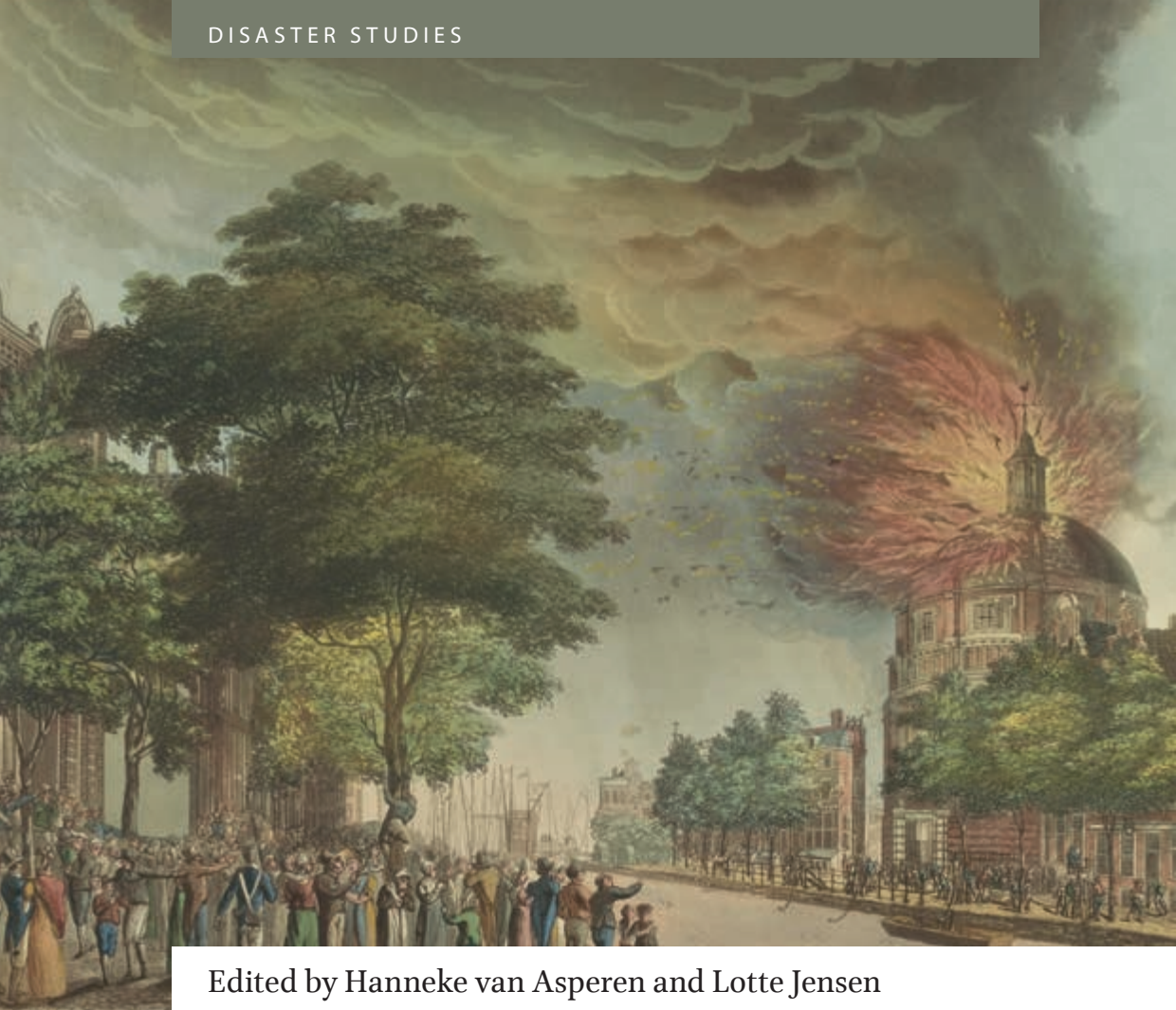


DISASTER STUDIES



Edited by Hanneke van Asperen and Lotte Jensen

Dealing with Disasters from Early Modern to Modern Times

Cultural Responses to Catastrophes

Amsterdam
University
Press

Disaster Studies

Throughout history disasters such as floods, famines, earthquakes, and epidemics have affected human experience in myriad ways. Disasters are given historical meaning through the impact of socioeconomic and political conditions, trauma support on a regional and national scale, and how transnational ties between global communities have ignited relief campaigns. Furthermore, for centuries, news about catastrophic events has been disseminated via media such as documentary, pamphlets, chronicles, newspapers, poems, illustrations and prints. As such, disasters have also been mediated through recurring cultural repertoires of representations.

This series seeks to address the ways in which communities in and beyond Europe have intervened in, coped with or given meaning to disasters that occurred close by or far away, in terms of both time and space. We invite submissions (both monographs and edited collections) in the fields of (political, socioeconomic and cultural) history, cultural studies, religious studies, art history, memory studies, gender studies, literary studies, and media studies.

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Cultural Responses to Catastrophes

*Edited by
Hanneke van Asperen and
Lotte Jensen*

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14 Disaster Memory and ‘Banished Memory’

General Considerations and Case Studies from Europe and the United States (19th–21st Centuries)

Christian Rohr

Abstract

In 1981 medievalist and cultural historian Arno Borst presented the thesis that today’s European societies have largely eliminated dealing with natural disasters from everyday life and that they have become a ‘society of banished memory’. This contrasts with premodern societies, which integrated the risk of natural disasters far more into everyday life. By ‘taming’ natural hazards through river straightening and various protective structures, especially since the nineteenth century, small and medium-sized events have generally been avoided, but serious events became even more devastating when hitting the unprepared population. A prolonged absence of extreme events, a ‘disaster gap’ (Christian Pfister), could thus significantly increase the catastrophic nature of a new event. This chapter analyses selected flood, avalanche, storm, and earthquake events from Europe and North America (late 19th c.–present) to show which factors might have contributed to reshaping memory cultures after catastrophic events and which encouraged banishing memory against better judgement.

Keywords

floods – avalanches – earthquakes – memory – Europe – United States

In 1981 medievalist and cultural historian Arno Borst provided an early case study of an extraordinary natural disaster in his essay ‘The Earthquake of

1348', published in German in the renowned journal *Historische Zeitschrift*.¹ In this article he put forward the thesis that today's societies in Europe have largely eliminated dealing with natural disasters from their everyday lives and that they have become a 'society of banished memory' (in German: *Katastrophenverdrängungsgesellschaft*). He contrasted this situation to premodern societies, which had integrated the risk of fires, natural disasters, and weather anomalies far more into everyday life.²

This chapter deals with memory cultures in premodern and modern societies in Central Europe and in the United States. In a first step, I will examine the parameters involved in perceiving a natural hazard as a disaster. These considerations include the assumption that a vivid memory culture will raise risk awareness and contribute to a higher level of resilience, two basic features of 'cultures of risk management'.³ On the other hand, societies with 'banished disaster memory' or at least 'neglected disaster memory' might be more surprised by and unprepared for extreme events and therefore more vulnerable. In a second step of this article, I will analyse historical cultures of risk management in Central Europe against river floods and avalanches. What had just been daily life to those societies, which events became extraordinary or even catastrophic, and why? Which prevention and coping strategies had been applicable and how were they influenced by a vivid memory culture? We will see how risk awareness changed after the straightening of riverbeds in the second half of the nineteenth century and how new types of awareness and memory cultures had to be reinstalled after destructive flood and avalanche disasters around 2000. In a final step, I will undertake a comparison with the USA. This section asks whether or not a 'rise up and never look back' mentality in dealing with disasters, as can be reconstructed for the 1906 San Francisco Earthquake and Fire, can also be generalised for recent events such as Hurricane Katrina in 2005 and its aftermath.

1 Arno Borst, 'Das Erdbeben von 1348. Ein historischer Beitrag zur Katastrophenforschung', *Historische Zeitschrift* 233 (1981), 529–69.

2 'Erdbeben als dauernde Erfahrung der Gesellschaft und der Geschichte anzunehmen, widerstrebt dem modernen europäischen Selbstgefühl zutiefst. Es isoliert Katastrophen in der Gegenwart und eliminiert sie aus der Vergangenheit, weil sie die Zukunft nicht definieren sollen'. Borst, 'Das Erdbeben von 1348', 532.

3 The term 'cultures of risk management' seems to me more applicable than 'cultures of disasters' as introduced by Greg Bankoff, *Cultures of Disaster. Society and Natural Hazard in the Philippines* (London: Routledge, 2003). By raising risk awareness and resilience, the perception of many hazards will be less catastrophic.

General Considerations on Disaster Perception

'Only human beings can recognize catastrophes, provided they survive them. Nature recognizes no catastrophes'.⁴ When the Swiss author Max Frisch composed these words for *Man in the Holocene*, one of his later volumes, he could not have foreseen that they would still be continuously cited in studies on historical natural disasters decades later. As Frisch highlights, talking about disasters and catastrophes depends on the perspective and on human perceptions in general.

The study of natural hazards from a cultural history perspective has become very popular in the last two decades.⁵ These studies tend to focus on the perception, interpretation, (risk) management, and commemoration of events by those affected and by human societies in general. In this context, the term 'natural hazard' is taken to mean the physical event itself, which in some instances impacts on the human environment, whereas 'natural disaster' is used to denote the perception of such an event by those involved.⁶ Several factors are necessary for a natural hazard to be considered a natural disaster. Not all of them must necessarily be relevant at the same time, but at least three or four should be applicable⁷:

4 Max Frisch, *Man in the Holocene. A Story*, trans. Geoffrey Skelton (London: Methuen, 1980), 102, originally published in German as *Der Mensch erscheint im Holozän* (1st ed., 1979).

5 See, for instance, Christian Rohr, *Extreme Naturereignisse im Ostalpenraum. Naturerfahrung im Spätmittelalter und am Beginn der Neuzeit* (Cologne, Weimar, and Vienna: Böhlau, 2007); Christopher M. Gerrard and David N. Petley, 'A Risk Society? Environmental Hazards, Risk and Resilience in the Later Middle Ages in Europe', *Natural Hazards* 69 (2013), 1051–79; Thomas Labbé, *Les catastrophes naturelles au Moyen Âge, XIIe-XVe siècle* (Paris: CNRS Éditions, 2017); Gerrit Jasper Schenk (ed.), *Historical Disaster Experiences. Transcultural Research – Heidelberg Studies on Asia and Europe in a Global Context* (Cham: Springer, 2017).

6 See, among others, Enrico Louis Quarantelli, *What Is a Disaster? Perspectives on a Question* (London: Routledge, 1998); Anthony Oliver-Smith, 'Theorizing Disasters', in Susanna M. Hoffman and Anthony Oliver-Smith (eds), *Catastrophe and Culture. The Anthropology of Disaster* (Santa Fe, NM: School of American Research Press, 2002), 23–47; Dieter Groh, Michael Kempe, and Franz Mauelshagen, 'Einleitung. Naturkatastrophen – wahrgenommen, gedeutet, dargestellt', in Groh, Kempe, and Mauelshagen (eds), *Naturkatastrophen. Beiträge zu ihrer Deutung, Wahrnehmung und Darstellung in Text und Bild von der Antike bis ins 20. Jahrhundert* (Tübingen: Gunter Narr, 2003), 11–33; Keith Smith and David N. Petley, *Environmental Hazards. Assessing Risk and Reducing Disaster* (London: Routledge, 2009).

7 Rohr, *Extreme Naturereignisse*, 50–57; Rohr, 'Floods of the Upper Danube River and Its Tributaries and Their Impact on Urban Economies (c. 1350–1600). The Examples of the Towns of Krems/Stein and Wels (Austria)', *Environment and History* 19: 2 (2013), 133–48, at 135; Christian Rohr, 'Disaster or Everyday Risk? Perceiving, Managing and Memorizing Floods in Medieval Central Europe', in Christopher M. Gerrard, Paolo Forlin, and Peter J. Brown (eds), *Waiting for the End of the World? New Perspectives on Natural Disasters in Medieval Europe* (London: Routledge, 2021), 201–17, at 203.

- (a) the helplessness of humans when attempting to cope with damage through available means;
- (b) an inability to explain and understand the event;
- (c) material and personal suffering;
- (d) the unexpectedness of the event, which depends on how prepared a society is for single or recurrent threats;
- (e) whether a series of natural hazards occurs within a short period of time, thereby raising the vulnerability of those afflicted;
- (f) symbolic connotations and patterns of interpretation, such as connections to natural disasters described in the Bible;
- (g) the wider historical context in the form of economic, religious, or climatic crises.

In addition, for the last two centuries, the prominent presence of disaster reports in mass media will also be decisive, indicating how widely spread disaster perception is.

Unexpected and sudden natural hazards, such as earthquakes, storm surges, severe thunderstorms with hail, or ice floods, are typically perceived as disasters, because people do not have time to install an effective system of prevention, which, in turn, means that the number of victims will be higher. In some cases, vulnerability also plays a role – for example, if settlements are erected carelessly in dangerous places or unsuitable building materials are used.

If a society is prepared to cope with an environmental hazard, people will account for it throughout their daily life and their socio-economic system. Based on their communal experience, they adapt the design and layout of settlements and their behaviour in order to minimise risks. Where the level of resilience in such a society is sufficiently heightened, the result may be a ‘culture of disaster’⁸ or, more correctly, a ‘culture of risk management’ (in German: *Risikogesellschaften*)⁹. The widely accepted term *Risikogesellschaft* has been

8 Bankoff, *Cultures of Disaster*.

9 See Rohr, *Extreme Naturereignisse*, 201–398; Gerrit Jasper Schenk, ‘Human Security in the Renaissance? *Securitas*, Infrastructure, Collective Goods and Natural Hazards in Tuscany and the Upper Rhine Valley’, in Cornel Zwierlein, Rüdiger Graf, and Magnus Ressel (eds), *The Production of Human Security in Premodern and Contemporary History = Die Produktion von Human Security in Vormoderne und Zeitgeschichte* (Cologne: Quantum Information, 2010), 209–33 for riverine cultures; see also Manfred Jakobowski-Tiessen, *Sturmflut 1717. Die Bewältigung einer Naturkatastrophe in der Frühen Neuzeit* (Munich: Oldenbourg, 1992); Marie Luisa Allemeyer, *‘Kein Land ohne Deich ...!’ Lebenswelten einer Küstengesellschaft in der frühen Neuzeit* (Göttingen: Vandenhoeck & Ruprecht, 2006); Adriaan M.J. de Kraker, ‘Reconstruction of Storm Frequency in the North Sea Area of the Preindustrial Period, 1400–1625 and the Connection with Reconstructed

introduced by sociologist Ulrich Beck.¹⁰ In addition, Niklaus Luhmann, another influential sociologist, made an important distinction between risk (in German: *Risiko*) undertaken consciously and danger/threat (in German: *Gefahr*), which is always useful for the study of historical societies exposed to natural hazards.¹¹

For these communities with a 'culture of risk management', most natural hazards cease to be disasters at all, and their inhabitants understand the reasons for and indications of these extreme events. They undertake strategies of prevention. These can include building and regularly maintaining dykes, locating settlements on relatively secure ground, and adapting building techniques to the risk. For example, windows are not placed at ground floor level in order to prevent the ingress of floodwater, or roof constructions are designed to withstand heavy storms. As far as is possible, warning systems may be installed as a further preventative measure. As will be demonstrated in this study, precisely this kind of 'culture of risk management' existed among urban communities in premodern Central Europe.

Examples from Europe: Floods

I have shown in several previous studies that 'cultures of risk management' had been developed since the Middle Ages within communities living near the rivers and lakes in Central Europe.¹² These case studies focusing on the catchment area of the Danube River and its major tributaries in Austria and eastern Bavaria could carve out clear adaptation strategies and memory cultures of floods. Life close to waterways was always between benefit and risk. The risk of flooding thus had to be integrated into daily socioeconomic life, e.g. by the continuous acquisition of timber to maintain bridges and constructions for flood prevention. The communities living close to the rivers also undertook structural adaptation strategies: settlements were erected on the more secure inner side of river loops, as the example of the small but wealthy city of Laufen on the Salzach River north

Time Series of Temperatures', *History of Meteorology* 2 (2005), 51–69 for maritime coasts in Northern Germany and the Netherlands.

10 Ulrich Beck, *Risk Society. Towards a New Modernity* (New Delhi: Sage, 1992), originally published in German as *Risikogesellschaft. Auf dem Weg in eine andere Moderne* (Frankfurt am Main: Suhrkamp, 1986).

11 Niklaus Luhmann, *Risk. A Sociological Theory* (Berlin: De Gruyter, 1993), originally published in German as *Soziologie des Risikos* (Berlin: De Gruyter, 1991).

12 Rohr, *Extreme Naturereignisse*, 208–398; Rohr, 'Floods of the Upper Danube River'; Rohr, 'Disaster or Everyday Risk'.

of Salzburg shows. We will come back to this site later on. Historical city centres were mostly situated on at least slightly elevated places. Only crafts dependent on waterpower and water supply were necessarily exposed to flood risk. Important buildings close to the river were adapted to the worst case concerning the position of windows or the possible evacuation of storage rooms, etc. A good example is the new tollhouse in the village of Engelhartzell east of Passau, an important toll station along the Danube River since the Early Middle Ages. During the 'millennium flood' of 1501, the old tollhouse had been flooded nearly up to the roof. The larger new tollhouse beneath, erected over the sixteenth century, had windows only higher than the peak discharge of 1501.¹³

Flood marks served as signs of a vivid memory culture. They had been affixed to public buildings and/or other highly visible places and go back to disastrous worst-case scenarios, such as 1501 in the catchment area of the Danube River or even to 1342 in the catchment area of the Rhine and Main Rivers. However, they are useful only to some extent for hydrological reconstruction because the riverbed could have deepened, the inundation areas might have changed, and the entire environment such as fluvial forests served as retention areas. Human-made flood protection as well as bridges causing artificial obstacles may also have an influence on the water level during a flood. In some cases we have evidence that marble plates with flood marks had been removed and re-affixed on another place or even on the replacement building. We sometimes cannot reconstruct with certainty whether the level of the peak discharge expressed by a line, an arrow, a hand, etc. still fits with the historical reality. A combination of several source types is therefore essential for verification. The above-mentioned site of Engelhartzell situated in a canyon-like narrow passage of the Danube River breaking through hard granite can be taken as example where those concerns seem to have been negligible. Nevertheless, those flood marks are documents of a vivid memory culture reminding the people passing by of the most remarkable flood events in the past. They became something like a *memento naturae*, a signpost to consider the risk of recurring flooding when building a house close to the river or for prevention measures in general.¹⁴

13 For a historical image showing both tollhouses after the flood of 1954 (this view is today blocked by a high protective dam), see Rohr, *Extreme Naturereignisse*, 377; Rohr, 'Disaster or Everyday Risk', 207.

14 On the reliability of flood marks for peak discharge reconstructions, see in general Rohr, *Extreme Naturereignisse*, 89–91; Mathias Deutsch and Karl-Heinz Pörtge, *Hochwasser in Thüringen. Hochwassermarken und Hochwassergedenksteine* (Jena: Thüringer Landesanstalt für Umwelt und Geologie, 2018); Oliver Wetter, Christian Pfister, Rolf Weingartner, Jürg Luterbacher, Tom

In the nineteenth century, particularly in the second half, a significant paradigm shift took place. The straightening of many rivers on a far larger scale than in the centuries before became a public task designed to reduce the risk of flooding in the cities and in the countryside. In addition, the deepening of riverbeds enabled steam-powered ships to run on 'industrialised' river systems. The straightening of river courses meant that smaller and medium floods were less likely to burst their banks and cause damage. This apparently created a deceptive feeling of security, which led to a low estimation of the risk of flooding. Former flood plains became attractive new settlement places. Upper-middle-class villas were in many cases built close to the river because the unobstructed view and the green spaces near the riverbank conveyed a closeness to nature, while industrialisation was otherwise advancing. They were situated in the green fringes of the old town centres, but still close to them.¹⁵

However, they remained endangered and were not completely suitable as construction sites: the soft soil caused rifts in the houses, and groundwater problems were frequent. In general, carelessness was widely spread, because new flood protection measures were sometimes erected much later than the houses. This became evident when those newly erected quarters were severely affected by floods, such as in 1897 and 1899 in Bavaria and Austria and in 1910 in France and Switzerland.¹⁶

In July and August 1897 and in September 1899, two successive heavy floods in the Bavarian-Austrian catchment area of the Danube River (and beyond in Bohemia, Moravia, Silesia, and Central Germany) occurred, causing severe damage everywhere.¹⁷ Many homeowners had obviously no

Reist, and Jürg Trösch, 'The Largest Floods in the High Rhine Basin Since 1268 Assessed from Documentary and Instrumental Evidence', *Hydrological Sciences Journal* 56: 5 (2011), 733–58.

15 See in detail Christian Rohr, 'Stadterweiterung versus Naturgefahr. Die Stadt Wels während der Hochwasserkatastrophen von 1897 und 1899', *Jahrbuch des Oberösterreichischen Musealvereines – Gesellschaft für Landeskunde* 157 (= *Jahrbuch des Musealvereines Wels* 36 (2012)), 551–74 (on the city of Wels, Austria, and the Traun River); Christian Rohr, 'Das Risiko im Bild. Frühe Naturkatastrophenfotografie als Quelle der Stadt- und Umweltgeschichte – die Beispiele Salzburg und Luzern', *Traverse. Zeitschrift für Geschichte* 21: 3 (2014), 73–82 (on the cities of Salzburg, Austria, and Lucerne, Switzerland); Christian Rohr, 'Urban Fringes. Conquering Riversides and Lakeshores in the Nineteenth Century – Examples from Austrian and Swiss Medium-Sized Cities', in Tim Soens, Dieter Schott, Michael Toyka-Seid, and Bert De Munck (eds), *Urbanizing Nature. Actors and Agency (Dis)Connecting Cities and Nature Since 1500* (New York: Routledge, 2019), 241–60 (on Wels, Austria, and Lucerne, Switzerland).

16 The Great Flood of 1910 will not be examined in more detail here. For Switzerland, see Rohr, 'Urban Fringes'. For Paris, this event has been analysed in detail by Jeffrey H. Jackson, *Paris Under Water. How the City of Light Survived the Great Flood of 1910* (New York: Palgrave Macmillan, 2010).

17 On these two severe flood events in the area of the lower Inn and Salzach Rivers, see in detail Eva-Maria Wiesner, 'Dann kam das Wasser ... Der Inn-Salzach-Bereich zwischen Hallein



Figure 14.1 The flood of 1899 in the city of Salzburg. Along the straightened Salzach River, the newly built villas as well as current construction sites are under water. Municipal Archives Salzburg, Sammlung Würthle, Sg. 320.112. Source: Fotoatelier Würthle

longer expected that such floods would still be possible after the river had been straightened. The flood of September 1899 in particular is excellently documented in photographs. Figure 14.1 shows the flood of 1899 in the city centre of Salzburg, where bourgeois villas were built along the Salzach River, which had been recently straightened as it flowed through the city centre.

Laufen (Bavaria) and Oberndorf (province of Salzburg), two small towns located about 15 kilometres north of Salzburg on the Salzach River, provide an interesting example with regard to the flood damage in 1899. While the damage inside the prominent Salzach loop, i.e. on the (Bavarian) Laufen side, was limited, the parts of Oberndorf that lay on the right bank of the Salzach River and thus on the outer edge of the loop were massively affected. The old centre of the settlement with around 200 houses – today the area around the so-called ‘Silent Night district’ – was relocated; new Oberndorf

und Schärding vor und nach den Hochwasserereignissen 1897 und 1899’, unpublished MA thesis, Universität Salzburg, 2009. On the city of Schärding (Upper Austria), see Anna Gugerbauer and Ernst Dürr, *Vom Zorn des Inn. Hochwasserkatastrophen in Schärding und den bayerischen Nachbargemeinden* (Wernstein: Eduard Wiesner, 1999), in particular 47–69 (with an abundance of pictorial evidence).

was built around 600 metres upstream.¹⁸ Likewise, the old bridge across the Salzach River was moved from its position behind the river bend to the new centre of Oberndorf upstream.¹⁹ However, this relocation progressed only haltingly for both political and financial reasons. It was not until 1920, when the next severe flood again caused damage to (old) Oberndorf, that the project was swiftly completed. The new, upstream village of (new) Oberndorf was then not affected by the first severe flood of the post-war period in 1954. However, the absence of further severe floods in the second half of the twentieth century again led to carelessness. During the 1970s and 1980s, the former area of old Oberndorf again became densely built up with mainly single-family houses. However, the embankment could not provide sufficient protection during the Century Flood in 2002. Many residents were surprised by the intensity of the flooding and were correspondingly ill-prepared. The protective embankments, which were subsequently raised again, including a device for installing mobile flood protection walls, only partially fulfilled their purpose during the last severe flood at the beginning of June 2013.²⁰

The example of Oberndorf fits within the diagnosis for which the climate historian Christian Pfister has coined the – controversial – term of a twentieth-century 'disaster gap'.²¹ According to his assumption, technical flood protection and straightening of rivers has avoided small- and medium-scale floods. In addition, relatively few severe large-scale floods took place in the foothills of the Alps, e.g. in the Swiss Plateau between 1910 and 1987 or in the Bavarian and Austrian catchment area of the Danube River between 1954 and 2002. However, recent studies with a focus on small- and medium-size rivers in these areas have shown that on a more regional scale, severe and even disastrous

18 On the effects of the flood of September 1899 in Laufen/Oberndorf and the relocation of Oberndorf, see in detail Herbert Lämmermeyer, 'Das Hochwasser 1899 und die Verlegung Oberndorfs', in Heinz Dopsch and Hans Roth (eds), *Laufen und Oberndorf. 1250 Jahre Geschichte, Wirtschaft und Kultur an beiden Ufern der Salzach* (Laufen and Oberndorf: Eigenverlag der Stadt Laufen und der Marktgemeinde Oberndorf, 1998), 270–76; Horst Hieble, Herbert Lämmermeyer, and Heinz Schmidbauer, *Die Salzachbrücke zwischen Laufen und Oberndorf. Von der ersten Erwähnung eines Salzachüberganges im Jahre 1278 bis zur Gegenwart* (Laufen: Oberholzner Druck KG, 2003), in particular 41–55 and 61–69.

19 See in detail Manfred W. K. Fischer, 'Die "neue" Salzachbrücke. Projektdiskussion und Baugeschichte', in Dopsch and Roth, *Laufen und Oberndorf*, 475–79; Hieble, Lämmermeyer, and Schmidbauer, *Salzachbrücke*, 69–119.

20 Cf. Christian Rohr, 'Zum Umgang mit schweren Hochwassern an der unteren Salzach und am unteren Inn seit dem späten Mittelalter', in Wolfgang Wüst and Gisela Drossbach (eds), *Umwelt-, Klima- und Konsumgeschichte. Fallstudien zu Süddeutschland, Österreich und der Schweiz* (Berlin: Peter Lang, 2018), 433–67, at 461–66.

21 Christian Pfister, 'Die "Katastrophenlücke" des 20. Jahrhunderts und der Verlust traditionellen Risikobewusstseins', *GAIA – Ecological Perspectives for Science and Society* 18: 3 (2009), 239–46.

floods remained frequent; Pfister's diagnosis is therefore too superficial.²² Nevertheless, carelessness concerning suitable settlement places became evident after World War II, in particular in the time of the 'economic miracle' (*Wirtschaftswunder*) of the 1950s and 1960s. The trend towards single-family houses erected in historically endangered areas ended only after the above-mentioned major floods of the late twentieth and early twenty-first centuries.

Another problem is caused by converting the use of historical buildings. In former centuries, the ground floor of buildings in endangered areas was mostly used for purposes that could be adapted quickly to an impending threat; furniture could be evacuated easily to the upper floors. Craftsmen like tanners lived and worked in the Matte Quarter in Bern (Switzerland), situated close to the Aare River. Now the ground floors are used by hairdressers, dentists, etc., whose equipment could not be removed during the disastrous flood of 2005. In sum, vulnerability has increased significantly to 'centennial floods' (HQ100 and higher). Integral flood protection measures have been discussed by experts since the 1970s in Switzerland, but they were politically enforceable only after the disastrous events of 1987 and 2005.²³

Finally, the long tradition of flood memory by flood marks has been vanishing during the last decades. Numerous old flood marks have even been abolished on purpose, as the comment of an anonymous real estate agent from Regensburg (Bavaria) shows. After the disastrous flood of the Danube River in 2002, many affected house owners neither restored old flood marks nor affixed new ones, because this would have diminished the value of the property dramatically.²⁴

Avalanches

Avalanches have always had a decisive influence on the life and death of people in alpine regions and have repeatedly led to massive demographic

22 For Switzerland, see the detailed case studies of Stephanie Summermatter, 'Die Prävention von Überschwemmungen durch das politische System der Schweiz von 1848 bis 1991', PhD dissertation, Universität Bern, 2017, <https://boris.unibe.ch/id/eprint/97587> (accessed 30 March 2023); Melanie Salvisberg, *Der Hochwasserschutz an der Gürbe. Eine Herausforderung für Generationen (1855–2010)* (Basel: Schwabe, 2017).

23 For a detailed hydrological analysis of the 2005 flood in Switzerland, see Gian Reto Bezzola and Christoph Hegg (eds), *Ereignisanalyse Hochwasser 2005*, 2 vols (Bern and Birmensdorf: Bundesamt für Umwelt BAFU and Eidgenössische Forschungsanstalt für Wald, Schnee und Landschaft WSL, 2007–8).

24 Oral information provided by Austrian hydrologist Dr Heinz Wiesbauer (2013).

cuts for the mostly very small high alpine communities. Firstly, the resident population groups, such as the Walsers in the Swiss, Italian, and western Austrian Alps, who settled permanently in high valleys and sometimes even above the tree line since the late Middle Ages, were exposed to the risk of avalanches. Secondly, travellers such as merchants and pilgrims had to cross the alpine passes, even in snowy winters. Thirdly, since the fifteenth century, there were also miners who lived in high alpine settlements and were exposed to particular risk from avalanches on the way to their even higher gold and silver mines.

To assess which avalanches in history had a particularly devastating effect, it is first necessary to look at the different types and general framework of conditions, because in many cases these factors were decisive in determining whether the event was unexpected for the resident population. One main group is formed by snow avalanches (e.g. loose snow avalanches, slab avalanches, slush avalanches), which usually follow a fairly constant avalanche path and can be powerful because they remain on the ground but are usually predictable, provided that the corresponding empirical knowledge is available. Avalanche catastrophes with high numbers of victims resulting from such snow avalanches therefore tend to affect pass routes or are related to cases in which people without sufficient avalanche knowledge were in high alpine terrain.²⁵

In contrast, powder snow avalanches are much more unpredictable. They consist of very loose snow that lifts off the ground increasingly quickly and eventually reaches speeds of up to 350 kilometres per hour. This means that even protective forests can be severely affected and rendered ineffective. In this way, powder snow avalanches can penetrate far into the valley and thus hit settlement areas, which are normally safe. The pressure wave mows down forests and destroys houses and other buildings; the highly compressed snow drastically reduces the chances of survival in the avalanche because the rescue work takes much more time. The majority of devastating avalanches in the Alps are probably caused by powder snow avalanches – unless explicitly mentioned otherwise in the sources.²⁶

25 Christian Rohr, 'Sterben und Überleben. Lawinenkatastrophen in der Neuzeit', in Michael Kasper, Robert Rollinger, and Andreas Rudigier (eds), *Sterben in den Bergen. Realität – Inszenierung – Verarbeitung* (Vienna, Cologne, and Weimar: Böhlau, 2018), 135–59, at 135 and 144–47; Christian Rohr, 'Risikobewusstsein und Risikomanagement gegenüber der Lawinengefahr in hochalpinen Gesellschaften des Mittelalters und der Frühen Neuzeit', in Benjamin Scheller (ed.), *Kulturen des Risikos im Europa des Mittelalters und der Frühen Neuzeit* (Berlin: De Gruyter, 2019), 175–94.

26 On the types and the occurrence of avalanches in the Alps, see in detail Walter Ammann, Othmar Buser, and Usch Vollenwyder, *Lawinen* (Basel: Birkhäuser, 1997); Martin Engler and Jan

Several factors are decisive for avalanches: the slope of the terrain between 35 and 55 degrees, the amount and structure of snow, weather phenomena such as wind or solar radiation, and vegetation, such as forest cover, which has a decisive influence on whether avalanches can form or which path they take. The higher regions in the Western Alps tend to be more at risk than those in the Eastern Alps. Most records of damaging avalanches therefore originate from Savoy (France), the entire Swiss Alpine area, Vorarlberg (Austria), Tyrol (Austria, Italy), and the Hohe Tauern (Austria). The Eastern Alps east of the province of Salzburg (Austria) reach only a little above the tree line and are generally more densely forested than the higher-up areas of western Austria.

In many places in the Alps, risk cultures developed from the Middle Ages onwards, which had to counteract the 'White Death' with reactive measures based on local experience. Rescue systems were established along the pass routes and in the villages at risk of avalanches, so that many people could be rescued alive from avalanches. In addition, preventive measures such as protected forests and shelters were gradually introduced in many places. In order to protect the high alpine settlements, the authorities imposed restrictions on the felling of high alpine forests, probably at the explicit request of many inhabitants in the affected places. In Switzerland, as early as the fourteenth century, individual sections of forest were declared 'ban forests' by so-called ban letters, in which logging and cattle grazing were strictly forbidden, for example a triangular piece of forest above Andermatt (canton of Uri) in 1397.²⁷ Protective walls, the first avalanche barriers, were built in the Swiss spa town of Leukerbad after a devastating avalanche in 1518 and then on a larger scale at the beginning of the eighteenth century.²⁸ To protect high alpine mining, so-called snow collars (*Schneekrägen*) were built in the Salzburg mining districts from the mid-sixteenth century onwards. The entrance to the tunnel, which was often exposed, was protected by a porch covered with logs or stone slabs. This was especially important because the miners' lives were in acute danger should the entrance be buried by an avalanche.²⁹

Protective structures for settlements and mines were continuously developed, e.g. in the form of splitting chocks, terracing in the start zone,

Mersch, *Die weiße Gefahr – Schnee und Lawinen* (Sulzberg: Martin Engler, 2001), 252–73.

27 Cf. Rohr, 'Risikobewusstsein', 191.

28 Cf. Isabel Furrer, 'Schadenslawinen im Oberwallis von 1500 bis 1900. Eine sozial- und kulturgeschichtliche Untersuchung', *Blätter aus der Walliser Geschichte* 51 (2019), 47–161, at 143–47.

29 Fritz Gruber, 'Lawinenschutzanlagen als Produkt des hochalpinen Bergbaus', *Technikgeschichte* 44 (1977), 203–12, at 204–5.

and ever more extensive avalanche protection walls. New types of houses, such as the Ebenhöch houses, which were widespread in large parts of Switzerland and probably appeared around 1500, increased the probability that people could survive the avalanche unharmed in their houses. In addition, the exact position of farmhouses and barns was increasingly optimised based on the knowledge of avalanche paths, as the example of the Vallée des Ormonts (canton of Vaud, Switzerland) shows.³⁰ Finally, in the writings of Placidus Spescha (1752–1833), an educated monk from the Grisons monastery of Disentis (Switzerland) with a high degree of local expert knowledge on avalanches, the first plans have been preserved, according to which endangered localities were to be relocated. They were based on the experiences from severe avalanches in the winter of 1816–17.³¹

Local cultures of remembrance can also be understood as forms of risk management, because they counteracted mental unpreparedness. This is evidenced by numerous *ex voto* commemorative tablets, for example from Lähn in the Außerfern (Tyrol, Austria) from 1726 or in the Rüti Chapel near St Gallenkirch, Montafon (Vorarlberg, Austria) from 1793 to 1830.³² The Tschagguns Miracle Book from 1757 contains entries with stories of unexpected survival after avalanches, which was attributed to the grace of the Virgin Mary, who was particularly venerated at this Montafon pilgrimage site.³³

30 On the technique of Ebenhöch houses, see Philippe Schoeneich, Denyse Raymond, and Mary-Claude Busset-Henchoz, 'Spaltkeil und Ebenhöch. Traditionelle Lawinen-Schutzbauten in den Waadtländer Voralpen', in Christian Pfister (ed.), *Am Tag danach. Zur Bewältigung von Naturkatastrophen in der Schweiz 1500–2000* (Bern: Paul Haupt, 2002), 147–52. For a focus on the architectural adaptation strategies in the canton of Valais, see Roland Flückiger-Seiler, 'Der Einfluss von Naturkatastrophen', in *Die Bauernhäuser des Kanton Wallis*, 3 vols, vol. 3.1: *Siedlungsformen und -anlagen im Wandel. Die traditionelle Walliser Landwirtschaft und ihre Bauten zwischen Rebberg, Maiensäss und Alp* (Visp: Rotten, 2011), 75–88. For the canton of Vaud, see Philippe Schoeneich and Mary-Claude Busset-Henchoz, *Les Ormonans et les Leysenouds face aux risques naturels. Représentation des risques naturels et stratégies d'occupation du territoire dans la Vallée des Ormonts (Préalps vaudoises)* (Zurich: Vdf, 1998), 59.

31 Disentis, Klosterarchiv, Ms. Pl Sp 5, 293–333. See Placidus Spescha, *Beschreibung der Val Tujetsch (1806)*, ed. Ursula Schollian Izeti, phot. Lucia Degonda (Zürich: Chronos, 2009), 317–31. On this passage, see also Christian Rohr, 'Placidus Spescha und seine Bedeutung für die historische Lawinenforschung', *Annalas da la societad retoromantscha* 127 (2014), 161–85, at 180.

32 For the example of Lähn, see Rohr, *Extreme Naturereignisse*, 413–14, colour plate 9; for the tablet from the Rüti chapel, see Andreas Rudigier, 'Das Bild zeigt Vertrautes und Fremdes. Ein unauffälliges Votivbild aus dem Bestand des vorarlberg museums mit bemerkenswerten Beziehungen', *Jahrbuch des Vorarlberger Landesmuseumsvereins* 2012 (2012), 32–49.

33 Cf. Klaus Beitzl, 'Von "Schneelanen" und "reissendem Wasser". Berichte aus dem Tschagguns "Mirakelbuch" von 1757', in Edith Hessenberger, Michael Kasper, Andreas Rudigier, and Bruno Winkler (eds), *Jahre der Heimsuchung. Historische Erzählbilder von Zerstörung und Not im Montafon* (Schruns: Heimatschutzverein Montafon, 2010), 207–13.

Furthermore, in the Montafon Valley, avalanche chronicles and avalanche letters were passed on from one generation to the next so that knowledge of the risk of avalanches was not lost.

In the late nineteenth century, the effects of avalanches were also recorded photographically for the first time and were partly reproduced via picture postcards. A series of five postcards documenting an avalanche disaster in Mittelberg (Kleinwalsertal Valley, Vorarlberg) on 31 January 1907 can serve as a good example.³⁴ These picture postcards were sold after catastrophic events to raise funds, as the inscription on the back of three of the five postcards shows:

Friends of humanity are asked by the parish office mentioned below to purchase the pictures of the terrible avalanche disaster (31 January [19]07), damage 200,000 marks, in the hamlet of Ahorn, Kleinwalsertal, at 15 pence apiece. The proceeds are for the 5 rescued children who were deprived of their breadwinners and all their belongings. The parish office of Riezlern.³⁵

The photos illustrate the destruction and recovery work in the hamlet of Ahorn (Fig. 14.2). Also noteworthy is the caption, which again illustrates the unexpectedness of the avalanche disaster: 'Partial view of the debris field of two houses and nine stables, 1000 metres long, 100 metres wide. These houses were considered a safe refuge for half a millennium in case of imminent avalanche risk'.³⁶ Another picture also shows nine recovered dead bodies, which are mentioned by name, another the salvage crew with the dead body of a twenty-year-old woman, who was only recovered after four days.³⁷ This is all the more remarkable because, in general, dead bodies were practically never depicted in early natural disaster photography before World War I. We can only speculate about the context in which these pictures were taken. Perhaps they are to be seen in the tradition of those

34 The photographs by Max Kessler, published by J. Heimhuber, have been preserved to this day in the Walser Museum Riezlern (inv. nos wamu-101 to wamu-105). Cf. Rohr, 'Sterben und Überleben', 154–56.

35 'Menschenfreunde bittet das gefertigte Pfarramt, die Bilder aus der schrecklichen Lawinenkatastrophe (31.1.07) Schaden 200.000 Mark, im Weiler Ahorn Kleinwalsertal, zu 15 Pfg. a Stück zu erwerben. Der Erlös für die 5 geretteten, ihrer Ernährer und ihrer ganzen Habe entblösten Kinder. Das Pfarramt Riezlern'.

36 Walsermuseum Riezlern, inv. no. wamu-104: 'Teilansicht des Trümmerfeldes v. 2 Häusern und 9 Ställen 1000m lang, 100 m breit. Diese Häuser galten ein halbes Jahrtausend als sichere Zufluchtsstätte bei drohenden Lawinengefahren'.

37 Walsermuseum Riezlern, inv. nos wamu-101 and wamu-102.



Figure 14.2 Picture postcard 'Partial view of the ruins of 2 houses and 9 stables ...' from Riezlern, Kleinwalsertal Valley, Vorarlberg (Austria). Walsermuseum Riezlern, wamu-104. Source: Verlag J. Heimhuber / Max Kessler

photographs of the late nineteenth century, showing the deceased laid out in the family circle. In any case, they illustrate the omnipresence of death under the avalanche in alpine communities.

In the last third of the nineteenth century, the major railway routes across and through the Alps were constructed. In Switzerland the Gotthard railway, with its 15-kilometre-long tunnel, even became a national symbol from its opening in 1882.³⁸ In Austria the Arlberg railway route, including a 10.6-kilometre-long tunnel, followed in 1884. Subsequent large railway projects in the Swiss Alps concentrated on a more westerly crossing of the Alps. Since 1906 trains were able to pass the Simplon route via a nearly 20-kilometre-long tunnel, and in 1913 the Lötschberg tunnel followed. In this way, the Swiss Plateau in the canton of Bern became connected with the upper Rhone valley (canton of Valais), the Val d'Ossola (Piedmont, Italy), and Milan, respectively. In addition, a regional transalpine railway network in the canton of Grisons was developed around 1900 to reach the main tourist hotspots such as Davos and St Moritz. All railway routes, however, were threatened by frequent avalanches. The need for the establishment of a

38 Cf. on the construction and the legacy of the Gotthard railway as a symbol of Swiss national identity Judith Schueler, *Materialising Identity. The Co-construction of the Gotthard Railway and Swiss National Identity* (Amsterdam: Amsterdam University Press, 2008).

large-scale protective system against avalanches became evident along the Gotthard and Arlberg lines after the snowy winter of 1887–88. Pioneers in technical avalanche protection such as Johann Wilhelm Fortunat Coaz in Switzerland and Vincenz Pollack in Austria were responsible for creating the first large-scale ‘alpine landscapes of defence’ in the start zone of the avalanches.³⁹

These protective measures, like the large-scale straightening of rivers, had a paradoxical impact: avalanches on these major railway routes through the Alps became less threatening in ‘normal’ years, but carelessness increased. After the disastrous avalanche winter of 1950–51 in Switzerland and Austria, large-scale avalanche protection was erected quickly to prevent further casualties.⁴⁰ In Switzerland the federal and cantonal authorities decided to protect instead of giving up endangered villages such as St Antönien (canton of Grisons).⁴¹ This process was also accompanied by extensive research by the already established Swiss Institute for Snow and Avalanche Research (SLF) in Davos.

This new ‘security’ in the high alpine areas was co-responsible for the establishment of large skiing resorts. The village of Galtür in the Tyrolean Paznaun Valley (Austria) had been a small and poor village founded by a Walser community. In the 1970s it became a popular ski destination for tourists, also due to its snow security at an altitude of 1584 metres a.s.l. Local memory culture had mostly vanished. Although the village had been hit by

39 Johann Wilhelm Fortunat Coaz, *Statistik und Verbau der Lawinen in den Schweizeralpen* (Bern: Stämpfli & Cie., 1910); Vincenz Pollack, *Ueber die Lawinen Oesterreichs und der Schweiz und deren Verbauungen. Vorträge gehalten im österreichischen Ingenieur- und Architekten-Verein in Wien am 29. November und 11. December 1890* (Vienna: Lehmann & Wentzel, 1891). On the beginning of ‘Alpine landscapes of defence’ in connection with the Lötschberg railway project, see Michael Falser, ‘Alpine Landscapes of Defence. On Modern-Vernacular Avalanche Protection Systems in the Swiss Alps’, in Schenk, *Historical Disaster Experiences*, 399–422. On the role of Johann Wilhelm Fortunat Coaz for the development of modern avalanche protection, see Michael Flütsch, *Johann Coaz als Begründer des Lawinenschutzes in der Schweiz* (Bern: Bern Open Publishing, 2023), https://www.hist.unibe.ch/forschung/publikationen/berner_studien_zur_geschichte/reihe_1_klima_und_naturgefahren/index_ger.html (accessed 30 March 2023).

40 Cf. M. de Quervain, T. Zingg, H.R. In der Gand, M. Schild, and H. Calörtscher, *Schnee und Lawinen in den Schweizeralpen. Winter 1950/51* (Davos: Eidg. Institut für Schnee- und Lawinenforschung, 1952); Martin Laternser and Walter J. Ammann, ‘Der Lawinenwinter von 1951 und seine Auswirkungen auf den Lawinenschutz in der Schweiz’, in Pfister, *Am Tag danach*, 153–68.

41 Cf. Ricky Umberg, ‘“Ohne besondere Schutzmassnahmen droht die Entvölkerung ganzer Talschaften”. Die Lawinenschutzbautätigkeit in Anbruchgebieten im Lauf des 20. Jahrhunderts in der Schweiz – mit besonderer Betrachtung St. Antöniens und Andermatts’, *Jahrbuch der Historischen Gesellschaft Graubünden* 150 (2020), 85–232.

numerous severe avalanches during the last centuries,⁴² hotels and other buildings were erected close to the avalanche-prone slopes, even in the endangered 'red zone'. Local knowledge about endangered settlement places had been neglected. Protective forests were mostly missing, in particular from the north. In February 1999 the village became world-famous due to the Galtür Avalanche (1999). On 23 and 24 February 1999, two disastrous powder snow avalanches hit the village itself and a nearby hamlet called Valzur; the only road to the village was blocked, preventing access of emergency vehicles and food supply.

What made Galtür such a disaster and a world-wide media event? Firstly, unpreparedness and carelessness led to an underestimation of the risk of avalanches. Secondly, historical local knowledge was neglected in the pursuit of the economic profit deriving from tourism. Thirdly, this high vulnerability can be seen in a large number of casualties (38 killed, dozens injured) and destroyed houses. Finally, help from outside was impeded, because the road through the Paznaun Valley was blocked for five days and evacuation by helicopter was partly impossible due to bad weather.

A clear paradigm shift can be observed in the aftermath of the catastrophic event. More protective buildings made of steel were erected in the start zone of possible avalanches. A new protective wall (345 metres long, 19 metres high) at the bottom of the slope was built to protect the village itself. In addition, a new culture of disaster memory developed: the *Alpinarium*, a meeting place and new museum about daily life in high alpine areas and about the catastrophe of 1999, was integrated into the protective wall. The event itself is treated in scholarly literature as well as in a lengthy Wikipedia article.⁴³ In general, the event is present in both personal and collective memory, as Bernd Rieken has shown.⁴⁴

However, a new disaster memory like the one in Galtür has not come back in general; there are still some examples of neglected and even consciously banished memory. This becomes evident in the example of Andermatt. The village in the canton of Uri (Switzerland) along the historical Gotthard pass route is one of the 'hotspots' for avalanches in the Alps and was severely destroyed in January 1951 despite its protective forest. After the large military barracks were abolished and the Gotthard motorway tunnel was opened in

42 According to local sources, nine people were killed by avalanches in 1613, another nine in 1622, and nineteen during the eighteenth century.

43 Wikipedia, '1999 Galtür avalanche', https://en.wikipedia.org/wiki/1999_Galtür_avalanche (accessed 30 March 2023).

44 Bernd Rieken, *Schatten über Galtür? Gespräche mit Einheimischen über die Lawine von 1999. Ein Beitrag zur Katastrophenforschung* (Münster and New York: Waxmann, 2010).

1980, the village suffered from economic decline. In the last fifteen years, Egyptian investor Samih Sawiris started to build the luxury hotel and private chalet resort *Andermatt Swiss Alps*⁴⁵, partly erected in places that were hit by avalanches in the past (e.g. the area of the former barracks with casualties in 1940). Obviously, the local authorities do not have any interest in memorialising the avalanche history of the village. In 2013, both in the German and English versions of the Andermatt Wikipedia article, none of the earlier avalanches was even mentioned. Now at least a very short notice refers to the more general article on the winter of 1950–51.⁴⁶

Disaster Memory and Disaster Banishment in the USA

Finally, some glimpses at disaster memory and disaster banishment in the USA may serve as comparison. These insights start with the basic assumption that the European colonisation of the USA in the nineteenth century began parallel to the emergence of a general 'disaster banishment' in Western cultures. On the one hand, newly arriving settlers in the North American west often lacked long-term local knowledge of natural hazards. On the other hand, they established a 'rise up' mentality: after every disaster, a city should emerge larger and more spectacular than before. Furthermore, due to the high value of freedom enshrined in the American Constitution and in the general thinking, compulsory preventive measures seem to be mostly inadequate because legal requirements contradict freedom of action. Finally, hardly any forms of an active memory culture of extreme natural hazards, such as monuments and yearly commemorative celebrations, can be found.

The 1906 San Francisco Earthquake and Fire may serve as an illustrative example. The event developed into a worst-case scenario due to a lack of preparation and numerous adverse breakdowns. However, reconstruction works were seen as 'resurrection like a phoenix from the ashes', as Maynard Dixon's cover of the monthly journal *Sunset*, designed only three months after the disaster, shows (Fig. 14.3).⁴⁷ During the Panama-Pacific International Exhibition in 1915, San Francisco presented itself as a glamorous, newly

45 Andermatt Swiss Alps, <https://www.ander-matt-swissalps.ch/en> (accessed 30 March 2023).

46 Wikipedia, 'Andermatt', <https://de.wikipedia.org/wiki/Andermatt> (accessed 30 March 2023).

47 On the pictorial evidence for the San Francisco Earthquake and Fire as well on its aftermath, see Jacob Birken, *Die kalifornische Institution. Fernwestliche Weltbilder um 1906* (Heidelberg: arthistoricum.net, 2018), <https://books.ub.uni-heidelberg.de/arthistoricum/catalog/book/415> (accessed 30 March 2023), in particular 191–98 on the motif of female personifications of San Francisco rising from the ruins.



Figure 14.3 Maynard Dixon, *The New San Francisco*, cover of the monthly *Sunset* (June and July 1906). The Bancroft Library, University of California, Berkeley, F850.S95 v.17

erected metropolis to host this world's fair.⁴⁸ Up to now hardly any noteworthy memory culture has developed in San Francisco: no larger permanent exhibition, no historical walking trail recalls this crucial event in the history of the city. The famous panoramic photograph of the destroyed city by George R. Lawrence (achieved by using aerial kites) has become a popular poster

48 Cf. Laura A. Ackley, *San Francisco's Jewel City. The Panama-Pacific International Exposition of 1915* (Berkeley: Heyday, 2014).



Figure 14.4 Flooded House Museum, New Orleans. Source: Sandy Rosenthal / levees.org

for tourists, but nothing more. Hidden traces of a memory culture must be discovered, such as the 'Little Giant' (20th and Church Street), a historical hydrant in use during the fire following the earthquake and still operative today. Lotta's Fountain in San Francisco became a place of an annual remembrance of the event (18 April, 5:12 a.m.) for the survivors. It was erected in 1875 and remained one of the very few monuments withstanding the 1906 earthquake and fire. The last two survivors died after the 2015 anniversary. However, it is not well-known among most of the inhabitants of the city.

Hidden traces of a memory culture can also be found related to other natural disasters in the history of the USA. The Galveston Hurricane of 1900 is commemorated by a small memorial on the beach of Galveston, Texas.⁴⁹ However, it was erected only for the centennial anniversary in 2000. In Old North Dayton, Ohio, a flood memorial park remembering the flood of 1937 was created. It was designed in 1992 by Andrew Leicester but abolished already in 2006. This banishment of memorialising the flood fits with the diagnosis offered by Uwe Lübken, who described the flood of 1937 as a 'return of the banished' ('Rückkehr des Verdrängten').⁵⁰

49 On the event, see Patricia B. Bixel and Elisabeth H. Turner, *Galveston and the 1900 Storm. Catastrophe and Catalyst* (Austin: Texas University Press, 2000).

50 Uwe Lübken, *Die Natur der Gefahr. Überschwemmungen am Ohio River im 19. und 20. Jahrhundert* (Göttingen: Vandenhoeck & Ruprecht, 2014), 206–38.

Hurricane Katrina hit the south coast of Louisiana, but also Florida, Mississippi, Alabama, and Georgia, in late August 2005. With gusts up to 344 kilometres per hour, it became one of the most devastating natural disasters in US history. After dyke breaches, up to 80 per cent of the urban area of New Orleans stood up to 7.60 metres under water. The more prosperous classes could mostly flee, whereas the poorer population stayed in their houses or fled to the Louisiana Superdome. In total, 1836 persons were killed, and numerous others went missing. The overall damage was estimated at around 100–125 billion USD. The catastrophic character of the event became even more dramatic due to inadequate individual prevention measures and looting in the city.⁵¹

In the aftermath of Katrina 2005 (and of other hurricanes after 2000), the discussion about compulsory building codes was raised. Guidebooks for hurricane-proof building exist for most of the affected states in the southern USA, mostly published by insurance companies. However, they are not executable for private houses, but only for public buildings such as schools, hospitals, or hotels. It is obvious that detailed regulations contradict the American mentality, in particular in traditionally conservative states in the south.

Memory cultures after natural disasters remain very fragmentary in the USA. Few museums or commemorative tablets dedicated to natural disasters exist – unlike political events such as 09/11 that have been prominently commemorated. Short-term 'remembrance' was created via YouTube, a platform established only some months before the event. A mentality of 'Rise up and never look back!' can also be seen related to hurricanes. Nevertheless, some first signs of a more conscious memorial culture after 2005 have become visible: In New Orleans, a large Hurricane Katrina Memorial was opened in 2006. A commemorative tablet stands on the 17th Street Canal Floodwall, and a building, which had been completely flooded and severely damaged, now serves as a Flooded House Museum due to an initiative of levees.org, a private commemorative platform founded by civic activist Sandy Rosenthal (Fig. 14.4).⁵²

51 On hurricanes in New Orleans and southern Louisiana from the early eighteenth century until 2012, see Eleonora Rohland, *Changes in the Air. Hurricanes in New Orleans from 1718 to the Present* (New York and Oxford: Berghahn, 2019), although without dealing with aspects of memory cultures. On the management and aftermath of the flood, see Arjen Boin, Christer Brown, and James A. Richardson, *Managing Hurricane Katrina. Lessons from a Megacrisis* (Baton Rouge: Louisiana State University Press, 2019).

52 The private museum was opened in 2019: Flooded House Museum on levees.org, <https://levees.org/flooded-house-museum/> (accessed 30 March 2023).

Conclusions and Outlook: On the Way to a Banished/Eroded Disaster Memory and Back?

In many societies that are exposed to recurring natural risk, 'cultures of disaster' or rather 'cultures of risk management' can be identified, be it 'flood cultures' on the rivers of Central Europe and on the North Sea coast in the premodern era or 'earthquake cultures' in the Mediterranean countries. Numerous forms of memory were omnipresent in these cultures as a form of 'mental prevention', from clearly visible flood marks to house chronicles about avalanches. With the 'taming' of natural hazards through river straightening and protective structures of all kinds, especially since the nineteenth century, small and medium-sized events have generally been avoided, but serious events then became even more devastating by hitting an unprepared population. A prolonged absence of extreme events, a 'disaster gap' (Christian Pfister), could thus significantly increase the catastrophic nature of a new event. The belief that technical precautions could be used to get a grip on natural hazards was shaken in many places towards the end of the twentieth century.

Disaster memory in premodern societies eroded if no one could remember an extreme event, i.e. after seventy to eighty years. This time of erosion has become increasingly short, probably reduced to one generation (twenty to thirty years) or even less in our present-day media society (*Mediengesellschaft*). Besides this erosion of disaster memory, some examples of a conscious banishment of disaster memory have been highlighted. This phenomenon is evident beginning in the late nineteenth century. It may demand further research to examine whether banishing or suppressing disasters from the mind is typical for rich Western societies relying on insurance systems.

Thus, in conclusion, the crucial question is whether the local population has learned nothing or too little from its centuries-long disaster history. Firstly, a central thesis here is that flood protection, river straightening, and protective measures against other natural hazards in the past were able to prevent smaller and medium-sized damaging events but also made people careless in the face of rarer major events. Secondly, the development of a new culture of disaster memory should be promoted. This cannot necessarily be done only through the (re)installation of flood marks, memorials, or similar forms of remembrance; it also requires platforms that utilize new media. In Switzerland the Mobilier Lab at the Oeschger Centre for Climate Change Research, together with Mobilier Insurance Company, launched the *Collective Flood Memory* platform in May 2018, where both experts and laypeople can upload their images of current or historical

flood events in Switzerland.⁵³ The precise geo-referencing of the images by specialists makes it possible to reconstruct the flood risk for many locations in Switzerland with pinpoint accuracy. Thirdly, new forms of knowledge transfer are needed between newcomers and people whose families have lived in the area for a long time (perhaps for centuries) and who know a lot about historical flood events through family tradition.⁵⁴ A higher sensitivity due to awareness of the climate crisis may help to draw attention to more disaster memory again.

About the Author

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53 Platform 'Überschwemmungsgedächtnis', Oeschger Centre for Climate Change Research, Universität Bern, <https://ueberschwemmungsgedaechtnis.hochwasserrisiko.ch/de/home> (accessed 30 March 2023).

54 Rohr, 'Umgang', 466–67.