

### Constructing the history of risk: foundations, tools, and reasons why

Mohun, Arwen P.

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# Constructing the History of Risk. Foundations, Tools, and Reasons Why

Arwen P. Mohun\*

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**Abstract:** »Risikogesichte: Wie, warum und zu welchem Ende schreiben wir eine Geschichte des Risikos?«. The risk of accidents and disasters has always been central to the human experience. Yet, historians have only recently begun to consider risk as distinct category of historical analysis. Instead, the study of risk has been fragmented into a series of rubrics, including: risk society, modernity, history of safety, and disaster studies. This article calls for a more analytically coherent approach to risk in history, which integrates theoretical tools developed by social theorists and contemporary sociologists, with the historian's attention to change over time, historical contingency, and individual agency. Borrowing from the work of historians of technology and material culture scholars, this approach also pays particular attention to how the material dimensions of risk entwine with politics and culture. The article also offers an overview of the existing literature and suggestions for areas of future research.

**Keywords:** Risk, accidents, disaster, risk society, safety.

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## 1. Introduction

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What is the history of risk? Risk, by definition, describes a potentiality, a future event, something that might or might not happen. The history of risk tells the story of how people in various times and places have responded to accidents and disasters, such as fires, floods, and airplane crashes. It explores their efforts to understand and mitigate past events as well as their attempts to shape the future. It is about both risk-taking and risk-avoidance, about rollercoasters as well as safety devices (Mohun 2013). The kind of risk history I have in mind is deeply material, situated at the intersection of the social, technological, and natural. It interrogates historical actors' options about where and how to live, how to build and use technology, and how to interact with nature. A material history of risk is also deeply embodied. Through much of human history, risk has been experienced through the senses as well as the mind and pocketbook. Thus, urban

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\* Arwen P. Mohun, Department of History, University of Delaware, John Munroe Hall, Newark, DE 19716, USA; mohun@udel.edu.

conflagrations, shipwrecks, and other calamities resulted not only in the loss of property but also of health, comfort, shelter, sustenance, and life itself.<sup>1</sup>

Public discussions about how the recent, tragic Germanwings crash might have been prevented offer one point of departure for imagining such a material study of risk. Each component of the disaster is embedded in a history of decision-making about how to manage the risks of air travel within the constraints of technology, economics, and culture. The use of two pilots is one of the most important and oldest measures used on commercial aircraft to overcome the “human factor” (as it is often called), including the possibility of pilot suicide. But the presence of another safety measure, the locked cockpit door, installed in the aftermath of the 9/11 hijackings, rendered such pilot redundancy ineffective (Mohun 2013).

Perhaps surprisingly, there is no scholarly history of aviation safety in English, let alone one that makes full use of the insights of risk studies as applied to a historical example.<sup>2</sup> What might such a study look like? It would begin by contextualizing the airplane as the first transportation technology created *after* risk experts and risk expertise had already become a part of industry and government across the Western world. It might explore the tensions between the glorification of risk-taking by early pilots and the need to commodify safety in order to sell air travel to the public. It could include consideration of how ideas of risk became materialized in the design and operation of aircraft and airports, with special attention to the conflicts and tradeoffs involved. How, for instance, has the discussion of automation in commercial aircraft changed over time? What evidence can be found for the discussion amongst engineers about how to design a cockpit door that will exclude potentially hostile intruders while ensuring entry in an emergency? And, more generally, what is the history of efforts to balance the risks of human operators with the dangers of automated technology?

To effectively write this kind of history requires historians to recognize the significance of risk in human history. It asks them to take a conceptual and methodological leap beyond chronicling events or making value judgments about our ancestors’ attitudes towards safety. It also requires synthesis. The history of risk, as it currently exists, is mostly fragmented under rubrics such as accidents, disasters, and safety, as well as naturalized into histories of technology, public policy, and expertise. But, as the essays in this HSR Special Issue

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<sup>1</sup> Although economics must be considered, the history of financial risk and risk-taking is an already well-developed area of research among economic historians and therefore outside the scope of this proposal.

<sup>2</sup> In the scholarly literature, discussions of aviation risk are most often found as a sidebar to other topics, for instance, the gendered history of flight attendants or as an aspect of the development of a particular technology (Conway 1998). Aviation professionals and journalist have also taken a crack at the subject (Kraus 2008; Sasfield 2000). At least one sociologist has also taken a partially historical approach (Jackson 2010).

demonstrate, there are compelling reasons for making risk an overarching category of analysis.

At the most fundamental level, risk is central to the human experience. Risk events such as fires, epidemics, and wars have often played a pivotal role in the largest-scale historical trends, including the rise and fall of nations and empires. The need and desire to control risk – in other words, to prevent or prepare for potential future calamities is, to put it grandly, one of the core reasons for creating complex social organizations, indeed, for civilization itself. The stockpiling of food, the formation of defensive armies, the building of levees and regulation of fire use are all risk-mitigating functions of the state that have existed since the first complex societies appeared millennia ago.

Contending with everyday risk is also a permanent fact of human existence, figuring into the almost infinite number of decisions that our species has made across time and place: Shall I plant my crop today? Shall I board that ship? Shall I volunteer to go to war? Social questions about the distribution of risk go to the heart of what brings us together and what divides us. By the same token, decision-making about acceptable levels of risk is historically and culturally contingent. Different societies at different times have drawn and redrawn the line between “dangerous” and “safe,” while implicitly or explicitly justifying the distribution of risk on the basis of gender, age, race, class, and a host of other distinctions. Only in the mid-nineteenth century, for example, did the public and policymakers begin to question whether young children should be employed in dangerous workplaces, including factories, mines, ships, and battlefields. Up until that point, the choice of exposing children to such risks was left to parents and the children themselves and the death of a cabin boy or coal sorter to accident was a matter for poetic lament, not public policy. This is still true in many parts of the world (Hindeman 2009).

If risk is indisputably important to the human experience, it is also good to think with. Social scientists, particularly sociologists, have known for a long time that studying risk can offer important insights into broader questions about the structure and function of society, most grandly, the nature of modernity itself (Beck 1986; Giddens 1991). Historians, with some exceptions, have been much slower to come to this realization – perhaps because the concept of risk itself requires a complicated way of thinking about time (and about the way our subjects think about time) that challenges how historians often construct narratives. Managing risk involves not only trying to imagine what might happen in the future, but also weighing the tradeoffs involved in various paths of action towards that future. It is precisely this complexity that makes risk an excellent point of access into the history of mentalities, to the way people in the past made sense of their experiences, individually and collectively.

Historical explorations of the uneven distribution of risk and decision-making about risk management also illustrate the material consequences of power relationships. Empirical evidence from history and more contemporary

examples both demonstrate that the poor are more likely to suffer both short-term and long-term loss in natural disasters because they more often live in structures and locations that are vulnerable to fire, floods, and earthquake. This pattern is familiar from the aftermath of the 2005 Hurricane Katrina flooding and the recent earthquake in Nepal, but can also be found across the sweep of global history, from China to Rome to Mexico City (Steinberg 2000; Janku et al. 2012).

The history of risk can also be used to explore the complicated and counter-intuitive workings of hegemony. Sometimes risk-taking is a way of claiming power when one has limited options. Calculated risk-taking, particularly when it is perceived as demonstrating leadership or competency, can also be a strategy for getting ahead. From Julius Caesar to George Patton, the battlefield, for example, has long provided ambitious men willing to confront extreme risk with opportunities for rapid professional and social advancement.

Risk, as it turns out, is a powerful tool for thinking through one of the central question of my own field, the history of technology: How do people and material things interact to create historical change? For instance, in the nineteenth-century United States, many technological systems embedded in industrial capitalism such as railroads and factories were built with less attention to risk than comparable technologies in Europe. Trains ran on flimsier tracks, without guards on crossing or double-tracking to prevent collisions. This “mutual shaping of technology and culture” (Lerman et al. 1997) changed over time as safety became a more important value (Aldrich 2006; Mohun 2013). The historical evidence suggests that people in the past created technology that reflected their values about risk but they also changed their behavior and thinking with regard to risk when confronted with new technologies. So, for instance, the introduction of the automobile required people to use the street in a different way but the design of early automobiles also reflected a culture that had not yet begun to think systematically about how to control and protect users of technology through devices like seatbelts (Blanke 2007).

Finally, a historical perspective is very much needed in both policy debates on risk management and in the social science research that often informs those debates. To take the particularly inflammatory example of gun control, my own research explains that in the United States, we have been having the same discussion about gun control in virtually the same terms for nearly one hundred years (Mohun 2013). Other scholars have used scholarly research to show that there is nothing new about government aid for disaster victims or to talk about how corporations have systematically undermined public safety with regard to the automobile (Clark 2007; Dauber 2013).

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## 2. Predecessors of and Foundations to the History of Risk

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For as long as there have been historians, people have written about topics that involve risk. But, until recently, they have rarely framed their work as being *about* risk. Instead, books about sailors talk about shipwrecks. Books about cities talk about fires. Books about automobiles often discuss not only accidents, but also the development of safety measures like stoplights (Bridenbaugh 1955; McShane 1994). The possible exception is “disaster” – a category of event that some scholars argue has been used to “think through” the nature of society from at least the Enlightenment onward (Huet 2012; see also the HSR Special Issue *Historical Disaster Research* 2007).

These absences of risk as an analytical category are not really surprising. The history of risk is so ubiquitous, so pervasive, that it has often been analytically invisible. This invisibility in plain sight can be compared to the way social historians did not begin to think about gender as a “useful category of analysis” until Joan Scott’s landmark 1986 essay of the same name, even though implicitly we had all been thinking about how people, activities, and objects are gendered for a very long time (Scott 1986; Bergman 2008).

Credit for first proposing risk as a useful category of historical analysis does not belong to professional historians at all, but rather to social theorists – most famously, Ulrich Beck. In the 1980s, Beck coined the term “risk society” to describe the way modern, industrial societies mobilize enormous resources to manage risk (Beck 1986, 1992). Beck’s ultimate goal was not to understand risk, but rather to diagnose what he and others, including Anthony Giddens, viewed as an enormous historical “rupture” in their own times; a dismantling of a kind of modernity born out of the Enlightenment in favor of something they variously labeled as “second modernity” or “reflexive modernity” (Giddens 1991). They thought social attitudes towards risk were a key component of that older form of modernity and also a marker of what was changing. Beck, in particular, also worried about the management of risks such as nuclear explosions that he saw as new and distinctive to second modernity (Sørensen and Christiansen 2012). As I and other scholars have pointed out, the concept of a “risk society” is intrinsically historical, because it posits change over time – a “before” and “after” – but for most risk society theorists, history functions as little more than a rhetorical device. Chronology and periodization are shaky or non-existent. Empirical evidence and the complexity that would flow from careful attention to specific historical evidence is also absent.<sup>3</sup>

A quarter-century after Beck’s introduction of the risk society concept, his claim that the management of risk is a central dimension of modernity remains

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<sup>3</sup> For critiques of Beck from the point of view of a few historians, see Mohun (2013), Boudia and Jas (2007), and Scott (2000).

an important part of the foundation for any effort to construct the history of risk. The work of risk society theorists is still worth reading as a starting point for formulating research questions. In particular, Giddens' generalizations about the historical relationship between risk and modernity are insightful and can be validated with historical evidence. Giddens states, for example, that the "dynamism" of modernity depends in part on the separation of space and time. This separation simultaneously creates risk and the means to control it (Giddens 1991). So, for instance, this means a telegraph message can send a train hurtling towards a collision far from the telegraph station. Or, telegraph signals can be used to coordinate the scheduling of trains to avoid collisions in complex systems (Aldrich 2006).

One of the consequences of modernity is a commitment to "colonize the future" as a means to control risk. Both Giddens and Beck are also interested in the way social relationships become "disembedded" (to use Giddens' term) from local context. The growth of expertise is one manifestation of this phenomenon. In a pre-modern world, experts were often local people who had earned their expertise through direct experience. Likewise, their authority came from demonstrating their knowledge through practice e.g. being able to sail a ship or shoe a horse. Expertise, in the modern world, often comes from theoretical knowledge gained from formal education. Beck and Giddens also point out that disembedding requires new ways of creating *trust* around the assessment and management of risk (Giddens 1991; Beck 1992). As expert knowledge about risk replaces local knowledge, credentialing rather than community status defines whose ideas about risk can be trusted. By the same token, quantification and "trust in numbers" becomes more important (Porter 1995, Mohun 2005).

In the late 1980s, questions about the role of risk and risk management in modern industrial societies also inspired two other works by sociologists that have been particularly important to some historians' efforts to think about risk in history. In *Histoire de L'État Providence*, French social theorist François Ewald writes about the passage of social insurance laws, particularly workmen's compensation insurance, as marking a larger shift in societal attitudes about risk, responsibility, and what Ewald's mentor, Michel Foucault, influentially called governmentality, meaning the displacement of individual agency by state-sponsored activities (including the management of risk) (Ewald 1986; Niget and Petitclerc 2012). In the United States, Charles Perrow's 1984 book, *Normal Accidents*, continues to be widely read as an accessible introduction to failures in complex socio-technological systems such as nuclear power plants. Perrow describes a distinctive pattern of cascading events that lead to such failures despite, or sometimes because of, multiple technological and organizational safeguards (Perrow 1994).

While historians have mostly turned to the work of sociologists for inspiration, the psychology of risk perception is also critically important for explaining the behavior of the historical actors we study. In a now classic 1987 article in *Sci-*

ence, Paul Slovic argued that various social and cultural factors shape the differing ways ordinary people perceive and evaluate risk. Among Slovic's conclusions: the greater the perceived social benefit, the greater the willingness to accept risk. He also found that risk judgments were highly dependent on reasoning from prior experience, intuition, and emotion. In Slovic's subsequent research, he also documented a significant gap between the views of experts and laypeople about risk (Slovic 1987, 2007). Thus, someone who had once survived an automobile accident while not wearing a seatbelt might insist that, despite expert prescriptions, they were safer not strapping themselves in. Other psychological researchers have explored different dimensions of the psychology of risk perception and risk-related behavior. For instance, Michael Apter and others have studied elective risk-taking and the psychology of excitement (Apter 1992).

In addition to considering risk in its relationship to larger historical processes such as industrialization and modernity, any project to construct the history of risk has had to contend with two other well-established approaches. The history of disasters and the history of safety already have their own historiographies, political agendas, and conceptual frameworks.

Like the study of risk societies, one version of disaster history has its conceptual roots in sociology. However, from the beginning, much of this research has been empirically based. Moreover, its aim has not been to describe the past but rather, to use Giddens' evocative phrase, to colonize the future (Giddens 1991). Disaster researchers have told various stories about the origin of their field, but it is clear that the funding to establish it as an academic discipline is a direct result of Cold War concerns about the behavior of civilian populations in the aftermath of what was euphemistically called "civil defense" emergencies – meaning nuclear strikes. Disaster researchers did field interviews and other forms of research in the aftermath of various kinds of natural and man-made disasters to ascertain patterns of social behavior. From this research, they developed prescriptions for public policy related to disaster preparedness and post-event rescue and rebuilding (Dynes 1970; Rodríguez 2006; Knowles 2011).

Disaster researchers have been very careful to define their subject to distinguish it conceptually from how historians and popular culture often treat disaster. Disaster researchers view disasters as social disruptions, in the words of one of the founders of the field, "creating a series of problems for communities and nations" (Rodríguez 2006, xiii). Although disaster researchers are quick to point out that they view disasters as processes, most of their research is time-bound, focusing on events such as hurricanes or terrorist attacks that can be pinpointed in place and time. This definition also analytically separates disasters from accidents by implying that accidents are risk events that happen to individuals while disasters should be seen as collective experiences. In practice and in popular discourse, the distinction is harder to make.

Beginning about two decades ago, two interrelated ways of conceptualizing disasters spread from their social scientific origins into the work of historians.

Environmental historian Theodore Steinberg's widely read book, *Acts of God: The Unnatural History of Natural Disaster in America* introduced the idea that no disaster is truly "natural." Steinberg's historical case studies hammer home the point that human decision-making, such as where to build and how to build, profoundly influenced the impact of hurricanes, earthquakes, and other similar events (Steinberg 2000). He also makes the point that disasters have often differentially affect those with the least power in society. Disaster researchers had, of course, been saying this for decades, but with a view to prevention and mediation in the future. They had also given the phenomenon a name: "vulnerability."<sup>4</sup> For historians, the concept of vulnerability is a potentially useful way of shifting emphasis away from disaster events themselves towards longer-term causes and consequences. The concept also provokes questions about agency and power: How do people become vulnerable? What has been the role of the state in constructing agency and ameliorating vulnerability? How have the most vulnerable members of society tried to do something about their vulnerability? The issues surrounding Hurricane Katrina's differential impact on the citizens of New Orleans provide a particularly well-publicized example of differential vulnerability. The poorest people, many of them African American, suffered the most because they lived in the most flood-prone areas, were not a priority for public officials, and often lacked access to automobiles with which to evacuate themselves (Wailoo 2010).

The history of disasters is the most diverse and, arguably, the best developed of the risk-related fields described in this essay. As noted earlier, there is a very long tradition of chronicling disaster events reaching back into the classical world. Cultural historians have analyzed what these texts tell us about the values and worldviews of the people who created them (Biel 1996; Rozario 2007; Janku et al. 2012). There is also an extensive popular and scholarly literature about specific events, as well as categories of events such as earthquakes and shipwrecks. Historians of science and technology have given particular attention to the development of expert knowledge regarding the prevention and mitigation of disasters (Geschwind 2001; Knowles 2012). Strikingly, the focus on community agency so characteristic of sociological disaster research is not a prominent focus of historical explorations of disasters.

While the origins of risk studies and disaster history are at least partially rooted in the social sciences, "safety" as a rubric for studying risk is almost entirely restricted to the domain of historians (and, to a lesser degree, safety practitioners documenting their own heritage) (Rodríguez 2010). This is perhaps not surprising since determination of whether a particular activity or situation is safe or dangerous can only be done looking backwards into history. Everything else is risk assessment.

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<sup>4</sup> For a very thorough discussion of the various implications of this term, see Hommels, Mesman and Bijker (2014).

Safety history emerged as an area of scholarly research in the same years as Beck and Giddens's explorations of risk and modernity, and under the influence of some of the same contemporary political issues. Outraged by the efforts of neoliberals to dismantle health and safety regulations, labor historians, public and occupational health historians, and economists began to turn their attention to the history of workplace safety. In the United States, this shift was prominently identified with the work of David Rosner and Gerald Markowitz (Rosner and Markowitz 1987). Rosner and Markowitz and many of their fellow scholars had a transparently political agenda that was tied to the rise of neoliberalism. They were using historical examples to protest the Reagan administration's efforts to dismantle occupational health and safety laws, agencies protecting American workers, and more generally, to make a counterargument against deregulation. Unlike the risk society theorists, they were deeply concerned with the local and with the question of agency and responsibility (Gersuny 1981; Cherniack 1986; Rosner and Markowitz 1987).

As a consequence of these political commitments, the narrative structure of many historical studies about workplace safety from this period follows a similar pattern: They described workplace accidents and occupational diseases as resulting from capitalist greed and malfeasance. Over time, greater workplace safety was achieved through the actions of reformers and their working-class allies. There is, of course, a great deal of truth in these narratives, but the process of trying to create a usable past tended to disguise the complexities of human risk taking behavior, particularly the subjective and contested nature of risk perception. This literature also tended to focus on involuntary risk taking, while ignoring situations in which workers chose to take risks, sometimes in defiance of safety experts trying to protect them.

In the 1990s, a second generation of workplace safety historians took a somewhat more nuanced view (Aldrich 1997; Rogers 2009). This decade also brought into conversation for the first time historians from a variety of sub-fields who shared a common interest in what could now be described as the history of risk. One result was a remarkable collection of essays, *Accidents in History* (Cooter and Luckin 1997). The use of the omnibus term "accidents" to describe the subject matter indicates the influence of the history of medicine, which was also generating a parallel literature on the history of exposure to toxins (Sellers 1997; Clark 1997; Sellers and Melling 2012; Warren 2000). In recent years, interest in the history of workplace safety has waned, especially in the United States. It is now undergoing something of a renaissance in Europe thanks to state-funded underwriting of various kinds of research groups (Long 2011; Le Roux 2013).

Although less overtly political in their agendas, many histories of transportation safety written by professional historians (and also by practitioners) share similar narrative strategies. They also highlight another theme that runs across many risk-related histories – the role of experts, expert-knowledge and profes-

sionalization (Burnham 2009; Gangloff 2013). Two forms of transportation have attracted, automobiles and railroads, have attracted almost all of the attention while attention to shipping and aviation have languished (McShane 1994; Aldrich 2006; Blanke 2007; Norton 2008; Vinsel 2011).<sup>5</sup>

It would be inaccurate to say that these “proto-fields” of risk history are mutually exclusive. They are not. There are also huge areas of overlap between them. Any description of risk-related historical research must also acknowledge that there is significant historical work that does not really fit neatly into any of my three major categories, risk studies, disaster history, and safety history. But different traditions of theoretical and historiographical development evidenced by the large number of terms to describe our subject – risk, safety, disaster, accident, hazard, and emergency – to name just the most important, signal a lack of a common frame of reference.

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### 3. Constructing the History of Risk: The Historian's Toolkit

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What tools, concepts, and approaches are needed then to construct a material history of risk that speaks to the intricate interrelationship between the social, the technical, and the natural? The social science literatures described above provide important elements for constructing the history of risk. Concepts such as risk cultures, risk society, and vulnerability have already begun to play an important role in framing historical studies. A common understanding of the terms we use may also help. It does not yet exist.

Perhaps more importantly, we as historians of risk need to deploy our own discipline's tools of causality, chronology, and periodization to create a shared map of the past seen in terms of risk. Might it be possible to combine our various timelines – of workplace and transportation safety, of professionalization and legislative reform, of modernity and second modernity as defined by risk – into a more general periodization scheme? As a thought exercise, how might a textbook on risk in modern European history be periodized and organized? Where would the timeline coincide with more conventional chronologies and where would it depart from them? What key turning points might be identified? The enterprise of periodization might begin, for example, by questioning the chronology offered by risk society theorists. It might also be mapped onto larger narratives – of particular nation states and of larger historical processes such as industrialization.

In my own research on risk in American history, I discovered that the Enlightenment, not the Industrial Revolution provided the most important starting point for modern ways of understanding and managing risk. It is in the eight-

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<sup>5</sup> A notable exception with regard to shipping is Fink (2011).

eenth century that quantification, systematic analysis, the application of science, and the use of technological solutions, particularly safety devices, first begin to replace older, vernacular methods for managing risk. The Enlightenment also marks the beginning of a decline in supernatural explanations for accidents and disasters and magic and the communal use of prayer as a means of managing risk. I also found that the American Civil War, the most important dividing line in most mainstream American history textbooks, seemed to have only an indirect effect on my chronology. Far more important were the introduction of new technologies, particularly the railroad in the 1830s, and the influx of ideas from Europe about humanitarianism and the regulatory role of the state in the last quarter of the nineteenth century (Mohun 2013).

Constructing the history of risk would also require systematic and inclusive thinking about actors and agency. Because they have left so much documentation behind, we already know a great deal about safety experts of various kinds. The same can be said about policymakers and legislators. We know much less about the actors who operated primarily within what I have termed elsewhere the “vernacular culture of risk” (Mohun 2013). The voices of experts are also so loud and insistent that it can be difficult for the historian to recognize how ordinary people thought about risk. We know almost nothing about vernacular cultures of risk among subaltern groups such as enslaved people or those living under the yoke of imperialism. We could begin by tapping the research of social historians, looking, for example, to the work of historian of criminality, Eric Monkkonen, to think about how risk has functioned in the lives of criminals (Monkkonen 1992), or to historians and sociologists of rural life to understand how to uncover the history of risk in non-urban environments (Harper 2001).

Within the history of technology, consideration is also given to the agency of objects (Latour 2005). How might serious consideration of the role of things in history change our understanding of risk? While it is clear that objects do not act on their own, their inherent characteristics, possibilities, and constraints; in other words, the way they are socially constructed plays an important role in the risk environments in which historical actors live their lives. In the modern world, human-made objects and systems are an important source of risk. There is also a long history of human decision making involving risk trade-offs in the construction and use of technology.

Legal sources also need to play a greater role in scholarship. In the Anglo-American world, courts have been an important site for settling disputes about who should pay the price when risk-taking results in damage to people or property. Documents collected or created in association with court cases include not only judgments, but also court transcripts and documents uncovered during the process of discovery. In the Anglo-American world, case law provides a rich and easily accessible source of information about risk-taking. It also reveals a key process through which other values are weighed against risk. When a court awards money to a plaintiff injured in a workplace accident or while riding in

an automobile, it is making a statement about our collective rights and responsibilities. A corollary source is the legislative debates and behind-the-scenes negotiation around law-making to manage risk. Over the last few decades, the creation of the EU has provided a fascinating context for international negotiations over what constitutes acceptable levels of risk.

Another set of relatively neglected sources of information about risk involve material culture analysis and experimental archeology. This could include something as simple as examining the machines or physical spaces one is studying. Being physically present in a particular risk environment, such as the deck of a ship or a factory floor, is always very illuminating, but photographs, blueprints, objects in museum collections, and even Google images and GIS mapping can provide a great deal of important information. There is also a lot to be learned from actually trying to do the things one is writing about or interacting with the physical objects that are part of one's story. For instance, sitting at the wheel of a model T automobile instantly conveys why so many people were killed in collisions in the first years of automobility. One is surrounded by metal and wood surfaces; seated on a hard bench set with no restraints and no headrest; easily catapulted out over the low doors or into the untempered glass windshield, which will shatter into knife-like shards on impact. Actually driving such a vehicle would reveal visibility is limited, brakes inadequate, and signaling devices non-existent.

Finally, a few scholars have experimented with compiling and analyzing historical statistics about risk. But we could really use much better quantitative data about accidents, injuries, and mortality (Lane 1979; Downs 2012). At present, the most easily available historical data on accident and injury rates is from census data, which typically aggregates all types of accidental mortality into a single category. This is particularly true for nineteenth-century data. A patient and resourceful demographic historian (or better yet, a group of demographic historians) could provide enormously useful information to risk historians by disaggregating categories and supplementing census data with information from other sources such as coroner's reports, parish records, and more specialized state-sponsored reports.

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#### 4. Questions, Needs, and Opportunities

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The historical demography of risk is only one of the many areas that await future historians. What kinds of questions might we ask to expand our understanding of risk in history and how might we go about answering those questions? Again, the possibilities are nearly limitless. A few particularly large categories of questions might serve as a starting point.

How and why have risk societies developed differently? How, for instance, does the management of risk figure into the process of development in coun-

tries like Brazil or India, where some aspects of European and North American modernization were adapted or adopted, while others were rejected or ignored. Automobility or industrial safety would be two interesting places to start. There is some English-language research on large-scale risk management failures in the Soviet Union, but I would like to know much more about how this worked in socialist as well as capitalist economies. The existing literature suggests that the Soviet Union prioritized productivity over the safety of its citizens to an even greater degree than many capitalist states, but does not explain whether there is a Marxist-Leninist ideology with regard to risk. It also does not parse the relationship between a pre-existing Russian risk culture and the Soviet state.<sup>6</sup> Comparative research might help us to sort out cultural, economic, and political factors in the creation of risk cultures within nation-states.

A corollary question is: What is the relationship between risk and citizenship in the modern world? We know a great deal about how the modern nation-state has stepped in to regulate risk in the workplace and the streets. But, what are the limits and trade-offs for such protection? How, for example, might we explain the role of the citizen-soldier in terms of risk assumption? Over last two hundred years, liberal nation-states have offered soldiers and former soldiers special status and special rewards, including pensions and medical care, in exchange for taking extraordinary risks on behalf of the state. Arguably, the development of modern warfare is driven by the risk calculation of protecting citizen-soldiers while doing the maximum amount of damage to the enemy's ability to fight. But the results have been an enormous level of casualties. One might also ask how these patterns vary with time period and context. Indeed, risk and war, is a rich and virtually unexplored topic.

The transnational history of risk is also an important and neglected area of research. How have ideas and practices like "safety first" been transferred and translated across national boundaries? We know a little bit about this, but mostly as a side-story to a bigger narrative about technology transfer and the out-migration of engineers and other technological experts to the rest of the world. But much more could be learned and written about regarding specific risk-mitigating techniques. Large-scale disasters are also an ideal topic for understanding the transnational character of modern risk-management. International responses to earthquakes in Haiti and Nepal is a phenomenon with a much longer history (Irwin 2013). And, of course, the risk-society literature took as its empirical focal point, the threat of global nuclear proliferation of both civilian and military technologies. The period of Chernobyl and doctrines of mutual assured destruction are now available for more measured historical analysis.

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<sup>6</sup> Although not explicitly a risk history, Paul Josephson's work is suggestive. See, for example, Josephson (2002). So too is Gabrielle Hecht's work on the Frenchness of French nuclear plants. See Hecht (1998).

To take very different tack: How can we stretch our chronological focus further into the past? Most of the published research on risk in history explores the period beginning in the late nineteenth century. And yet, as I argued earlier, concerns about risk have always been part of the human condition and focused efforts to manage risk predate the emergence of nineteenth century industrial safety efforts. From the existing scholarship, we already know that many of the instruments of managing risk that we think of as relatively modern such as insurance and labor regulation are present in merchant shipping, at least in Northern Europe and North America in the eighteenth century. Where else might such precursors of modern ways of managing risk be found? Once we begin to ask the right questions, the topics for future research begin to multiply in scope and variety.

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## 5. Conclusion

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As this essay has suggested, there are many compelling reasons why historians might frame their scholarship in terms of risk. Once available as a category of analysis, risk is revealed to be a crucial element of the human experience from our earliest moments as a species to the present. Framing historical analysis of accidents and disasters in terms of risk can take us beyond simply looking backwards to say what was safe and what was dangerous, into the realm of the cultural. Because risk is about possibilities and potentialities as well as actual events, this approach compels us to engage in more complex way of thinking about time and to think hard about how our subjects tried to plan for the future. Looking for risk in history also allows us to revisit familiar topics with fresh eyes, to connect previously unconnected topics, and to find significance in under-explored subjects.

Thanks to many decades of research by sociologists, social theorists, psychological researchers, and other social scientists, historians have a sophisticated toolkit of theories and hypotheses upon which to draw for this work. These include the core ideas of risk society theorists: that systematically managing risk is an essential characteristic of modernity, and the more recent insights of disaster researchers: that no disaster is truly natural and that the impact of risk is highly dependent on social vulnerability. Historians of technology help show the way for understanding that the history of risk is constructed through the mutual shaping of material things and social and cultural contexts. Previous generations writing about the history of disasters and safety have also laid the empirical groundwork for future studies, as have historians who have been unknowingly writing the history of risk for millennia. It is up to us to take up the challenge of bringing all these components together to make something new and enlightening.

The essays in this volume illustrate some of the ways scholars are already beginning to think about risk. But many more exciting opportunities await historians who are willing to take up the challenge of this complex and multi-faceted area of research.

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