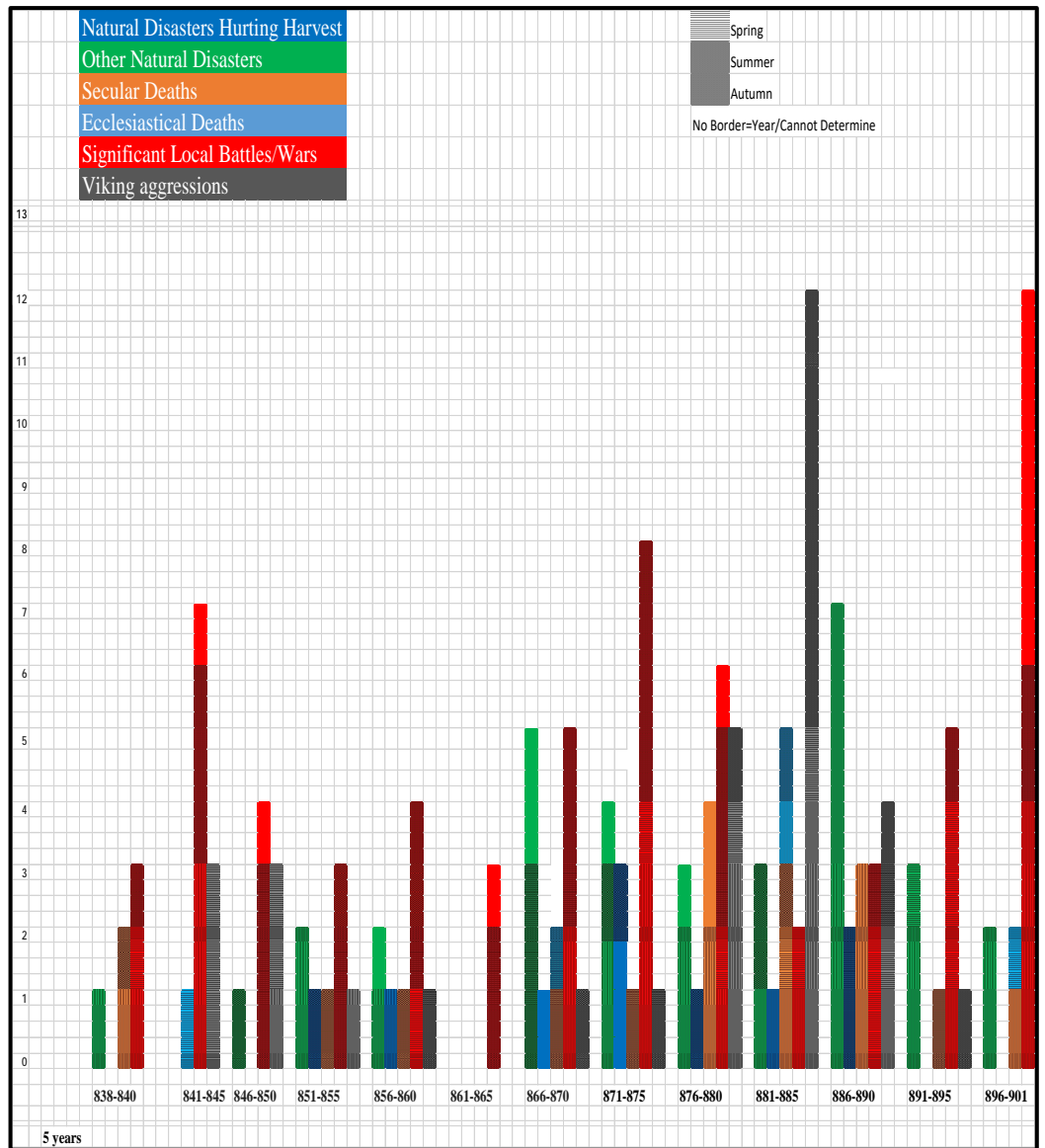
AX Natural Disasters/Aggressions



AB Natural Disasters/Aggressions

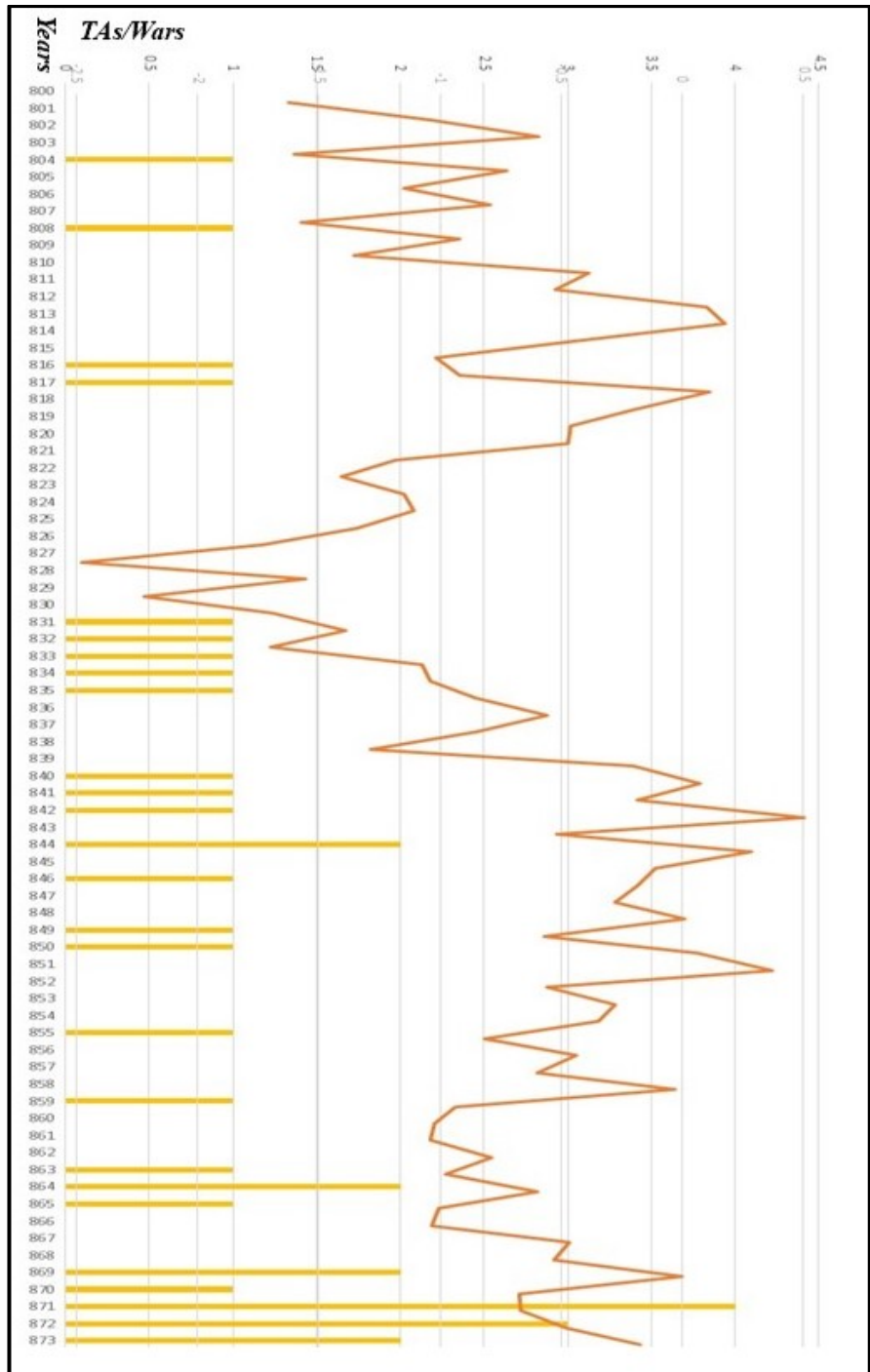


AF Natural Disasters/Aggressions

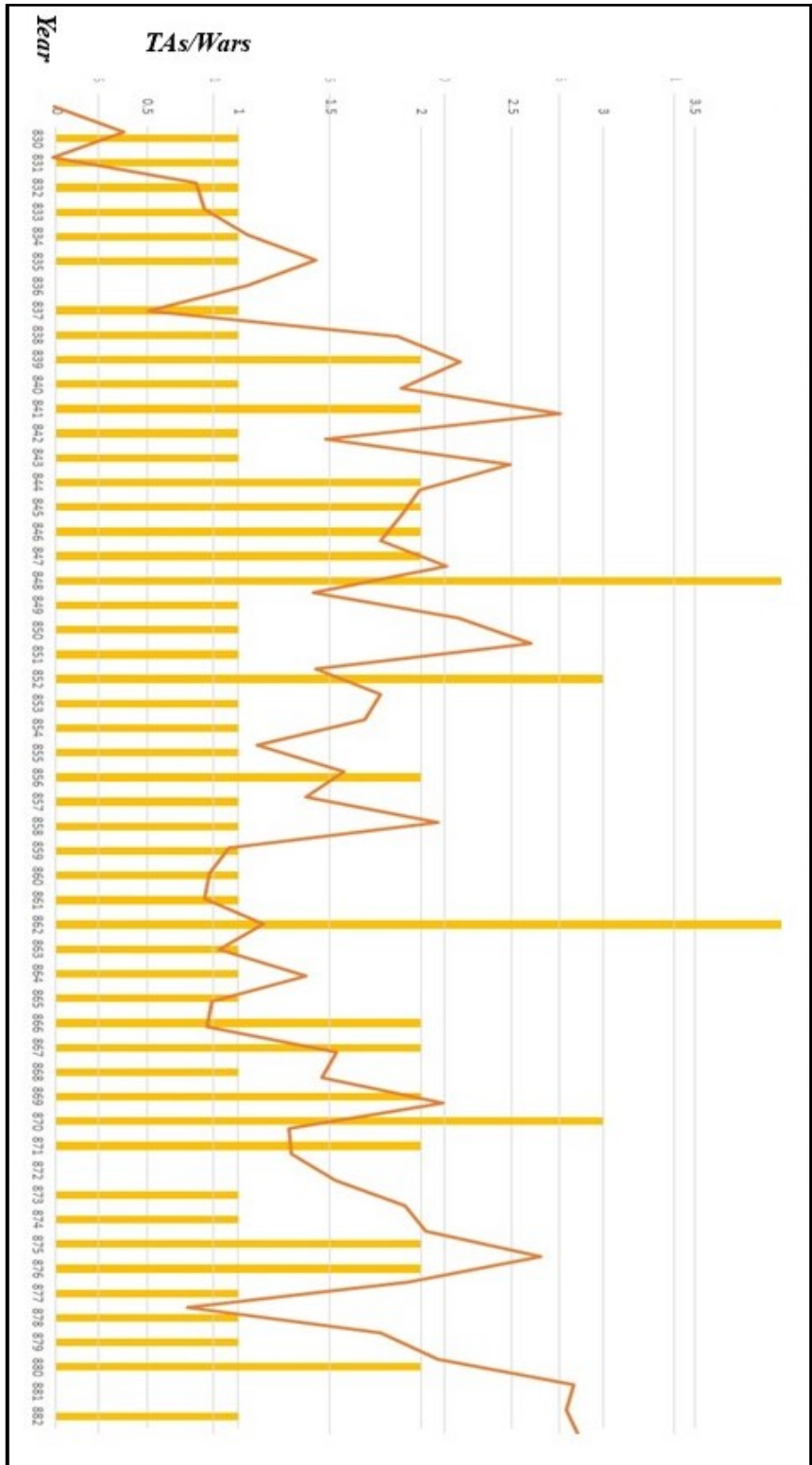


Chapter 4

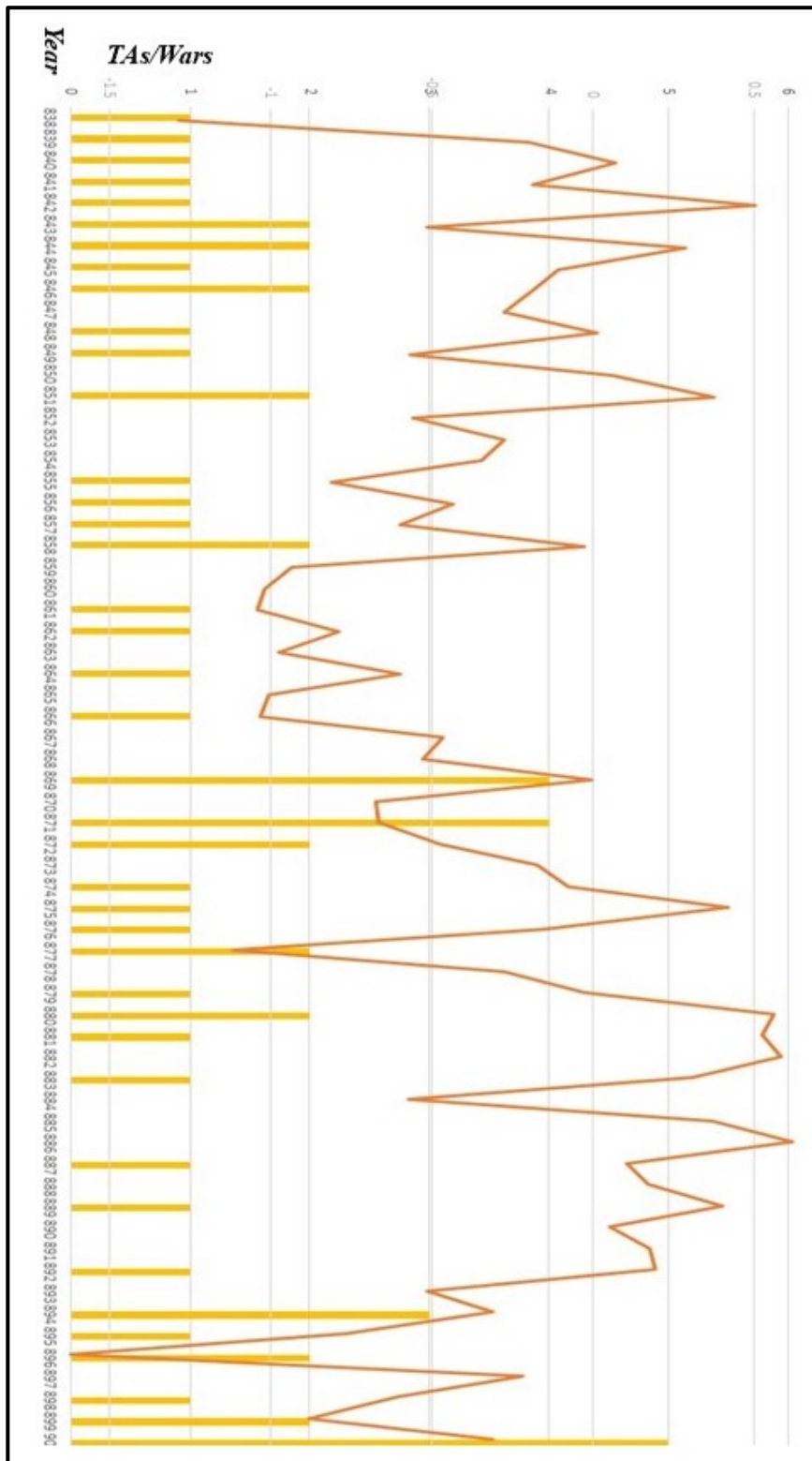
AX Local Warfare/OTC



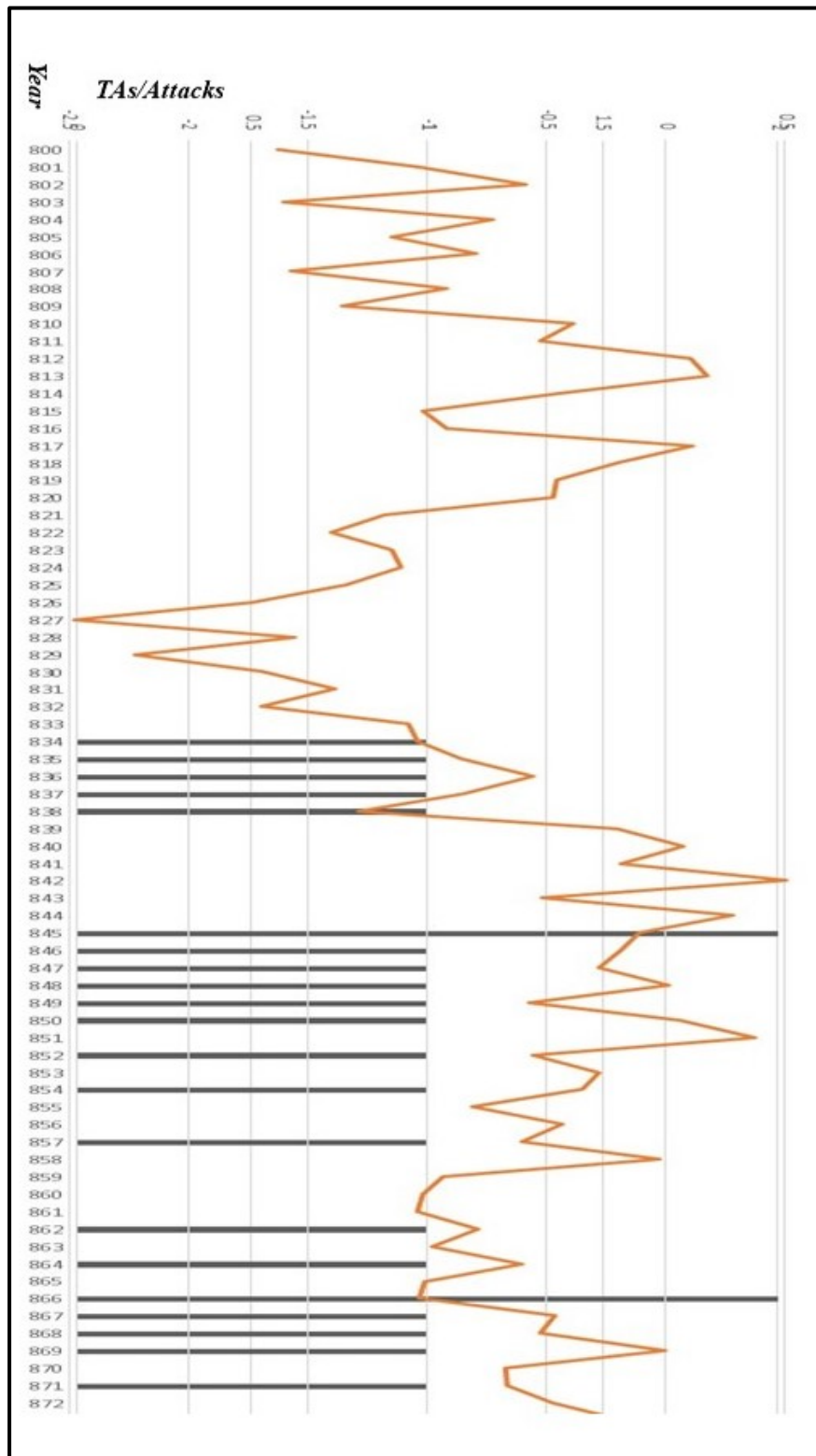
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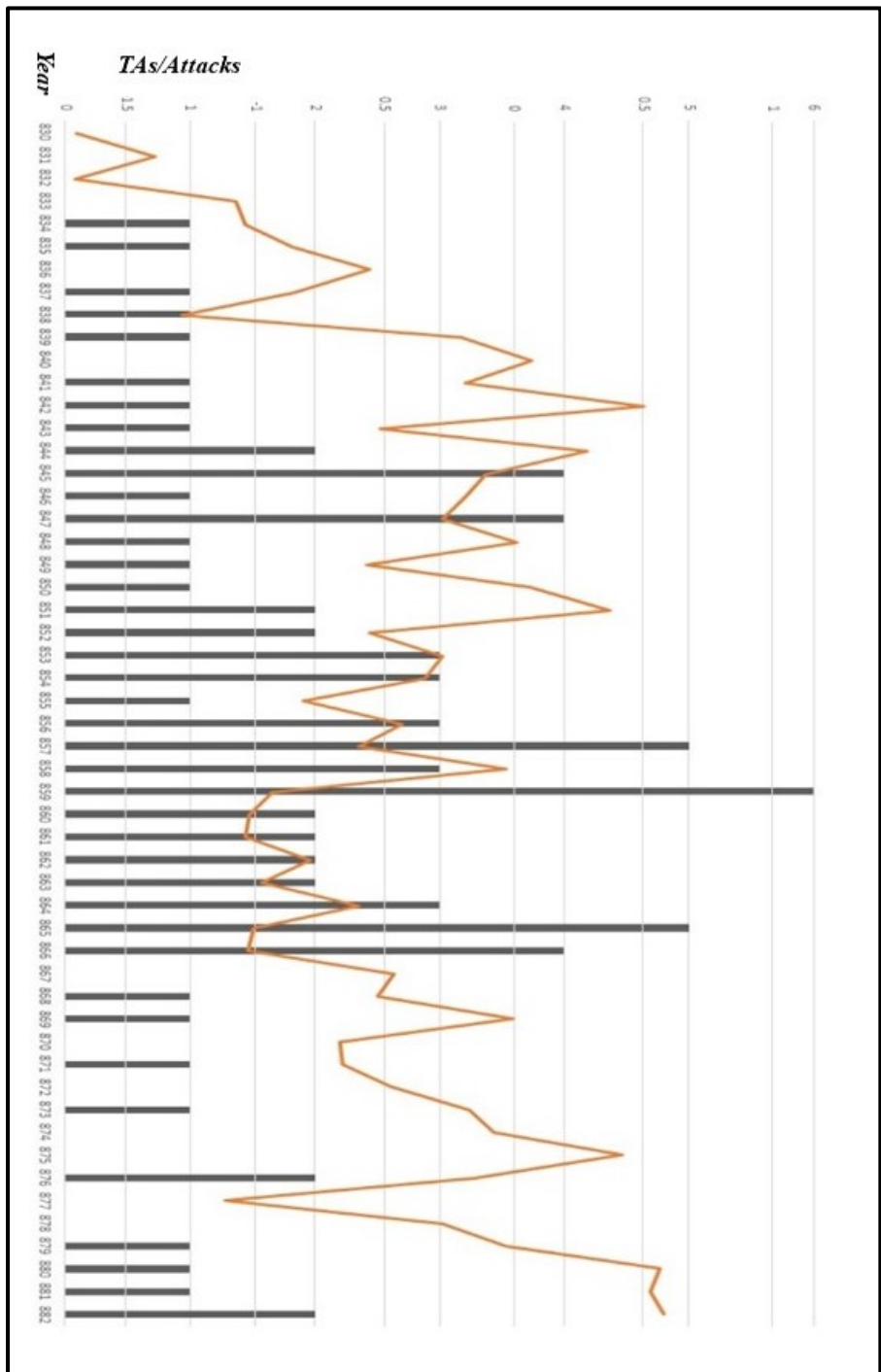
AF Local Warfare/OTC



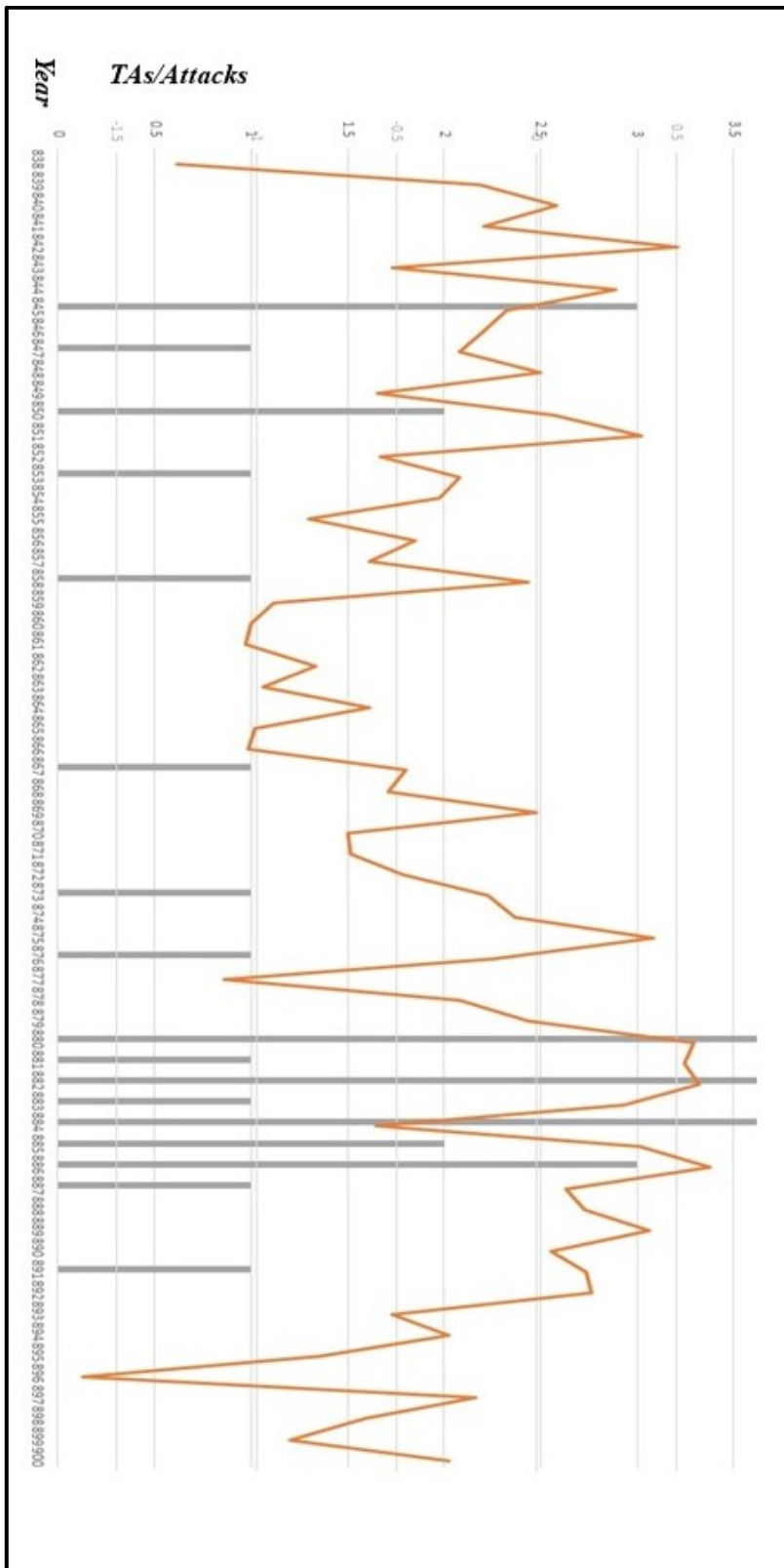
AX Aggressions/OTC



AB Aggressions/OTC



AF Aggressions/OTC



Chapter 6

Statistical/Correlated/Corroborated Anomalies

Statistical Anomalies	Correlated Anomalies	Corroborated Anomalies
AD 810: Cattle Plague throughout empire/Raids on Frisia	AD 834: Flooding throughout Carolingian Empire /Sack of Dorestad	AD 886: Flood Isolating tower under siege of Paris/Scandinavian aggressors capture them because of it.
AD 820: Ruined harvest and plague/Raids on Flanders, Seine, and Bouin	AD 838 Huge tide covers Frisia December/AD 839 Frisia	
AD 837-8: Windstorms first winter/Walcheren and Frisia	AD 843-844: Famine after war in Brittany/the first raids on Brittany	
AD 839-40: Harsh winter/Rouen spring-summer	AD 845: Cold winter and West Gaul Famine/Raids on Seine spring-summer, Aquitaine autumn	
AD 851: Harvest failure and famine of Sorbs/Frisia	AD 846-847 Cold north wind in Troyes/scattered attacks directly north in Frisia	
AD 852: Excessive heat and famine/Seine	AD 850: Rhine famine/Roric captures Dorestad	
AD 856-7: Human plague throughout /Five scattered attacks AD 857	AD 863-864: Rhine flooding/first Rhine lootings since AD 859	
AD 858-9: Human plague/Six scattered attacks AD 859	AD 869: Loire and Burgundy famine winter/battle between Abbot Hugh and Gauzlin with "Loire Northmen" later that year	
AD 863: Flooding and stormy winter/Frisia	AD 878-879: Murrain autumn AD 878 prominently on Rhine/Scandinavian aggressors landing on the Scheidt July AD 879	
AD 873: Locust plague and famine/Unclear number of aggressions and the siege of Angers	AD 880: Frozen Rhine and Main/Battle of Thimion	

Chapter 7

Statistical/Correlated/Corroborated Anomalies

Statistical Anomalies	Correlated Anomalies	Corroborated Anomalies
AD 837-8: Windstorms first winter/Malcheren and Frisia	AD 838 Huge tide covers Frisia December/AD 839 Frisia	AD 810: Cattle Plague throughout empire/Raids on Frisia
AD 839-40: Harsh winter/Rouen spring-summer	AD 843-844: Famine after war in Brittany/the first raids on Brittany	AD 820: Ruined harvest and plague/Raids on Flanders, Seine, and Bouin
AD 851: Harvest failure and famine of Sorbs/Frisia	AD 845: Cold winter and West Gaul Famine/Raids on Seine spring-summer, Aquitaine autumn	AD 834: Flooding throughout Carolingian Empire/Sack of Dorestad
AD 852: Excessive heat and famine/Seine	AD 846-847 Cold north wind in Troyes/scattered attacks directly north in Frisia	AD 880: Frozen Rhine and Main/Battle of Thimeon
AD 856-7: Human plague throughout /Five scattered attacks AD 857	AD 850: Rhine famine/Roric captures Dorestad	AD 886: Flood isolating tower under siege of Paris/Scandinavian aggressors capture them because of it.
AD 858-9: Human plague/Six scattered attacks AD 859	AD 863-864: Rhine flooding/first Rhine lootings since AD 859	
AD 863: Flooding and stormy winter/Frisia	AD 869: Loire and Burgundy famine winter/battle between Abbot Hugh and Gauzlin with "Loire Northmen" later that year	
AD 873: Locust plague and famine/Unclar number of aggressions and the siege of Angers	AD 878-879: Murrain autumn AD 878 prominently on Rhine/Scandinavian aggressors landing on the Scheidt July AD 879	

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