

Chapter 2

Recognising Global Interdependence Through Disasters



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2.1 Introduction. From Isolation to Global Responsiveness

In 2015 we commemorated the bicentenary of the eruption of Gunung Tambora, in Sumbawa Island of south-eastern Indonesia, on 10 April 1815. It was the most devastating eruption anywhere in the last 500 years, and brought disasters to the whole planet. It is interesting to speculate how different the world's responses would be if a comparable eruption occurred tomorrow. The closest recent analogy to help us must be the eruption of Mount Pinatubo in 1991, the biggest of the last 50 years, although with less than a tenth the explosive capacity of Tambora.

Tambora was the last great pre-telegraph disaster. Although the sound of the explosion was heard in Batavia (modern Jakarta) and Padang, information about the eruption that caused the noise didn't reach these places for weeks. Europeans and North Americans experienced their 'year without summer' in 1816, when crops failed and thousands died, but had no idea why. Only 150 years later did it begin to be understood that these global disasters were caused by an eruption on the other side of the world. The people of Indonesia's southeastern island chain—Bali, Lombok, Sumbawa—died without warning, without help, in isolation. Hot gases and pyroclastic flows killed the 8000 people of the Tambora Peninsula of Sumbawa almost immediately. The disaster wiped out the Tambora language, which had up to then been the most westerly survival of a Papuan-type (non-Austronesian) language (Donahue 2007). The three islands were covered with ash that destroyed cultivation. In Lombok 'the depth of ashes which fell...varied...from one to two feet in depth. This not only destroyed the growing crops, but for some years prevented the sowing of corn, and the result was famine, disease and the cutting off of much of the popula-

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tion' (Crawfurd 1856 p. 220). The population of Sumbawa in the first post-disaster count, in 1847, had still only recovered to 74,500, about 40% of the pre-eruption population, even though more than 10,000 immigrants had arrived to take advantage of the vacant land newly fertilised by the phosphates (Crawfurd 1856, pp. 420–1). Bali, further west again, suffered terrible famines for 5 years before crops could again flourish. It normally exported chiefly rice, but for 15 years after the eruption exported only slaves, desperate to escape starvation by selling themselves to whoever would feed them. These three islands must have lost well over 100,000 people, probably about a quarter of their total population, without any effective relief from outside except for the buying of slaves (Reid 2014).

The eruption of Mount Pinatubo in 1991 was a remarkable demonstration of how a modern state supported by the best international science and assistance can moderate such effects. Fortunately Pinatubo also behaved well, from the viewpoint of geologists from the Philippines, the US Geological Survey and elsewhere, by escalating its outbursts to confirm the increasingly urgent warnings and evacuation orders. About 60,000 people were evacuated in stages during the month before the eruption, including 14,000 from the US Air Force base at Tarlac, 15 km from the volcano, which was never re-established. It was estimated that 20,000 of these would have died immediately from the major eruption if not evacuated. Only 700 did so, mostly due to roofs collapsing from the weight of the pyroclastic material deposited. Globally there was an estimated one degree drop in temperatures, and the sulphur dioxide in the atmosphere boosted the ozone hole over the Antarctic to the largest so far recorded. The longer-term effects on agriculture were also moderated by national and international aid, with the Filipino diaspora proving once again its great value. Two years after the event, it was estimated that 2.1 million people had been affected, 8000 houses and 81,900 hectares of rice land destroyed, and 779,000 head of livestock and poultry killed. The Department of Agriculture in Central Luzon calculated total losses from lahars and ash deposits as 1.5 billion pesos (US\$55 million) (Mercado et al. 1993; Pappas 2011). Over a million people were cared for in evacuation centres until they could be resettled in new farms or different occupations. Aid flowed in from 27 countries, and from international organisations like WHO, UNDP, UNICEF, UNDRO and WFP (Guzman n.d.).

There were at least 20 encounters of aircraft with the volcanic ash, two of which caused engine failure (although a fatal crash was averted). These near-disasters, compounding the near-loss of two jets over Java as a result of the Galunggung eruption in 1982, caused a tightening of restrictions on flights through volcanic ash. A consequence was the chaos of thousands of flight cancellations in Europe in 2010 (Webster et al. 2013), as well as closure of five airports and cancellation of hundreds of flights to Bali and elsewhere in July and November 2015, as a result of three moderate eruptions at Iceland's Eyjafjallajökull, East Java's Raung and Lombok's Rinjani respectively.

In short, global awareness of and response to such disasters have been totally transformed in the two centuries since Tambora. The immediate casualties of another Tambora-scale eruption in our day would be much reduced by advance warning, evacuation and relief measures. The impact of the agricultural destruction would be evened out by national and international food distribution and resettlement efforts. Today's effects would be immediately understood as global in scale in

our interdependent world. In ways unimagined two centuries ago, global air traffic would be devastated by the first Tambora-scale eruption of the age of aviation, while the world's scientists would at once begin to calculate the effects on weather, global temperatures, sulphuric acid dispersion and ozone depletion. Environmental disasters have become spectacular reminders of our interdependence.

2.2 Explaining Disasters, East and West

The global sense of responsibility for disaster victims is relatively new, though one can trace a few ancestors. I will oversimplify greatly by suggesting three broad historic patterns of response to natural disaster in the Eurasian civilisational pool: viewing it as a punishment for sin (scriptural), a cosmic judgement on the ruler (classic empires), or a cosmic omen (especially southern Asia). Blaming and dehumanising victims for their sins, rendering them undeserving of empathy like enemies in war, was by no means the only response of the ancient world, but it is the best remembered because it is firmly embedded in scripture.

Otherwise inexplicable catastrophes were seen as divine punishment in the three great Abrahamic religions that shared the basic mythology of the early chapters of the Torah or Old Testament. The first archetype was the great flood in the mythological remote past that destroyed all humans except the family of Noah in the Old Testament/Torah (Genesis 6 and 7) or Nuh in the Qur'an (Surah 11 and 71). The explanation was their general godlessness and immorality. More specific sins were held to cause the destruction of Sodom and Gomorrah in the fertile plain to the south of the present Dead Sea, in the proto-historic time of Abraham (Genesis 13 and 19; Deuteronomy 29), known as Ibrahim in the Qur'an (Sura 11). Christian and Islamic scripture has insisted that this divine punishment was because of sexual transgressions, especially homosexuality, hence the English term sodomy (and most other European languages, from the Latin Vulgate's *sodomiticum*). But there are other Biblical traditions (reflected in Isaiah 1 and 3) that have a much broader list. Collectively, these traditions tend to suggest a major volcanic eruption:

The Lord rained down sulphurous fire upon Sodom and Gomorrah. He overthrew those cities and the whole Plain ... [Abraham looked back on the Plain and] saw dense smoke over the land rising like fumes from a furnace. (Genesis 19: 24–5)

In the Qur'an's more extensive treatment, 'We turned (the cities) upside down, and rained down on them brimstones hard as baked clay, spread, layer on layer' (Qur'an 11: 82, in Yusuf Ali translation).

In the Sinic world, blame was more likely to be cast on the ruler. The classical Chinese authors had taught that the occurrence of natural disasters was evidence that the emperor had lost the mandate of heaven. His 'virtue' (*de*), the quality that demanded grateful submission in subjects, was no longer sufficient to guarantee popular welfare (Sanft 2014, pp. 47–48). Disasters were interpreted as sent by heaven (*tian*) to mark the decline of a dynasty, or at best to test the mettle of a ruler

to overcome the disaster (Janku 2009). Chroniclers therefore paid particular attention to such disasters, giving us a better record of earthquakes, floods and droughts in Northeast Asia than in other pre-modern societies. The cosmos was basically knowable and benign, and Emperors were responsible for maintaining that beneficence. China, it has been argued, pioneered not just the bureaucratic and meritocratic state, but the welfare state (Mair and Kelley 2015, p. 342, citing Bin Wong).

Because of this sense of imperial responsibility, substantial resources were devoted to preventing and responding to disasters. Records of imperial relief to victims of disaster go back at least as far as the Han Dynasty, and an established 'natural disaster policy' (*huang zheng*) was often appealed to thereafter. Pierre-Etienne Will (1990) has shown that when the Qing Dynasty was at its expansive eighteenth century peak, famine relief was at a level of efficiency never reached (or indeed needed) by Europe, in marked contrast with the mishandled disasters of nineteenth century China and India (see below). During the El Niño drought and famine that struck Zhili (now Hebei) province in 1743–1744, some two million otherwise starving peasants in North China were kept alive for 8 months by massive government shipments of grain from the South. The food security of the people remained a major preoccupation of the imperial system for the remainder of the century.

The same imperial ideology held Vietnamese rulers to account for climatic disasters like droughts, floods and typhoons. Only in the nineteenth century, however, did the reach of Vietnamese emperors and their literati advisors extend to the more vulnerable coastline of what is today central and southern Viet Nam. For this last dynasty, the Nguyen (1802–1883), there seemed no respite from disasters somewhere. The chronicles tell us much about them, and about the government's response. The emperors devoted considerable resources to organising the correct 'calling for wind and rain' (*cầu đảo*) rituals, even for epidemics and other disasters not related to drought. They diverged from their Chinese counterparts, however, in providing little by way of practical relief throughout their extensive domains. Even the costs of the ritual requirements to satisfy the spirits were imposed on local authorities wherever possible (Dyt 2015).

State concern for disaster victims may have been more a feature of imperial world rulers than of Confucian ideas *per se*. Roman emperors from the time of Augustus (27BCE–14CE) also established their legitimacy and benevolence by assisting the victims of natural disasters. Right at the beginning of his reign, Augustus responded generously to a petition carried to him from the island of Chios where a city had been destroyed in an earthquake. It was rebuilt from imperial funds, and renamed Caesarea in a show of imperial propaganda (Higgins 2009, pp. 64–5). Subsequent emperors appear to have followed this example, providing tax relief and monetary grants to the survivors of major earthquakes in both Italy and the eastern Mediterranean (Dillon and Garland 2015, p. 678; Higgins 2009, pp. 64–74). Some pre-Christian writers saw natural disasters as signs of divine intervention in human affairs, and were not above blaming the victims to make moral points about who was selected for destruction. The emperors, however,

appear to have seen these events as an opportunity to demonstrate their power and benevolence—even including the notoriously less benevolent Caligula and Vitellius.

Once the Roman emperors became Christian, they merged this tradition with the scriptural idea of natural disaster as divine punishment for sin. Some Christian emperors appear to have taken these signs of divine disapproval personally, publicly demonstrating their repentance and humility. Justinian responded dramatically to an earthquake in Antioch in 526:

He threw aside his crown and imperial robes, and, dressed in dirty rags, he wept for many days, and even on feast days he entered the temple in wretched garments, for he could not bear to wear any symbols of power. And all those who were in the city gathered in their rags... and for seven days they fasted and prayed. (Cedrenus, cited in Higgins 2009, p. 75)

Outside the sphere of Sinic influence, the Asian response was largely of the third type: natural disaster was seen as a signal to the living from gods and spirits, but not necessarily of a negative or judgemental kind. The Indic and Southeast Asian literatures record little by way of benevolence by the wealthy and powerful towards victims of disaster. The principal means of assisting those dying of hunger was to accept them as slaves or bondsmen. The chronicles and inscriptions do not, indeed, see natural disaster as tragic so much as portentous. An indication of this is the way Buddhist and Hindu temples were built in stone even in earthquake-prone Burma, Sumatra and Java, presumably with the knowledge that these would be destroyed sooner or later by earthquakes. These were the abodes of gods, not men, and gods had a right to destroy them, giving humans the opportunity to build them again and gain further merit. The places where humans congregated, including hermitages, monasteries, religious schools and mosques, were always built of wood and bamboo and had little to fear from earthquakes.

The frequent volcanic eruptions of Java and the earthquakes of Sumatra were reported in the chronicles and inscriptions as omens, frequently of the birth, death or great achievement of some divinely-inspired figure (Reid 2015, pp. 66–68). The Javanese regularly built temples on the slopes of active volcanoes, and developed ritual responses to great events. The major eruption of Mount Merapi in 1822 was widely interpreted to presage the coming of the messianic ‘just king’ (*ratu adil*), a figure the anti-Dutch rebel Diponegoro then sought to embody (Christie 2015). A probable mega-tsunami in 1618 may have been used by the rising dynasty of Mataram as a sign that Sultan Agung and his successors alone could harness the supernatural powers of the Queen of the South Seas (Ratu Kidul) by mating with her (Reid 2016a, pp. 99–107). Going further back, the Javanese court poet Mpu Prapanca, who wrote his *Desawarnena* (or *Nagarakertagama*) in 1365, described a 1334 eruption thus:

The earth quaked and rumbled, there was a rain of ash, thunder and lightning zigzagged through the sky,

Mount Kampud [Kelud] erupted and the wretched evildoers were annihilated and died without a gasp. (Robson 1995, p. 26)

Prapanca saw this as supernatural confirmation of the birth of a great king, his patron King Hayam Wuruk, whom he exonerated from blame by insisting that only evil people were killed.

Burmese traditions popularised the Buddha's explanation of earthquakes to his favourite disciple, Ananda. The first of the eight causes he gave was about the fragile structure of the cosmos, with the earth resting on water, which in turn rested on unstable air. The other seven all had to do with marking the progress of some gifted individual toward Buddhahood (Shway Yoe 1896, p. 575).

Throughout Eurasia, the great religions encouraged compassion towards the suffering victims of life, on the grounds that all men are essentially brothers with similar destinies. Everywhere there are exemplary stories of compassion. But it is difficult to trace the rise of empathy towards distant victims, beyond the specific responsibility of rulers towards their subjects, until the transformation of European communications and sensibility in the eighteenth and nineteenth centuries. Hence we must return to that western extremity of Eurasia, itself relatively free of natural disasters, to take the story forward.

2.3 1755 and the Beginnings of European Transnational Compassion

Europe developed its economic leadership in the past millennium in part because it was unusually favoured climatically and geologically. Its disasters were chiefly man-made in the form of endless wars. After reviewing the ancient writers who attributed the fall of the Roman Empire to divine punishment of its excesses through natural disasters, Edward Gibbon sagely pointed out that in reality:

Man has much more to fear from the passions of his fellow-creatures than from the convulsions of the elements. The mischievous effects of an earthquake or deluge, a hurricane, or the eruption of a volcano, bear a very inconsiderable proportion to the ordinary calamities of war. (Gibbon 1789/2008, p. 70)

This certainly was the case in war-ravaged Europe, if not perhaps in the 'ring of fire' unknown to Gibbon. The 1755 Lisbon earthquake therefore came as a considerable shock. Most of the buildings of Europe's fourth-largest city were destroyed, with probably 4000–8000 of its population killed (though this number was greatly inflated by posterity) and much of the remaining 150,000 made homeless (Aguirre 2012). The disaster appeared to have no remembered antecedents in Western Europe. Though European colonists in Latin America, the Philippines and Java had reported drastic events in these places, a delay of months in the news weakened the impact of these faraway events. The destruction by earthquake and tsunami of Port-Royal (Jamaica), the Caribbean's busiest port, in 1692, and most of Lima, one of South America's richest cities, in 1746, may have been comparable disasters, but had little impact in Europe. Catania, in Sicily, destroyed by Mount Etna's eruption in 1669, was poor and peripheral. As Goethe rhapsodised, 'Raging volcanoes rise

up in the distance, seeming to threaten the world with destruction. Yet the bedrock of my refuge remains unshaken, while those who live on distant shores and islands are buried beneath the faithless land' (Goethe 1998, p. 133).

But Lisbon was close, and the growing newspaper culture reported the disaster around Europe within days. 'For the first time in the western world, the press helped to create the illusion of proximity and unity among the peoples of different European nations' (Araújo 2006). The philosophers all took it up. For Voltaire, famously, it was proof that God was either not benign, or not omnipotent. Goethe too thought it destroyed the benign fatherly figure of God. Rousseau took it as proof that crowded cities were not part of the divine plan, and one should return to nature. John Wesley, the founder of Methodism, was more representative of popular ideas in his continued insistence that divine intervention was the best explanation for this and the other more distant natural disasters. He did not exactly blame the victims, but saw the earthquake as a timely reminder that no amount of wealth or science could protect man against such disasters, but only prayer (Wesley 1755).

The earthquake marked a shift in European worldview, whereby the catastrophic spasms of the planet became subjects for intense interest, an essential part of Enlightenment enquiry. The buried city of Pompeii, near Naples, had been rediscovered in 1748, and excavation proceeded throughout the remainder of the century. It and the active volcano Vesuvius, erupting frequently between 1744 and 1761, became crucial agenda items on the grand tours which Enlightenment intellectuals made to Italy. The volcanists championed by Alexander von Humboldt argued that earthquakes and eruptions revealed a necessary but decentred process of ongoing creation. The rival Neptunists, inspired by Abraham Gottlieb Werner, preferred a more coherent design for creation, in which water played the central role. Volcanoes became such a fashionable topic that artificial ones were built, such as that in the famous garden of Prince Franz of Anhalt-Dassau (Brodey 2008, p. 30).

For many, however, 1755 represented a humanitarian disaster for the innocent people of a small country, deserving of international support. The Spanish king arranged to send as much money to Lisbon as a courier could manage every day. The German cities of Hamburg and Danzig sent off several shiploads of building supplies. King George II requested the British Parliament to vote £100,000 for his faithful ally in Lisbon, to arrange 'such speedy and effectual relief, as may be suitable for so afflicting and pressing an exigency' (cited in Murteira 2004). International responsibility for innocent victims of natural disasters had begun.

2.4 A Genealogy of Globalising Relief

For Western Europe, 1755 was an exception. Warfare remained the great killer in that sub-continent, and it was war that provoked the first international relief organisation. The Swiss businessman Jean-Henri Dunant witnessed the Battle of Solferino in Italy in 1859, where 40,000 men were left dead or wounded on the battlefield in a single day. He did his best in the following days to help bury the dead and tend the

wounded, but it was his 1862 book about the event, *A Memory of Solferino* (1986) that had the greater effect. Its plea for international treaties to provide and protect health personnel bore fruit in a conference around these ideas in October 1863. Thirteen European governments and various non-government groups there agreed on the establishment of national relief societies in each country for care of the war wounded, whose personnel should be protected from attack. The following Geneva Convention in 1864 included representatives from outside Europe, from the US, Brazil and Mexico. In 1876 the international character of the movement was given structure and a name: the International Committee of the Red Cross.

While wars remained the primary scourge of geologically safe Europe, the non-European members of the Red Cross pressed to add natural disasters to their mandate. The American branch begun by Clara Barton was always more concerned with natural disasters. It aided victims of a forest fire in Michigan in 1881, a Mississippi River flood in 1884, another flood from a dam break in Pennsylvania in 1889, and a hurricane in a South Carolina island in 1893. At the Third International Red Cross Conference in Geneva in 1884, Barton pressed for the extension of the official Red Cross mandate to natural disaster relief. Her 'American amendment' eventually prevailed over much European resistance. The American branch led in the internationalisation of relief to subsequent victims of volcanic eruptions and earthquakes in Chile, Colombia, Ecuador, Costa Rica, Iran, Japan and Turkey (Red Cross 2015). The spread of telegraphic communications around the world in the 1860s and 1870s helped give a sense of immediacy to these disasters, so that newspaper readers in Europe and North America could begin to empathise and mobilise support within days of a disaster.

The Save the Children Fund was also founded to ameliorate the horrors of Europe's wars, working on the effective strategy of exempting 'innocent' children from the dehumanisation that had been accorded to enemies in war. The well-connected Jebb sisters founded the organisation at a surprisingly successful meeting at the Albert Hall in 1919. They were aghast at the destitution of Germany and Austria, whose peoples had been demonised during the war. Younger sister Eglantyne had the organisational skill to turn this tide of sympathy into an international organisation centred in Geneva the following year, and its activities moved on from crisis to crisis around the world.

The internationalising of responses to epidemics took place in roughly the same globalising period of improved communications. It was however more of a top-down process, led by governments concerned to inform and protect their own populations against border-crossing epidemics. Intergovernmental 'sanitation' conferences began in Europe in 1851 to coordinate the reporting of and response to the outbreak of epidemics. The eleventh such conference, in 1903, recommended the formation of what became the Office International d'Hygiène Publique in 1907. This was overshadowed after the war by the Health Organisation of the League of Nations, set up in Geneva in 1921 to monitor and exchange epidemic information (Charles 1968). The WHO is its much more ambitious descendent, established as a UN agency in 1948.

Most of the other international organisations that we now expect to respond to the latest disaster owe their origins only to the post-colonial moment since 1945. Responsibility for poor societies shifted from colonial powers to international organisations at a time when the gulf between rich West and poor rest was at an all-time peak. Even that most ancient of international organisations, the Catholic Church, had no international structure for its relief activities until the 1950s. The Acting Vatican Secretary of State, Monsignor Montini (the future Pope Paul VI), convened a meeting in Rome of thirteen national Caritas organisations in 1951. That of Germany was the oldest and strongest, founded in 1897, and it took a lead in implementing Montini's call for an 'international organism' to coordinate relief. In 1954 Caritas International was formed. It began relief immediately in response to floods in Italy, Holland and Belgium, and in following years to China, Viet Nam and Ethiopia. By 1962 it had 74 national members (Caritas 2015).

Oxfam had been founded in Oxford for famine relief in 1942, but became an international organisation only in 1995. Médecins sans Frontières was established in Paris in 1971 as a reaction to the perceived failure of the Red Cross to speak out against atrocities during the Nigerian war against Biafra. Its first mission the following year, like many that followed, was to relieve a natural disaster, when an earthquake destroyed much of the Nicaraguan capital, Managua. Though less rigorously non-political than the Red Cross, it did learn the benefits of strict neutrality during the Lebanese conflicts. It developed an international network in the 1980s (Newell 2005).

2.5 Asian Disasters and Western Empathy

This process of developing a global infrastructure of relief took place during the late imperial period, and more intensively as that system died after 1945. In the century 1860–1960 the gap had grown ever wider between wealthy and powerful western countries and populous but poor Asian ones. The latter were prone to horrendous disasters that dwarfed anything in European and American experience. Better communications, the telegraph, the press, a growing public sphere, and graphic photography gradually drew sympathy and relief efforts from the rich West to the poor East.

A major turning point was the exceptionally severe El Niño of 1876–1879, which appears to have been responsible for the worst series of droughts and crop failures around the tropical world known to history. Well over 30 million people must have died in the resulting famines—probably 'the worst ever to afflict the human species' (Davis 2001, p. 1, quoting John Hidore). They devastated agricultural regions of South India, Java, the western Visayas (Philippines), North China, Brazil, New South Wales and eastern Africa. Research has focussed on India and China, which appear to have lost 6–10 million and 9–15 million people respectively through famine deaths in this period (Davis 2001, p. 7; Janku 2009).

The two responsible imperial governments, British and Manchu, were for different reasons unable or unwilling to provide effective relief. The Indian Viceroy Lord Lytton and his key advisors were perversely committed to Adam Smith's doctrine that interference with the market only made shortage more acute, and rewarded unviable inefficiency. The Government had responded effectively to the earlier Bihar famine in 1873–1874 by importing rice from Burma, which had kept mortality commendably low through an exceptional drought. This policy had been rejected by Lytton for disturbing the rice market, creating dependency and endangering the budget needed for expensive wars in the Northwest. He imposed a much harsher line this time, allowing Indian grain to be exported for better prices in Britain while millions starved (Hall-Matthews 1996; Davis 2001, pp. 25–54).

In China the precociously advanced Qing system of managing state granaries to provide for famine assistance had broken down before a century of environmental degradation, destructive war and rebellion, and what Davis (2001, p. 344) calls 'the commercialization of subsistence'. By 1820 the grain shipped north to the capital on the Grand Canal had already ceased to provide the stocks needed as a buffer against recurrent famines in the north. In mid-century, foreign-owned coastal steamers became the principal means of shifting grain around, guided by profit margins rather than need. The Qing government could respond to the prolonged drought only by urging local authorities to do their best, and providing them pitiful assistance in cash.

As British and American military successes unlocked China, Japan and India to the universality of trade and investment in the middle third of the nineteenth century, global interdependence became manifested through the new norm of rich west and poor east. For the first time the telegraph communicated the scale of disaster and coordinated responses to it, while photography displayed the stark horror of events. Horror, guilt and pity were mobilised among the global rich (however unevenly) towards the poor. Debate began almost at once about the causes of the famines. While the British establishment viewed Asian despair as a product of Malthusian overpopulation crisis and 'natural' disaster, its many critics focussed on the opium trade, cynical government misallocation of resources, and indifference. The case against the Indian government's criminal irresponsibility was made by radical journalists William Digby and Robert Knight, and later by economic historian R.C. Dutt, contributing to the inter-communal nationalism of the first Indian National Congress in 1885 (Davis 2001, pp. 55–9).

Despite the stern hostility of the Viceroy to publicity or fund-raising for the victims, the Madras Governor chaired a public meeting in his capital in August 1877. It formed a famine relief committee which telegraphed the Lord Mayor of London, whose Mansion House had already become the first address for disasters closer to home. From there the appeal went out to other cities around Great Britain, and after some offended protests from them, also to distant but wealthy British cities such as Melbourne. Indian Famine Relief Committees were formed in many cities and gained the support of radical and Christian reformers like Florence Nightingale. These committees raised £689,000, of which £52,000 was from Australia (Twomey and May 2012, pp. 233–37).

Imperial solidarity appeared to be the central motive for the generous British and Australian response, in which civic networks played a larger role than religious ones. Other appeals for disasters in the 1870s rested largely on the solidarity of ethnic diasporas towards their countries of origin. Australian donations reached only £3600 for the great Chinese famine (1878) and £1087 for a Persian one (1872), but £95,000 for an Irish one (1880), reflecting the numerical and financial strength in Australia of the Chinese, Jewish and Irish diasporas respectively on which these three campaigns rested (Twomey and May 2012, pp. 247–50). The Indian fund was different, with Anglo-Australian establishment support on grounds of imperial solidarity. ‘The vastness of empire and identity of interests,’ the Archbishop of Sydney declared, tended ‘towards softening asperities of creed, and towards breaking down the isolation of antagonistic race’ (cited in *ibid.*, p. 239).

In the case of China, by contrast, it was largely western missionaries who publicised the despair of the famine victims around the world, and sought to mobilise empathy beyond ‘antagonistic race’ through description, photos and sketches. British missionary Timothy Richard drew foreign attention to the famine with his heart-rending account of starving people lying helpless, wives and children being sold, and children being eaten. The Shandong Famine Relief Committee was formed by the foreign community in Shanghai in March 1877. Missionary accounts were circulated to comparable committees in London (where the great opium trading firms provided support), Europe, America and Australia. Donations were tiny in Britain and Australia in comparison with the India campaign. The warmest response was in the United States, where missionary pressure produced a bill in Congress to return to China some of the indemnity that had been extracted from its government in 1859. The bill failed to gain support, however, overcome by the wave of hysteria in California against Chinese immigration. In total the campaign is estimated to have raised some US\$400,000. The Chinese state’s once-formidable capacity for famine relief was shown to be in ruins, and private fund-raising both among affluent Chinese (in the south and in diaspora) and around the world began to take its place (Janku 2009, pp. 236–7; Davis 2001, pp. 64–79).

Despite the unifying effects of telegraph and of international organizations such as the Red Cross, in other words, international responses continued to be extremely uneven, dependent on the presence or absence of particular sources of empathy. Two fateful stereotypes were formed in this crisis. In the West the problem of ‘Asia’s starving millions’ became entrenched, breeding concern, anger, or Malthusian fatalism in different quarters. In China the inadequate efforts of missionaries to rescue some from the disaster fostered resentment at ‘rice Christians’ and the ‘buying’ of babies.

Tectonic traumas—earthquakes, tsunamis and eruptions—were less destructive of lives than these terrible famines, but more spectacular in their visual effects and in the way they affected wealthy cities rather than poor peasants. Two deadly Northeast Asian earthquakes in the 1920s again demonstrated a marked difference in international response. Essentially the 1920 Gansu earthquake in northern China and the 1923 Kanto earthquake in the Tokyo area of Japan each killed at least 140,000 people and rendered millions homeless, but the latter evoked the first truly

global relief effort while the former was scarcely known outside China, and received only local relief.

Tokyo was already a significant global city, East Asia's largest and most modern, well connected to the world by telegraph and press networks. The destruction of urban buildings was spectacularly obvious, and well reported both verbally and graphically. Japan was relatively well-organised in its response, with a domestic Red Cross Society connected to sister organisations throughout the world. About US\$100 million was channelled to the Japanese societies by its sister organisations. Sympathy was highest in the United States, where the Red Cross was already specialised in disaster relief, and where the Japanese diaspora provided a visible and organised source of organisation and empathy. President Coolidge gave a strong and public lead in calling for a sympathetic response as soon as the news reached the US, and American ships from the China station were sent promptly to Tokyo Bay to render assistance. In proportion to GDP at the time, this may have been the largest international relief effort to date. Even though domestically the disaster could still be interpreted as divine punishment, provoking a nasty pogrom against 'polluting' Koreans, it was the first major example of international structures working effectively for aid and reconstruction (Schencking 2013, pp. 116–152).

The Gansu earthquake, centred in remote Haiyuan, affected mostly rural Hui Muslim people, many of them living in cave-like homes dug out of the fine yellow loess. Landslides and collapses of such dwellings may have accounted for about 100,000 deaths, while a comparable number died of starvation, thirst or exposure as they wandered about looking for help. This occurred amidst another drought-induced famine affecting some 20 million people on the North China plain, which absorbed what relief supplies the struggling Chinese Republic then had to offer. Military units in the immediate vicinity offered a little assistance in the form of tents and food in some areas, while gentry committees also mobilised some rice and shelter. The Gansu diaspora in the eastern cities was able to organise a little aid, while foreign missionaries in the area also helped with reconstruction in the year following. But like many disasters in China before and since, the broader international community knew almost nothing about this disaster, and its victims suffered much as they always had, in relative isolation (Fuller 2015).

2.6 Cold War and Nationalism Interrupt the Globalising Trend

Interdependence was not a linear progression. The profound political divisions of the twentieth century interrupted the expansion of global empathy and coordination that better communication would otherwise have made possible. After each of the World Wars there were great steps forward towards global coordination and understanding, quickly undermined by polarisation and belligerence. The Cold War (1948–1989) poisoned empathy and ruptured cooperation across the iron and

bamboo curtains, while the self-righteous nationalism of some fragile new nations made them reluctant to accept outside aid. Sukarno's Indonesia was busy launching its confrontation of Malaysia at the time of the eruption of Bali's Gunung Agung in 1963, the most severe in Indonesia's relatively moderate twentieth century. The pyroclastic flows killed 1580 people immediately, though over 50,000 more were 'missing' from the 1971 census in the four affected eastern districts, their crops destroyed by ash and acid (Reid and Rangkyu 2014). Bali and neighbouring eastern Java were already in near-famine conditions as a result of Sukarno's mismanagement. The Bali Governor reported that 100,000 hectares of rice land would be unproductive for many years to come. 'We have to feed 85,000 refugees and we simply do not have the food to do it' (Robinson 1995, pp. 239–40).

The 1976 Tangshan earthquake in Northeast China, although probably the deadliest of the twentieth century anywhere (at least 250,000 died), was poorly reported both inside and outside China in a year of political crisis in which both Zhou Enlai and Mao Zedong died. Mao's successor Hua Guofeng did gain stature in China by visiting the disaster site and showing sympathy for the victims, but his radical rival, Mao's widow Jiang Qing, prioritised her campaign against the comeback of Deng Xiaoping. She was widely quoted in China as having said, 'There were merely several hundred thousand deaths. So what? Denouncing Deng Xiaoping concerns 800 million people' (Palmer 2011, p. 189). The international assistance that was offered, even that of the United Nations, was rejected by the Chinese government.

2.7 The Globalised Present

The period since the end of the Cold War in 1989 marks the most remarkable extension of global information exchange, preparedness and response to natural disasters. The 2004 Indian Ocean tsunami was the most dramatic example, with amateur videos keeping graphic images on TV screens around the world as never before. Aid for the relief effort was pledged from at least 54 countries, most of them having lost their own citizens in the exceptionally transnational disaster. International organisations also moved quickly to provide assistance, to a record total in excess of US\$13.5 billion. Nearly \$6 billion of this was provided by private donations through NGOs of all kinds. It was the most generous international disaster response in history, and indeed raised many questions about whether such funds should have been distributed more equitably for development purposes (Telford 2012; Brauman 2009).

Even a purely China-based phenomenon like the Sichuan earthquake of 2008 (over 80,000 killed) was reported widely and responded to internationally. Although there was protest in China (well publicised by Ai Weiwei) at the government's withholding information about the carnage resulting from badly constructed schools, the contrast with the 1976 event was enormous. The Chinese government response was effective, centralised and military-led on this occasion, but billions of dollars in aid were also delivered by other governments, Red Cross societies and international

agencies (IFRC 2012; UNICEF 2009). Regional rivals Japan and Russia were particularly quick to offer aid in money and kind.

Both sides of the old iron curtain now cooperate in the sharing of data, while satellite imaging and other forms of global monitoring provides better information than most governments can generate. Bodies such as the US Geological Survey have established a global reach, and web sites proliferate to assemble data on a global basis. The 24-h news cycle, the ease of electronic communication and the universality of mobile phones with a video capability combine to ensure that graphic, emotive images of disasters anywhere in the world are on our screens within hours. International journalists are on the scene of every disaster within days, and recovery teams and aid workers swiftly follow. There is increasing coordination between the various UN agencies concerned with disaster relief (WHO, UNHCR, WFP, UNICEF, UNDP) and increasingly globalised NGOs such as Red Cross/Red Crescent, OXFAM, Caritas, Médecins sans Frontières and World Vision. The UN's Office for the Coordination of Humanitarian Affairs (OCHA) seeks to coordinate the UN's response to these disasters, while an Inter-Agency Standing Committee (IASC) attempts the even more difficult task of coordinating the work of all agencies, government, UN and private.

Subjectively, we are all aware of what appears to be an increasing frequency of mega-disasters in the Asia-Pacific. The devastating tsunamis of 2004 (Indian Ocean) and 2011 (Honshu) in March 2011 were brought to our living rooms with unprecedented vividness. Cyclone Nargis in the Irrawaddy delta in 2008 (138,000 dead) appeared to have no Burmese precedent. Typhoon Haiyan in the Central Philippines in 2013 created a record for the destruction of homes, and we need to go back at least to 1897 to find a comparable event, with many fewer casualties (Switzer 2015). Nor had the Philippines experienced for centuries a volcanic eruption on the scale of Mount Pinatubo in 1991. The floods that affected Bangkok and all the deltaic areas of Indochina in 2011 were, in dollar terms, as destructive as any fresh-water flood in human history (Reid 2016b, pp. 46–50).

How much of this impression reflects reality, as opposed to the effect of intensified coverage and journalistic fashion? Firstly the reality. The numbers for property damage do tend to increase with higher coverage, inflation and rising living standards. Increased population, especially in vulnerable cities, also increases the numbers rendered homeless or otherwise affected by a disaster. The numbers killed in disasters (Fig. 2.1), however, are dropping, at least relative to population. The reasons are better preparedness both nationally and internationally, and more effective systems of relief.

In the past 30 years Asia has provided the overwhelming majority (almost 90%) of people affected by disasters, due to its very high population densities, and the rich countries relatively few. The incidence of disasters in Asia was rather low in relation to Asia's share of world population (Table 2.1). If we go further back in time, it is clear that the most destructive volcanic eruptions, earthquakes and floods of the last thousand years have been in Asia, and can be expected to recur there in the twenty-first century to a greater extent than they did in the twentieth. Indonesia's Tambora (Sumbawa) and Samalas/Rinjani (Lombok) eruptions in 1815 and 1257, respectively,

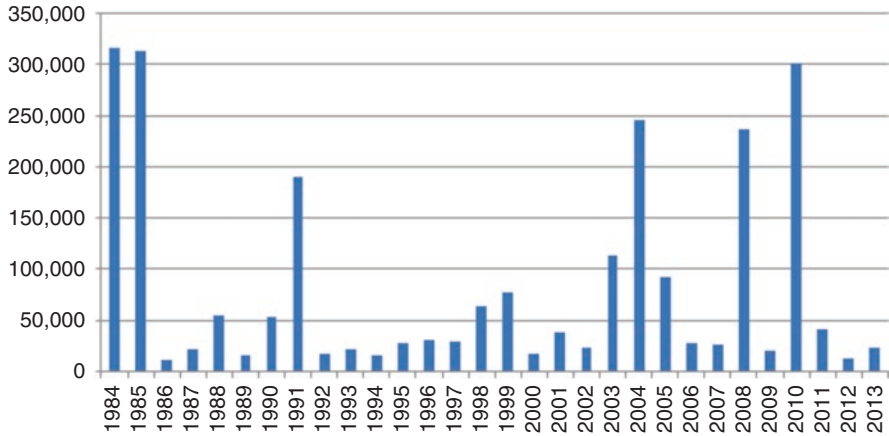


Fig. 2.1 Numbers killed by natural disasters worldwide, 1984–2013 (Source: Asian Disaster Reduction Center 2014)

were of a magnitude more than ten times greater than anything that has occurred since 1900. Of the many earthquakes in China over the past century, none has come close to the Shaanxi earthquake of 1556 in the mortality it caused (over 800,000), despite the far greater population of modern China's cities. It may be fair to say, therefore, that although deaths from natural causes are not tending to increase in absolute terms during the time-scale when we have credible data, Asia is the likeliest place for a future mega-disaster of a very different order of magnitude.

The media coverage of natural disasters appears to be increasing both in quantity and universality. A Red Cross report on the media pointed out that:

News must be new. Editors sort stories by death tolls. Disasters that are unusual yet explainable, and that cause considerable death or destruction in accessible places which the audience is believed to care about, get covered. Baffling stories get less attention.

The commercial imperative has sharpened journalists' quest for ratings. Today, TV news is part news and part entertainment. So it's understandable that sudden, dramatic disasters like volcanoes or tsunamis are intensely newsworthy, whereas long-drawn-out crises (difficult to describe, let alone film) are not. (ICRC 2005)

Popular consciousness of the depredations of natural disasters has undoubtedly increased in the last 40 years, out of proportion to any identifiable increase in the victims of natural disaster. Part of this is explained by the visual images now available from spectacular natural events, and the capacity of modern media to deliver them to our living rooms. Perhaps partly for this reason, there appears to have been a gradual growth of empathy for victims perceived as innocent fellow-humans in great need.

The other sea change that has been occurring in my lifetime is the reduction of wars and armed conflicts, now well documented by Steven Pinker (2011). Observable globally since 1945, this trend was slower to manifest itself in the Asia-Pacific region, where the Cold War was at its hottest. There too the period of peace since

Table 2.1 Impacts of natural disasters by region, 1984–2013

<i>Region</i>	<i>Impact</i>					
	Occurrence (Share in %)	Killed (Share in %)	Affected (Share in %)	Damage (US\$ million) (Share in %)	Damage (US\$ million) (Share in %)	Damage (US\$ million) (Share in %)
Africa	2099 (20.2%)	726,996 (29.3%)	423,394,194 (15.7%)	19,064 (7.0%)	19,064 (0.3%)	19,064 (0.3%)
Americas	2495 (24.0%)	339,148 (15.7%)	204,311,734 (47.7%)	916,177 (88.7%)	916,177 (36.3%)	916,177 (36.3%)
Asia	3952 (33.1%)	1,136,437 (47.7%)	5,396,306,705 (7.1%)	1,169,341 (0.6%)	1,169,341 (12.9%)	1,169,341 (47.0%)
Europe	1398 (13.5%)	176,505 (7.1%)	35,344,415 (0.2%)	320,256 (0.3%)	320,256 (2.6%)	320,256 (12.9%)
Oceania	432 (4.2%)	5753 (0.2%)	20,431,165 (109.0%)	64,662 (100.0%)	64,662 (2.6%)	64,662 (2.6%)
Total	10,376 (100.0%)	2,434,339 (109.0%)	6,030,733,213 (100.0%)	2,439,499 (100.0%)	2,439,499 (100.0%)	2,439,499 (100.0%)

Source: Asian Disaster Reduction Center (2014)

1980 has been unprecedented. Wars and conflicts dominated the news media for much of the twentieth century, and still do even when the violence-hungry media have to make do with dozens killed by terrorists rather than millions in earlier conflicts in Indochina, China, Korea, India-Pakistan, Nigeria, Congo or Indonesia. Fortunately we appear to be a little less desensitised to mass killing than our grandparents, a little more outraged that violence continues. But natural disasters have come into their own as sources of shock and horror. It has been noted that Hollywood's current output of disaster movies began as US coverage of armed conflict in Indochina ceased in the 1970s (Mauch 2009, p. 2).

This shift of attention is fraught with imbalance, inconsistency and chaotic competition between agencies. But it has fortunately nudged forward the desperate need of *Homo sapiens* to think as global citizens whose destinies are interdependent, before we destroy our species and our planetary environment. Environmental disasters and the threat of their future recurrence are powerful incentives to establish regional and global regimes regarding nuclear energy and weapons, water rights, pollution and carbon emissions, epidemics and solar storms, to minimise their severity and destructive impact on humans. The monitoring of such regimes is highly technical, shifting some supra-national authority to the international community of scientists and technicians. Though such experts can provoke populist backlash, as in the European Community, they are less politically unpalatable than the clash of global contestants for power.

2.8 The Way Ahead

We remain grossly unbalanced in the resources every country devotes to preparing for war to destroy each other, as against preparing for a common effort to save our species and our planet as it faces future threats. The more we can encourage a trend in this direction, the better it will be for all. For all the chaos, competitive infighting and waste that marked the unprecedented response to what seemed an unprecedented disaster in the 2004 tsunami, this had the effect of ending a secessionist war in Aceh. The global spotlight was briefly turned to a nasty but forgotten war, and the contestants were shamed into ending it. Although unfortunately the tsunami had no such effect on equally conflicted South Thailand or Sri Lanka, the potential of disaster response to promote interdependence was clear.

Singapore and Australia, the two rich countries little threatened by natural disasters in an otherwise poor and vulnerable region, have an opportunity to play a constructive role in regional preparedness. They are by far the biggest military spenders in the region, with a total expenditure of US\$9.8 billion and \$25 billion respectively in 2014. Such expenditure dwarfs that of their giant, but poor but vulnerable, neighbours Indonesia (\$7 billion) and the Philippines (\$3.2 billion), let alone that of equally vulnerable Papua New Guinea, Vanuatu and the Solomons with their negligible military forces. In per capita terms these two rich regionals are among the

biggest military spenders in the world, at more than tenfold the rate of their neighbours (SIPRI 2015).

Both countries justify their large expenditures, big arms purchases, and in Singapore's case compulsory military service, in terms of insecurities deriving from the threats of the 1940s (Japan in Australia's case) and the 1960s (Malaysia and Indonesia in Singapore's). These imagined dangers have little to do with present realities, though military and industrial interests have persuasive reasons to keep funds flowing their way. Regional disaster governance provides a powerful twenty-first century reason for these two militaries to retain their critical position while tilting their objectives towards the certainty of environmental disasters in the region rather than the memory of obsolete threats. The bloated mega-cities of maritime Asia are particularly at risk. Military cooperation with poorer neighbours in modelling and planning for transnational disaster governance is a positive path towards trust and a sense of common interests. It provides a more urgent regional justification for the new US base in Darwin and docking facilities in Singapore than insurance against hypothetical military threats.¹

References

- Aguirre, B. E. (2012). Better disaster statistics: The Lisbon earthquake. *Journal of Interdisciplinary History*, 43(1), 27–42.
- Araújo, A. C. (2006). The Lisbon earthquake of 1755: Public distress and political propaganda. *E-journal of Portuguese History*, 4(1), 1–11. viewed 9 May 2016, https://www.brown.edu/Departments/Portuguese_Brazilian_Studies/ejph/html/issue7/html/aaraujo_main.html.
- Brauman, R. (2009). Global media and the myths of humanitarian relief: The case of the 2004 tsunami. In R. A. Wilson & R. D. Brown (Eds.), *Humanitarianism and suffering: The mobilization of empathy* (pp. 108–117). Cambridge: Cambridge University Press.
- Brodey, I. S. (2008). *Ruined by design: Shaping novels and gardens in the culture of sensibility*. New York: Routledge.
- Caritas 2015. History: Who we are, viewed 9 May 2016, <http://www.caritas.org/who-we-are/history/>
- Asian Disaster Reduction Center. (2014). *Natural disaster data book 2013*. Kobe: Asian Disaster Reduction Center (ADRC).
- Charles, J. (1968). Origins, history and achievements of the World Health Organization. *British Medical Journal*, 168(2), 293–296.
- Christie, J. W. (2015). Under the volcano: Stabilizing the early Javanese state in an unstable environment. In D. Henley & H. Schulte-Nordholt (Eds.), *Environment, trade and society in Southeast Asia: A longue durée perspective* (pp. 46–61). Leiden: Brill/KITLV.
- Crawford, J. (1856). *A descriptive dictionary of the Indian islands and adjacent countries*. London: Bradbury & Evans.
- Davis, M. (2001). *Late Victorian Holocausts: El niño famines and the making of the third world*. London: Verso.

¹ It was welcome news that the new flagship of the Australian Navy, *HMAS Canberra*, commissioned in November 2015, was designed in part for 'conducting large-scale humanitarian and disaster relief missions' (Royal Australian Navy n.d.). The same unfortunately cannot be said for vast projected expenditure on twelve submarines.

- Dillon, M., & Garland, L. (2015). *Ancient Rome: Social and historical documents from the early Republic to the death of Augustus* (2nd ed.). Abingdon: Routledge.
- Donahue, M. (2007). The Papuan language of Tambora. *Oceanic Linguistics*, 46(2), 520–537.
- Dunant, H. (1986). *A Memory of Solferino [1862]*. Geneva: International Committee of the Red Cross.
- Dyt, K. (2015). Calling for wind and rain: Rituals, environment, emotion, and governance in Nguyễn Vietnam, 1802–1883. *Journal of Vietnamese Studies*, 10(2), 1–42.
- Fuller, P. (2015). Writing disaster: A Chinese earthquake and the pitfalls of historical investigation. *History Workshop Journal*, 80(1), 201–217.
- Gibbon, E [1789] 2008. *The history of the decline and fall of the Roman Empire*, 7, Cosimo, New York.
- Goethe, J. W. (1988). In D. Miller (Ed.), *The collected works, scientific studies*. New York: Princeton University Press.
- Guzman, (n.d.). Eruption of Mount Pinatubo in the Philippines in June 1991 publicized', Asian Disaster Reduction Center, retrieved October 2015, www.adrc.asia/publications/recovery_reports/pdf/Pinatubo.pdf.
- Hall-Matthews, D. (1996). Historical roots of famine relief paradigms: Ideas on dependency and free trade in India in the 1870s. *Disasters*, 20(3), 216–230.
- Higgins, C 2009. Popular and imperial response to earthquakes in the Roman Empire, Unpublished MA Thesis, Ohio University.
- ICRC 2005. International Committee of the Red Cross, World Disasters Report 2005, Chapter 6: Humanitarian media coverage in the digital age. <http://www.ifrc.org/en/publications-and-reports/world-disasters-report/wdr2005/wdr-2005>.
- IFRC 2012. Emergency appeal final report: China: Sichuan earthquake, emergency appeal no. MDRCN003, GLIDE no. EQ-2008-000062-CHN, International Federation of Red Cross and Red Crescent Societies (IFRC), Geneva, retrieved 9 May 2016, <https://www.ifrc.org/docs/Appeals/08/MDRCN003fr.pdf>.
- Janku, A. (2009). Heaven-sent disasters in Late Imperial China: The scope of the state and beyond. In C. Mauch & C. Pfiste (Eds.), *Natural disasters, cultural responses: Case studies toward a global environmental history* (pp. 233–264). New York: Roman & Littlefield.
- Mair, V. H., & Kelley, L. (2015). *Imperial China and its southern neighbours*. Singapore: ISEAS.
- Mauch, C. (2009). Introduction. In C. Mauch & C. Pfiste (Eds.), *Natural disasters, cultural responses: Case studies toward a global environmental history* (pp. 1–16). New York: Roman & Littlefield.
- Mercado, RA, Lacsamana, JBT, Pineda, GL 1993. Socioeconomic impacts of the Mount Pinatubo eruption, viewed 2013, <http://pubs.usgs.gov/pinatubo/mercado/>
- Murteira, H. (2004). The Lisbon earthquake of 1755: The catastrophe and its European repercussions. *Economia Global e Gestão (Global Economics and Management Review)*, 10, 79–99.
- Newell, C 2005. 'A working history of Médecins sans Frontières: The changing face of humanitarian aid', University of Ottawa, viewed 10 May 2016, <http://www.med.uottawa.ca/historyof-medicine/hetenyi/newell.html>.
- Palmer, J. (2011). *Heaven cracks, earth shakes: The Tangshan earthquake and the death of Mao's China*. New York: Basic Books.
- Pappas, S 2011. 'Pinatubo: Why the biggest volcanic eruption wasn't the deadliest', *Live Science*, 15 June, viewed 2013, <http://www.livescience.com/14603-pinatubo-eruption-20-anniversary.html>.
- Pinker, S. (2011). *The better angels of our nature: Why violence has declined*. New York: Penguin Books.
- Red Cross 2015. American Red Cross History: Founder, Clara Barton, American Red Cross, viewed 9 May 2016, <http://www.redcross.org/about-us/history/clara-barton>.
- Reid, A. (2014). Population history in a dangerous environment: How important may natural disasters have been? *Masyarakat Indonesia*, 39(2), 505–526.

- Reid, A. (2015). History and seismology in the Ring of Fire: Punctuating the Indonesian past. In D. Henley & H. Schulte-Nordholt (Eds.), *Environment, trade and society in Southeast Asia: A longue durée perspective* (pp. 62–77). Leiden: Brill/KITLV.
- Reid, A. (2016b). Building cities in a subduction zone: Some Indonesian dangers. In M. Douglass & M. Miller (Eds.), *Disaster governance in urbanizing Asia* (pp. 45–6059). Singapore: Springer.
- Reid, A. (2016a). Two hitherto unknown Indonesian tsunamis of the seventeenth century: Probabilities and context. *Journal of Southeast Asian Studies*, 47(1), 88–108.
- Reid, A, Rangkuty, H 2014. ‘Testing in Bali the demographic effects of tectonic and political disaster’, unpublished paper presented to the Indonesia Study Group, Australian National University.
- Robinson, G. (1995). *The dark side of paradise: Political violence in Bali*. Ithaca: Cornell University Press.
- Robson, S. (Ed.). (1995). *Desawarnana (Nagarakrtagama)*, by Mpu Prapañca. Leiden: KITLV Press.
- Royal Australian Navy 2016. **Ships, boats & craft**: HMAS Canberra (III), viewed 9 May 2016, <http://www.navy.gov.au/hmas-canberra-iii>
- Sanft, C. (2014). *Communication and cooperation in early Imperial China: Publicizing the Qin Dynasty*. Albany: SUNY Press.
- Schencking, J. C. (2013). *The great Kanto earthquake and the chimera of national reconstruction in Japan*. New York: Columbia University Press.
- Shway Yoe [Sir J.G. Scott]. (1896). *The Burman: His life and notions*, Macmillan, London.
- SIPRI 2015. Military expenditure data base: World military expenditure by Country per Capita, Stockholm International Peace Research Institute, SIPRI, Sweden.
- Switzer, A 2015. ‘The significance of historical typhoon records: Notes from a comparative study of Super-Typhoon Haiyan and its 1897 predecessor in the Philippines’, Paper presented to Euroseas Conference, European Association for Southeast Asian Studies, Vienna.
- Telford, J. (2012). Disaster recovery: an international humanitarian challenge? In P. Daly, M. Feener, & A. Reid (Eds.), *From the ground up: Perspectives on post-tsunami and post-conflict Aceh* (pp. 1–22). Singapore: ISEAS.
- Twomey, C., & May, A. J. (2012). Australian responses to the Indian Famine, 1876–78: Sympathy, photography and the British Empire. *Australian Historical Studies*, 43(2), 233–252.
- UNICEF 2009. Sichuan earthquake: One year report, retrieved 9 May 2016, http://www.unicef.org/eapro/UNICEF-China_Sichuan_Earthquake_One_Year_Report.pdf.
- Webster, H. N., Witham, C. S., Hort, M. C., Jones, A. R., & Thomson, D. J. (2013). *NAME modelling of aircraft encounters with volcanic ash plumes from historic eruptions, forecasting research technical report no. 552*. Exeter: Met Office.
- Wesley, J 1755. Some serious thoughts occasioned by the late earthquake at Lisbon, Furman University, viewed 9 May 2016, <http://history.furman.edu/benson/hst11/docs/wesley.htm>.
- Will, PE 1990. *Bureaucracy and famine in eighteenth century China*, Forster, E (trans.), Stanford, Stanford University Press.