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Introduction

Apocalypse, technoscience, empire

After millennia, not so much of humanism as of (Graeco-Latin and Judaeo-Christian) anthropocentrism, a great schism is in preparation, and we are living through the beginnings of it.


‘Fertile ground for us, the States – very good ground. The great Republic has the roots of the destructive matter in her.’


‘Greenwich Degree Zero’, a 2006 multimedia installation by Rod Dickinson and Tom McCarthy, was a reimagining of an incident that took place at London’s Greenwich Park in 1894. On 15 February, a French anarchist named Martial Bourdin was killed when a bomb he was carrying detonated on the slope beneath the Royal Observatory in the park. The motivation behind Bourdin’s act was never made clear – or even if the Observatory was his actual target – but it was assumed that his intention was to blow up the building. The project by Dickinson and McCarthy restaged the incident as a successful attack through an exhibition of fabricated late-Victorian media texts: fictionalised newspaper clippings, a short film created with a hand-cranked camera capturing the destruction of the Observatory, photographs of its ruins, police telegrams, anarchist pamphlets. In this version of alternative history, the press reacts with outrage to the event, the police raid an anarchist association in central London, and anarchists support the attack as a symbolic act against the British Empire. Blurring the boundaries between fact and fiction,
the installation aimed to interrogate ‘the mass construction of reality through the media’ and hold up ‘a mirror to our own time’ (O’Nions 2010). The imagery of smoke above the Observatory in the shaky film endlessly repeating itself in loops was bound to bring associations of the live coverage of 9/11 in this recreation of the first instance of international terrorism in the dominant empire of the late nineteenth century.

The late Victorian period was the cultural moment to witness ‘the invention of modern terrorism’ (Townshed 1995: 2). Terrorist attacks during the 1990s such as the ‘terrorist bombings of the World Trade Centre (1993) and a federal building in Oklahoma City (1995)’ as well as the second attack on the Twin Towers on 9/11 ‘could have headlined newspapers a century ago, when Fenians and anarchists resolved to shake the social order’ (Farrell 1998: 4). The topic became a major theme in a number of late-Victorian popular fictions that involved anarchists threatening to overthrow civilisation. The year just before the Greenwich incident witnessed the publication of three representative examples: George Griffith’s *The Angel of the Revolution: A Tale of Coming Terror* (1893) was an enormously successful novel about a global network of anarchists, socialists and nihilists called ‘the Brotherhood of Freedom’ that defeat the dominant imperial powers with the use of airships in order to abolish private property, secure socialism and eradicate war in a ‘climax of the story of mankind: a virtual day of judgment’ (Beresford 1985: 32). In Douglas Fawcett’s *Hartmann, the Anarchist; or, The Doom of the Great City* (1893), a secret cell of anarchists use an armed flying machine invented by their demented leader Hartmann who is intent on wreaking destruction upon London and other major European cities. T. Mullett Ellis’s *Zalma* (1893), on the other hand, follows the story of the title’s main character, the daughter of the leader of an international anarchist movement, who takes over his place after his death and plots a revolution by launching above the capitals of Europe a fleet of balloons infested with anthrax – a text that has received attention in discussions of the anthrax scare after 9/11 as one of the first accounts on the use of this entity as a biological weapon (Stark 2010). The idea of aerial warfare was relatively new at the time and it was a recurring theme in a wider group of narratives of which these fictions were a part, and which have been variously described as ‘future war’, ‘imaginary war’ or ‘invasion scare’ novels: a series of texts that proliferated in late-Victorian Britain after the publication and tremendous popularity of Colonel George Chesney’s *Battle of Dorking* (1871), a novel describing a successful invasion of Britain by Germany while the British Navy is away protecting the interests of the Empire. One of
the most representative examples of this genre, H.G. Wells's *War in the Air* (1908), is a novel whose description of an aerial bombing of New York by the Kaiser's Germany was referenced in discussions of 9/11 by critics, journalists and readers of Wells's fiction. But *War in the Air* was hardly the only fiction that was mentioned in relation to the terrorist attacks on the World Trade Centre. People who watched the attacks live on television rather thought of those Hollywood disaster movies that were compulsively restaging the destruction of the dominant power of the late-twentieth century, from John Carpenter's *Escape from New York* (1981) to Roland Emmerich's *Independence Day* (1996) that, for Slavoj Žižek, had provided a libidinal investment of the terrorist threat; the 'unthinkable' of 9/11 was 'the object of fantasy' (2002: 17). The 'invasion narrative', Sean Redmond has also suggested, 'emerges in times of crisis' and, in the political climate of the 1990s, films such as *Species* (Donaldson 1995), *Independence Day*, *Mars Attacks!* (Burton 1996) and *Starship Troopers* (Verhoeven 1997) 'can be seen to speak to the fear of terrorism and to “wish for” terrorist acts' (2009: 137–8). Invasion scare fictions of the 1890s and disaster movies of the 1990s thus emerge as two sets of narratives whose evocation of the ‘sense of an ending’ sublimated underlying anxieties about contemporary political realities. Projects like ‘Greenwich Degree Zero’ seem to suggest that there may be some continuities across these two different historical and political realities.

In its attempt to engage with the ways in which history is tied ‘inextricably to the processes, institutions and technologies through which it is both represented and interpreted’ (Dickinson 2006), the installation by Dickinson and McCarthy may be seen within a wider tendency to revisit, interrogate and rewrite ‘History’ that has been increasingly widespread during the last few decades. In literature, Linda Hutcheon discussed the work of John Fowles, E.L. Doctorow, Robert Coover, Ismahel Reed, Gabriel Garcia Márquez, Umberto Eco, among others, as part of a trend of ‘historiographic metafiction’: a historical novel self-conscious of the mediated nature of history whose understanding of history as ‘a human construct’ (Hutcheon 1988: 16) encouraged the use of intertextuality, parody and the blurring of fact and fiction. The ‘neo-Victorian turn’ of the last two decades associated with the writings of Michel Faber, D.M. Thomas, Sarah Waters and Michael Redhill, among others, has been seen as part of this trend, at least by scholars such as Dana Shiller who defined neo-Victorianism in terms of its ability to ‘repudiate the traditional boundaries between historical fact and fiction’ (1997: 540) and its motivation ‘by an essentially revisionist impulse to reconstruct...
the past by questioning the certitude of our historical knowledge’ (541). Steampunk, once a subgenre within Science Fiction (SF) writing but now a distinct aesthetic across various media, fashions and subcultures, is further indicative of a wider tendency to reconfigure what is called ‘Victorianism’ within the contemporary technocultural framework. Although earlier texts have been included in genealogies of these last two trends, the beginnings of both neo-Victorianism and steampunk are often identified in the early 1990s and associated with the publication of texts such as A.S. Byatt’s Possession (1990) and William Gibson’s and Bruce Sterling’s The Difference Engine (1990), respectively. The late Victorian period in particular received increasing attention during the decade as the Millennium was approaching, even as academic discussions in the Humanities witnessed a critical tendency to compare centuries’ ends, especially the 1890s with the 1990s (Briggs and Snowman 1996; Danchev 1995; Kleist and Butterfield 1996; Newman 1996; Scarry 1995). It seems that, in 2014, the legacy of these two decades is still actively informing contemporary fictions, art projects, fashions and subcultures.

The present book revisits the critical tendency to compare the two centuries’ ends and interrogates its resonance within the contemporary cultural moment, but with a different twist. Unlike some of the earlier attempts, which I discuss in the following section, my discussion refrains from simply identifying similarities or differences between the two decades. It is hardly productive (if possible) to claim either that Wells ‘predicted’ 9/11 or that Al-Qaeda read The War in the Air while preparing for their attacks. My focus is less on similarities and more on continuities between the social, cultural and political anxieties that were sublimated in the apocalyptic culture of the two periods under consideration. If, as Frank Kermode has argued in his seminal Sense of an Ending (1967), apocalyptic fears tend to emerge in periods of transition, narratives of the 1890s and the 1990s appropriated the sense of an ending generated by the century’s end in order to articulate anxieties concerning major transformations in contemporary political, social and cultural discourses and formations. The intertext of the above-mentioned examples already points towards two major areas that the apocalyptic imagination of the last two centuries’ ends was obsessed with: technoscience and empire. Below I provide a more detailed discussion of some of those transformations in these areas that were perceived in terms of ‘shock’ and ‘trauma’, two concepts that have a central place in the theoretical framework that informs this book.
One distinctive feature of these turn-of-the-century fictions is that the apocalypse envisioned was less divine and more secular – a feature that marks more of a radical departure from earlier similar fantasies in the case of late-Victorian fictions. The End would not be brought about anymore by God but by humanity itself, armed with either cutting-edge or imaginary futuristic technologies. In this sense, even if apocalyptic speculation dates from ancient times, the fictions of the last two centuries’ ends are quintessentially modern, an aspect that I discuss in the following section of this Introduction. The flying machines and airships in the tales by Griffith, Fawcett, Ellis and Wells were only one example of a series of inventions, real or imaginary, that were employed in the battle for Armageddon. It is quite indicative that Paul Virilio began his response to 9/11 by turning to War in the Air not for its descriptions of the destruction of New York but for the technological discoveries that Wells was imagining for the future in that novel:

When you look at one of those sets of pictures which, in 1900, claimed to show daily life as it would be in the year 2000, you notice, in fact, that everything which constitutes our current technical environment was there, already planned out – television, computers, the high-speed monorail, the moon rocket, weapons of mass destruction, robotics, home automation, rollerblades in city streets . . . (2002: 2)

The apocalyptic imaginary of the period was bound to be informed by technological discourses and formations during a period that is often described as the ‘Second Industrial Revolution’: a period ranging roughly from 1870 to 1914 that witnessed an increasing acceleration of technological progress that led to the invention of the first modern media technologies: the typewriter (1867), the telephone (1876), the phonograph (1877), cinema (1895), wireless telegraphy (1895), and radio (1906), among others. All these new technologies transformed everyday life in drastic ways even as tremendous advances in areas of scientific inquiry such as uniformitarianism in geology, thermodynamics in physics, and evolutionism in biology during the ‘scientific nineteenth century’ radically challenged established assumptions about nature, humanity and the universe itself. These ‘triumphs of scientific progress’, according to Kirby Farrell, ‘could entail psychic injury because they undercut traditional immortality systems and read the eventual extinction of humankind in the fossil record’ (1998: 43). The first chapter of this book concentrates on two distinct yet related
scientific theories, those of entropy and degeneration, in order to explore the ways in which these two doctrines infiltrated the apocalyptic fantasies of the fin de siècle that articulated anxieties about the ‘heat death of the universe’ and the regression of humanity to lower levels of biological complexity. Scientific discourses like these and new technological inventions like the above, my discussion will argue, brought about a cultural shock that was translated in apocalyptic terms in popular fictions of the end – a shock that will be referred to throughout this book as a ‘technocultural shock’. A prominent example in this context that I discuss in that chapter is the work of Henry Adams, who created an apocalyptic model of history by relying on concepts from thermodynamics when he formulated a ‘law of acceleration’ in his understanding of technological progress that would lead to ‘a new universe which had no common scale of measurement with the old’ (1900: 381). Adams almost uncannily anticipated the idea of a ‘technological singularity’ that served as a major site for apocalyptic speculation in 1990s SF after the delivery of Vernor Vinge’s lecture on the topic in 1993, according to which the ‘acceleration of technological progress’ had brought humanity ‘on the edge of change comparable to the rise of human life on Earth’: developments in robotics, biogenetics and nanotechnology would lead towards the emergence of Artificial Intelligence and the subjection of humanity to enslavement, extinction or transcendence to a posthuman state of existence. Juxtapositions of works such as those of Adams and Vinge from the two periods under consideration seem to be encouraged by discussions that have recognised the technological explosion of the late nineteenth century as a moment that set the conditions of emergence for the Information Revolution of the late twentieth. The continuities between the two periods, according to Friedrict Kittler, may be identified retrospectively in the literary production of the time:

in the founding age of technological media the terror of their novelty was so overwhelming that literature registered it more acutely than in today’s alleged media pluralism . . .. What writers astonished by gramophones, films, and typewriters – the first technological media – committed to paper between 1880 and 1920 amounts, therefore, to a ghostly image of our present as future. Those early and seemingly harmless machines capable of storing and therefore separating sounds, sights, and writing ushered in a technologising of information that, in retrospect, paved the way for today’s self-recursive stream of numbers. (1999: xl)
Due to this scientific and technological revolution, ‘Great Britain was already moving away from manufacturing and toward a service and finance economy, not unlike Rust Belt America weathering the information and cybernetic revolution a century later’ (Farrell 1998: 30). Farrell’s argument is only one in a series of discussions that have identified connections between the Information Revolution of the late twentieth century and the Second Industrial Revolution of the late nineteenth. Fredric Jameson, for instance, has aligned the two periods in terms of the nihilistic and apocalyptic mood in response to these technological revolutions:

> there is some historical irony in the way in which . . . the Third Technological Revolution in the West (electronics, nuclear energy) – in other words, a whole new step in the conquest of nature by human praxis – is philosophically greeted and conceptually expressed in a kind of thought officially designated as ‘antihumanist’ and concerned to think what transcends or escapes human consciousness and intention. Similarly, the Second Technological Revolution of the late nineteenth century – an unparalleled quantum leap in human power over nature – was the moment of expression of a whole range of nihilisms associated with ‘modernity’ or with high modernism in culture. (1984: 191)

The Information Revolution was therefore perceived in similar nihilist terms to those of the Second Industrial Revolution, an apocalyptic sensibility that permeates just as much the work of postmodern philosophers like Jean Baudrillard as well as popular fictions of the end, whose cyborgs, flying saucers, virtual realities and biological weapons served as agents of apocalypse configured according to contemporary advances in digital technology. I mention Baudrillard at this point because his theory of simulation and hyperreality highlights further the relevance of the exhibition by Dickinson and McCarthy to this discussion. According to the French philosopher, the proliferation of information and media technologies in every aspect of everyday life and the transformation of everything into ‘zeroes’ and ‘ones’ by digital technology has thrust humanity into a universe of simulation where mediated representations are experienced as more real than reality itself – in his terms, ‘hyperreal’ (Baudrillard 1981). Western industrialist societies have been saturated by ‘simulacra’, copies of copies endlessly repeating themselves, dismantling any distinctions between reality and representation. ‘Greenwich Degree Zero’ may be read against this theoretical background as ‘a work about mediation and repetition’ that was
‘interrogating the notion of “event” by retrieving an occurrence which did not quite take place from its event-degree zero while still holding it in the negative space of non-event’ (Dickinson 2006). It is in this sense that, in this installation, the Greenwich explosion emerges as ‘a kind of primal scene of what was once more confidently designated by the term postmodernity’ (Kenning 2006: 32).

The original incident at Greenwich was seen at that time as a symbolic attack against the British Empire, since the Royal Observatory was the place from which all time throughout the Empire was measured. In Joseph Conrad’s *The Secret Agent* (1907), a novel inspired by the incident, the attack to the first meridian is ‘not an attack on pure mathematics, but a displaced attack on the empire’ (Whitworth 1998: 55). Whereas *The Secret Agent* does not envision an apocalypse in literal terms, the anarchist plot is essentially an attack against time, an attempt to bring an ‘end-time’, ‘when time shall be no more’, ‘an effort to end history – thereby theoretically achieving the revolutionary goal of a world beyond history and without time’ (Fleishman 1965: 213). In this respect, the novel is indicative of the second trend within apocalyptic fictions of the two periods under discussion, whereby the preoccupation with technoscience was coupled with anxieties about contemporary imperial discourses and practices – or, more specifically, with the deployment of technoscientific inventions for imperialist interests. This intersection of technoscience and empire is a dominant feature in apocalyptic fictions of these two periods that is indicative of a number of convergences of contemporary discourses of knowledge and power. The Second Industrial Revolution coincided with, indeed contributed to, the period of the ‘New Imperialism’, a period ranging roughly from 1875 to 1914 that represents ‘a more frenetic vision of expansionism and militancy’ between dominant imperial powers like Great Britain and France and emerging rivals such as Germany and the United States that ‘intensified through the fin de siècle’ (Beckson 1992: 363–4). It is a period that is very self-conscious of the currency of imperialist practices – the very word ‘imperialism’ was coined in political and journalistic discourses of the 1890s and it was ‘on everybody’s lips’, according to the contemporary liberal politician J.A. Hobson, ‘used to denote the most powerful movement in the current politics of the western world’ (1902: xvii). Part of its ‘newness’, however, consisted largely in the increasing use of technoscientific formations for the perpetuation and expansion of imperial control. This new stage in the history of imperialism was not only the result of ‘mere superiority’, but also of ‘the unleashing of overwhelming force at minimal costs’ (Headrick 1981: 10), a potential enabled
by the technological advances of the Second Industrial Revolution. ‘Technological changes’, Daniel Headrick underlines, ‘affected the timing and location of the European conquests. They determined the economic relations of colonialism. And they paved the way for the astonishing reversal of the world balance that we are currently witnessing’ (10). These technological changes ‘made imperialism happen, both as they enabled motives to produce events, and as they enhanced the motives themselves’ (11). Accordingly, references to new technologies and scientific theories were intertwined with an imperialist subtext in fin-de-siècle fictions whose prospective ‘end of the world’ was often synonymous with the end of the Empire. The industrial warfare staged in the future war fictions mentioned above needs to be seen in this historical, political and cultural context.

At the same time, The War in the Air now seems strikingly prescient in Wells’s suggestions that the conflict staged in the narrative was a result of the obsolescence of ‘the old separations into nations and kingdoms’ (1908: 73) and that it could be overcome through a ‘newer wider synthesis’ into an ‘orderly, scientific, and secured’ World State (246) – an idea that Wells reiterated on several occasions in other fictional and non-fictional texts. In this respect, the text may be read against arguments circulating during the 1990s regarding an alleged ‘end of the nation state’. For Kenichi Ohmae, the end of the Cold War had ‘fractured beyond repair’ the ‘long-familiar patterns and oppositions among industrialised nations’ (1995: 223) and the nation-state became a ‘nostalgic fiction’ (224) of classic nineteenth-century imperialism after the emergence of global flows of capital and information as dominant agents of imperial power. Once again, there are historical reasons for those aspects of late-Victorian fictions that may be read against the political realities of globalisation. Scholars have identified the period between 1850 and 1945 as the stage of ‘modern globalisation’, whose defining feature was ‘the political and military reach of European and American empires which achieved their furthest extent, creating a truly global network of interconnections, albeit fragmented by imperial rivalries’ (Held et al. 2003: 422). During this period, imperial powers acquired industrialised capitalist economies, advanced weaponry and naval technologies, new infrastructures of communication and transportation such as railway networks and transoceanic telegraphy, whose diffusion ‘dramatically raised the velocity of communication’ (423) and brought about ‘the threat and consolidation of European empire across the globe’ (421). Railway networks in particular were fundamental to imperialist expansion insofar as they both ‘consolidated . . . national
industrial economies’ and opened territories in ‘colonised and economically dominated regions’ to ‘penetration by capitalist economies, allowing for their incorporation into imperialist economic systems’ (Hardt and Negri 2000: 298). Cable telegraphy, on the other hand, was referred to as ‘the nerves of empire’ (Peel 1905) in its ability to secure Britain’s imperial and economic hegemony by controlling the global flow of information on politics and foreign markets and administering its military power more efficiently than ever before. The two technologies also converged, as railway companies used the telegraph to co-ordinate the flow and traffic of trains and, together with other means such as the steamship or, later, the telephone, they ‘made it possible for people to imagine knowing things not sequentially but simultaneously’ (Richards 1993: 5–6). ‘It was only in the nineteenth century’, according to John B. Thompson, ‘that communication networks were systematically organised on a global scale. It was in the nineteenth century, therefore, that the globalisation of communication took hold’ (1995: 152). These technologies have been seen as predecessors of the global information networks of the late twentieth century, either by Michael Hardt and Antonio Negri who have suggested that the ‘global information infrastructure’ of the 1990s finds its origins in ‘the construction of railways to further the interests of nineteenth- and twentieth-century imperialist economies’ (2000: 298) or by Tom Standage who has described the telegraph as the ‘Victorian Internet’ that is more responsible for the contraction of time and space associated with globalisation than the Internet itself: ‘If any generation has the right to claim that it bore the full bewildering, world-shrinking brunt of such a revolution, it is not us – it is our nineteenth-century forebears’ (1998: 199–200).

If these transformations in the relations between technoscience and empire were represented in apocalyptic terms in turn-of-the-century popular fictions, a similar sensibility was reproduced during the period that established the term ‘globalisation’, the 1990s. Earlier utopian musings about a ‘global village’ during the 1960s were replaced by an increasingly apocalyptic rhetoric in proclamations of the ‘end of the nation-state’ (Ohmae 1995), the ‘end of history’ (Fukuyama 1992) or the end of imperialism and the beginning of what Michael Hardt and Antonio Negri (2000) called ‘Empire’. By Empire, the two theorists referred to ‘a new form of sovereignty’ which was ‘composed of a series of national and supranational organisms’ that emerged at the ‘twilight of imperial sovereignty’ (xii). ‘Imperialism’, for Hardt and Negri, was ‘over. No nation will be world leader in the way modern European nations were’ (xiv). This millennialist tone, for Lee Quinby, was ‘what
makes it compelling'; *Empire* reflected ‘so many of the ideological conflicts of Millennial Madness’ (2004: 232). But the text’s apocalypticism was not just a matter of tone: the new system of global sovereignty was operating through a pervasive sense of global crisis that was ‘proper to imperial control’ and ran ‘through every moment of the development and recomposition of the totality’ (Hardt and Negri 2000: 385). In this respect, *Empire* participated in an increasing attention to the importance of crisis, disaster and trauma for the operation of global power, whether in the case of Ulrich Beck’s ‘risk society’ (1992), Naomi Klein’s ‘disaster capitalism’ (2007), or Simon Cottle’s theorisations of global crises as ‘the dark side of globalisation (2009: 3). Furthermore, the perpetuation of crisis was largely dependent on the information networks of what Manuel Castells had already described as a ‘network society’, a society ‘structured in its dominant functions and processes around networks’ (1999: 408) of technologies, corporations, states and non-governmental organisations. It is against this background that my discussion will approach the wider significance of networking and interconnectedness not only in real-life issues that were invested with apocalyptic speculation, such as the Y2K phenomenon, but also in these narratives that envision the prospect of an impending apocalypse due to the networking of computers, missiles or spaceships – popular films such as *The Terminator* (Cameron 1984), *Independence Day* or *The Matrix* (Wachowskis 2000), among others. The second chapter of this book discusses these fictions in relation to the contemporary popularity of chaos theory, which is discussed as a discipline embedded in discourses of globalisation, even as its origins are traced in scientific theories of the late nineteenth century. Indeed, the indebtedness of apocalyptic fictions of the turn of the twenty-first century to this discipline is evident in their strictly determinist narrative structure: often the impending or actual disaster is attributed to a major incident or accident that organises the entire plot – from the above films, the achievement of sentience by the evil computer network Skynet in the *Terminator* franchise is a representative example. The proliferation of ‘singularity fictions’ during the last two decades may be seen within this determinist paradigm that has been emerging in fictions such as Greg Bear’s *Blood Music* (1985), Octavia Butler’s *Lilith’s Brood* (1987–9), Greg Egan’s *Schild’s Ladder* (2002) or Charles Stross’s *Accelerando* (2005), among others.

In the first work by a major novelist to make references to 9/11, William Gibson’s *Pattern Recognition* (2003), the chapter dedicated to the terrorist attacks is titled ‘Singularity’. According to Neal Easterbrooke,
this is a novel where ‘[c]ultural singularity overlaps with psychological singularity, since 9/11 is both an individual and a wider cultural trauma, which can often have a primarily psychological vector (2012: 21–2). All the above references to a singular major incident or accident, to global disaster and trauma lead to one final reference to 9/11 that may be identified in ‘Greenwich Ground Zero’: the ‘zero’ of the title establishes associations among the first meridian, the Greenwich bombing and the ‘Ground Zero’ of 9/11. The choice of name for the site where the World Trade Centre used to be was, however, an allusion to ‘that earlier event to whose priority and precedence as the archetype of catastrophe it cannot help but refer’ (Stamelman 2003: 13), the fall of the atomic bomb over Nagasaki and Hiroshima during World War II, a cultural moment that will be seen as a turning point around which the apocalyptic cultures of the last two centuries’ end revolve. The atrocities of the war, scientific progress in disciplines such as information theory and cybernetics as part of the war effort, and the accelerating militarisation of science and technology of the time render the middle of the twentieth century a cultural moment that now serves as a major point of reference for the apocalyptic speculation of the 1890s and the 1990s. In his discussion of the ways in which the site of 9/11 was transformed into a memorial site, Richard Stamelman associated the ‘zeroness’ with ‘the hole of absence figuring a lost presence’ with ‘the hole of the real’, ‘the term that the French psychoanalyst Jacques Lacan once used to express the sudden apparition of death’ (15). Lacan’s concept of the Real is not synonymous to reality; in Lacanian psychoanalysis, ‘everything we are allowed to approach by way of reality remains rooted in fantasy’ (Lacan 1988: 95). Fantasy emerges after the human subject’s introduction to the Symbolic register, the universe of mediation and signification in which the subject is immersed after the entry into language. The Lacanian perception of everyday reality is that of ‘a fragile, symbolic cobweb that’, however, ‘can at any moment be torn aside by an intrusion of the real’ (Žižek 1991: 17). The register of the Real refers to the excessive, the overwhelming, the unrepresentable that irrupts in the Symbolic order ‘in the form of a traumatic return, derailing the balance of our daily lives’ (29). The Real, Lacan had underlined, emerged in psychoanalytic theory ‘in the form of that which is unassimilable in it – in the form of the trauma, determining all that follows, and imposing on it an apparently accidental origin’ (1973: 55). As Žižek has elaborated, the psychoanalytic perception of reality is that of ‘a fragile equilibrium that can be destroyed at any moment if, in a quite contingent and unpredictable way, trauma erupts’ (1991: 17). Žižek has discussed precisely
in these terms the confusion between reality and fiction in audiences’ immediate responses to 9/11:

The Real which returns has the status of a(nother) semblance: precisely because it is real, that is, on account of its traumatic/excessive character, we are unable to integrate it into (what we experience as) our reality, and are therefore compelled to experience it as a nightmarish apparition. This is what the compelling image of the collapse of the WTC was: an image, a semblance, an ‘effect’, which, at the same time, delivered ‘the thing itself’. (2002: 19; original emphasis)

The associations of the attacks with disaster movies have also been discussed in relation to another major psychoanalytic concept that will be used throughout my discussion, Sigmund Freud’s (1919) idea of the uncanny, the combined experience of familiarity and estrangement that he associated with the return of repressed material from the unconscious. According to Nicholas Royle, for instance, in the live transmission of the attacks, ‘a sense of the uncanny seemed all-pervading: Is this real? Is this really happening? Surely it’s a film? Is this our apocalypse now?’ (2003: vii–viii). The uncanniness of the apocalypse is an aspect that has been undertheorised in discussions that mostly associate the concept with the sublime. And yet, there is a number of relations between the uncanny and the apocalypse. The apocalypse is uncanny in its tendency to emerge in periods of transition, insofar as the uncanny is ‘often to be associated with an experience of the threshold, liminality, margins, borders, frontiers’ (vii). In its sense as ‘destruction’, the apocalypse is also uncanny in referring to a situation whereby a given reality ends, when ‘reality’ is not ‘real’ anymore – Freud discusses the uncanny as ‘an affair of “reality-testing”, a question of the material reality of the phenomena’ (1919: 248). In its sense as ‘revelation’, it corresponds to the relation of the uncanny to the ‘return of the repressed’: in signifying ‘that class of the frightening which leads back to what is known of old and long familiar’ (220), it signals what Jacques Derrida has described as the ‘specifically apocalyptic unveiling’ of ‘the disclosure that lets be seen what to then remained enveloped, secluded, held back’ (1984b: 5). For Evan Calder Williams, an accurate understanding of the idea of apocalypse lies in that moment when the two senses of the term converge: an apocalypse is ‘an end with revelation’ (2011: 5). According to Williams,
sudden exposure of what was present but not visible, because it
didn't accord with those real structuring forces of a totality. (5)

Given these structural and conceptual similarities between the uncanny
and the apocalyptic, it is hardly a surprise that many turn-of-the-century
fictions discussed in this book reproduce the experience of uncanniness –
what might be termed ‘the apocalyptic uncanny’.

The connections between the Freudian uncanny, the Lacanian Real
and trauma may be identified in one example of uncanniness that
Freud mentions in his essay, the factor of ‘involuntary repetition which
surrounds what would otherwise be innocent enough with an uncanny
atmosphere’ (Freud 1919: 237). Since his early studies on hysteria
with Josef Breuer, Freud had diagnosed the ‘repetition compulsion’ as
a post-traumatic symptom, ‘a clear indication that a fixation to the
moment of the traumatic accident lies at their root’: ‘It is as though
these patients had not finished with the traumatic situation, as though
they were still faced by it as an immediate task which had not been
dealt with’ (1917: 274, 275). The repetition compulsion, a symptom
whereby victims restage the traumatic incident in nightmares or hal-
lucinations, is an attempt to master an incident too overwhelming to
be processed at the moment of its occurrence. Post-traumatic experience
itself is ‘intrinsic uncanniness’ as it finds ‘cultural expression in ghostly
visitations, prophetic dead, spooky coincidence or telepathic transfer’
(Luckhurst 2008: 98). The repeated transmission of images of two planes
crashing on the Twin Towers has been read by Žižek as an instance of
the repetition compulsion: ‘When, days after September 11 2001, our
gaze was transfixed by the images of the plane hitting one of the WTC
towers, we were all forced to experience’ the ‘compulsion to repeat . . .
we wanted to see it again and again; the same shots were repeated ad
nauseam’ (2002: 11–12). This argument corresponds with the reading
of the live coverage as the irruption of the Real within the network of
Symbolic signification, insofar as the Real ‘always comes back at the
same place’ (Lacan 1973: 49), it always irrupts the Symbolic order ‘in
the form of a traumatic return, derailing the balance of our daily lives’
(Žižek 1991: 29). It is in this sense that ‘9/11 has awakened us from
the dream of Reality into the nightmare dawn of the Real’ (Sass 2003:
162). From this theoretical perspective, the shaky film footage of the
Greenwich Observatory ablaze endlessly repeating in endless loops in
‘Greenwich Degree Zero’ may be seen as another instance of the com-
pulsion to repeat, an acting out of historical trauma that reverberates
retroactively back to the days of the British Empire. The importance of
the themes of ‘mediation’ and ‘repetition’ for the installation certainly encourages such an interpretation, insofar as trauma is essentially about mediation, or rather the lack of it: in his discussion on traumatic neuroses in *Beyond the Pleasure Principle* (1920), Freud invoked a metaphor of the human psyche as an amoeba-like organism coated with a ‘protective shielding’ which is pierced by an overwhelming incident. Trauma is therefore ‘a situation in which the outside goes inside without mediation’ (Matus 2001: 423).

The work by Dickinson and McCarthy may therefore be seen as part of the increasing interest in trauma across different media, disciplines and areas of popular culture that emerged from the 1980s onwards and led critics to argue for the emergence of a ‘post-traumatic culture’ (Farrell 1998), a ‘trauma culture’ (Kaplan 2005) or a ‘trauma paradigm’ (Luckhurst 2008). My discussion will be relying on this theoretical background in order to view apocalyptic fictions as narratives of trauma and trauma as ‘the psychoanalytic form of apocalypse’ (Berger 1999: 20). According to James Berger, apocalypse and trauma are ‘congruent ideas’ insofar as ‘both refer to shatterings of existing structures of identity and language, and both effect their own erasures from memory and must be reconstructed by means of their traces, remains, survivors, and ghosts: their symptoms’ (19). Kirby Farrell has already discussed apocalyptic fictions of the last two centuries’ ends as ‘fantasies about trauma’ (1998: x) in an approach where the psychopathology emerges as ‘both a clinical syndrome and a trope . . . a strategic fiction that a complex, stressful society is using to account for a world that seems threateningly out of control’ (2). My own discussion, however, concentrates specifically on the relation of discourses and narratives of trauma to contemporary formations of technoscience and empire. The earliest theorisations on traumatic neurosis were made during the 1860s at the request of insurance companies that were receiving claims from victims of railway accidents who appeared physically unharmed and yet demonstrated symptoms that are now recognised as posttraumatic. The psychopathology therefore was introduced into medical and legal discourses in response to the operation and malfunction of the railway, that was seen as a symbol not only of ‘the visible presence of modern technology as such’ (Trachtenberg 1977: xiii) but also of imperial expansion and control. The sense of a ‘technocultural shock’ that I introduced earlier on is particularly relevant in this context. Early theorisations on trauma reproduced a dialectic between external, physical ‘shock’ and an internal, psychological ‘trauma’. The earliest medical discussions were pathological in orientation as they attributed post-traumatic symptoms
to the stimulation of the spinal cord caused by the accident, what was termed by John Eriehsen (1866) ‘railway spine’ (also, see Camps 1866; Buzzard 1867). A different yet related line of inquiry considered the shocks of mechanised travel to be responsible for symptoms of ‘fatigue’ in travellers who were overwhelmed by the ‘rapid, short vibrations and oscillations’ of the train (Lancet 1862: 40–1). This orientation only gave way to a more psychological approach in the 1880s in the work of Herbert W. Page (1883), whereas the term ‘railway spine’ was replaced by ‘traumatic neurosis’ after the studies of Hermann Oppenheim (1889). An exclusive psychological approach was established by Freud, in whose work ‘the final reminiscences of the material-mechanical explanation of the causation of trauma gradually wear away’ (Shivelbusch 1977: 147).

The term ‘shock’, however, persevered in later theorisations on the effects of technological modernity, as in the writings of Walter Benjamin, who described the experience of the modern metropolis as a ‘series of shocks and collisions’ that the human subject was subjected to while confronted with diverse images and signs in the city: ‘technology has subjected the human sensorium to a complex kind of training’ (1973: 171). In the postwar period, Alvin Toffler’s best-selling Future Shock (1970) diagnosed a general sense of ‘shattering stress and disorientation’ in populations of Western industrialised societies that he attributed to an ‘information overload’ (350–5) induced by contemporary information and communication technologies. By the 1980s, Fredric Jameson would theorise the ‘postmodern turn’ in terms of ‘the shock of some new, hard, unconceptualised, resistant object which the older conceptuality cannot process and which thus gradually generates a whole new problematic’ that was conceptualised in ‘the coding of linguistics and information theory’ and was ‘attributed to the unexpected explosion of information and messages of all kinds in the media revolution’. (1984: 191). The tendency to use a terminology of shock and trauma in order to give the sense an over-accumulation of technologies and information – a technocultural shock – was encouraged by the use of technological metaphors by Freud himself in his theorisations on the psychopathology. The element of excess is one of the defining features of trauma; it is an experience that is too overwhelming to be processed by the human subject at the moment of its occurrence. For Freud, it is ‘an experience which within a short period of time presents the mind with an increase of stimulus too powerful to be dealt with or worked off in the normal way’ (1917: 275), a description that evokes a sense of an ‘information overload’ that the ‘psychic apparatus’ cannot process. Writing in the midst of the Second Industrial Revolution, Freud's
theorisations of the human psyche are saturated with technological terms: ‘resistance’, ‘excitation’, ‘discharge’, ‘cathexis’, induction’ and so on. His materialism, according to Kittler, ‘reasoned only as far as the information machines of his era’ (1997: 134). His choice to theorise, not a ‘psyche’ or even a ‘soul’, but a ‘psychic apparatus’ suggests an understanding of the human brain as a machine that ‘implemented all available transmission and storage media, in other words, an apparatus just short of the technical medium of universal-calculation, or the computer’ (134). It is perhaps not surprising then that theorists have turned to this psychiatric discourse in order to convey the sense of an over-accumulation of information during postmodernity.

A similar tendency to resort to technoscientific terms and metaphors may be identified in those discourses, practices and formations that emerged in response to the perceived sense of crisis, shock and trauma in the two periods under consideration, the utopian projects set up in response to an impending apocalypse. In late-Victorian Britain, fears either of a potential ‘degeneration’ of the nation, of biological warfare waged by terrorists, or of a major conflict with imperialist rivals were countered by the increasing popularity of the movement of eugenics from the 1880s onwards. Existing criticism concentrates mostly on the extent to which the founder of the movement Francis Galton reformulated elements from the theories of his cousin Charles Darwin for a project that would concentrate on ‘the study of agencies under social control that may improve or repair the racial qualities of future generations, either physically or mentally’ (cited in Kevles 1995: 37). My discussion of eugenics in the last chapter of this book focuses more on the ways in which Galton and his followers combined strains of Darwinian evolution with contemporary scientific disciplines that would prove fundamental to the emergence of information theory and cybernetics in the middle of the twentieth century, such as statistics. The tremendous popularity of the movement and its infiltration in early-twentieth-century utopian writing is discussed within a wider trend at ‘regeneration’ of the nation and the Empire prevalent at the time. And whereas the atrocities of the Holocaust and the atomic bomb during the Second World War brought a deathly blow to most eugenic movements that had outlasted the first war, the final chapter traces the ways in which the spectre of eugenics haunted biogenetic discourses of the 1990s, such as the Human Genome Project (HGP), whose conceptualisation of the human body demonstrated an indebtedness to information theory and cybernetics. The theoretical orientation during that part of my discussion combines trauma theory with the work of Michel
Foucault on what he terms ‘biopower’. Foucault theorised this concept during his discussion of the ways in which modern power mutated into more sophisticated formations from the eighteenth century onwards. In contrast to the classical age, when sovereign power was exercised through juridical models relying on the right of the rulers to decide over the life and death of individuals and populations, the modern period witnessed the emergence of an internalised form of power exercised not in the name of death but in the name of life itself: ‘a power that exerts a positive influence on life, that endeavours to administer, optimise, and multiply it, subjecting it to precise controls and comprehensive regulations’ (1978: 137). The last two centuries’ ends, my discussion seeks to illustrate, were crucial moments in the trajectory of modern biopower, and projects such as those of eugenics and the HGP are only its most obvious manifestations. My arguments in this context paraphrase J.G. Ballard when suggesting that the comparative investigation of the apocalyptic culture of the last two centuries’ ends demonstrates the ways in which modern power witnessed a transition from ‘outer space’ to ‘inner space’. ‘Inner space’, in this context, does not denote only psychological space, as in Ballard’s use of the expression, but also biological, corporeal space. Most critical discussions of biopower and ‘biopolitics’ concentrate on biological discourses; further attention needs to be placed on the pervasiveness of biopower in psychological discourses as well, especially when it comes to those dedicated in a psychopathology that was originally associated with biological symptoms (‘trauma’ means ‘wound’ in Greek) only to be associated with a psychological aetiology during the late nineteenth century. Such a critical attention, which I seek to give in this discussion, would need to concentrate further on the extent to which ‘[t]rauma discourse itself participates to a therapeutic understanding of experience that forms part of medical and managerial modes of surveillance and control’ (Meek 2010: 3).

For Farrell, comparing the last two centuries’ ends helps providing a ‘stereoscopic view of modernism’ (1998: 4). In my own account, this project enables such a stereoscopic view to the entanglements of technoscientific and imperial discourses, formations and practices. It helps illustrate the ways in which modern discourses of knowledge and power got intertwined with each other in more complex formations from one period to the other. The last two centuries’ ends emerge as two cultural moments to witness crucial transformations in the project of modernity and the comparative approach to these two periods reveals the ways in which modern power mutated into towards more sophisticated, internalised forms from the one period to the other. The following section
discusses these two periods more specifically with regard to their place within the project of modernity and highlights the ‘modern’ quality of the apocalyptic fictions of each period. At the same time, it examines existing comparative approaches to different centuries’ ends and contextualises my own study in relation to this theoretical context.

**Apocalypse: modernity, fin de siècle, postmodernism**

Taking shape at century’s end is an aesthetics of chaos.

Hillel Schwartz, *Century’s End* (1990: 206)

[N]ot only is our century superior to any that have gone before, but . . . it may be compared with the whole preceding historical period. It must therefore be held to constitute the beginning of a new era of human progress.


The term ‘fin de siècle’ usually refers to the last decade of the nineteenth century, a period of aestheticism, decadence, ennui and apocalyptic gloom. First appearing in France as a title of an 1888 play by H. Micard and Francis de Juvenot, the term was then used in the title of an 1889 novel by Humber de Gallier, and it was introduced in Britain by Oscar Wilde in *The Picture of Dorian Gray* (1891). The journalist Max Nordau popularised the term even further in his *Degeneration* (1895), where he envisioned an impending ‘Dusk of the Nations, in which all suns and all starts are gradually waning, and mankind with all its institutions and creations is perishing in the midst of a dying world’ (2). For Nordau:

One epoch of history is unmistakably in its decline, and another is announcing its approach. There is a sound of rending in every tradition, and it is as though the morrow would not link itself with to-day. Things as they are totter and plunge, and they are suffered to reel and fall, because man is weary, and there is no faith that is worth an effort to uphold them. (5–6)

Nordau diagnosed a wider process of decay, decadence and degeneration in works as diverse as the naturalist writings of Emile Zola and Henrik Ibsen, decadent and symbolist poetry, the philosophical writings of Friedrich Nietzsche, ghost stories and the contemporary fascination with mysticism and the occult. *Degeneration* received very
mixed responses. Many did not take it seriously, but it was successful enough to be translated into several languages in 1895, and it was considered significant enough to receive responses such as the anonymous *Regeneration: A Reply* (1895) or George Bernard Shaw’s *The Sanity of Art* (1895). The importance of the text therefore lies more in its status as ‘a curious but informative chapter of cultural history rather than the scientific document [Nordau] intended it to be’ (Bergonzi 1961: 4). If anything, the book familiarised a wider public with the term ‘fin de siècle’ and eventually editorialists, writers and composers started employing it to refer to the general mood of the times.

By now, the term has become ‘an attitude of mind, not a chronological moment’ (Townshed 1995: 202) and it has been associated with a general fear of the apocalypse at a century’s end not only in popular fictions but also in a strand of academic criticism of the 1990s that was invested in identifying a ‘postmodern fin de siècle’. ‘From urban homelessness to imperial decline, from sexual revolution to sexual epidemics, the last decades of the twentieth century’ seemed to Elaine Showalter ‘to be repeating the problems, themes, and metaphors of the fin de siècle’ (1991: 1). The theoretical framework which informs most of these attempts is mainly temporal: what generates fears of an impending apocalypse at the end of a century is the ‘sense of an ending’ determined by what Frank Kermode has termed ‘saecula’, temporal constructs such as that of the ‘decade’, the ‘century’ and the ‘millennium’ whose impact on the human imagination responds to ‘a permanent need to live by the pattern rather than the fact’ (1967: 11). The influence of saecula is stronger as a century reaches its end. ‘Our sense of epoch is gratified above all by the ends of centuries’ (96) and the ‘mood of fin de siècle is confronted by a harsh historical finis saeculi’ (98). Kermode’s argument has been very influential in most of these discussions: According to Hillel Schwartz, for instance, the fin de siècle is ‘a trick that works because we are time-minded enough to prospect for ends, numerate but visionary enough to be impressed by imaginary numbers, punctual enough to attend to a common calendar of years’ (1990: 7). Millenarianism, according to this approach, is ‘the most prominent aspect of the fin de siècle phenomenon’ (West 1993: 2).

This theoretical orientation is epitomised by Schwarz’s quotation that opens this section. Alfred Russell Wallace’s *Wonderful Century*, however, is only one text indicative of an expression of optimism at the close of the century that contradicts Schwartz’s assumption. During the fin de siècle, Karl Beckson has argued, ‘many intellectuals, having abandoned their religious faith but inspired by utopian dreams, envisioned a new
age in the next century, convinced that the past – with its failures and disappointments – was a burden to be abandoned’ (1992: xi). Walter Laqueur has also suggested that any apocalyptic forebodings during the 1890s were limited in the main to the avant-garde. Middle and low-brow culture, was, on the whole, optimistic and believed in progress. One could go further and argue that even the avant-garde did not really believe in disaster, that it thought in terms of a spiritual cataclysm rather than physical destruction. (1997: 246)

Many of the intellectuals associated with *fin-de-siècle* culture did not necessarily think of themselves as nihilists but as innovators. If Nordau believed that some of these artists were suffering from degeneration, intellectuals like George Bernard Shaw argued that their work was rather an indication of *regeneration*: ‘At every new wave of energy in art the same alarm has been raised, and . . . these new alarms always had their public, like prophecies of the end of the world’ (1895: 319).

Furthermore, approaches like Schwartz’s seem to ignore Kermode’s insistence that ‘[a]ny date can be justified on some calculation or other’ (1967: 98). Apocalyptic literature has been running even within centuries, as James Annesley (1996) demonstrates when he brings up examples such as Aldous Huxley’s *Brave New World* (1932), George Orwell’s *Nineteen Eighty-Four* (1949), Ray Bradbury’s *Fahrenheit 451* (1953) or David Cronenberg’s *Videodrome* (1982): ‘Intimations of impending apocalypse haunt almost every decade of every century in a way that problematises the attempt to identify these fears as specific manifestations of millennial concern’ (367). An exclusive reliance on the impact of *saecula* may therefore reduce any comparative approach to a ‘*fin-de-siècle* essentialism’ that ignores contemporary social, political and cultural factors that contributed to a sense of impending apocalypse. Erin Mitchell, for instance, has engaged in a comparative approach to Oscar Wilde’s aestheticism with Woody Allen’s witticism in order to argue that

both Wilde and Allen depended upon the rigidity and stability of values, categories, and social codes in order to practice their parody and decadent undermining of social and artistic arrangements. Without such a dialectical relationship, there is no possibility that parody and decadence can effect a ‘cure’ of the society they undermine and chide. (1996: 85)
But despite some insightful remarks on the function of aestheticism and
parody ‘in liberal societies, such as that of Great Britain in the 1880s
and 1890s, and our own [the United States] in the 1980s and 1990s’
(86), Mitchell does not focus on any specific socio-historical conditions
that might account for the emergence of these similarities in the first
place. Attempts like this provide examples of how it is

very easy to look back on fin de siècle fiction and offer a lazy reading
of contemporary narratives as simple re-enactments of the strate-
gies of the past. The obvious danger with such an approach is that
interpretation of the specific characteristics of each literary project
will be replaced by a bland and unproductive sense of similitude.
(1998: 112)

An emphasis on structural similarities therefore needs to be accompa-
nied by an attention to historical specificities. If ‘the Victorian fin de
siècle re-enacts patterns of apocalyptic yearning’, at the same time ‘it
is undeniably the case that the late Victorians enact their own peculiar
patterns, speak their own dialect’ (Arata 1996: 1–2). Traces of such a
theoretical orientation may already be found in Kermode’s discussion, in
his association of the ‘sense of an ending’ with the ‘sense of a transition’: apocalyptic fantasies emerge in periods of transition because of their
ability to articulate anxieties and concerns that arise out of these transi-
tions: ‘we are always somehow ready for the end, and for a beginning;
we instantly identify our moment as transitional. So transition is the key
term, and we recognise it or its onset by the unmistakable signs of deca-
dence’ (Kermode 1967: 75). The experience of ‘living in the middest’ is
therefore central to the apocalypse. But this sense of transition should
not be perceived in purely temporal terms if a sustained theoretical com-
parison of the last two centuries’ ends is to be carried out. As outlined in
the previous section, it is the founding argument of this book that the
1890s may be placed next to the 1990s insofar as the ‘sense of an end-
ing’ that pervaded the two periods served to articulate anxieties related
to transitions in contemporary discourses of science, technology and
empire, discourses firmly embedded in the project of modernity.

I underline the ‘modern’ quality of these fictions because it is the
overarching common feature these two periods share and it forms the
wider framework within which the preoccupations with technoscience
and empire were articulated. The apocalypse of the 1890s and the 1990s
is thoroughly modern. The origins of the sense of ‘living in the middest’
to which they are indebted lie in the work of Joachim of Fiore, that
medieval monk whose work was fundamental to the emerging processes of secularisation during the Middle Ages that would eventually lead to the modern period. On Easter Sunday of 1183, Fiore was inspired to write his *Exposition on the Apocalypse*, a text considered to be ‘the most influential prophetic system known to Europe’ which ‘ignited the greatest spiritual revolution of the Middle Ages’ (Benz 1975: 36). The work provided a historical model structured according to a Trinitarian pattern of three epochs (‘Stations’), according to which history was progressing from the Station of the Father and the Law, based on the wrathful God of the Old Testament, to the Station of the Son and Love, associated with Christ and the New Testament, to reach the Station of the Spirit, the final phase of millennial preparation, a period of transition identified with the present. By associating the Station of the Spirit with the present, Joachim was the first one to suggest a conception of the present as a transitional period. Ever since, in a ‘modern apotheosis of Joachism’ (Kermode 1967: 101, 28), ‘we have merely elevated the interstitial period into an “age” or *saeculum* in its own right’. Furthermore, the early modern quality of Fiore’s historical model also lay in its teleological nature, which prefigured nineteenth-century evolutionary models of history such as those by Hegel and August Comte. ‘By casting history as a self-transcending process’, Erik Davis has suggested, ‘Joachim had prepared the way for thoroughly modern ideas about progress, revolution, and social development’ (1999: 258). Finally, this early work that would prove fundamental to the apocalyptic sensibility of the last two centuries’ ends demonstrates early modern qualities in its relationship to contemporary technology. Fiore produced his work during a period that witnessed a wider tendency towards secularisation in which technology was perceived as an indication of humanity’s God-given superiority to the rest of nature and its ability to transform the world. Joachim’s drive to perfect history emerged at a time where monasteries adopted the once-considered lowly ‘mechanical arts’ into their otherworldly labour, when religious cravings for redemption and salvation served as a strong motivation for technological advance (Maurer 1983). The ‘new historicised millenarianism’ that served as a context for Joachim’s model ‘encouraged as never before the ideological wedding of technology and transcendence. Technology now became at the same time eschatology’ (Noble 1998: 22).

The apocalyptic cultures of the 1890s and the 1990s are also modern in another sense: their indebtedness to Kermode’s *saecula* and the sense of an ending at a century’s end betrays an understanding of temporality and historicity that is specifically modern. In *Degeneration*, Nordau
suggested that it was not ‘the first time in the course of history that the horror of world-annihilation has laid hold of men’s minds. A similar sentiment took possession of the Christian peoples at the approach of the year 1000’ (1895: 2). This is actually a myth surrounding the year 1000 that began circulating only towards the end of the sixteenth century (Schwartz 1990: 7). Medieval people did not experience time in terms of hours, days, decades or centuries; premodern conceptions of temporality were based on regnal or seasonal cycles, according to the reigns of kings and the seasons of the liturgical year. The word ‘century’ was used to refer to a hundred similar things, such as military units, ballads, prayers or poems. It was associated with time only when it turned into a ‘secular unit’ and a ‘distinctively secular vessel of awareness’ (Townshed 1995: 198). Although the term started being used as a temporal concept increasingly during the Renaissance, it was the Republican Calendar of the French Revolution, which was adopted to remove any religious or royalist influences, that firmly established the concept within a modern, secular temporal framework. Adopted on 5 October – retroactive to 22 September 1792 – the new calendar was based on a decimal base: a ten-month year, a ten-day week, a ten-hour day, a hundred-minute hour and a hundred-second minute. Although it barely outlasted the eighteenth century, this reformation firmly associated the modern meaning of ‘century’ with the emancipation from theology and a radical rupture between the past and the present.

The word ‘siècle’, on the other hand, was established during the seventeenth century ‘as a means of putting an end to an age and its turmoil’ according to Joan DeJean, ‘to a period we would characterise, in a terminology not yet available to those who brought siècle into modern time, as a fin de siècle’ (1996: 791). At ‘a moment during which numerous structures essential to intellectual modernity were invented’ (793), the term started acquiring its modern, temporal sense, a process that DeJean associates with the Enlightenment concept of progress. The term ‘siècle’s passage from the vaguer sense of “an age” to a more or less precise sense of “one hundred years” was intimately bound up with simultaneous making and unmaking of the doctrine of progress’ (806). It is for this reason that Leo Brandy has also suggested that in the ‘history of apocalyptic and millennialist thought, the 1690s across Europe mark the first time the last decade of a century was so generally perceived as a significant signpost of time’ (1995: 66).

One further point of convergence between the last two centuries’ ends is their self-consciousness. The acceleration of modernity during the nineteenth century was accompanied by an increasing awareness of the temporal units of this modern understanding of time, such as
a ‘century’. 1801 was the year when a New Century Fire Society was founded in Boston and the first magazine to address the new century was published: *Eunonia: ein Zeitschrift des neunzehnten Jahrhunderts* (‘a Journal of the Nineteenth Century’). Similar publications followed throughout the century: *La revue du XIXe siècle* in 1836 Paris, *The Nineteenth Century* in 1848 Philadelphia and the London *Nineteenth Century* in 1877 that was renamed as *The Nineteenth Century . . . and After* in 21 December 1900. Wallace’s *The Wonderful Century* that opens this section may be seen as a representative example of this tendency. ‘Never since the beginning of Time’, Thomas Carlyle wrote in 1831, ‘was there . . . so intensely self-conscious a society’ (83). The 1890s in particular were ‘the most self-conscious decade so far’ (Townshed 1995: 200). Furthermore, contemporary ideas of historiography driven by concepts such as Hegel’s *Zeitgeist* had been imported from the Continent and encouraged a tendency to compare the current century with previous ones. ‘The idea of comparing one’s own age with former ages’, according to John Stuart Mill, ‘or with our notion of those which are yet to come had occurred to philosophers; but it never before was itself the dominant idea of any age’ (1831: 1). It is within this context that we may interpret the indebtedness of the apocalyptic culture of the 1890s to that of the late eighteenth century. The revival of Gothic fiction, for instance, enabled a major site for apocalyptic speculation through the works of Grant Allen, Arthur Machen, Richard Marsh or Bram Stoker, among others. The genre’s emergence in the late eighteenth century has often be seen as a reaction to the Enlightenment belief in progress, reason and rationality that had encouraged the production of the first modern futuristic narratives such as the anonymous *Reign of King George VI* (1763) and Louis-Sebastien Mercier’s *Year 2440* (1771). These fictions are now seen as important predecessors of science fiction and utopian writing insofar as they mark ‘the beginnings of a vast new literature of anticipation, which has been characteristic of the industrialized nations’ (Clarke 1979: 2). But it was partly in reaction to the Enlightenment optimism of these texts that the cleric of the *ancien régime* Jean-Baptiste Cousin de Grainville wrote his epic poem *Le Dernier Homme* (1805), probably the earliest narrative to depict the extinction of human-kind not by divine intervention but due to soil exhaustion, human sterility and a dying sun. The text’s theme was reproduced in the 1820s in a poem by Thomas Campbell (1823), a skit by Thomas Hood (1826) and a novel by Mary Shelley (1826), all under the title ‘The Last Man’. Often considered the first consistently secular apocalypse, Shelley’s *Last Man* established a number of motifs that were reproduced in *fin-de-siècle* fictions, such as that of the plague in William Delisle Hay’s *The Doom of the Great City* (1880), natural catastrophe in Richard Jefferies’s *After
London (1885), or the last man in M.P. Shiel’s The Purple Cloud (1901). Even the proliferation of invasion scare narratives has been seen by Laurence Davies as part of the neo-Romantic revival of the period insofar as these stories were reproducing ‘an aesthetic of the sublime, a late romantic craving for terrifying yet pleasurable grandeur’ brought to ‘the present-day streets of Paris, London and New York’ (Davies 1993: 67). The futuristic quality of these fictions was thus countered by their indebtedness to the past tradition of the turn of the nineteenth century.

From this perspective, the critical attempts to associate late-twentieth-century apocalyptic speculation with the culture of the fin de siècle during the 1990s may be seen as reproducing nineteenth-century ideas of historiography within a postmodern context. But the apocalyptic tone of major works associated with postmodern theory itself certainly encouraged any associations between the late twentieth century and the fin de siècle. For Jean-François Lyotard (1979), the postmodern was a period where the emphasis on ‘operationality’, ‘performativity’, and ‘efficiency’ in the increasingly militarised areas of science and technology of the postwar period had brought about a general distrust to the ‘grand narratives’ of modernity: the belief in the emancipation of humanity from slavery and class oppression heralded by the French Revolution; and the aspiration towards the speculative unity of all knowledge into absolute Spirit deriving from German idealism. The postmodern was characterised by an ‘incredulity towards meta-narratives’ at the multiplication of fragmented, localised and heterogeneous ‘micro-narratives’. Lyotard diagnosed in the postmodern a ‘break’ with the modern narrative of progress, which Fredric Jameson identified as a ‘radical break or coupure, generally traced back to the end of the 1950s or the early 1960s’ which set off ‘the arrival and inauguration of a whole new type of society, most famously baptized “postindustrial society” (Daniel Bell) but often also designated consumer society, media society, information society, electronic society or high tech, and the like’ (1991: 3). The postmodern was a condition where ‘the apocalyptic suddenly turns into the decorative (or at least diminishes abruptly into “something you have around the home”)’ (xvii). Of all the theorists of the postmodern, however, it has been Baudrillard’s work that has been associated specifically with a ‘fin-de-siècle feeling’, at least by theorists that reproduced the thought and style of his writings during the 1990s, such as Arthur Kroker and Michael Weinstein:

Unlike the 1890s with its romantic invocation of catastrophe scenarios, the 1990s emerge as an era of general cultural recline: a time of
cynical romanticism and cold love, where the body disappears into a virtual imaging system, and where even catastrophes are reversed by the media-net into specular publicity for a crash that will never happen. (1994: 2)

Baudrillard himself was largely responsible for these associations of his work. Especially after the mid-1980s, he adopted a self-conscious fin-de-siècle tone in his writings that seemed ‘more cynical, more exhausted, more iconoclastic and more burned-out’ in a disposition ‘reminiscent of fin de siècle exhaustion at the end of the nineteenth century, then associated with a period of cultural exhaustion, decadence, and ennui’ (Kellner 1989: 208). Baudrillard did not only make increasingly more overt references to catastrophe and the millennium during this period, he also adopted a writing style consisting of parodying, even self-mocking, epigrammatic phrases which have been criticised for being contradictory and incoherent. ‘For all their incoherence’, however, Patrick Brantlinger has suggested, ‘his claims about history are best read as ironic, often sharply observant aphorisms on a Wildean or Nietzschean model’ (1998: 73).

The relatively recent neo-Victorian trend has encouraged further discussions of the relations between postmodernism and the Victorian period. One early yet representative example would be the discussion by John Kurich and Diane F. Sadoff, who have coined the term ‘post-Victorian’ to refer to the increasing interest in Victorianism in postmodern culture as a ‘mirror’ reflecting the origins of postmodernity. Paraphrasing Fredric Jameson, they consider the nineteenth century to be ‘a crucial historical break’ (2000: x) that marks the gradual emergence of the postmodern. Such a critical trend, however, may be identified earlier on, in the early 1990s, in critical discussions such as Marjorie Perloff’s ‘Postmodernism/Fin de Siècle: The Prospects for Openness in a Decade of Closure’ (1993), which hardly touches upon the late-nineteenth-century movement and is mainly interested in outlining a genealogy of postmodernism. Walter Laqueur, on the other hand, argued more directly that in the 1990s ‘fin-de-siècle manifests itself in the shape of postmodernism and poststructuralism’ (1996: 24). Other critics have pointed towards more specific connections between the postmodern and the late Victorian period. Joan DeJean has suggested that ‘during the first fin de siècle to be called by that name, the literary characteristics that are now associated with the movements known as modernism and postmodernism underwent their initial formulation’ (1996: 797). Sally Ledger, on the other hand, provided a more detailed
discussion of the relations between the two centuries’ ends in terms of what she calls the ‘critical “holy trinity”’ of gender, class and ‘race’:

the concepts and conflicts around issues of ‘race’, class and gender which inform contemporary cultural criticism emerged at the last fin de siècle; the critical ‘holy trinity’ which takes centre stage in our own post-epochal, postmodern fin de siècle had its origins in the cultural politics of the end of the nineteenth and the beginning of the twentieth century. (1995: 72)

Whereas these critical approaches identify the origins of the postmodern at the fin de siècle, most of them consist in predominantly descriptive and enumerative accounts of similarities of the two periods under consideration, without focusing enough on the socio-cultural and historical contexts that would provide an explanation for the existence of these similarities in the first place. A notable exception is James Annesley’s (1996) comparison of fin-de-siècle decadent writing with the ‘blank generation’ of American writing of the 1980s that includes Brett Easton Ellis, Jay McInerney or Tama Janowitz, among others. Annesley compares fin-de-siècle British and postmodern American narratives by relying on Ernest Mandel’s historical model of capitalist expansion. In Late Capitalism (1972), Mandel identified three stages in the evolution of capitalism: ‘market’, ‘monopoly’ and ‘post-industrial’ or ‘multinational’ capitalism. Since the two latter stages coincide with the last two centuries’ ends, Annesley views decadence and blank fiction as cultural responses to these shifts in modes of capitalist production:

Unlike the superficial connections between the thematic foci of fin de siècle European writing and contemporary American narrative, this understanding of decadence as a response to changes in the mode of production offers a means of connecting the two forms in a way that actually compares like with like. The suggestion is that blank fiction, in processes that are similar to those made in fin de siècle writing, articulates a specific kind of response to shifts in the organisation of capital. If the emergence of nineteenth century decadence can be ascribed, in part, to an imaginative dilemma generated by the change from market to monopoly capitalism, then blank fiction can be interpreted in terms of the change from monopoly capitalism to late, multi-national or consumer capitalism. (1996: 373)

Mandel’s periodisation of capitalism, however, was also focused on ‘the three general revolutions in technology engendered by the capitalist
mode of production since the “original” industrial revolution of the late 18th century’ (1972: 118). His historical model underlines the fundamental role of steam-driven motors for the emergence of market capitalism, whereas the transition to monopoly capitalism was largely facilitated by the proliferation of combustion motors. Post-industrial capitalism, finally, was seen by Mandel as operating through electronic and nuclear-powered apparatuses. Annesley’s periodisation in terms of different stages of capitalist expansion may therefore be complemented by an approach that focuses on the ways in which turn-of-the-century apocalypse registers shifts in technological progress and discovery under the Second Industrial Revolution and the Information Revolution. Furthermore, capitalism has been the generating force for imperialism during these two periods that saw major transformations in existing modes of imperial control. A distinctive feature of the New Imperialism lay in its status as ‘a new era of national expansion in which . . . political and economic elements were no longer clearly separable’ and which was associated with ‘a new phase of capitalist development’ (Hobsbawm 1987: 59). This was ‘an era of competition between rival industrial-capitalist national economies’ which was intensified by the pressure to ‘secure and safeguard markets in a period of business uncertainty’ (73). Imperialism at that moment in history represented ‘the globalisation of the capitalist mode of production’ (Williams and Chrisman 1994: 2). The late twentieth century, on the other hand, was a period that witnessed speculations on the decline of the nation-state as a major political formation at the emergence of multinational corporations, non-governmental organisations and media networks as major sites of political power. According to Susan Strange, the ‘declining authority of states’ during the 1990s was reflected in ‘a growing diffusion of authority to other institutions and associations, and to local and regional bodies’ (1996: 4). It was the ‘impersonal forces of world markets’ that were ‘more powerful than the states to whom ultimate political authority over society and economy [was] supposed to belong’ (4). These shifts in the relations between power and knowledge, this book will discuss, were registered in the popular cultural production of each period that represented the transitions in the connections between science, technology and empire in apocalyptic terms. From this perspective, comparing the two centuries’ ends helps demonstrate a double process of a ‘politicisation of technology’ and ‘technologisation of politics’ that takes place during these two periods. The term ‘technoscience’ is not used as a shorthand for ‘science’ and ‘technology’ but as a concept that denotes these embraces between discourses of knowledge
and power. The theoretical implications of the term are explored in the following section, which traces the convergences of these discourses in the two periods under consideration while highlighting the significance of the middle of the twentieth century for these convergences.

Technoscience and empire

After the first bomb, the *atom bomb*, which was capable of using the energy of radioactivity to smash matter, the spectre of a second bomb, capable of using the interactivity of information to wreck the peace between nations.


[I]n these days, when a member of Parliament is supposed to know all about everything, information’s the one thing wanted.


In Virilio’s apocalyptic vision of the year 2000, the Information Revolution was haunted by the history of the atomic age; the present was faced with the ‘threat of cybernetic control of the politics of states’ even as the prospect of a nuclear conflict had become ‘generally commonplace’ (2000a: 135–6) in the post-Cold War era. The increasing ‘scale of technical catastrophes occasioned’ had become a more defining feature than ‘the extent of progress achieved’ for a science that had mutated into ‘technoscience’: ‘the product of the fatal collision between the *operational instrument* and *explanatory research*’ (1; original emphasis). The term ‘technoscience’ therefore denotes the convergence of the values of knowledge and operationality that Lyotard associated with the postmodern condition. Jacques Derrida had already adopted this term in his own response to the ‘nuclear issue’ in the mid-1980s, when he addressed the extent to which ‘the frontier is more undecidable than ever’ between ‘those whose competence is techno-scientific . . . and those whose competence is politico-military’ (1984: 22). These ‘techno-scientific competent parties’ were defined by Derrida as ‘those who invent in the sense of unveiling or of “constative discovery” as well as in the sense of production of new technical or “performing mechanism”’ (22). ‘Technoscience’ is therefore a term that underlines the embeddedness of science and technology in socio-cultural, political, military and economic discourses. This sense of the term was established
by Bruno Latour who first defined ‘technoscience’ as ‘all the elements tied to the scientific contents no matter how dirty, unexpected or foreign they seem’ (1984: 174). Latour distinguished the term from those of ‘science’ and ‘technology’, insofar as the latter two seem to imply two spheres isolated from the rest of society. This understanding of scientific research and technological invention as ‘pure’, disinterested activities carried out exclusively in the name of ‘progress’ is ‘a figment of our imagination’ and ‘only a sub-set which seems to take precedence only because of an optical illusion’ (175). Virilio’s approach, however, is the most relevant in the context of my discussion insofar as he considers the increasing consolidation of discourses, practices and formations of power and knowledge signified by ‘technoscience’ to be a direct result of the increase in scale and number of technical accidents and disasters caused by technoscience itself. The industrial accident is not an aberration but an index of technological progress: ‘the more powerful and high-performance the invention, the more dramatic the accident’ (Virilio 2007: 31). There is a dialectic relationship between technological invention and the industrial accident whereby the accident is a symptom of technoscientific progress even as it provides impetus for further development. This relationship follows a metaleptic logic whereby the shipwreck is the futuristic invention of the ship, the railway accident the invention of the train, the plane crash the invention of the supersonic airliner, and so on.

Writing before 9/11, Kirby Farrell suggested that the plane crash was one of the ‘few images’ that ‘evoke the traumatic potential of modernism, or its late-Victorian antecedent, the train wrecks that indirectly contributed to the concept of traumatic neurosis’ (1998: 175). The analogy between plane crash and railway accident is reproduced in Virilio’s approach that follows Wolfgang Schivelbusch’s seminal discussion of the proliferating railway accidents in Victorian Britain: ‘the more efficient the technology, the more catastrophic its destruction when it collapses. There is an exact ratio between the level of the technology with which nature is controlled, and the degree of severity of its accidents’ (1977: 133). The dialectic between industrial accident and technoscientific development is reproduced in the narrative resolution of Richard Marsh’s *The Beetle* (1897). The main plot involving the revenge of a mysterious shape-shifting creature with mesmeric abilities against a British politician is complemented by a subplot involving the researches of the inventor Sydney Atherton on a ‘Magic Vapour’. His words quoted in the beginning of this section are from a conversation he has with the MP Percy Woodville on this vapour that may be fired from a huge gun and ‘in less than an instant of time, a hundred thousand men, – quite
possibly more! – would drop down dead, as if smitten by the lighting of the skies’ (137). The main plot leads to a final pursuit of the Beetle on a train that is halted by a severe railway accident where everything gets covered with ‘gritty dust’ and the engine runs ‘a complete somersault’ and ‘vomit[s] forth smoke, and steam, and flames’ (318). By the end of the novel, Atherton continues his work and extends his research ‘into the subject of aerial flight, which have brought the flying machine within the range of practical politics, are on everybody’s tongue’ (321). The Beetle therefore stages the defeat of occult enemies by the new technological demons of modernity even as it engages with themes of chemical warfare and aerial conflict that were reproduced in contemporary future war stories such as the ones by Griffith, Fawcett, Ellis and Wells mentioned in the beginning of this Introduction. As such, it is a text whose narrative is propelled by a conflict between ‘the non-rational, the inexplicable, the archaic, the other’ with ‘various facets of late-Victorian modernity’ such as ‘the nineteenth-century investment in the attainability and efficacy of knowledge as a form of power and control’ (Wolfreys 2004: 12). The significance of ‘control’ underlined in Julian Wolfreys’s reading is therefore intertwined with the importance of ‘information’ in Atherton’s quote in another fin-de-siècle fiction that demonstrates emerging connections of power and knowledge in the late Victorian period. As such, it may be seen as a text that paves the way for a discussion that focuses on the consolidation of the relations between ‘control’ and ‘information’ and the crystallisation of ‘science’ and ‘technology’ into ‘technoscience’ during the last two centuries’ ends. At the same time, this section also concentrates on the ways in which the middle of the twentieth century constitutes a turning point in the relations between the two main periods under discussion.

In the early 1990s, Gilles Deleuze diagnosed ‘the progressive and dispersed installation of a new system of domination’ (1992: 7) that was integral to the ‘societies of control’ that had arrived to replace what Michel Foucault had described as ‘disciplinary societies’. Disciplinary societies were regulated by institutions such as the family, the school or the factory, which were preserving social control by structuring individual thoughts and practices. These societies had emerged in the classical age of French civilisation and expanded during the first phase of capitalist accumulation up until around the Second World War. At the postwar period, these institutions were ‘finished’ and ‘new forces’ were ‘knocking
at the door’, signalling the emergence of the societies of control, which operate through ‘a code . . . The numerical language of control is made of codes that mark access to information, or reject it’ (5). Control is perpetually maintained through information technologies: ‘the societies of control operate with . . . computers, whose passive danger is jamming and whose active one is piracy and the introduction of viruses’ (6). Information, what Deleuze refers to as the ‘code’, is central to the exercise of control in this new social formation: ‘The numerical language of control is made of codes that mark access to information, or reject it’ (5).

The societies of control were therefore associated by Deleuze with the ‘information society’, a term established in the late 1950s by the economist Fritz Machlup (1962) to refer to that sector of US economy associated with the production and distribution of knowledge. The origins of the information society may be identified in the work of the Bell Labs engineer Claude Shannon in the late 1940s. In July and October 1948, Shannon published two papers in the *Bell Systems Technical Journal* on the ‘Mathematical Theory of Communication’ that are often considered to mark the beginning of information theory. While working on the problem of sending messages from one place to another without any errors during transmission, Shannon built an abstract technical model of communication, according to which a ‘message’ is sent by a ‘sender’ to a ‘recipient’ through a ‘communication channel’ which is always contaminated by ‘noise’, any chance fluctuations, interferences and transmission errors that degrade the signal. In order to address the issue of noiseless communication, Shannon postulated that ‘information’ in this model is irrelevant to ‘meaning’. Any ‘semantic aspects of communication’ in this theory were ‘irrelevant to the engineering problem’ (Shannon and Weaver 1964: 31). Shannon’s definition of information was context-free, constant and closed. His second theorem postulated that any information could be transmitted through noise as long as the natural capacity of the channel – its ‘bandwidth’ – was factored into the equation. The integrity of information could be preserved if it was translated into digital codes of varying degrees of complexity and accuracy, data which would allow the recipient to ensure that the message received is the proper one. Information was therefore defined as a mathematical function depending entirely on the transmission of message elements, regardless of the extent to which the message contained any meaning for the receiver. As N. Katherine Hayles explains:

In Shannon’s equations, the informational probability of an element can be calculated only with reference to the ensemble from which it
is drawn, that is, not absolutely but through a series of differences. This move allows the information content of a message to be quantified regardless of its context or meaning. (1990: 178)

Shannon’s theory was ‘the first, and perhaps the most crucial, move in the information revolution’ (Hayles 1987: 25). His definition of information as a mathematical entity that could be transposed across different discursive contexts was largely responsible for the ensuing gradual digitalisation and computerisation of Western societies of the Information Age:

Once information received an abstract and universal form, it somehow became more real . . . an objective yet essentially mindlike material that could help explicate any number of seemingly unrelated phenomena by boiling them down to the crisp binary unit of the bit. (Davis 1999: 83)

As a consequence, terms and concepts from information theory were gradually disseminated across various diverse disciplines, from sociology to biology and from economics to psychology. Lacanian psychoanalysis was not left unaffected in this respect: the ‘quantity of information’ became for Lacan ‘that dimension in which thought tries to order itself and find its correct symbol’ (1988: 83). In his discussions of traumatic neuroses, the Freudian ‘repetition compulsion’ was transcoded into ‘automatism of repetition’ in a gesture that replaced ‘the supposed unconscious death wish with the senseless functioning of a machine, the unconscious henceforth being identified with a cybernetic automaton’ (Dupuy 1994: 19). Trauma became a disruption to ‘the subjectifying homeostasis that orientates the whole functioning defined by the pleasure principle’ (Lacan 1973: 55). ‘Homeostasis’, in Lacan’s discussion associated with the pleasure principle, originally referred to the ability of living organisms to maintain a steady state with the environment and it was a concept introduced by the physiologist Walter B. Cannon (1929) and later discussed in his studies in the psychology of fear (1942). The concept then emerged as a major idea in the early years of the discipline of cybernetics, as it was applied to machines, which were then seen as maintaining a homeostatic state through feedback loops. Cybernetics complemented the theorisations of ‘information’ in the work of Shannon with new definitions of ‘control’, a concept central to work of the founder of the discipline, Norbert Wiener. Wiener
Introduction

and Shannon had not collaborated but their work was remarkably close and for a while the new theory was known as the Wiener–Shannon theory of communication until Shannon’s formulation endured in the end. Cybernetics – from the Greek ‘kybernetes’ (‘steersman’) – is a wide-ranging discipline interested in the study of the stability and preservation of order and consistency within a system. Its objective, for Wiener, would be the ‘study of messages, and in particular of the effective messages of control’, a term understood as ‘the sending of messages which effectively change the behaviour of the recipient’ (Wiener 1950: 8). The founding assumption of Wiener’s cybernetics was that ‘control’ and ‘communication’ are concepts tightly related to the idea of the ‘message’. Perhaps more important, the theory was for Wiener ‘a metadiscipline, something akin to what Michel Foucault would later term “episteme”’ (Kay 1997: 40). In his own words:

society can only be understood through a study of the messages and the communication facilities which belong to it; . . . in the future development of these messages and communication facilities, messages between man and machines, between machines and man, and between machine and machine, are destined to play an ever-increasing role. (Wiener 1950: 9)

The importance of ideas of control in this theory must therefore also be seen in extra-discursive terms. Information theory and cybernetics emerged out of the conflicts of the Second World War and are indicative of ‘the pervasiveness of postwar military culture’ (Kay 1997: 31) in scientific research. Shannon’s theory emerged out of his work on secrecy systems and cryptanalytic techniques that he had been assigned to work on during the involvement of Bell Labs in the war effort. ‘Military imperatives simultaneously guided technological design and theory construction. These communication technologies shaped the form, scope, and limits of Shannon’s information theory, and its peculiar feature as a communication devoid of semantics’ (Kay 1997: 40). Wiener’s Human Use of Human Beings, on the other hand, ‘spread the cybernetic vision in a culture that was becoming enamoured with the nascent, computer-driven technosciences: systems analysis, operations research, industrial and military automation’ (46). Furthermore, the increasing interest in coding and communication that Shannon’s theory precipitated demonstrated a gradual shift of focus to values of performativity and efficiency at the expense of truth and knowledge. The Shannon–Wiener theory
may be said to epitomise this convergence of discourses of knowledge and power in the respective emphasis of the two theorists on ‘information’ and ‘control’. Although Lyotard did not include Shannon in his scientific references in *The Postmodern Condition*, the emergence of information theory is exemplary of the processes he identifies with the postmodern. Shannon was working in an institution focused on operating on a managerial philosophy established by the first president of Bell Labs, which had ‘set a high premium on the integration of science and engineering’ (40). He was an engineer rather than a theoretical scientist, someone who wanted to pave the way for a new technology and it was his need for reliable quantification that motivated his research. This institutional context and theoretical motivation render the discipline an indicative example of the privileging of performativity over knowledge that Lyotard identifies with the postmodern.

And yet, the Information Revolution precipitated by Shannon’s work was at the same time ‘not so much the result of any recent social change, as of increases begun more than a century ago in the speed of material processing’ (Beniger 1986: viii). Information technologies are ‘merely the latest instalment in the continuing development of’ what James Beniger has called the ‘Control Revolution’, a period ranging between 1870 and 1910 which represents ‘a complex of rapid changes in the technological and economic arrangements by which information is collected, stored, processed, and communicated, and through which formal or programmed decisions might effect societal control’ (vi). The Control Revolution is that cultural moment to consolidate the conditions of emergence for the Deleuzian societies of control. Wiener’s work emerges as a watershed in this trajectory, whose definition of ‘control’ is strikingly similar to Beniger’s: ‘purposive influence toward a predetermined goal’ (7). Wiener had placed his discipline in a continuum with the Second Industrial Revolution: whereas the first Industrial Revolution, ‘concerned the machine purely as an alternative to human muscle’, inventions of the Second Industrial Revolution such as the gramophone, the cinema, the typewriter and the telephone concerned ‘the field in which the communicative characters of man and of the machine impinge upon one other’ (Wiener 1950: 164).

The entanglement of discourses of ‘information’ and ‘control’ in the late Victorian period must therefore be seen as related to the convergences of the Second Industrial Revolution and the New Imperialism respectively. The late Victorians ‘had found themselves in the midst of the first knowledge explosion’ (Richards 1993: 5) because of the
increasing accumulation of information that the tremendous advances in scientific inquiry and technological advance had brought about:

If today we call this the ‘information explosion’, it was because by the century's end many people had stopped using the word ‘knowledge’, which always had something about it of a prospective unity emerging, and started using the word ‘information’, with its contemporary overtones of scattered disjunct fragments of fact. (5)

A quick overview of some of the major scientific developments during the century might be helpful in giving a sense of this ‘knowledge explosion’. By the end of the century, science had emerged as that specialised, professional institution that presented itself as a detached source of knowledge that might be recognised today as ‘modern’. One of the first major scientific breakthroughs of the century was the emergence of geology in the 1830s, with scientific documents as influential as Charles Lyell's *Principles of Geology* (1830–3), whereas physics was an area that witnessed a number of major discussion during the 1850s in thermodynamics. The end of this decade is the most significant scientific moment of the century, as the publication of Charles Darwin's *Origin of Species* (1859) initiated the emergence and establishment of evolutionary biology as a major scientific paradigm. At the same time, widespread activity in different areas of scientific inquiry led to the formation of new scientific disciplines, like seismology (in 1858) or embryology (in 1859), and the further specialisation of existing ones. The very terms ‘science’ and ‘scientist’ were coined in this century, originally in 1834 by the Cambridge mathematician Reverend William Whewell, who, in 1840, urged again for the need ‘to describe a cultivator of science in general’ which he ‘incline[d] to call him a Scientist’ (Whewell 1840: cxiii) until the term eventually gained currency at the last quarter of the century. The century therefore witnessed a tremendous accumulation of new scientific knowledge in many areas of research that became more complex and specialised, resulting in an increasing separation of contemporary scientific disciplines from the rest of society – this was, in Frank Turner’s words, ‘the last era when the essential theories of science could be understood by the layman without training in advanced mathematics’ (Turner 1974: 11).

Technological discovery also underwent tremendous progress during the century. Like the term ‘science’, this is the century to establish the term ‘technology’ after the publication of Harvard professor of medicine Jacob Bigelow's *Elements of Technology* in 1829, who adopted the term
‘technology’ to refer to ‘the principles, processes, and nomenclatures of the more conspicuous arts, particularly those which involve applications of science, and which may be considered useful, by promoting the benefit of society, together with the emolument of those who pursue them’ (1831: v). A quick review of the technological discoveries of the century illustrates the need for a new term. The 1830s was the decade to witness the discovery of photography and telegraphy, while transatlantic cable was established in the 1860s. This is also the decade when the typewriter was invented, only to arrive to the marketplace in the late 1870s. The last quarter of the century witnessed an increasing acceleration of technological discovery, when the invention of the first ‘mass media’ took place: the telephone was first demonstrated by Alexander Graham Bell at the Philadelphia Centennial Exhibition in 1876, while it was commercialised in the 1880s, and long-distance lines were developed in the 1890s. The phonograph was patented by Edison in 1877 and improved by the 1890s in Hans Berliner’s gramophone as a means by which a sponsor’s message could be distributed to households. The 1890s was a decade that witnessed an even more rapid development of broadcast media. The ‘motion picture’ was invented by Edison after 1891, the kinetoscope in 1893 and the cinematograph in 1895, initially placed by sponsors in public places, only to be projected in ‘movie houses’ in the 1900s. Long-wave wireless telegraphy was invented by Guglielmo Marconi in 1895, whereas transatlantic wireless communication followed in 1901, public radio broadcasting in 1906, and commercial radio by 1920. All these ‘[n]ew machines’, according to the late-Victorian writer Grant Allen, ‘had come in to make life still more complicated: sixpenny telegrams, Bell and Edison, submarine cables, evening papers, perturbations coming in from all sides incessantly; suburbs growing, the hubbub increasing, Metropolitan railways, trams, bicycles, innumerable’ (1894: 119–20). These discoveries brought about major transformations to society which ‘signalled the end – after some ten thousand years – of a predominantly agricultural society’ (Beniger 1986: 2). This end was often perceived in apocalyptic terms:

In the burst of new technologies and inventions that characterized the ‘Second Industrial Revolution’, developments in communication and transportation were powerful shapers of cultural productions of all sorts, from music to sports, poetry to advertising. Responses to new cultural patterns ranged from a facile technological optimism to diagnoses of ‘degeneration’ and ‘the dusk of nations’. (Brantlinger 1990: 98)
According to Thomas Richards, the increasing accumulation of information had led to a shift of focus, from problems of organisation to those of disorganisation of knowledge: ‘Our idea of information still has something about the frustration the Victorians felt at watching all their knowledges fly apart’ (1993: 76). ‘If the period suffered a crisis’, Farrell has suggested along similar lines, ‘it was a crisis of awareness: the dissonance of suddenly knowing more than the culture could process’ (1998: 69). It is in terms of this element of the excessive and the overwhelming that trauma may be seen as a trope for fin-de-siècle apocalyptic culture, insofar as it has been theorised as an experience whereby the ‘influx of excitations is excessive in relation to the tolerance of the psychical apparatus’ (Laplanche and Pontalis 1980: 466). The fin de siècle, Bernard Bergonzi has argued, was ‘the expression of a prevalent mood: the feeling that the nineteenth century – which had contained more events, more history than any other – had gone on too long, and that sensitive souls were growing weary of it’, which led to ‘a certain loss of nerve, weariness with the past combined with foreboding about the future’ (1961: 3–4).

What has not been underlined enough so far, however, is the extent to which the ‘knowledge explosion’ and ensuing ‘crisis of awareness’ were symptomatic of the indebtedness of scientific research and technological discovery to the British Empire that had become much more important to the late Victorians than in earlier stages of its history. By the century’s end, Britain’s formal empire was occupying more than a fifth of the world’s land area, stretching from South Africa to India, Malaya, Australia and New Zealand, through Canada and a group of smaller territories, whereas its informal empire of trade and investment reached as far as Latin America, the Middle East and east Asia. The size, range, and power of the Empire was one of the major reasons for the resurgence of patriotic fervour towards the end of the century. Imperialism had become ‘one of the pivotal facts of the late Victorian and Edwardian years’ (McDonald 1994: 4) and ‘by the 1890s, it is clear’ to Robert McDonald that ‘British society was saturated with nationalist and militarist ideas’ (2) that were expressed through the phenomenon of jingoism – a term coming from G.W. Hunt’s song ‘By Jingo’ (1878) that was sung in music halls during the Russo-Turkish war of 1877–8, ‘jingoism’ being those politicians intending to bring Britain into the war on the side of the Turks. Jingoism was a trend that rose steadily from the 1880s onwards and escalated further in the latter part of the 1890s to reach its peak in the enthusiastic celebrations of the Diamond Jubilee in 1897. But it was precisely the range of the vast Empire that also
generated fears that this size and diversity might lead to its destruction. In the same year that witnessed the coinage of the term ‘jingo’, William Gladstone warned that ‘the cares and calls of the British Empire are already beyond the strength of those who govern and have governed it’ (cited in Buckley 1967: 81). Even Rudyard Kipling, a fervent believer and supporter of British imperialism, found the excessively lavish display of the Diamond Jubilee as ‘one with Nineveh and Tyre’ (1897: 377). By the time, the British, for Kipling, had become ‘drunk with sight of power’ and he was praying ‘[f]or frantic boast and foolish word / Thy mercy on Thy People, Lord!’ (378). The increasing jingoist fervour was therefore accompanied by an undercurrent fear of impending doom and decline that ‘accompanies this era of seemingly unstoppable expansion’ (Ledger and Luckhurst 2000: 134). It is in this sense that ‘the late-nineteenth-century formalisation of Empire’ also produced ‘the crises, oxymorons and violence of an imperial (un)conscious’ (Chrisman 1990: 57). The period created ‘both the conditions which formed anti-imperialist leaders and the conditions which . . . began to give their voices resonance’ (Hobsbawm 1987: 78).

At the same time, the vast range of the British Empire provided a major context that affected late Victorian scientific research and technological development. ‘Unquestionably’, for Richards, the British Empire was ‘the most productive of knowledge than any previous empire in history’, ‘one of the most data-intensive’ empires’ (1993: 4). By the century’s end, the ‘enormous empire’, Bruce Hunt has also pointed out, ‘affected virtually every aspect of Victorian life’ and ‘provided one of the principal contexts for Victorian science’ (1997: 312). Exploration, commerce and conquest provided new materials and data that introduced new topics to be researched whereas the use of technologies for imperialist purposes presented new problems to be addressed and led to the development of new inventions and theories. At the same time, imperialism enabled encounters with local scientific traditions and institutions in the colonies that led to a reciprocal influence between metropolitan and colonial science. A large degree of the ‘knowledge explosion’ of the Second Industrial Revolution was therefore largely a result of imperialist practices: ‘much of what was distinctive about Victorian science’, according to Hunt, ‘can be traced to the fact that it was pursued within a global commercial empire’ (312). The technology that he concentrates on is cable telegraphy that was a ‘quintessential technology of empire’ insofar as it ‘provided much of the impetus for British work in electrical physics in the second half of the nineteenth century. Through it, the British context shaped electrical science in
deep and distinctive ways’ (313). Different theoretical approaches to communication between Britain, Germany and France were, according to Hunt, shaped by the different demands and opportunities set by their imperial context. In this sense, technoscientific development was indicative of ‘how the imperial context could shape the content of scientific work done not just in colonial outposts, but in the metropolitan centres themselves’ (315). The ‘crisis of awareness’ that Farrell diagnoses in the fin de siècle, a symptom of the ‘knowledge explosion’ that Richards has identified, may be seen within a political context as what Beniger describes as a ‘crisis of control’: ‘a period in which innovations in information-processing and communication technologies lagged behind those of energy and its application to manufacturing and transportation’ (1986: vii).

One of the major distinctive features of this new, Control Revolution lay in its approach to natural world and biological organisms as information systems subject to processing and control: ‘Life itself implies control, after all, in individual cells and organisms no less than in national economies or any other purposive system’ (Beniger 1986: vi). The Control Revolution, according to Beniger, ‘transformed no less than the essential life function itself’ (36). As such, this revolution may be seen as prefiguring a third ‘bomb’ that Virilio has discussed, the ‘genetic bomb’ that he juxtaposes to the ‘information bomb’ and the ‘atom bomb’. Biogenetic discourses in the 1990s were indicative, for Virilio, of a shift of focus in practices and discourses of power, ‘from the nuclear state to the promise of a state eugenics, from the atomic bomb to the genetic bomb’, one that ‘would have been impossible without the “information bomb” (2002: 3). The importance of ideas of ‘information’ and ‘control’ in biogenetics is underlined in his discussion of the ‘coupling of the life and information sciences’ which he describes as a form of ‘cybernetic eugenicism’:

a eugenicism which owes nothing to the politics of nations – as was still the case in the laboratories of the death camps – but everything, absolutely everything, to science – an economic techno-science in which the single market demands the commercialisation of the whole of living matter, the privatisation of the genetic heritage of humanity. (2000a: 132)

The term ‘cybernetic eugenics’ is useful in suggesting the importance of disciplines like information theory, cybernetics and nonlinear dynamics within discourses of biogenetics that have theorised the human body
as an information system that can be decoded, analysed, monitored and manipulated. Late-Victorian technoscientific discourses that were fundamental to the emergence of these disciplines, I discuss in the relevant chapter, found their place within the movement of eugenics. As such, projects like the Human Genome Project in the 1990s and eugenics in the 1890s may be seen as exemplary sites of Foucauldian biopower, whose main focus ‘centred on the body as a machine: its disciplining, the optimisation of its capabilities, the extortion of its forces, the parallel increase of its usefulness and its docility’ and ‘its integration into systems of efficient and economic controls’ (Foucault 1978: 138). Biopower, my discussion will argue, occupies a central place in turn-of-the-century apocalypse: the main subject of one of the texts that established the term ‘fin de siècle’, Nordau’s Degeneration, is the contemporary popular pseudoscientific theory of reverse evolution called ‘degeneration theory’ whose ideological uses for the stigmatisation of any marginalised social group ‘provide a striking instance of Foucault’s power/knowledge nexus’ (Arata 1996: 17). The emergence of new forms of biopower will be seen as a response to the two crises perceived by Farrell and Beniger: a crisis of awareness and an ensuing crisis of control, crises that were registered in apocalyptic terms in the popular fictions of the time. The examination of the ways in which biopower permeated the apocalyptic culture of the two periods in the last two chapters will illustrate the ways in which modern power witnessed a transition from ‘outer space’ to ‘inner space’.

My discussion follows a structure organised around the three major concepts of this book. The first two chapters examines the ways in which contemporary technoscientific discourses infiltrated apocalyptic narratives of the last two centuries’ ends, whereas the last two investigates the ways in which these discourses and narratives articulate anxieties related to contemporary imperial formations and practices. Whereas the overall discussion touches upon a number of different disciplines, the main focus is on entropy and degeneration in the first chapter, and chaos theory in the second. I have also organised the discussion according to the two meanings of the term ‘apocalypse’, as destruction and rebirth. Whereas the following chapter concentrates on linear narratives of apocalypse leading to an irreversible end, the chapter on chaos concentrate on cyclical, repetitive models of apocalyptic speculation. The focus of this part is therefore on apocalypse as primarily a temporal concept. The last two chapters, on the other hand, concentrate on the relation of the apocalypse to ideas of space. ‘Dusk of the Nations’ concentrates on narratives of destruction and invasion and
follows a gradual progression of fictions that envision invasion from ‘outer space’ to others that concentrate on the infiltration of ‘inner space’, such as fictions of viruses, epidemics and biological warfare. The final chapter examines utopian visions as a counter to apocalyptic speculation that were founded on biopolitical discourses such as those of eugenics and biogenetics.

The focus is largely on fin-de-siècle Britain and late-twentieth-century America, mainly for lack of space rather than in order to suggest that there was not apocalyptic speculation during America’s ‘Gilded Age’ or the post-imperial Britain of Thatcher and Blair – far from it. My discussion does not seek to imply any clear-cut comparative templates between times and spaces, decades and empires (‘1890s Britain’ / ‘1990s America’). This book is less about ‘similarities’ and ‘differences’ and more about patterns and disruptions, continuities and ruptures, equivalences and disjunctures in the ever-renewing narratives of the End that individuals and societies produce and consume in order to come to terms with the changes that happen around them.
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