

## 1 EARTH-SHATTERING EVENTS

Not long after midnight on an ordinary evening in late February 2008, I had an uncanny seismic experience. I had just finished writing a book review (for the scientific journal *Nature*) of an intriguing new study by a Californian seismologist published under an attention-grabbing title—*Apocalypse: Earthquakes, Archaeology, and the Wrath of God*. While editing my draft, I felt the floor in my fourth-floor flat in London shift almost imperceptibly for a second or two. My partner joked that it must be an earthquake, but I couldn't believe it. In four or five decades, I had never knowingly witnessed a British earthquake. Perhaps the vibration had been caused by a London Underground train passing not far away from our early-Victorian square. I forgot about it and went to bed.

The following morning, however, the BBC radio news bulletin confirmed that there really had been an earthquake, at 12.56 a.m. The British Geological Survey had monitored the event as having occurred at a depth of 5 kilometres (about 3 miles), with its epicentre in the county of Lincolnshire, roughly north of London around 200 kilometres (125 miles) away, and with a potentially destructive magnitude of 5.2. According to the survey's records, it was the biggest earthquake in the United Kingdom since 1984, in other words for nearly a quarter of a century.

One serious injury was reported: a student in his attic bedroom was hit on the pelvis by a falling chunk of chimney stack. Many houses close to the epicentre suffered damage, chiefly to chimneys, roofs and garden walls. And a lot of people were rudely awoken from sleep and became alarmed enough to go into the street; local emergency services and the British Geological Survey were inundated with calls. A resident of nearby Scunthorpe told a national newspaper: 'My whole house shook like it was going to fall over and it felt as if the whole roof was coming off. I thought a tree had been thrown into the roof by a tornado or something.' Another person, further away from the epicentre to the south, in Northampton, also thought that his house was coming down. He added: 'I knew it was an earthquake straight away. It was as strong as I have ever felt anywhere, and I lived on the west coast of America for four years.' A third person, resident on the nearby east coast, commented that the tremor was 'much stronger' than one he had experienced in Los Angeles.<sup>1</sup>

Every year in Britain some 200 minor tremors are recorded by seismographs. A magnitude-4 earthquake occurs every two or three years on average; a magnitude-5 quake every ten years on average; in 1931, there was a quake of magnitude 6.1—the largest British earthquake measured by seismologists to date. As a rule, 90 per cent of these tremors go undetected by the public. Those that are noticed—like the 5.2-magnitude earthquake on 27 February 2008—are nevertheless rapidly

forgotten. To most people, earthquakes and England would appear to have little connection, and British earthquakes to be a topic that offers hardly anything of interest to a writer—compared with the almost apocalyptic earthquakes that strike places such as California and Alaska, Chile and Peru, Mexico and the Caribbean islands, North Africa, Portugal and Italy, Turkey and Iran, Pakistan and India, Indonesia, New Zealand, China and Japan, where violent shaking of the earth has devastated towns and cities and killed millions of people in the modern period. (In China alone earthquakes have claimed thirteen million lives since records began three millennia ago, of whom 830,000 died in one mega-disaster in 1556.) Yet, the facts of the historical record show that such complacency and indifference towards British earthquakes are unwarranted.

An authoritative study of the subject, *A History of British Earthquakes* by a mathematician, Charles Davison, published by Cambridge University Press in 1924 just before the advent of modern seismography, lists 1,190 earthquakes that the author was able to authenticate. For the period up to AD 1000, Davison was compelled by lack of evidence to consider a rare, two-volume, compilation published in London in 1749 by a Sheffield physician and fellow of the Royal Society, Dr Thomas Short, entitled *A General Chronological History of the Air, Weather, Seasons, Meteors, etc.* Short noted that he had spent 16 years in collecting his ‘scraps of histories’, but sadly he elected to provide virtually no details of his sources.<sup>2</sup> His first report of a British earthquake, dated AD 103, refers to an unnamed ‘city’ in a western English county, Somersetshire, which was supposedly ‘swallowed up, name and all’—a disaster that seems highly improbable, and was dismissed by Davison. A later report by Short, dated 811, states that an earthquake ‘destroyed’ St Andrews, in Scotland (‘most of the town and 1400 people’)—another claim dismissed by Davison and others as a tall story.<sup>3</sup>

But after leaving behind Short’s catalogue, Davison’s sources become more reliable, that is, from about 1000 onwards. Here are some examples of authentic British earthquakes. In 1114, during a violent earthquake in England—which coincided with one in Italy—the unfinished walls of a new Lincolnshire church at Croyland ‘gave way, and the south wall was cracked in so many places that the carpenters were obliged to shore it up with timbers till the roof was raised’.<sup>4</sup> In 1248, the vaulted roof of the celebrated medieval cathedral at Wells in Somerset was thrown down by an earthquake. In 1580, in London, a boy and a girl died during an earthquake under masonry falling from Christ Church; St Paul’s Cathedral was slightly damaged; and the great bell in the Palace of Westminster was set ringing. At Dover, part of the white cliffs fell into the English Channel along with a portion of the castle wall. In 1692, a violent shock with its probable focus in Brabant (what is now the

Netherlands/Belgium) made people in London ‘greatly affrighted’, according to a letter written soon after by the diarist John Evelyn, whose son lived in central London (Evelyn himself, then in Surrey, felt only a minor tremor).<sup>5</sup>

In 1750, which became known as the ‘year of earthquakes’, several areas of the country were shaken. In London, four shocks occurred in February and March—the fourth of which was centred 2 or 3 miles north of London Bridge, lasted for between 5 and 6 seconds and caused great stones to fall from the new spire of Westminster Abbey—followed by a tremor on 20 March. Londoners became so alarmed by a madman’s prediction of a future shock on 7-8 April that thousands of them chose to spend the night out of doors, either in tents in Hyde Park, or in their carriages or simply in the open. Some women even had ‘earthquake gowns’ made to keep them warm while sitting outside on this unique occasion, noted the aristocratic Horace Walpole in an amused letter to a friend on 7 April. Those who could afford it—some members of the nobility and the gentry—left London altogether: ‘within these three days seven hundred and thirty coaches have been counted passing Hyde Park corner, with whole parties removing into the country’, reported a sceptical Walpole.<sup>6</sup> Nothing happened on the predicted day (though in June there was ‘loud report like that of a cannon’ at London and Norwich, without any tremor).<sup>7</sup> But the earthquakes proved a boon to the certain clergymen, including the evangelist John Wesley, who prayed from their pulpits for repentance by sinful Londoners, so as to avert God’s wrath. Moreover, many fellows of the Royal Society, most notably John Michell at Cambridge University, were at last provoked to begin research into earthquakes. By the end of 1750, almost 50 articles and letters on the subject had been read before the Royal Society, which were promptly published as an appendix to its *Philosophical Transactions*. The serious study of British earthquakes may be said to date from this time, notes Davison.

Then, at 9.18 a.m. on 22 April 1884, came the so-called Great English earthquake, the most damaging quake of all, which wrecked houses and toppled churches in and around the ancient Roman town of Colchester in the coastal county of Essex, while pitching the engine driver of the waiting Colchester-London 9.20 a.m. express train out of his cab onto the station platform. It also rattled nearby London. In the Houses of Parliament, within the Palace of Westminster, puzzled MPs were ‘stopped in their tracks, jolted against walls, or felt papers and briefcases jerked from their hands’.<sup>8</sup> Officials were immediately despatched to investigate the possibility that there had been a Guy Fawkes-style explosion in the cellars of the palace, perhaps set off by the notorious Dynamiters, who were at this time being prosecuted by the police for

their anarchist activities. The 1884 British earthquake lasted maybe 5 seconds (like the March 1750 earthquake), according to a reliable eyewitness near the epicentre—a professional sailor who was no stranger to earthquakes in other lands. Had it lasted a few seconds longer, noted a sober report in a local Essex newspaper four days after the dramatic disturbances, ‘there is little doubt that the countryside would have been completely destroyed and the loss of life would have been incalculable’.<sup>9</sup>

England’s greatest writer, William Shakespeare, was clearly alive to the reality of local earthquakes in the sixteenth century, judging from a number of references in his works. In Shakespeare’s *King Henry IV*, Hotspur declares:

*Diseased nature oftentimes breaks forth  
In strange eruptions, oft the teeming earth  
Is with a kind of colic pinch’d and vex’d  
By the imprisoning of unruly wind  
Within her womb, which for enlargement striving  
Shakes the old beldam earth, and topples down  
Steeple and moss-grown towers.*<sup>10</sup>

Three significant English earthquakes—in London in 1580, in Canterbury in 1580 and near York in 1581—are known to have occurred during the early youth of Shakespeare (who was born in 1564). One of them is thought to have been the source of a topical reference in his play *Romeo and Juliet*, when Juliet’s nurse remembers an unforgettable day:

*’Tis since the earthquake now eleven years,  
And she was wean’d—I shall never forget it—  
Of all the days of the year upon that day.*<sup>11</sup>

The most likely candidate is the 1580 earthquake in London, which caused a real stir, as we know. Some Shakespeare scholars have therefore dated the original composition of *Romeo and Juliet* to 1591, eleven years after the earthquake. (Others, however, prefer 1596, the year before the play’s first publication.)

All of this is not to suggest that British earthquakes have any global significance. Indeed, they will hardly rate another mention in this book. But their very existence over many centuries serves to illustrate the truth that no part of the earth is entirely free from the effects of earthquakes—not even stolid Britain.