

Dominik Collet · Maximilian Schuh
Editors

Famines During the 'Little Ice Age' (1300–1800)

Socionatural Entanglements in Premodern
Societies

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Part I
Introduction

Chapter 1

Famines: At the Interface of Nature and Society

Dominik Collet and Maximilian Schuh

Abstract Famines have re-entered public consciousness. While most research focuses on modern and future crises, the past offers a rich and largely untapped archive of societies that have already faced similar challenges. However, current research is characterized by antagonisms of the natural sciences and the humanities. In this paper we argue for an integration of the ‘archives of nature’ and the ‘archives of man’. We survey emerging interdisciplinary research designs (vulnerability studies, social ecology, disaster studies) that facilitate such an approach and contend that due to their unique scope, famines constitute an excellent ‘boundary object’ to study socionatural entanglements. Examining the famines of the ‘Little Ice Age’ (1300–1800) can therefore overcome socially or environmentally determinist models of human-environment interaction. As a result, the research approach presented here, can advance our understanding of how past societies dealt with natural challenges and improve the basis for future decision making.

Keywords Famine · Historical climatology · Interdisciplinarity · Human-environment interactions

Famines have re-entered public consciousness. The predicted rise of crop failures associated with climate change put this ‘old’ topic back on the agenda (Field 2012; Willenboeckel 2012). Most research focuses on the simulation of future crises. The past, however, offers a rich and largely untapped archive of societies that have already faced similar challenges. Examining the way these encounters have been negotiated may improve the basis for future decision making.

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Famines posed a fundamental threat to people experiencing them and continue to do so. Yet these events also challenge their researchers. Famines occur at the precarious interface of nature and society. They involve both a biophysical side affecting the availability of food and a social side governing the access to food. The most severe events result from the interaction of both these spheres, when environmental anomalies concur with war, economic stress and social inequality. As a result, the character of famines is best described as 'socionatural'. Such events transgress the well-tended boundaries between the sciences and the humanities. Consequently, any comprehensive study on famines requires the interaction of various academic fields (Pfister 2012). In many cases this involves not just the collaboration of neighbouring disciplines, but the notoriously difficult 'big interdisciplinarity' between the measuring and the hermeneutical sciences. In the context of the current academic framework this takes the researcher far into uncharted territory.

At the same time, the study of famines provides great opportunities. It relates to a range of pressing current debates: How do societies react to extreme natural events? How can human-environment relationships be framed without resorting to deterministic modes of explanation? How do we advance beyond the disputed and increasingly irrelevant dichotomy of nature and culture? These fundamental questions inform emerging transdisciplinary fields such as Social Ecology, Environmental Humanities or Disaster Studies and their conceptualizations of Socionatures, Panarchies, Naturecultures or the Anthropocene (Gunderson and Holling 2002; Cote and Nightingale 2012; Hall et al. 2015). They all react to the shared impression that current research designs and the ongoing disciplinary fragmentation have caused rather than addressed many major ecological challenges we face today.

So far, the potent tropes associated with narratives of famine inform widely held assumptions about future catastrophes. But the lack of integrated studies has meant that these expectations are based on fragmentary and often misleading evidence. What role does ecological stress play in famines? How did environmental impacts become an economic challenge? How do affected social groups perceive, cope, and possibly appropriate extreme events? Researching past famines can help to substantiate speculative debates in fields ranging from technologies of risk and 'cultures of disaster' to environmental migration and 'climate refugees' (Bankoff 2003; Lübken 2012). A multifactorial, empirical approach can safeguard against simplistically 'predicting the past' (Collet 2014).

However, the benefits of an inclusive, socionatural approach do not stop with current affairs. It similarly sharpens our grasp of premodern societies where famine was a constant companion, and broadens the methodological repertoire available to historians and paleoclimatologists. So far, historical research has been reluctant to engage with premodern famines because of their unfamiliar natural aspects. In order to stay well clear of climate determinism historians focused on more recent, predominantly man-made events that fall more easily within the remit of the humanities, such as the Irish Famine (1845–48) or twentieth century crises in totalitarian regimes (Ó Gráda 1999; Wheatcroft and Davies 2004; Wemheuer 2012). Earlier famines, primarily associated with 'natural' causes, have received much less attention. However, the wariness to engage with environmental impacts has relinquished

central fields of historical research. Famines constituted key events of premodern agrarian societies. The production and provision of food legitimized rulers, its price regulated the economy, its consumption shaped popular culture. Crises of subsistence therefore cut to the very heart of past lifeworlds. They reveal complex socio-natural arrangements, the embedded economies of survival, practices of social inclusion and exclusion, the crisis-driven intensification of governance as well as early attempts at securitization. In fact, famines can justly be described as the ‘normal exceptions’ (Grendi 1977) to premodern agrarian life. They reveal the deeper conflicts of societies that otherwise remain hidden and have been identified as the ‘missing pages’ of the great historical narratives (Davis 2001, 8). Rediscovering famines may serve as a reminder that human societies are open metabolisms, in constant exchange with the natural environment surrounding them. In these ‘built environments’ natural impulses enable social observations, without limiting them to simple deterministic cascades of cause and effect (Oliver-Smith 2004). Studying famines has the potential to not just broaden but deepen historical understanding.

The same applies to the natural sciences. Fields such as paleoclimatology have experienced difficulties connecting their increasingly detailed findings to social developments. Not only is it challenging to find adequate natural ‘proxies’ (such as tree-ring, stalagmite and lake sediment data) that can be synced with historical ‘sources’ (such as narrative and administrative records). The integration of scientific analyses with the contingencies of human action requires new integrative approaches. As a result, social responses to environmental triggers often remain side-lined in scientific studies. They are frequently added with little or no integration into the original research design (Collet 2014). The resulting studies condense the plurality of social responses into fixed reactions to external triggers. These reductions of the human sphere stand in sharp contrast to the complexities attributed to the natural phenomena discussed (Hulme 2011). The growing concern about the effects of environmental degradation and climatic change, however, demands a more integrated approach that transcends mere reconstructions.

Famines at the intersection of the social and natural spheres constitute an excellent starting point to bridge established disciplinary divisions. They leave traces in natural as well as social ‘archives’ and have fostered an inclusive methodology in the form of vulnerability studies (Collet 2014). As a result, their transgressive character can challenge social and climatic determinism and suggest alternative, more dynamic approaches to the entanglement of environment and society.

Antagonisms

Famines have long proved a challenge for research designs. Few events can match the impact a famine has on society. The collective experience of starvation often leaves a mark on entire generations of victims. Their occurrence is remembered on par with war and plague; their absence sets good times apart from bad times. The physical and emotional violence of food shortages unsettles all areas of social,

economic, and cultural life. Furthermore, famines constitute ‘slow disasters’. Unlike floods, earthquakes, or fires they can take months or years to fully develop and have the potential to affect large geographical areas. Because of their scope they provide ample space for the interaction of physical and social factors that cannot be limited to straightforward impacts and responses (Pfister and Brázdil 2006). Studying them, it is necessary to employ broad, multifactorial approaches.

However, past research on famines is characterised by a paradox. The richness of the field resulted in the dominance of narrow, disciplinary approaches. Medicine, economics, geography, or anthropology each have developed their own research methodologies for studying famines (Murton 2000). The sheer wealth of data and sources made collaboration seem unnecessary. Instead of emulating the multifaceted event it studies, the research field is characterised by a rigid, unproductive fragmentation.

Today one research tradition stresses ‘natural’ causes while the other focuses on ‘political’ factors—an opposition rooted in the division of natural and cultural sciences. Translated into academic settings, the sciences focus almost exclusively on the external, biophysical impacts studying the *archives of nature* (precipitation and temperature data reconstructed through the analysis of proxies such as speleothems, sediments or tree-rings). Similarly, the humanities limit themselves to internal, societal factors such as socio-economic inequality and resulting entitlement failure based on the *archives of man* (records of prices, births, and deaths, etc.). These approaches do not just use different data sets; they also suggest entirely different causalities of famine. The former regards famine as the straightforward result of the decreasing *availability* of food, advocating a strong link to climate impacts. The latter considers the decline in socially differentiated *access* to food as the root cause of famine, highlighting political or ‘green famines’ with no relevant link to climate, particularly in modern post-colonial settings. In order to frame this antagonism Amartya Sen coined the terms Food Availability Decline (FAD) versus Food Entitlement Decline (FED) (Sen 1981).

During the 1980s the rivalry of production- and distribution-based approaches initiated productive research. It successfully challenged the dominant explanatory models focussing on natural causes and technological remedies. In the long run, however, this antagonism has resulted in scientific deadlock. It limits the potential to address current challenges, where risks are understood to result from the interlacing of climate change and social inequality.

The FAD/FED divide also impedes research into historical famines: Both approaches maintain that past crises differ from modern famines and were mainly driven by natural impacts. The claimed mono-causality has encouraged climatologists to stay within their disciplinary comfort zone and discouraged historians to engage with the field. Researching historical events, the models of both climatologists and economists focus on an abstract sequence of external stress and demographic response. They fall far short of E. P. Thompson’s pressing question: “Being hungry, what do people do? How is their behavior modified by custom, culture, and reason?” (Thompson 1971, 77–78). As a result, for most historians working in a field shaped by the recent praxeological and cultural turns, famines seemed increasingly irrelevant.

The indifference of historians also reflects the genesis of their discipline: for centuries historians studied the natural world alongside human societies. The split of professional historiography from the field of ‘natural history’ occurred only during the nineteenth century. This decoupling resulted in the marginalisation of natural factors and a strong aversion to perceived environmental and climatic determinism (Chakrabarty 2009). This tendency has been reinforced by the growing disenchantment with earlier cliometric or econometric approaches. They reduced the interaction of environment and society to one of climate and demography, forces beyond the reach of the individual (Mauelshagen 2010, 115). Such an approach is at odds with the commitment of the historical field to the autogenesis of humankind. The conviction that our fate is in our own hands and that human agency is the dominant factor of historical change is fundamental to the practice of historians. As a result, nature is rarely imagined as part rather than as counterpart of history.

When historians do engage with premodern famines they usually recur (explicitly or implicitly) to the model of the ‘*crise de type ancien*’. Developed by Ernest Labrousse and Wilhelm Abel in the 1940s, it draws mainly on anonymised serial sources, such as price indices and demographic data. Their model of an immutable cycle of harvest failure, economic crisis, malnutrition, and excess mortality—invariable until the time of the industrial revolution—left little room for societal intervention and privileged natural causation. Few researchers embraced the alternative explanatory models of neighbouring disciplines drawing on socioeconomic factors instead. Historians have been slow to pick up Amartya Sen’s work on the crucial role of shifting entitlements and endowments, even though it offered more room for human intervention. This is even more surprising as his approach focussed on non-industrialised countries, non-market transactions, informal exchanges, and the heterogeneous composition of the poor that characterise many premodern societies.

Instead of serving as a testing ground for studies on human-environment interaction, research on historical famines reflected the wider antagonisms of the field. Today it is marked by the renaissance of environmental determinism on the one hand (Fagan 2002) and the claim, that virtually all famines, including those in historical societies, constitute an exclusively man-made phenomenon on the other (Fogel 2004).

Entanglements

Multifactorial approaches have only recently regained popularity. They are, however, not a modern invention but rather a rediscovery of earlier pluralities. Premodern societies understood famines to be caused by a combination of extreme natural events, human neglect, and divine intervention. While the weighting and relative importance of the three fields—real shortages, profiteering, punishment by an angry god—were eagerly discussed, all three were conceptualised as being closely interwoven. Mono-causal explanations only became dominant during the nineteenth century, when a new, secular worldview conceptualised man and nature

as fundamentally distinct (Walter 2008). In this respect, integrative approaches to famine not only frame both sides of the reductionism characteristic of high-modernity (Zwierlein 2015). They also realign modern interpretations with more plural perceptions prevalent in the historical societies under scrutiny.

Recent research increasingly conceptualises natural environments and human practices as closely entangled. These integrated approaches have been pioneered by historical disaster studies examining extreme natural events as momentous interfaces of nature and culture (Johns 1999; Mauch and Pfister 2009). However, they focused on rapid onset disasters with a clear natural stressor, such as earthquakes or floods. Slower, socionatural hybrids, such as famines, remained on the fringes. Disaster historians side-lined them because their natural impact appeared too limited, just as crisis-studies dismissed them because it seemed too dominant. Researchers of historical catastrophes have, however, argued convincingly that while hazards are natural, disasters are not (Bankoff 2004). As a result, they should be classified as ‘cultural’ as well as ‘natural’ catastrophes. Disaster studies have also revealed historical patterns of interpretation and coping to be unexpectedly dynamic (Walter 2008).

These observations apply equally to research on past famines. They critique determinist approaches to climate and hunger and open the field to the methodological register of cultural history. The emphasis on the cultural consequences of disasters challenges claims by demographers and economists, that premodern famines constituted ‘mere fireworks’ in the historical record (Hoyle 2010, 975). Instead, concepts of a ‘culture of disaster’ (Bankoff 2003; Rozario 2007) encourage researchers to incorporate the similarly vibrant studies of cultural historians and anthropologists on specific historical cultures of hunger (Camporesi 1996; Montanari 2006; Scott 1976; Spittler 1989; Apt Russell 2005; Vernon 2007).

The suggested integrative approaches have been incorporated in the field of environmental history. Here the co-constitution and co-development of nature and culture informs the research perspective. Its major studies on the links of nature and power, sites of ‘socionatural encounter’, or the metabolisms and resource flows of historical societies have tried to chart the ‘entangledness’ of human-environment relations beyond the confines of geomaterialism and ecodeterminism, as well as reconcile materialistic and symbolic modes of interpretation (Knoll 2013, 92–107). The perceptions of nature and of natural impacts in modern and premodern societies is another strand of environmental history strongly influenced by cultural research methods. Studies range from the powerful narratives of nature to the framing of catastrophes and extreme weather (Cronon 1992; Rohr 2007; Schuh 2016). Again, these concepts along with the respective research designs have yet to be taken up by studies on historical famines.

So far, most historians of famine have refrained from exploring the interaction of natural and social stressors in their investigations. Instead, they focus on the economic and demographic effects of food shortages or highlight the role of governments, tracing the repertoire of famine policy as far back as Ancient Rome and Carolingian Europe (Garnsey 1988; Jörg 2010). They illustrate how famine prevention and food security became a catalyst of state formation, starting in medieval

cities and spreading to the early modern territories and states (Jörg 2008; Lachiver 1991; Monahan 1993; Cullen 2010; Alfani 2013; Kaplan 1976). Some also investigate the cultural impacts of these events (Behringer 2015).

Very few studies pursue a more integrative approach. Historical climatologists have been particularly active. They attempted to identify the biophysical triggers of harvest failures, explore bi-directional models of socrionatural interaction and suggest ways to tie acute weather extremes into the long-term anomalies of the *Little Ice Age* (Pfister and Brázdil 2006; Behringer 2009). The crises of 1570–75 and 1815–17 have been studied from the broader perspective of environmental history (Behringer 2003; Krämer 2015). Socioecological connections are also made plausible in works on the great famine of 1315–18/22 and the global famines of the late nineteenth century (Jordan 1996; Davis 2001). They trace the entanglements of extreme weather and social phenomena such as witch hunts, state-formation or imperialism. Bruce Campbell recently extended his explorations of medieval climate and societies to the crucial link with disease (Campbell 2016).

Many other areas remain uncharted. The role of epidemics has been explored mainly in demographic macro-studies (Post 1990). Famine-driven migration is often alluded to, but has seen much less empirical research than the better known cases of the 19th and 20th centuries (Engler and Werner 2015). Few historical studies draw on the rich field of current famine research. Little is known about the role of non-state actors, of gender, or of the informal economies, entitlements, and relief that inform the *sustainable livelihood approach*, even though they played a similarly crucial role in premodern societies (Chambers and Conway 1991). The same applies to the vast array of anthropological studies on hunger in non-European societies, even though famine has rightly been described as the ‘great leveller’ (Parker 2013, 695). Its physical and emotional violence reduces the differences between modern and premodern, Western and non-Western societies to the basics, substantially increasing the potential of comparative approaches.

Due to these gaps in research, most studies regularly underestimate both the potential and the plurality of premodern crises. This has encouraged claims that earlier famines were predominantly perceived in religious terms or that the mediation of catastrophes, the charitable engagement of civil society, or the discourse on disaster ‘victims’ are characteristic only of current events. There is little awareness of the striking plurality of perceptions and practices that link these premodern disasters not to later mono-causal explanations but to the current ‘socrionatural’ realignments.

Famine as Boundary Object

The ecology of famine constitutes an excellent interdisciplinary research field. It highlights the interactions of the natural environment and social behaviour transgressing disciplinary boundaries. It can be studied in Western and non-Western settings of historical as well as current societies. Its extreme character produces a

range of sources and data across the societal and natural archives even in areas or epochs that are otherwise poorly documented. Its physical and emotional force reveals socio-ecological arrangements and conflicts that would remain hidden under normal conditions. Famines can therefore be analyzed as *Realexperimente*. They allow testing societal responses to changes in fields that we cannot usually manipulate on a similar scale, such as the economy, culture, demography, or climate (Groß et al. 2005; Behringer 2015, 9).

Because of their unique scope, famines constitute an excellent ‘boundary object’ of transdisciplinary research. It is both robust enough to maintain its uniform features across the disciplines, and plastic enough to organise co-operation and invite interdisciplinary ‘borrowing’ (Star and Griesemer 1989). Because of this pliability to multifactorial research settings, the field is characterised by a ‘natural’ affiliation to other integrative concepts such as Social Ecology or to the Environmental Humanities. However, it also comes with its own methodological approach in the form of Vulnerability Studies, which were developed in response to the increasing antagonisms in famine research during the 1980s. By then the continuation of severe crises in the developing world had raised awareness of man-made factors in famine causation and fostered the opposition of natural and political factors in the FAD versus FED debate. In a bid to return to a more graded approach, Robert Chambers suggested that famine vulnerability has, in fact, ‘two sides: an external side of risks, shocks, and stress to which an individual or household is subject; and an internal side which is defencelessness, meaning a lack of means to cope with damaging loss’ (Chambers 1989, 1). In order to understand these events, both needed to be addressed in their mutual interaction. His approach and terminology was quickly picked up and extended to a systematic conceptual approach. Ecological and cultural factors were added in the equation. The initially static ‘mapping’ of vulnerability soon gave way to a more procedural approach, opening the field to the humanities. Its use has extended from famine research into a wider field that studies human-environment interactions—most notably research on the consequences of climate change. At its core is not a fixed methodology but a specific research perspective: multifactorial rather than mono-causal approaches, dynamic interdependencies rather than rigid determinisms, and an understanding of human-environment relations as entangled rather than conflicted (Collet 2012, 2014).

As a result, the research field provides both data and methods for multifactorial approaches that have not yet been applied to their full potential. Their implementation has the potential to address both a class of events that fundamentally shaped historical societies and the current debate on socionatural entanglements.

Famines During the *Little Ice Age* (1300–1800)

The papers in this volume take up this challenge from a variety of disciplinary backgrounds. They are the result of a meeting organised by the research group ‘Environment and Society’ at the Heidelberg Center for the Environment and

hosted by the Center for Interdisciplinary Research (ZiF) in Bielefeld. Focussing on ‘Socio-natural Entanglements in Premodern Societies’, it brought together researchers from the natural and social sciences as well as the humanities studying both European and non-European cases.

Collectively, these texts seek to probe ways to integrate the *archives of nature* with the *archives of man*. For most of the researchers this meant leaving the comfort zone of their disciplinary settings. They did so with reference to a variety of interdisciplinary concepts (disaster studies, environmental humanities) and methodologies (vulnerability studies, historical climatology). In order to challenge deterministic models of human-environment interaction, the individual studies follow small-scale high-resolution research designs instead of the larger frameworks popular in human-environment research. Taken together they aim at establishing a model for empirical studies on the socio-natural character of historical societies.

The case studies begin with events around 1300 to secure a record rich enough to connect data from natural proxies and historical sources. They extend to approximately 1800, in order to focus on agrarian societies where the interaction of natural and social factors is particularly intense and famines were a regular feature. The *Little Ice Age* was acknowledged as a guiding framework, fully aware of recent criticisms of the concept (Rotberg et al. 2014), considering the increased frequency of extreme weather conditions (LIATE) as more significant than overall trends (Pfister and Brázdil 2006). The *Little Ice Age* also serves to test our observation that established historical periodisation can be unsettled when environmental issues are included in the equation. In regard to experiencing, perceiving, and dealing with famine, the separation of medieval and early modern (and indeed some later) settings bears little significance. For the same reason, the volume includes case-studies that go beyond the classical arenas of European history. Their addition also reflects the desire to challenge the narratives of the ‘European Miracle’ (Eric Jones) or the ‘Great Divide’ (Kenneth Pomeranz) that place Europe’s supposedly superior mastery of nature and its food regimes at the heart of modern history—a claim increasingly disputed (Scott 1976; Parker 2013).

All papers are inspired by three fundamental questions: What ‘archives’, both natural and societal, can provide the necessary data? Which research designs work best at challenging the opposition of natural and cultural factors with multifactorial, dynamic approaches? How can a focus on the entanglement of nature and society reshape our understanding of human-environment relations?

Attempting to answer these problems, the case-studies have been grouped into four sections. These trace socionatural interactions on various levels of intensity and proximity. The first methodological unit charts new ‘Interdisciplinary Approaches’. Bruce Campbell argues for an integrative perspective drawing on the disastrous coupling of extreme weather and epidemics in fourteenth century England with developments in the economic and political sphere. He attributes the harrowing consequences of the ensuing crisis to the combined and interdependent impact of these stressors on an already vulnerable society. His study calls for the inclusion not just of climate and society but also of the etiology of epidemics into

the analysis. Heli Huhtamaa discusses the potential of natural proxies such as dendrochronological records to supplement the study of areas with a limited body of written sources. Using early modern Finland as an example, she demonstrates how integrating serial datasets on tree-ring growth can be linked to historical accounts on prices and demography. Both give formidable examples of highly integrated research designs spanning the natural sciences and the humanities.

The second section explores the high-resolution study of ‘Socionatural Entanglements’. Chantal Camenisch investigates the crises of the 1480s and 1490s in Switzerland and the Low Countries. Her combined analysis of narrative and administrative sources as well as grain price series programmatically highlights the confluence of both FAD and FED factors in the evolution of these crises. Rudolf Brázdil, Oldřich Kotyza and Martin Bauch focus on famines in the Czech lands around 1500. They illustrate the momentous interplay of intense biophysical stress with long-term changes in political and economic environments. Steven Serels studies the impact of extreme weather patterns on the pastoral societies of East African coastal regions, demonstrating the broad range of societal responses, adaptations, and appropriations. Besides facilitating a flexible and strategic migration system, the rise of Sufi communities provided spiritual and physical relief, challenged established political regimes, and initiated the conversion of parts of the East African population to Islam. All these essays make use of the broad range of available ‘archives’, ranging from tax reports to tree-rings. While they stress the need to address the differences in resolution and precision of these data sets, they argue for the value of their integration in order to capture the complex socio-natural character and effects of famine events.

The third section advances from the identification of exposure to the realm of ‘Coping’ with famines. At this ‘second-tier’ level, interactions are still noticeable and momentous. Andreas Rüter discusses migration as a potential mechanism to deal with the combination of environmental and societal stress. Drawing on the interpretation of the German medieval eastward expansion as a direct response to deteriorating subsistence levels, he indicates the gaps of the historical record on the motivation of migrants and explores the interconnections of multiple stimuli instead. Guido Alfani traces the interaction of political and economic appropriations of environmental pressure in Italy highlighting the diversity of the social responses and economic ‘solutions’ to similar challenges. Jessica Dijkman extends these explorations to rural settings. Her close reading of the records of charitable institutions reveals not only the dynamic adaptation to environmental stress but also high levels of cooperation fostered by these challenges. Andrea de Vincenti analyses the interaction of secular and spiritual authorities in Zurich during the famine of 1771/72. As both sides agreed to a moral interpretation of the event, the environmental shock served as a catalyst for educational and agricultural reform. These case-studies present the potential of integrated, micro-historical approaches that reduce the scope to improve the resolution as natural impacts travel through the complex tiers of social arrangements.

The fourth section engages the realm of culture and traces practices of ‘Perceiving and Remembering’. Even though these fields are mediated through

tradition and convention they prove to be dynamic. As such, they not only reflect the socationatural arrangements of the affected societies but also inform and change their responses. Stephan Ebert examines the interpretation of famine in Carolingian times. He illustrates how the historiographical construction of a vulnerable society served to strengthen spiritual and secular authorities. Maren Schulz investigates the use of processions and their images, whose medial transposition not only processed the need for closure, but also organised a new socio-political agreement of the affected population. The concluding essay by Andrea Fadani explores the material culture of famine. His tour of the material record of museums unlocks objects as another significant historical archive, serving as a potent reminder of the impact these events had on collective memory and revealing the tangible dynamics of remembrance.

Together, these essays make the case for an integrative, transdisciplinary approach to historical famine research. Each of the events discussed is attributed to the interplay of multiple stressors rather than one dominant cause. They rate climatic and political, biological and cultural factors not as antagonisms but as communicating spheres that interact and co-develop. They do so not in fixed relations of cause and effect but in dynamic and unexpected forms of entanglement. Depending on local constellations, environmental stress could initiate not just widespread suffering but also cross-confessional collaboration, educational reform, religious conversion, or increased political participation. The societal perceptions, responses and appropriations are characterised by their plurality. However, there are also substantial cross-temporal and -cultural commonalities that link medieval and enlightened as well as Western and non-Western ways of coping. The experience of famine reveals fundamental conflicts grains-based societies and regimes shared across the globe in a highly asymmetrical distribution of risk, resources, and entitlements. Their ecologies are, therefore, best described as 'embedded' (Polanyi 1944).

The cross-disciplinary 'borrowing' of data, methodologies, and perspectives of inquiry practised in this volume allows re-capturing the complex socationatural settings of famine. The volume demonstrates that integrative approaches are now able to draw and expand on a range of recent cross-disciplinary research designs, such as disaster studies, food history, vulnerability studies, and environmental history. It also confirms that there is a growing body of researchers capable of and interested in putting these designs into practice. However, the essays also illustrate that this scope of disciplinary transgression requires a carefully limited field of study. Integrating the different natural and societal 'archives' works best in high-resolution, small-scale case-studies. Such an approach yields much needed empirical studies on the effects of extreme events on past societies. It can serve to substantiate a debate that tacitly informs our understanding of the dangers of the current climate change, but has so far been limited to conjectures rather than to in-depth research.

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Part II
Interdisciplinary Approaches

Chapter 2

The European Mortality Crises of 1346–52 and Advent of the Little Ice Age

Bruce M.S. Campbell

Abstract Between 1315 and 1352 populations in first northern, then southern and finally the whole of Europe succumbed to a succession of devastating mortality crises. These derived from a common episode of climatic instability generated by global processes of climate reorganisation. From the 1330s, climate forcing grew in strength until between 1342 and 1353 all parts of Eurasia were experiencing exceptional levels of environmental stress. This was the context for the poor harvest of 1346 in northern Europe and failed harvest of that same year in southern Europe, plus concurrent arrival of plague in the Crimea following its long westward migration from its reservoir region in the Tibetan-Qinghai Plateau of western China. In Europe the human impact of this conjuncture of climatic and biological extremes was amplified by escalating warfare and onset of a severe commercial recession. The notorious mortality crises of 1346–52 thus emerge as a multi-causal and multi-dimensional disaster.

Keywords Climate change · Extreme weather · Harvest failure · Famine · Plague · 1340s

The innate seasonal and annual variability of weather in temperate Europe meant that harvest shortfalls were an unavoidable feature of pre-industrial economic life. Moreover, the effect of the transition to the atmospheric circulation patterns of the Little Ice Age (LIA) was to heighten that variability. In England, for instance, during the 200 years spanning both the Wolf (c. 1282–1342) and the greater part of the Spörer (c. 1416–1534) solar minima (Stuiver and Quay 1980), between 1270 and 1480, one grain-harvest in nine delivered a net yield at least 20% below trend (Campbell and Ó Gráda 2011, 865). Especially to be dreaded were the back-to-back failures of this magnitude that occurred on average two to three times a century, for, at the least, these caused serious subsistence crises and, at the worst, major famines, when populations suffered a net loss as fertility slumped and mortality soared. In these

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crisis situations, deaths from starvation and hunger-related diseases reflected both the absolute supply-side deficiency of food and the demand-side inability of many of the poorest and most vulnerable individuals and households to gain licit access to such food stocks as were available. Social and economic factors, therefore, in the absence of effective institutional counter measures, typically compounded and sometimes greatly amplified the human consequences of bad weather.

Agricultural producers obviously did what they could to mitigate the risks of harvest failure by cultivating a mix of winter-sown and spring-sown crops and combining arable with pastoral husbandry but were effectively powerless when confronted by extreme weather events that depressed output across the board and over a geographically extensive area. High storage costs meant that carryovers of food stocks from one year to the next were always small and were soon exhausted when harvests failed in consecutive years. Prior to the development of long-distance bulk supply networks that tapped into different climatic zones, external sources of relief food supplies were limited and costly to obtain, especially for inland localities lacking cheap water transport. Major cities often succeeded in securing relief grain supplies, their rural hinterlands did not (Jordan 1996, 146–147, 161–162; Keene 2011; Jansen 2009, 22–23). Inadequate transport infrastructures, imperfect markets, ineffective governments, significant numbers of households and individuals living below the poverty line, and the want of systematic welfare provision beyond Christian charity all meant that malnutrition became rife and excess deaths difficult to prevent when harvests failed in successive years.

Late-medieval chroniclers commonly commented upon the links between bad weather, poor harvests, high food prices, hunger, and famine deaths among poor people (Schofield 2013, 74–76). Verification of these assertions is provided by independent palaeo-climatic evidence of weather conditions, the historical record of grain harvests and prices, and occasional archaeological finds of mass burials of economically, socially and demographically marginalised individuals (Connell et al. 2012), notably malnourished parentless, landless and jobless young males and females. In England the acute scarcities of 1202–1204, 1258 and 1295/96, all of them the result of back-to-back harvest failures, are well documented (Campbell 2016, 57, 61, 201–202), as are those of 1282 and 1286 in Tuscany (Herlihy 1967, 123). In each case annual prices of staple bread grains rose by between 50 and 100%. These thirteenth-century crises occurred notwithstanding the still prevailing relatively stable and benign climatic conditions of the Medieval Climate Anomaly and the momentum of economic expansion established by the medieval commercial revolution (Campbell 2016, 30–133), which demonstrates that setbacks could and did occur even at the best of times.

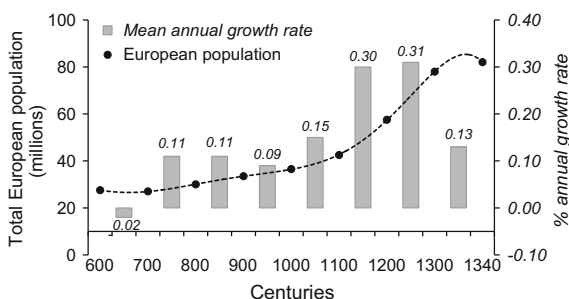
Significantly, none of these thirteenth-century subsistence crises constituted more than a temporary interruption to the strongly rising population trends then prevailing in England, Italy and Europe as a whole (Fig. 2.1). On the contrary, over the course of that century Europe's population grew by over a third and Italy's and England's by approximately half. In fact, on the bishop of Winchester's large multi-manorial complex of Taunton in Somerset the 1258 food crisis had no observable effect upon the rising numbers of adult males in tithing and even during the more straitened

conditions of the 1290s numbers of recorded males held more-or-less steady, before rising to a temporal peak in the 1310s (Titow 1961, 224, revised by Christopher Thornton). No matter how grim these thirteenth-century famines may have been for those exposed to them, demographically and economically they were essentially transitory events. Not so the famines and harvest failures of the next century.

During the first half of the fourteenth century serious harvest failures occurred in increasingly close succession in both northern and southern Europe and, in both regions, at the point when population growth ceased and decline set in (Fig. 2.1). The greatest of these famines have consequently acquired a prominence in the historiography of the period, especially in those neo-Malthusian analyses that emphasise the imbalances that had arisen between population and available resources on the one hand and the diminishing returns to both land and labour on the other (Abel 1935, 1980; Postan 1966; Hatcher and Bailey 2001, 21–65). By any standard they were certainly unusually severe events, whether measured by the sheer scale of the precipitating food-availability decline, the magnitude of the consequent socio-economic stress, or the numbers of those who perished (Campbell 2010, 284–313). Levels of price inflation were unprecedented (Fig. 2.2a) and the real wage rates paid alike to building labourers (Fig. 2.2b) and farm labourers plunged to their lowest levels on historical record (Munro no date; Clark 2007, 2009).

During the Great Northern European Famine of 1315–1318, so great was the mismatch between supply and demand that in England, in breach of thirteenth-century precedent, oats prices doubled and those of barley and wheat trebled (Fig. 2.2a). That substantial excess mortality occurred both here and across northern Europe is beyond doubt, with the worst affected communities and regions sustaining net population losses of approximately 10% (Jordan 1996, 117–122, 146–148; Campbell 2009, 42–44). A dozen years later, in 1329/30, it was southern Europe's turn to suffer. Here, too, the scale of the harvest shortfall sent prices soaring and the purchasing power of labourers' daily wage rates tumbling (Fig. 2.2a, b). In hard-pressed Florence only determined action by the civic authorities in the form of the bulk purchase of imported southern Italian grain and subsidised sale of bread baked in the commune's own ovens prevented the situation from escalating out of hand (Jansen 2009). Few other cities, however, proved to be as resourceful (Herlihy 1967, 124) and problems were particularly acute in the countryside where most people had to fend for themselves.

Fig. 2.1 Estimated total European population and average annual growth rates, AD 600–1340 (Source Biraben 1979, 16)



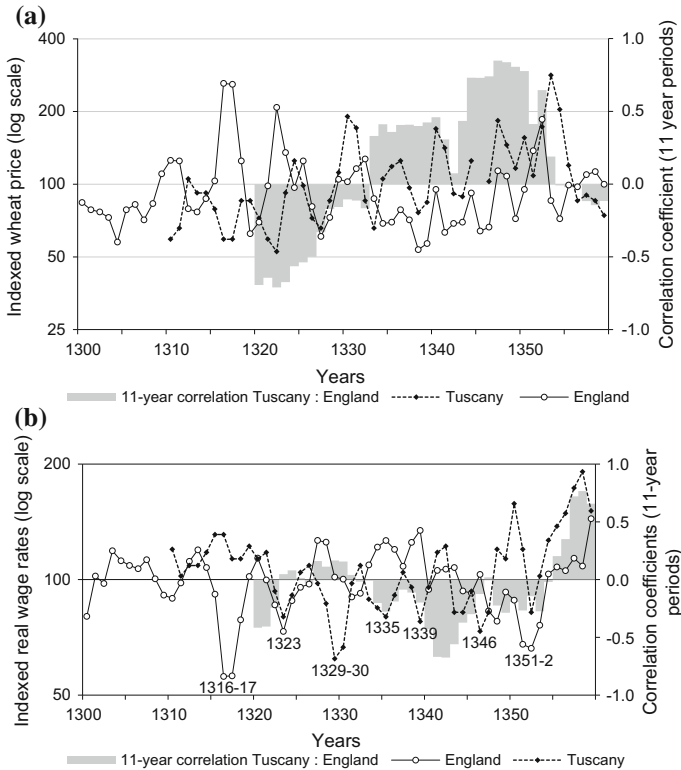


Fig. 2.2 **a** Indexed annual English and Tuscan wheat prices (100 = mean 1310–49) and the correlation between them (11-year periods, end-year plotted) (*Sources* Farmer 1988, 790–1, 1991, 502; Malanima no date). **b** Indexed annual English and Tuscan building labourers’ daily real wage rates (100 = mean 1310–49) and the correlation between them (11-year periods, end-year plotted) (*Sources* Munro no date; Malanima 2012)

It is difficult to deny that these great crises arose in part because of the enlarged proportion of the population living on or below the poverty line, as defined by the ability to afford the more abundant and better quality respectability basket of consumables rather than some version of the inferior bare-bones consumption basket (Broadberry et al. 2015, 215–216, 328–330). The cumulative effect of generations of population growth (Fig. 2.1) had reduced many in the countryside to the status of semi-landless small holders, while the populations of most towns and cities had been swollen by an influx of landless rural migrants (Rutledge 1988, 28; Kowaleski 2014, 593–596). In England by the close of the thirteenth century, where average population densities were more than double the European average and maximum densities, at over 60 per km², were four times that average (Campbell and Barry 2014, 66–68), small holders, cottagers, agricultural labourers and rural artisans collectively accounted for over three-quarters of all rural households. Together, they occupied just a third of all the arable land and received less than half

of total rural incomes (Campbell 2016, 168–170). Processes of subdivision, sub-letting and piecemeal reclamation had stoked the multiplication of these immiserated households and the morcellation of the holdings from which they struggled to eke out a living, augmented by whatever else they could earn from casual labouring and an assortment of by-employments (Campbell 2005). The situation was little different in rural Tuscany and was especially pronounced in northern France and the southern Low Countries, where population densities often exceeded 70 per km² (Pounds 1973, 332, 337; van Bavel 2010, 283). By the 1330s Guy Bois (1984, 287) considers that three-quarters of the population of Normandy were “wretched smallholders with 1–2 acres of land”. Survival of numbers of these households was threatened whenever harvests failed, prices soared, wage-earning opportunities withered and tax demands rose.

The challenge of economic survival would have been less acute had market-generated economic growth of the sort envisaged by Adam Smith created supplementary means of earning a livelihood outside of agriculture. That, after all, had been the case for much of the twelfth and early thirteenth centuries when Europe’s demographic expansion had been underpinned by an equally dynamic commercial revolution (Lopez 1971; Campbell 2016, 85–130). But from the 1290s the European economy was in the grip of a deepening commercial recession which reinforced the traditional economic reliance upon primary production and fed the hunger for land. Responsible were military and commercial setbacks in the Levant; a tightening Mamluk monopoly upon Red Sea trade with India and the Orient; punitive papal embargoes upon Christian trade with the Sultan of Egypt; interference by the French Crown in the hitherto politically neutral operation of the Champagne Fairs and discrimination against the many Flemish and Italian merchants who traded there; the increasing risks to trade and traders almost everywhere presented by armies, war bands, brigands, pirates and corsairs; and successive bankruptcy of the Sienese and Florentine banking companies (Campbell 2016, 135–142). Traffic still flowed along Europe’s commercial arteries, and those that connected Europe with Asia, but it was reduced in volume and subject to higher tolls. It also increasingly fell foul of the depredations of rent-seeking lords and war-mongering monarchs.

Figure 2.3a illustrates some of the more quantifiable of these developments: a fall of at least 75% in the seigniorial revenues generated by the English international fairs of St. Giles Winchester and St. Ives (Huntingdonshire) between 1285 and the 1340s; an 80% reduction in tax receipts from the Champagne Fairs between 1295 and 1340; a halving of the rental values of Cheapside property in central London between 1305 and 1335; a 73% decline in the value of English overseas trade handled by alien merchants between 1300 and 1335; and (Fig. 2.3b) an upsurge in English net tax receipts following Edward III’s declaration of war against France in 1337. Collectively, this evidence leaves little doubt that national and international trade had declined to a particularly low ebb by the 1330s and 1340s. As Munro (1991, 120–130) has highlighted, deteriorating security on the old trans-Alpine overland routes, piracy on the alternative but more circuitous and costly shipping route between the Mediterranean and North Sea, and the manifold delays,