CHAPTER 1

Risk and Uncertainty

A Risk Society

Risk defines modernity. We see it in almost every aspect of life, from disease to climate change, accidents to crime. Risks such as these pose a threat to our health, our safety, our finances and our mental health. The German sociologist Ulrich Beck has argued that Western civilisation is nothing other than a 'risk society', in which not only are our lives shaped by the calculation of probabilities but the number of risks has multiplied in line with innovations in technology.[1] Be it nuclear bombs or the threat of environmental catastrophe, Beck's world is packed full of the dangers created by scientific advances – except that they are no longer seen as advances. The old narrative of science as a force for good has been fundamentally weakened by innovations that threaten human existence itself. People have come to distrust the motives – as well as the statistics – of experts. As the Coronavirus pandemic showed clearly, experts disagree, often fundamentally, and, indeed, make errors in their predictions. Why should ordinary individuals believe and trust in experts when they can agree on neither the data nor its interpretation?

Paradoxically, therefore, greater scientific knowledge has resulted in greater general uncertainty. For Beck, this is a sign of a 'reflexive modernity', where respect for traditional sources of knowledge, such as scientists, has declined and left a void and a desperate feeling of anxiety and insecurity. Devoid of reliable and trustworthy sources of information, individuals are left to seek out their own knowledge about the nature of

[1] U. Beck, *Risikogesellschaft: Auf dem Weg in eine andere Moderne*, Frankfurt: Suhrkamp, 1986, translated as *Risk Society: Towards a New Modernity*, trans. M. Ritter, London: Sage, 1992. See also J. Franklin (ed.), *The Politics of Risk Society*, Maldon, MA: Polity, 1998, and S. Bennett (ed.), *Innovative Thinking in Risk, Crisis and Disaster Management*, Farnham: Gower, 2012. A good overview of the concept of a Risk Society and its place in wider risk studies can be found in D. Lupton, *Risk*, 2nd edition, Abingdon: Routledge, 2013.

the risks they face in their lives and have turned to all manner of 'alternative' experts in a search for reassurance, ranging from internet conspiracy theorists to the new certainties of various counter cultures. The globalised economy has generated an extraordinary array of life choices for the individual to make, but such choice has generated yet more fear. Taking the wrong course exposes individuals to risks and represents a failure on their part to understand the implications of their actions, a failure which only adds to their sense of anxiety. Not surprisingly, Beck argues, reflexive modernity has sought cover by taking control of all aspects of life and attempting to eliminate risk from ordinary life. Taking any form of unnecessary risk becomes an act of ignorance – an immoral refusal to understand the dangers implicit in a particular course of action.

Beck, however, sees risk as the product of modern capitalism. By definition, therefore, he denies that the concept existed in the pre-modern world. Risk represents what Beck calls 'a systematic way of dealing with hazards and insecurities induced and introduced by modernization itself', as opposed to 'older dangers', or what Giddens calls 'inclement nature'.[2] 'Human dramas', argues Beck, such as 'plagues, famines and natural disasters' and 'the looming power of gods and demons . . . differ essentially from "risks" in my sense since they are not based on decisions, or more specifically, decisions that focus on techno-economic advantages and opportunities and accept hazards as simply the dark side of progress'.[3] Pre-industrial hazards were 'strokes of fate', no matter how large and devastating they were, and they were attributable to an outside 'other' and could be blamed on gods. Whereas modernity, in this view, has introduced a whole range of mega-risks, unlike anything seen before, in the pre-modern world 'danger' offered a sufficient range of vocabulary because an intuition existed of the possibility of future harm without there being much desire, need or ability to quantify it. Or as Joffe explains: 'The incalculable threats of pre-industrial society are turned into calculable risks in industrial society, in line with the modern project of promoting rational control in all spheres of life.'[4]

Beck's work has been highly influential in the field of risk studies and clearly has important implications for any proposed analysis of risk in the Roman world. And Beck is certainly not alone in seeing the ancients as

[2] Beck, *Risk Society*, p. 21; A. Giddens, *Modernity and Self-identity: Self and Society in the Late Modern Age*, Cambridge: Polity, 1991, p. 19.
[3] U. Beck, 'From industrial society to the Risk Society: questions of survival, social structure and ecological enlightenment', *Theory, Culture and Society*, 9 (1992), 97–123, p. 98.
[4] H. Joffe, *Risk and 'the Other'*, Cambridge: Cambridge University Press, 1999, p. 5.

passive victims of fate. The social theorist Tony Giddens also sees modernity as living 'after tradition', and 'is essentially to be in a world where life is no longer lived as fate'.[5] In this view, whatever disasters happened to humanity in the past were the work of an unseen divine or other supernatural power. They were events that were not, Beck concludes, 'politically charged'. We need think only of accusations that Nero deliberately caused the Great Fire of Rome in 64 CE to see that the reality in Antiquity was different. But, to be fair to Beck, as a social theorist, the ancient world has never been of much relevance to his work. Elsewhere he does appear to accept that risks have always been present, but he argues that the nature of modern risks is of a different order: the consequences of nuclear war are unfathomable and far greater than anything humanity has faced before.

As one writer has noted, 'risk is quite unique in the quantity and extent of research that draws upon it'.[6] But it is perhaps this denial of risk's existence in the pre-industrial world that explains why the subject has been of limited interest to scholars of Antiquity. The work that has been done is mostly on the Greek world and has been focused on peasant culture or on the use of divination to understand the future. Garnsey examined the frequency of food crises in Antiquity and how peasants and emperors responded to this risk. Gallant looked at the strategies adopted by peasant farmers in response to climatic variability and fluctuations in harvests. This included the cultivation of social relations to build up potential support networks. Grey adopted a similar approach towards the later empire. These books contain only brief discussions of what constitutes risk and how the concept might be applied to the ancient world, understandably preferring to focus on the specific practices they are examining. Grey's study of the effect of the eruption of Vesuvius contains a more detailed and useful discussion of the concept of risk in relation to that calamitous event.[7] Beard's article on Roman aleatory culture also contains useful observations on how Romans dealt with and even embraced risk.[8]

[5] A. Giddens in Franklin, *The Politics of Risk Society*, p. 26.
[6] A. Burgess, A. Alemanno and J. Zinn (eds.), *Routledge Handbook of Risk Studies*, London: Routledge, 2016, p. 1.
[7] P. Garnsey, *Famine and Food Supply in the Graeco-Roman World: Responses to Risk and Crisis*, Cambridge: Cambridge University Press, 1988; T. Gallant, *Risk and Survival in Ancient Greece: Reconstructing the Rural Domestic Economy*, Cambridge: Polity, 1991; C. Grey, *Constructing Communities in the Late Roman Countryside*, Cambridge: Cambridge University Press, 2011 and also 'Risk and vulnerability on the Campanian plain: the Vesuvius eruption of A.D. 472', *Journal of Interdisciplinary History*, 51 (2020), 1–37.
[8] M. Beard, 'Risk and the humanities: alea iacta est', in L. Skinns, M. Scott and T. Cox (eds), *Risk*, Cambridge: Cambridge University Press, 2011, pp. 85–108. I discuss this work further later.

Eidinow has published a popular book on the subject of luck, fate and fortune, which shows, in an accessible way, how ancient understandings and discussions concerning these concepts are still relevant to the modern world of risk. Beerden includes a more detailed discussion of the concept of risk in her work on divination in the ancient Greek world, although this follows a narrow, statistical approach, seeing the concept as a quantifiable uncertainty and therefore inapplicable to Antiquity. For her, divination was how the ancient Greeks dealt with their unquantifiable uncertainties. A similar approach is taken by Eidinow, who sees risk as 'quantified certainty' and therefore argues it cannot be applied to Antiquity.[9] Both these approaches provide excellent insight into how the practice of various forms of divination allowed the Greeks to try to manage the uncertainties in their life.

There is an increasing body of work dealing with the substantial threats that the Romans confronted. My own work looks at how the Romans thought about and dealt with disasters as a whole and the strategies they used to try to prevent them from happening, while there have been various studies that examined particular events, such as the Great Fire of 64 CE.[10] Scheidel and Harper have both provided comparative historical studies of plagues and pandemics and, in Scheidel's case, war.[11] Interest in the risks posed by climatic conditions and changes in Antiquity has also grown rapidly, with various attempts to interpret the historical data.[12] The Justinianic plague has seen substantial new research, including an increase in analysis of new forms of genetic evidence.[13] There is also an ongoing

[9] E. Eidinow, *Luck, Fate, and Fortune*, Oxford: Oxford University Press, 2011; K. Beerden, *Worlds Full of Signs: Ancient Greek Divination in Context*, Leiden: Brill, 2013; E. Eidinow, *Oracles, Curses, and Risk among the Ancient Greeks*, Oxford: Oxford University Press, 2007, pp. 196–203.

[10] J. Toner, *Roman Disasters*, Cambridge: Polity, 2013; V. M. Closs, *While Rome Burned: Fire, Leadership, and Urban Disaster in the Roman Cultural Imagination*, Ann Arbor: University of Michigan Press, 2020; J. J. Walsh, *The Great Fire of Rome: Life and Death in the Ancient City*, Baltimore, MD: Johns Hopkins University Press, 2019.

[11] W. Scheidel, *The Great Leveler: Violence and the History of Inequality from the Stone Age to the Twenty-First Century*, Princeton, NJ: Princeton University Press, 2017; K. Harper, *Plagues upon the Earth: Disease and the Course of Human History*, Princeton, NJ: Princeton University Press, 2021. On the late empire, see P. Sarris, 'Climate and disease', in E. Hermans (ed.), *A Companion to the Global Early Middle Ages*, Leeds: Arc Humanities Press, 2020, pp. 511–38.

[12] See F. L. Cheyette, 'The disappearance of the ancient landscape and the climate anomaly of the early Middle Ages: a question to be pursued', *Early Medieval Europe*, 16 (2008), 127–65; M. McCormick, 'Climates of history, histories of climate: from history to archaeoscience', *Journal of Interdisciplinary History*, 50 (2019), 3–30.

[13] See L. K. Little (ed.), *Plague and the End of Antiquity: The Pandemic of 541–750*, Cambridge: Cambridge University Press, 2007. On the genetic evidence, see L. K. Little, 'Plague historians in lab coats', *Past and Present*, 213 (2011), 267–90; M. H. Green, 'When numbers don't count: changing perspectives on the Justinianic plague', *Eidolon*, 18 (2019).

debate over the seriousness of the impact of both this plague and ancient climate change.[14]

There have also been many studies into various aspects of more specific risks that Romans faced. These have included demographic studies into life expectancy, given the significant threats of disease and malnourishment, and how these relate to the assumptions at work in Ulpian's Life Table of annuities. There have also been studies into a wide variety of ancient phenomena, ranging from military logistics, to legal aspects of uncertainty and maritime loans, all of which reveal something of how the Romans understood future danger. These are all examined in more detail in later chapters.

This book looks at how the Romans understood, thought about and dealt with risk. It sets out to challenge the views of Beck and Giddens in a number of ways. It argues that risk is a useful term to apply to Antiquity and that the Romans did not simply see themselves as passive in the face of fate. It argues that the Romans did display some understanding of risk and took a variety of steps to help manage it. And it argues that modernity's attitude to risk should not be seen as entirely unique. Pascal's 1654 discovery of probability represented a significant step forwards in the understanding of uncertainty. But it was a shift along a spectrum, not a sudden change from darkness to enlightenment, from total ignorance to knowledge.

Probability and Risk

Pascal's understanding of the stable relative frequencies of certain chance events meant that the future could be calculated and, for some, represents

[14] See K. Harper, *The Fate of Rome: Climate, Disease, and the End of an Empire*, Princeton, NJ: Princeton University Press, 2017. There have been several critical responses to this work, most notably J. Haldon et al., 'Plagues, climate change, and the end of an empire: a response to Kyle Harper's *The Fate of Rome* (1): Climate', *History Compass*, 16 (2018); J. Haldon et al., 'Plagues, climate change, and the end of an empire: a response to Kyle Harper's *The Fate of Rome* (2): plagues and a crisis of empire', *History Compass*, 16 (2018); J. Haldon et al., 'Plagues, climate change, and the end of an empire: a response to Kyle Harper's *The Fate of Rome* (3): disease, agency and collapse', *History Compass*, 16 (2018). Also, K. Sessa, 'The new environmental fall of Rome: a methodological consideration', *Journal of Late Antiquity*, 12 (2019), 211–55. Note also Harper's response to the critiques of him: K. Harper, 'Integrating the natural sciences and Roman history: challenges and prospects', *History Compass*, 16 (2018). On the impact of the plague, see also L. Mordechai and M. Eisenberg, 'Rejecting catastrophe: the case of the Justinianic plague', *Past & Present*, 244 (2019), 3–50; M. Meier, 'The "Justinianic plague": an "inconsequential pandemic"? A reply', *Medizinhistorisches Journal*, 55 (2020), 172–99; P. Sarris, 'New approaches to the Plague of Justinian', *Past and Present*, 254 (2022), 315–46.

'the underlying essence of risk'.[15] Once it was understood that there is a one-in-six chance of a dice throw producing a six, then this could be used to predict how later dice rolls would turn out. It is worth remembering that this is a model that will not necessarily correspond to the actual future. It may instead happen that the next three dice rolls all produce sixes, but the likelihood of this unusual occurrence could also now be calculated (as $6 \times 6 \times 6 = 1/216$) and used to plot a normal distribution chart, known as a bell curve, which captures the likelihood of the various combinations of throws occurring. Pascal's discovery had significant implications for how uncertainty was seen, in that it could now be quantified, for decision-taking about what courses of action to take in the future, and indeed people's relationship with the future. Some aspects of the future were now mathematically knowable (which is not the same as knowable).

Interestingly, in the two centuries before Pascal's discovery, the notion of risk also emerged across Europe as a way to denote situations of potential damage to seaborne cargoes. We can interpret both as part of a societal shift towards a more calculating worldview, according to which people were trying to quantify unknowns and calculate the likelihood of certain outcomes and therefore make decisions about what was the best course of action to take. The term entered English during the 1660s from the French *risque*, itself derived from the Italian *riscare* (to run into danger), formulated from the medieval Latin *risicum*. As for the original etymology, as the *Oxford English Dictionary* notes, the origin of *risk* is 'much debated'. One theory is that the term risk comes from the Latin *resecare* (to cut off), from which the Spanish *risco*, cliff, derives, which obviously posed a threat to shipping; or that it comes from the Icelandic *ráðask* (meaning something like 'to decide to launch an attack'), a military term introduced into Latin following Norse attacks on the European continent; another possible source is the Arabic root *rizq*, meaning 'sustenance', 'income' or 'fortune', originally derived from the Persian *rozik*, 'daily bread'; or another is the Greek *rhiza*, meaning 'root' or *rhysis*, 'deliverance'. Whatever the ultimate source, it is clear that all these origins contain a sense of undertaking actions where there is the potential for both benefit and harm.

As for what the term risk has come to mean in the modern world, there is no simple consensus or accepted definition. In its simplest form, risk is

[15] Burgess, Alemanno and Zinn, *Routledge Handbook of Risk Studies*, p. 3. See also I. Hacking, *The Emergence of Probability: A Philosophical Study of Early Ideas about Probability, Induction and Statistical Inference*, 2nd edition, Cambridge: Cambridge University Press, 2006.

about the future. Since the future is unknowable, risk is also about uncertainty and the inability of humans to be sure of the consequences of their actions. It represents a lack of knowledge, since there can be no risk when there is certainty. Or, to put it another way, risk cannot exist in a predetermined world, a world of fate.[16] In a broad sense, therefore, we can see risk as relating to events where something is at stake and where the outcome is uncertain.[17] When dealing with probabilities, therefore, risk can be described as a neutral term, concerned merely with mathematically calculated losses and gains. In Frank Knight's classic book, *Risk, Uncertainty and Profit* (1921), risk was defined as an objective quantity that could be obtained by calculation according to the factors relevant to the outcome. By contrast, uncertainty was something more subjective and judgemental that could not be worked out mathematically.[18]

The Knight approach was later adopted in various areas of risk management and finance. In finance, risk was seen as representing volatility, which could be calculated based on the previous price behaviour of an asset. The more an asset's price moved the greater its volatility and risk. The capital asset pricing model took this further and argued that, for investors to attain higher returns, they had to accept higher risks.[19] One benefit of this approach is that, whereas the term risk tends to highlight the downside, volatility is a more neutral term that reflects the fact that risk can produce both good and bad results. The problem is that it is a predictive model that can estimate future outcomes based only on what has happened in the past. When events do not turn out as expected, the consequences can be dramatic. The collapse of the highly leveraged Long-Term Capital Management (LTCM) in 1998 and the 2008 Great Financial Crisis both showed that any calculation of risk in this way always includes a large element of qualitative assessment or reliance on past behaviour as an indicator of the future.

There are, then, limits to the calculation of risk based on probabilities. The calculation can be based only on *a priori* knowledge, as is the case with dice, where there is a limited range of possibilities, or it can represent a

[16] See S. O. Hansson, *The Ethics of Risk: Ethical Analysis in an Uncertain World*, Basingstoke: Palgrave Macmillan, 2013.

[17] For this definition, see E. A. Rosa, 'Metatheoretical foundations for post-normal risk', *Journal of Risk Research*, 1 (1998), 15–44, p. 28: risk is 'a situation or event where something of human value (including humans themselves) has been put at stake and where the outcome is uncertain'.

[18] F. H. Knight, *Risk, Uncertainty and Profit*, Boston, MA: Houghton Mifflin, 1921.

[19] For the classic paper, see H. M. Markowitz, 'Portfolio selection', *Journal of Finance*, 7 (1952), 77–91.

statistical probability based upon previous events, such as is done in insurance.[20] In real-life problems, the number of relevant factors is often so large as to mean that no *a priori* knowledge is usable. Also, real life tends to throw up unexpected or even unimagined outcomes. I sat on my Cambridge college's committee that examined the risk register and we never even considered the possibility of a pandemic. That is not a criticism but simply a statement that it is extremely difficult to plan for extreme events, let alone for what former US Secretary of Defense Donald Rumsfeld notoriously called 'unknown unknowns'. These unimagined risks have also been termed 'Black Swans', in reference to the discovery of such animals in Australia by Europeans to whom it had never occurred that such birds might have existed.[21] Whereas Knight's approach argued that uncertainty differed from risk because it was not reducible to numerically definite probabilities, Black Swan events showed that many situations threw up eventualities that had never even been imagined as possibilities. The financial calculations of the Nobel Prize–winning economists of LTCM generated a comforting sense of being in control until something unexpected blew them out of the water. In such a context, where there are so many variables and unknowns, risk calculations should not be seen as objective evaluations but more accurately as estimates, or 'judgements in the context of uncertainty'. They represent more of a subjective probability. Indeed, any risk that is fully measurable does not in reality represent an uncertainty, in that the future outcomes are known, and so there is no risk of any alternative scenario occurring. The boundary between risk and uncertainty has therefore become blurred at best.

Risk has always been a term used mostly of negative outcomes. It is therefore about danger and has become widely used to represent specific dangers themselves (as in, 'we face a number of risks'). Some people prefer to call these dangers 'hazards' as a way of differentiating from the act of risk calculation. So, a hazard can be seen as 'a set of circumstances which may cause harmful consequences', whereas risk is 'the likelihood of it doing so'.[22] This can be taken further, and risk can be calculated as the size of the hazard multiplied by exposure to it, where exposure means the extent to which the victim can be affected by the hazard.[23] The problem with this

[20] R. Boyne, *Risk*, London: Open University Press, 2003.
[21] P. Faulkner, A. Feduzi and J. Runde, 'Unknowns, Black Swans and the risk/uncertainty distinction', *Cambridge Journal of Economics*, 41 (2017), 1279–302.
[22] *Living with Risk: The British Medical Association Guide*, Chichester: Wiley, 1987, p. 13.
[23] A. Doyle and D. Ericson, *Uncertain Business: Risk, Insurance, and the Limits of Knowledge*, Toronto: Toronto University Press, 2004, pp. 4–5, define it as follows: 'risk is the frequency with which an

approach is that 'hazard' is a term that is rarely used as a noun in modern English, and its use attempts to force specific, technical meanings onto the term 'risk' when this has become widely used in a more general sense. Some might like to define risk as a scientific concept, but most calculations of risk involve the assessment of expectations of future behaviour based on knowledge and experience of the past, and knowledge and experience can be obtained by both formal and informal means. Tradition, custom, rules of thumb, estimates, judgements based on practice – all are ways that lay people can make risk assessments based on their own experience. Great bodies of scientific data may give a sense of objectivity compared with such common-sense calculations, but events such as the pandemic have highlighted the fact that such data are far from straightforwardly objective.[24]

One of the problems of trying to define 'risk' is that it serves only to limit what has become a broad term, used in a variety of ways:[25]

1. the chance or possibility of a usually negative event happening
2. danger or the cause of danger
3. the probability of an event happening
4. the size of the negative impact.

This variety of usage does not simply reflect a recent lack of precision, since the term has always been employed in a wide variety of ways since its introduction more than three centuries ago. The reality is that the term 'risk' is now used in all manner of technical and everyday contexts, but that frequency is itself a measure of how important a concept it has become in the modern world.

Despite this breadth, there are some shared implications in the use of the term. The first is that it suggests that the future can be changed – not necessarily controlled completely but influenced and to some degree altered by analysing the factors affecting possible outcomes and making judgements accordingly. As we have seen, some have argued that this represents a fundamental shift from the pre-modern past, in that the future is now manageable by humans rather than supernatural forces, a question to which I return. All risk concepts share this element in common: a belief

unwanted outcome is likely to occur and the severity of losses suffered when it does occur'; '[u]ncertainty is the lack of secure knowledge about an unwanted outcome'.

[24] See P. O'Malley, *Crime and Risk*, Los Angeles: Sage, 2010 and *Risk, Uncertainty and Government*, London: GlassHouse, 2004.

[25] See N. Luhmann, *Risk: A Sociological Theory*, trans. R. Barrett, New York: de Gruyter, 1993, pp. 1–31, 'The concept of risk'.

in the distinction between reality and possibility that means there is no room for fatalism.[26]

The second implication is that, since risk refers to the future, it in some sense exists only in the imagination. As we have noted, even Pascal's probabilities represent solely a model of what will actually happen when dice are rolled. If risk is a model for the future, then any more complicated calculation than dice-rolling is going to involve various assessments about what is acceptable or desirable as an outcome. This, by definition, involves a variety of value judgements. Risk, it therefore becomes clear, is a matter of perception and how it is perceived will contain a moral dimension.

Culture and Risk

While uncertainty can be seen as an 'objective feature of the universe', at least as far as human experience goes, risk is in the eye of the beholder.[27] Every society has a unique set of fears about the future that it prioritises over others. Different risk attitudes can be adopted by different societies to the same underlying uncertainty. The actions a society takes to alleviate these and the degree to which it treats them as acceptable depend on various cultural factors. In this context, it is evidently problematic to treat risk as an objective, technical concept. Instead, what constitutes a risk reflects a range of ideological, structural and social-psychological elements in a given social situation. Societies can in these ways be seen as revealing themselves by how they deal with dangers.[28] They have what can be described as specific risk cultures.

This approach was influenced by the work of the anthropologist Mary Douglas.[29] Douglas did not deny the reality of the underlying dangers: 'this argument is not about the reality of the dangers, but about how they are politicized'. She argued that there is always a moral dimension to risk-taking and that a failure to follow societal norms resulted in the victims themselves being blamed, especially in the modern world with regard to sexual behaviour and drug-taking. In this way, real dangers are used to give 'automatic, self-validating legitimacy to established law and order'.[30]

[26] O. Renn, 'Concepts of risk: a classification', in S. Krimsky and D. Golding (eds), *Social Theories of Risk*, Westport, CT: Praeger, 1992, pp. 53–79, p. 56.
[27] S. L. Savage, *The Flaw of Averages: Why We Underestimate Risk in the Face of Uncertainty*, Hoboken, NJ: John Wiley, 2009, p. 53.
[28] For the Roman case, see J. Toner, *Roman Disasters*, Cambridge: Polity, 2013.
[29] M. Douglas, 'Risk as a forensic resource: from "chance" to "danger"', *Daedalus*, 119 (1990), 1–16.
[30] M. Douglas, *Risk and Blame: Essays in Cultural Theory*, London: Routledge, 1992, p. 29.