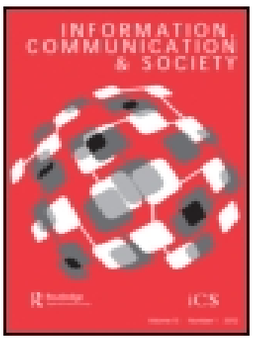

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David S. Wall

CYBERCRIME AND THE CULTURE OF FEAR

Social science fiction(s) and the production of knowledge about cybercrime

This article maps out the conceptual origins of cybercrime in social science fiction and other 'faction' genres to explore the relationship between rhetoric and reality in the production of knowledge about it. It goes on to illustrate how the reporting of dystopic narratives about life in networked worlds shapes public reactions to technological change. Reactions which heighten the culture of fear about cybercrime, which in turn, shapes public expectations of online risk, the formation of law and the subsequent interpretation of justice. Finally, the article identifies and responds to the various mythologies that are currently circulating about cybercrime before identifying the various tensions in the production of criminological knowledge about it that contribute to sustaining those mythologies.

Keywords cybercrime; cyberpunk; culture of fear; internet myths; reassurance gap; science fiction

Introduction

When politicians, police, interest groups, policymakers and others are pushed for comments about dramatic crimes or events that have captured the public imagination, their immediate response nowadays seems to be to point to the internet as a causal factor. Yet, at the end of the day after the investigations are over the internet links are very often found to be circumstantial and rarely causal. Despite these inconsistencies, the initial reactions never seem to be retracted or for that matter critically challenged, thus causing the internet, cyberspace and the cyber-offender to be further demonized, with adverse effects upon the way that it is viewed and used. If, however, these events are viewed critically,

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then the more they are examined, the more apparent it becomes that conceptualisations of cybercrime, like cyberspace, are riddled with epistemological disparities between 'what is' and 'what aught'. Most notable of these is the startling contradiction between the apparently high levels of public fear about cybercrimes (fuelled by reports of high prevalence) and the rather sober reality of very few prosecutions (Wall 2008).

Drilling down for an explanation of the contradictions between what people say (reporting) and what is happening (prosecutions) reveals a mythology about cyberspace and cybercrime that originates, not so much in fact, but rather in fiction, or social science fiction – the branch of science fiction that explores those forms of society that are the product of technological change. This mythology emerges from technical scientific possibilities that justify fictional ideas which subsequently become presented as truths that reinforce existing public anxieties and apprehensions. Thus, as the line between reality and social science fiction becomes blurred then 'what we already fear can now thrive in the new space provided by the internet' (Furedi 2002, p. 34). Central to this 'culture of fear' is 'the belief that humanity is confronted by powerful destructive forces that threaten our every day existence' (Furedi 2002, p. vii), which is quite startling when the unprecedented high levels of personal security that now exist in Western societies are taken into consideration.

It is argued in this article that social science fiction contributes to the framing of the cultural frameworks and mythologies that configure our discussions about cybercrime, and in so doing structures our expectations of it in terms of what we expect it to look like. The subsequent text therefore explores the curious relationship between new technologies and social science fiction to map out their influence upon the production of knowledge about cybercrime. The first part looks at the conceptual origins of cyberspace and cybercrime in social science fiction print and audio-visual media. It illustrates how dystopic- and utopic-simulated realities represented in networked worlds not only shape broad public reactions to technological change (the Futureshock and the emergence of a culture of fear) but also public expectations about online risk. The second part maps out and responds to the resulting myths and mythologies about cybercrime. The third and concluding part of the article briefly discusses the tensions in knowledge production that need to be overcome to demythologise cybercrime.

The conceptual origins of cybercrime

The term 'cybercrime' symbolises online insecurity and risk and it is widely used today to describe the crimes or harms that are committed using networked technologies. 'Cybercrime' is relatively meaningless by itself because it is mainly a fictional construction that has no original reference point in law, science or

social action. It also tends to be used metaphorically and emotively, rather than rationally, to express ambivalent and general concerns about hacking. The term is, however, gradually entering formal legal terminology due to the harmonising influence of the 2001 COE Cybercrime Convention (ETS No. 185), to describe computer misuse legislation. For example, in Australia (Cybercrime Act 2001), Nigeria (Draft Cybercrime Act) and the United States (proposed Cybercrime Act 2007). The issue is that many of the so-called cybercrimes are not necessarily crimes in criminal law, nor are they variations of traditional forms of offending. If we could turn the clock back in time then perhaps the term 'cyberspace crime' would have been a more accurate descriptor. However, merits and demerits aside, the term 'cybercrime' prevails as the accepted term (Wall 2007, p. 10).

Cyberpunk literature – from meatspace to cyberspace and meatcrime to cybercrime

Much of the conceptual baggage that 'cybercrime' carries can be traced back to the cyberpunk social science fiction literature of the 1970s and 1980s. Cyberpunk authors combined cybernetics with the sensibilities of the contemporary punk movement to form a genre of science fiction that thematically joined ideas about dystopic advances in science and information technology with their potential capability to breakdown the social order. As Person (1998) observes

> Classic cyberpunk characters were marginalized, alienated loners who lived on the edge of society in generally dystopic futures where daily life was impacted by rapid technological change, an ubiquitous datasphere of computerized information, and invasive modification of the human body.
>
> (Person 1988)

The cyberpunk leitmotif was essentially a 'hi-tech but low-life' aesthetic and the 'Classic cyberpunk characters' described by Person became a social blueprint for the hacker stereotype.

The term 'cyberspace' appears to originate in William Gibson's 1982 highly influential short story 'Burning Chrome' about the hacker group 'Cyberspace Seven' (Gibson 1982).[1] The short story was published in *Omni Magazine*, a science fiction meets hard science forum that existed between 1978 and 1998[2] and which promoted explorations into cyberpunk. Along with other science fiction forums, novels and films during the 1980s, *Omni*, contributed to the progressive definition of virtual 'cyberspace' as a contrast to the physical environment or 'meatspace' (Gibson 1984) and the linkage between cyberspace and crime was just another short step. Having said this, the linkage has been somewhat confused by the evolution of two quite different visions of cyberspace that are usefully delineated by Jordan (1999, pp. 23–58). Gibson's original symbolic

vision of cyberspace sees individuals shift their consciousness from their 'meat-space' into 'cyberspace' a la *The Matrix*, leaving their physical bodies or 'meat' behind. Whereas, the John Perry Barlow's hybrid (Barlovian) vision combined Gibson's concept with real-world experience to join image with reality (Jordan 1999, p. 56; Bell 2001, p. 21). The product was an environment that could be constitutionalised (Barlow 1996). This alternative vision of cyberspace is, after Sterling (1994, p. xi), a place that is not inside the computer or inside the technology of communication, but in the imaginations of those individuals who are being connected. Although imaginary, it is nevertheless real in the sense that the things that happen in that space have real consequences for those who are participating.

The actual point of origin of the term 'cybercrime' is unclear, but it seems to have emerged in the late 1980s or even early 1990s in the later cyberpunk print and audiovisual media.[3] However, the linkage between cyberspace and crime was implicit in the early cyberpunk short stories by William Gibson, Bruce Sterling and Bruce Bethke[4] and many others. The cyberspace-crime theme was subsequently taken to a wider audience in popular contemporary novels such as Gibson's 'Sprawl' trilogy of *Neuromancer* (1984), *Count Zero* (1986) and *Mona Lisa Overdrive* (1988) and Stephenson's *Snowcrash* (1992).[5] Cyberpunk effectively defined cybercrime as a harmful activity that takes place in virtual environments and made the 'hi-tech low-life' hacker narrative a norm in the entertainment industry. It is interesting to note at this point, that whilst social theorists were adopting the Barlovian model of cyberspace, it was the Gibsonian model that shaped the public imagination through the visual media.

Haxploitation movies

Cyberpunk was very popular within the social science fiction community, but its audience was nevertheless relatively small and cliquish. The cultural fusion of cyberspace and crime into mainstream popular culture was largely due to the second and third, of three generations of hacker movies into which some of the cyberpunk ideas dripped. The first generation had conceptually predated cyberpunk, but demonstrated to a wider audience the use of computers to 'hack' into infrastructural systems – these include the *Billion Dollar Brain* (1967), *The* (Original) *Italian Job* (1969), *Superman III* (1983) and *Bellman and True* (1988). In these movies the 'hackers' tended to be portrayed as male, fairly old and usually somewhat comical or eccentric, see, for example, Benny Hill as Professor Peach in *The Italian Job* and Richard Pryor as Gus Gorman in *Superman III*.

The second generation of hacker films, in contrast to the first, were clearly defined by cyberpunk ideas and focused on the hacker rather than the hack. The earlier of the second generation films romanticised the guile of the hacker as a penetrator of inter-connected computer systems. These films consolidated the 'hacker' stereotype which endures to this day of a disenfranchised, misunderstood

genius teenage male who uses technology to put wrongs right whilst having a 'coming of age' experience and some fun in the process. The films include *War Games* (1983), *Electric Dreams* (1984), *Real Genius* (1985), *Weird Science* (1985) and *Ferris Bueller's Day Off* (1986). The later second generation films were a little more sophisticated in that the hackers they depicted tended to use the Internet, or an imaginative sci-fi equivalent. The focus also shifted from portraying hacks across communication networks to hacks in different types of new virtualised environments, with hackers still young(ish) and male (though not always) and less likely to adopt moral high ground than in earlier films. They include *Die Hard* (1988), *Sneakers* (1992), *Goldeneye* (1995), *Hackers* (1995), *The Net* (1995), *Johnny Mnemonic* (1995), *Independence Day* (1996), *Enemy of the State* (1998), *Takedown* (2000), *AntiTrust* (2001) *Swordfish* (2001) and *The (new) Italian Job* (2003).

The third generation of films were defined by both the hacker and the hack being within virtual environments and are epitomised by *The Matrix* (1999) and its derivatives. The basic concepts behind *The Matrix*'s screenplay can be traced back to Gibson's separation of cyberspace from meatspace, but also social philosophy. Jean Baudrillard's ideas about Simulacra and Simulation are supposed to have inspired the films' producers and writers and shaped the construction of the narrative. Although, true to his form, Baudrillard is reported to have curmudgeonly retorted that he thought the producers and writers had misunderstood his work (see Hanley 2003). Observant viewers of the 'follow the white rabbit' scene in *The Matrix* will have noticed that Neo stores his computer disks in a hollowed out hardback copy of *Simulacra and Simulation* (Baudrillard 1994).

The dystopic conceptual linkage between crime and cyberspace has been further exploited in 'haxploitation' print and audio-visual media. Coined by internet journalist John Leyden (2001, 2007), 'haxploitation' defines a genre that deliberately exploits the public fear of hackers for entertainment (my definition). However, in recent years there has been a noticeable shift away from, what had become, the traditional hack narrative that emphasised the hacker's power over the state and society along with the humiliating public exposure of the state's impotence in the face of the hacker. Instead, the new haxploitation narrative erodes the boundaries between the individual hacker and the state to re-express its dominant norms and effectively redress the perceived power imbalance found in the earlier movies. Moreover, in the new narrative there is a clear reversal of the roles so that the state itself effectively takes over the prime hacker role in order to suppress its more deviant and dangerous subjects. See, for example, movies such as *Die Hard 4.0.*, where the state hits back, along with some help from an ethical, or white-hat hacker, or *Enemy of the State* where the state hacks the individual when driven by rogue elements. The 'factional' images described, skilfully combine fact with fiction, and have crystallised the 'super-hacker' offender stereotype as the archetypal 'cybercriminal' (Wall 2007, p. 16).

What makes these various 'hack'-related sources of visual and textual imagery significant is that 'contemporary movie and media imagery subconsciously orders the line between fact and fiction' (Furedi in Wall 2007, p. 16). So much so that Roger Burrows (1997) argued in his ground-breaking article on 'Cyberpunk as Social Theory' that not only has the Gibsonian concept of cyberspace transmuted into a tangible reality, but his (Gibson's) technological vision has also fed back into the theory and design of computer and information systems. Furthermore, despite the contradictions between the different visions of cyberspace, Gibson's fictional perspectives on cultural, economic and social phenomena have also begun to find their way into social and cultural analyses as viable characterisations of our contemporary world (Burrows 1997). Yet, as outlined earlier it was the hybrid Barlovian model of cyberspace, rather than the pure Gibsonian vision, that has actually found the greater purchase with social theorists, especially in thinking about cybercrime. Because if cyberspace is also a space in which criminal intent can be expressed as action, then the extent to which harmful acts are mediated by networked technologies therefore becomes a useful measure of whether or not an act is a true cybercrime or not. When the range of harmful activities that are tagged as cybercrimes are explored (see Wall 2007), some are found to be familiar forms of offending, but others not. However, when they are assembled in terms of the extent of mediation by networked technology then three distinct generations of cybercrimes can be identified that can exist simultaneously – which may explain some of the apparent differences of opinion in definition (see Wall 2007, pp. 44–48). The first generation are traditional crimes where a computer has been used peripherally in the offending. If you take away the internet then the same crimes will still take place. The second generation are hybrids which are traditional forms of offending for which new global opportunities have emerged. Take away the internet and they simply reduce in number and become more localised. The third generation are those patterns of offending that have been created by networked technologies and disappear when the internet is taken away.[6]

Dystopias and futureshocks

The contemporary, though now traditional, science fiction hacker narrative is, surprisingly, neither unique nor innovatory. Quite the opposite, in fact, because it tends to conform to a character type that originated in Victorian science fiction, namely, a person who constructs or appropriates technological inventions in order to give them extra-human power to wield control over others. It is as popular now as a core theme of science fiction as it was a century or more ago. See, for example, the science fiction novels of H. G. Wells[7] and others, which were written during a time of great social upheaval caused by technological innovation, and which described worlds that had been transformed, but also threatened by new and potentially oppressive technologies. This tradition continued through

to the cyberpunk of the present day via the works of Brian Aldiss, Aldous Huxley and contemporaries. Indeed, at the centre of most of these works was the 'savant', a learned person of profound knowledge who could utilise technology to his or her (usually his) advantage for good or bad. However, it is the potentially dystopic power that the savant can wield through technology that makes them so much more interesting as a science fictional character. The 'savant' was, in effect, the Victorian equivalent of the hacker.

The different science fiction genres not only strengthened the modern 'hacker' narrative by emphasising the technological power binary (powerful versus non-powerful), but more generally they also helped to strengthen existing post-war cultural reactions to techno-social change. Interleaved with science fiction, for example, was the social science fiction novel, of which the most well-known example was probably Orwell's now, classic work *Nineteen Eighty Four* first published in 1949 (Orwell 1990). Orwell captured the post-war zeitgeist by combining ideas about technological change with contemporary political events and social theory in order to describe a dystopic future in which state power was augmented by technological innovation.

Nineteen Eighty Four and its literary offspring served to heighten cold-war anxieties about the potentially dystopic power of technological invention and also fed these ideas back into social theory. Toffler's *Futureshock* (1970), for example, draws upon the dystopic themes to describe how fear of the future tends to rear its head whenever there is a significant period of technological transformation. More recently, Furedi (2002) and others have described the prevailing *culture of fear* which is a sort of ideological fear of fear, that leads to exaggerated public expectations of, amongst other things, crime and danger, which is felt regardless of whether any actually exist. Such process is not far from Garland's 'crime complex' whereby public anxiety about crime has become the norm and now frames our everyday lives (Garland 2001, p. 367), so that we expect crime to exist regardless of whether it actually does, and we are shocked, and even panic, when we do not find it! Garland (2001) and Simon (2007) have suggested that governments and policymakers tactically use prevailing fears of crime to control a broad range of risks.[8] That this tactic should also be used with cybercrime is of no surprise. Taipale has argued that the fear of technology, what he calls 'Franken-Tech', now exists because the 'public debate on complex policy issues is often dominated by information entrepreneurs (including activists and the media) who attempt to engender information cascades to further their own particular agenda' (Taipale 2006, p. 153). Because the resolution of 'issues' takes place 'in situations where the manageable risks are inflated or misunderstood' (Taipale 2006, p. 153), then unnecessary levels of public anxiety can result in resource managers being pressurised into misallocating (usually public) resources.

The gap that inevitably emerges between the expected threat and the provision of security, displayed, for example, by the disparity between reporting and prosecution as illustrated earlier, is a *reassurance gap* (Innes 2004) that

clearly needs to be closed. The need for reassurance typically becomes expressed in the form of public demands for more law and 'police' action which, of course, the police find hard to provide because not only is the factual basis of the demands flawed, but police funding models are usually determined by responsive routine activities based upon the 170-year-old Peelian model of policing dangerousness (Wall 2007, p. 161). This Peelian model remains similar in principle to its original form in the late 1820s, even though it now exists in more complex late-modern societies.

The upshot of the argument so far is that the uncritical coupling of the social science fiction driven hacker narrative with the ambiguous scientific conceptualisation of networked virtual space, viewed in terms of a traditional Peelian crime and policing perspective, against a dystopic social science fiction backdrop distorts perceptions of the reality of cybercrime. The conceptualisation of cybercrime in social science fiction as dramatic, futuristic and potentially dystopic proscribes public expectations of cybercrime as above the capabilities of normal folk, as sensational, disempowering victims and being beyond the scope of state protection (e.g. policing). When these perspectives are placed against a backdrop of contemporary cultural reactions to technological change, then they create the circumstances right for the creation and maintenance of mythologies.

Myths and the construction of cyberfear – rhetoric versus reality

The distortions described earlier are reflections of, and also reflect upon, the ways that incidents of cybercrime are reported in the news, which has the knock-on-effect of reinforcing existing (cyber) fears. News reporting tends to simultaneously feed the public's lust for 'shocking' information, but also feeds off it – the relationship is dynamic rather than causal. This endless demand for sensationalism sustains the confusion of rhetoric with reality to create, what Baudrillard described as 'le vertige de la realité' or 'dizzying whirl of reality' (1998, p. 34). By blurring predictions about 'what could happen' with 'what is actually happening' the message is given by various media that novel events are far more prevalent than they really are. Once a 'signal event', such as a novel form of cybercrime, captures media attention and heightens existing public anxiety then other news sources will feed off the original news story and spread virally across cyberspace. In such manner, relatively minor events can have significant impacts upon public beliefs compared with their actual consequences, especially when they result in panics and moral panics (Garland 2008). Furthermore, although signal events may not necessarily constitute a major infraction of criminal law, or necessarily a minor one, their outcome is that they 'nonetheless disrupt the sense of social order' (Innes 2004, p. 151). By capturing the public and media's attention they exert 'a disproportionate impact upon beliefs

and attitudes when compared with their "objective" consequences' (Innes 2005, p. 5), raising levels of (cyber) fear and sustaining internet mythology.

For a simple practical illustration of the way that one news item can spread across the internet, the reader should type the term 'haxploitation' (mentioned earlier) into the Google search engine. Whilst 'haxploitation' is not a crime signal event, it is a unique word with a distinct origin and is therefore easy to follow on the internet in order to illustrate the point being made here. Leyden mentioned the term in his August 2001 article and then again in another in December 2007, and seemingly no where else. On the 30 January 2008, 45 of the first 100 hits were direct reproductions of Leyden's 2007 news item.[9] Consequently, many (possibly hundreds) of news outlets have subsequently fed off these few sources, and judging from the large incidence of direct copying of the original text it would seem that in some cases this process may even be automated. In this way, information begins to flow virally across the internet. What tends to happen with the more dramatic incidents is that they subsequently get transmitted across blogsites as comment, which is then responded, or rather reacted to, thus creating new sources of news on the same topic.

Over the past two decades a number of internet-related urban myths have established themselves as common wisdoms with the effect of not only distorting our understanding the present, but also a new range of emerging issues, even though any factual basis that contributed to their initial creation may long since have disappeared. A paragraph from the abstract of the House Of Lords Science and Technology select committee report conveniently encapsulates much of this dramatic mythology.

> But the Internet is now increasingly the playground of criminals. Where a decade ago the public perception of the e-criminal was of a lonely hacker searching for attention, today's 'bad guys' belong to organised crime groups, are highly skilful, specialised, and focused on profit. They want to stay invisible, and so far they have largely succeeded. While the incidence and cost of e-crime are known to be huge, no accurate data exist.
>
> (House of Lords 2007, p. 6)

An otherwise informative report, the phrasing of this paragraph embodies a range of assumptions and prevailing myths: that cybercrime is dramatic; the internet is pathologically unsafe and criminogenic; hackers are all powerful 'bad-guys'; hackers have become part of organised crime; hackers are anonymous, they cannot be tracked, they go unpunished; there is no reliable data. And almost unsaid, is the implicit assumption that individual users cannot be trusted and need to be protected from themselves and others. With the exception of the point about reliable data which is dealt with later, they are unpicked and explored below, along with responses and also some of the new issues which they obfuscate.

Cybercrime is dramatic, futuristic and dystopic

One of the main problems with maintaining this view is that true cybercrimes actually lack the drama of conventional crime. Whilst there exist three distinctly different types of cybercrime, for example, crimes that attack computer systems, crimes that use computers to commit crimes, crimes related to the content of computers, they are mainly small impact, bulk victimisations that are informational, global and networked. Generally speaking, they tend to be dramatic in their aggregate rather than individually, which is one of the main challenges for those charged with resolving them (see Wall 2007, pp. 52–159).

Cyberspace is pathologically unsafe and criminogenic

The sheer volume of millions upon millions of person to person, person to business, business to business, government to person and business transactions that take place simultaneously is testament to the fact that the internet is currently working. Against these numbers, even the wilder estimates of levels of cybercrime would still be relatively minor. Plus, for the most part, a good quality regularly updated security product combined with discretionary usage will drastically reduce levels of risk to the user. Despite this, there remains an underlying public concern, propagated by media reportage and adverse commentary, that the internet is not only criminogenic, but also downright dangerous and culpable. On the day of writing these sentences, for example, a mini internet panic occurred over whether or not social networking sites romanticised suicide. This panic had been sparked following the heartbreaking suicides of seven (13 in total) young people in South Wales (BBC 2008a). The local MP and others quickly and publicly blamed the internet, and the police announced that they were conducting an investigation. Without any concrete evidence demands were made for inquiries into social networking sites, police investigations and legislation to make internet service providers and host sites more legally responsible. Interestingly, the BBC asked for comments on the question of whether or not social networking sites romanticised suicide and of the 100 published comments most disagreed and did not think that the internet was to blame; only a small handful were in agreement (BBC 2008b). The coroner who subsequently investigated the deaths said that he did not believe them to be linked (BBC 2008e). The same day 'virtual worlds' such as Second Life took over as the concern du jour after US intelligence analysts identified them as potential recruiting grounds for terrorists (O'Harrow 2008, p. D01).

A recent hacking prosecution also usefully reveals the extent to which cyberspace is considered to be pathologically vulnerable to attack. An Estonian man was prosecuted in January 2008 for conducting a 'cyberwar'. Between April and May 2007 he had blocked the website of the Reform Party Prime Minister as one of a series of hacks on Estonian institutions and businesses (BBC 2008c).

The immediate political and media response was to assume that something more sinister and organised was afoot. In this case, the Russian government was blamed for hacking into the websites, without any supporting evidence (BBC 2007f). The Russians strongly denied involvement, which, of course, until the facts were presented in court also served to strengthen the myth.

Perhaps the greater risk is not so much direct purposeful threats, but accidental damage; for example, in January 2008 many internet connections throughout the Middle East were severely disrupted when a submerged cable was allegedly damaged by a ship's anchor (BBC 2008d). Another area of risk to networked systems is its management and the ability to securely manage the large amounts of critical information that are contained within it, especially when concentrated within one source, such as a database. Again, purposeful attacks are only one aspect of the overall risk. The issue of information management came into the spotlight in November 2007 when CD-ROM disks containing personal information of 25 million child benefit claimants were lost in postal (not electronic) transit from one public agency to another (BBC 2007b). The resulting panic not only brought to light other losses (BBC 2007d; 2007e), but it has also illustrated how potentially vulnerable such concentrations of data are and how important security policies are to the politics of personal security. At the time of writing no evidence has yet been presented to suggest that any of the missing data has caused loss through fraud – although there could be a long delay before any frauds are detected and there exist reasons why they may not be reported.

In addition to outlining potential vulnerabilities, the data losses also emphasise the importance of maintaining existing security policies when critical functions are increasingly being outsourced, especially the security of public data when it is shared across the public and private sectors. Yet, these possibilities should also be part of information management plans. What these incidents highlight most of all is that all informational activities within cyberspace will carry risks, as they do in the terrestrial world, and such risks have to be identified and remedied, however, as the events in the United Kingdom have illustrated, the risk lies more in human failings than in the virtual environment.

The omnipotent super-hacker

The super-hacker stereotype is found just about everywhere from cyberpunk to haxploitation and features prominently in policy debates about cybercrime. Hackers have long been renowned and even feared for their expert knowledge of the workings of communications systems and many folk would still believe that they can make planes fall from the sky and interfere catastrophically with aspects of the critical infrastructure. Nissenbaum (2004) has argued that the reconstruction of the public image of the ethical hacker from one-time folk hero to miscreant, vandal, criminal and more recently, terrorist, has occurred not as the result of a direct and rational public debate about conflicting ideals and

interests, but through 'an ontological shift mediated by supportive agents of key societal institutions: legislative bodies, the courts, and the popular media' (Nissenbaum 2004, p. 195). The mythology surrounding the super-hacker not only assumes that their expert knowledge and cunning skills give them 'access to all areas', but once their moral bind has eroded and they go over to the 'dark-side' then they become a danger to society. Ohm (2007) has observed that the cybercrime expert discourse is replete with the construction of super-hackers (he calls them 'superusers'). These 'mythical' super-hackers are assumed to be immune from technical constraints and aware of legal loopholes, and are therefore greatly feared by policymakers. Policymakers, whom, Ohm argues, exaggerate their power and too often, overreact by 'passing overbroad, ambiguous laws intended to ensnare the Superuser, but which are used instead against in culpable, ordinary users' (Ohm 2007, p. 1). So, how robust is the myth of the super-hacker?

For many years, the face of the super-hacker was Kevin Mitnick until he was eventually caught and jailed. His own account (Mitnick & Simon 2002) usefully deconstructs his own myth. His account reminds us that at the height of hacker mystique in the 1980s and 1990s overall levels of security were much lower than today. It was not uncommon at the time, for example, to find systems with a default user identity of 'Admin' being accompanied by the password 'Admin'. Where security was tighter, the majority of deep level penetration was and still is the result of 'social engineering' – persuading those in low-level occupations within an organisation to reveal their access codes (Mitnick & Simon 2002). The evidence from the literature suggests that hackers tend to focus their efforts upon easy victims or 'low hanging fruit' (Ortega 2006, p. 6).

Yet, the super-hacker/superuser myth continues to prevail and in January 2008 a former intelligence analyst claimed in a paper that crackers had caused major power blackouts in order to blackmail foreign governments (Leyden 2008), a story that could have come straight from the pages of a social science novel. As is frequently the case, responses are divided between those who believe such statements and the growing army of sceptics. Rosenberger, one of the more vociferous cyber-sceptics, critically questions the evidence for this and other similar statements (Rosenberger 2008). Furthermore, Leyden (2008) argued that evidence for similar attacks on utilities are thin on the ground and cited as examples three cases of attacks against utilities running Supervisory Control and Data Acquisition (SCADA) systems which work on (usually corporate) networks and are therefore potentially 'hackable' from within those systems. They include an Australian case in early 2000 where a disgruntled ex-employee hacked into a water control system to wreak revenge by flooding the grounds of a hotel with a million of gallons of sewage. In 1999, malicious Russian hackers took control of a Gazprom[10] gas pipeline for a day, and finally there was a case in early 2003 where a Slammer worm interfered with the running of the corporate network at an inactive nuclear plant in Ohio and in

so doing disabled a safety monitoring system for some hours (Leyden 2008). Although potentially serious, none of these examples were thankfully catastrophic and were seemingly not intended to be. There is also a question over whether they could be catastrophic if the intent were there because of the widespread existence of national infrastructure protection plans. Such plans include airgaps between the internet and critical systems and most nations now have them in place, precisely to reduce their risk of falling victim to attack.

Sommer argues that the (super)hacker myth today is little more than 'an amusing diversion and [no longer] an opportunity to dust down 20-year old clichés about teenage geniuses' (Sommer 2004, p. 10). Ironically, although still present, the super-hacker myth contrasts with a new style of automated hacking (Wall 2007, p. 150) that is potentially more potent in the way that it casts a wide net for victims by using malicious software such as viruses, worms that install remote administration software, key-stroke loggers, spyware and so on. These tools are unwittingly downloaded onto computers through spam, deceptive emails or from fake www sites (drive-by downloads). Once activated, the software enables others to obtain access codes, and even use the computers remotely via botnets (networks of infected computers [Wall 2007, p. 150]). Consequently, identity theft and account take-over is now of great concern, though it is mostly related to collecting information as a precursor to fraud rather than what we conventionally understand as hacking. It is not the result of a direct hack attack, but an electronic trawl or 'phishing' expedition. In terms of news values, the new style 'hack' has neither dramatic impact nor is it carried out by a troubled genius. However, once the impact of ID theft is felt beyond the credit card and its attendant bank guarantees then the intrusion into one's life can become extremely invasive – a spectre that has the hallmarks for spawning a new series of myths.

Hackers have become part of organised crime

The alleged link between hackers and organised crime has long been made but has always lacked conclusive proof. It is a link that is hindered by differences in legal definitions of organised crime which range from three to four individuals temporarily working together to commit a crime, to massive international 'mafia' organisations with clearly defined lines of command and control – *cyberpunk* meets *The Godfather*. Predictably, the terminology of internet mafia, digital mafia, or hi-tech crimes gangs is frequently used to invoke imagery of the latter rather than the former (see Lewis 2007; Ward 2008).

In her interesting study on organised criminal activity on the internet, Brenner predicted that it would more likely manifest itself in 'transient, lateral and fluid' forms, as networks of criminals (Brenner 2002, p. 1) rather than replicate the 'gang' and hierarchical American 'Mafia' models of organised criminal activity found offline in the terrestrial world. Mainly because they evolved largely in response to real world opportunities and constraints that

are largely absent in cyberspace. In support of Brenner's 2002 prediction, there have since been a number of examples of the emergence of new forms of online criminal organisation, but they differ greatly from the mafia model. The first is the finding in 2004 by a German Magazine *C'T*, following the botnet explosion in 2003/04 that virus writers had been selling the IP addresses of computers infected with their remote administration Trojans to spammers (*C'T* 2004). The second was in June 2005 when the National Infrastructure Security Co-ordination Centre (NISCC) warned users about 'a highly sophisticated high-tech gang' reputed to be located in the far-East using various means, including botnets, to infect sensitive computer systems to steal government and business secrets (NISCC 2005; Warren 2005). The final example is 'Operation Firewall' which led to the investigation and prosecution of 'shadowcrew', an international identity theft network which hosted online forums that shared information about stealing, trading and selling personal information that could be used to commit frauds. The various reports of the investigation and prosecution illustrate how different the groups were in terms of their networked organisation. The head of e-crime at SOCA[11] observed that the Shadowcrew worked 'remotely, without ever needing to meet', which is 'typical of how the new e-crime networks operate compared to the old-style "top down" organised crime groups' (Rodgers 2007). These groups have a very detailed division of labour with specific skill sets rather than the 'usual pyramid structure'. One person would provide the documents, 'another would buy credit card details, another would create identities while another would provide the drop address' (Rodgers 2007). The key difference is its networked structure and global reach (see BBC 2007c; Goodin 2007a, b). Together both examples detail the relatively new forms of networked criminal organisation that depart from traditional thinking about hierarchically organised crime.

Criminals are anonymous and cannot be tracked

Whilst it is true that individuals can use false identities to go online – as they can also do in the terrestrial world – one of the more stunning and frequently overlooked features about networked technologies is that every move online can be tracked and the 'mouse droppings' as they are called, leave a data trail behind. The issue is therefore not so much one of anonymity, but rather one of investigators having the human and technological resources available to follow the digital trail. See for example, the case of the 'Shadowcrew' investigations mentioned earlier. The members of the crime ring had never met in person, thinking that their participation was anonymous. But it had been penetrated by the US secret service and the UK's SOCA who had tracked their activities both electronically and remotely (Wall 2007, p. 80; Rodgers 2007; Parizo 2005). We are actually witnessing the 'disappearance of disappearance' (Haggerty & Ericson 2000, p. 619) because we cannot hide any more, only disguise immediate

identities and even then our online behaviour patterns leave algorithmic 'signatures' that can allegedly be traced with the right technology and resources.

Criminals go unpunished and get away with crime

The low reporting to prosecution rate mentioned earlier (also see Wall 2008) could be interpreted to suggest that there is some substance to this statement. But, low reporting to prosecution rates are to be found with nearly all aspects of crime, terrestrial or online. What is being overlooked here is that cybercrimes have some different qualities that set them apart from traditional forms of offending. Research into offences reported to and recorded by the police found very few related to the internet (Wall 2007, p. 164). Furthermore, not only is the nature of cybercrime victimisation considerably different (see later) because there are more of them and over a broader area, but, the example of 'Operation Bot Roast' (BBC 2007c) which brought down a massive botnet, suggest that there are possibly fewer offenders than anticipated as the technologies give criminals such a wider and globalised reach.

Users are weak and therefore need to be protected from themselves

There seems to be an implicit assumption within the computer security community that users have to be protected from themselves, to prevent them from becoming either victims or offenders. This is a view that appears to run counter to the findings of the British Crime Survey and Offending, Crime and Justice Surveys (Allen *et al.* 2005; Wilson *et al.* 2006) which found relatively little personal victimisation and offending. The prospect of active third-party intervention to protect users also runs against the original end-to-end principles of the internet which favoured open communications with end users making the choices as to what to send and receive (Saltzer *et al.* 1984). Please do note, however, that there are some vulnerable groups in society, namely new users, cognitively impaired and others, and that novel forms of victimisation also catch users out, the point being made here is that most users tend to be aware of the risks that they face.

Intertwined with the innate distrust of internet users is the fairly widespread view that not only does the internet place individuals at risk, but it can also corrupt normally law-abiding individuals who go on a moral holiday when on the internet. The internet certainly broadens internet users' life experience and exposes them to a range of social activity that may be outside the confines of their everyday life. But the evidence from research into the moral usage of the internet (Walker & Bakopoulos 2005, and also others) suggests that the greater majority of individuals tend to take their social values with them online. Virtual environments, for example, are increasingly becoming places where all kinds of social relations are being simulated or tried out before participants venture into 'meatspace' (see Wall & Williams 2007). The findings of

research into online dating suggest that such relationship building can be positive and not as risk prone as pundits have suggested. In 2005, a University of Bath-led survey by Gibbs *et al.* (2006) studied 229 people aged 18 to 65 who used UK internet dating sites to find that 94 per cent of them went on to see each other again (University of Bath 2005). Yet, this sort of positive interaction tends to be treated with much suspicion, even derision, and the negatives, such as the potential for online grooming never seem to be far away from the surface of the discussion. We really must not lose sight of the fact that individual users should and do take responsibility for their actions and, rather controversially in light of some of the security reports, the internet is remarkably ordered if you consider the sheer number of users and the immense volume of transactions that take place on it.

This critical appraisal of prevailing assumptions is important in an information age in which technological development and its associated thinking changes very rapidly. We have to continually subject our conventional wisdoms to critical appraisal, because an acceptable position, say, even two or three years ago may have changed by the current time. Such appraisal is an important tool in the dispelling of myths, because they are at their most destructive when they triumph over reason (Trevor-Roper 1972, p. 259). Worse still, once embedded in local culture they become self-perpetuating. Understanding change as it happens around us requires new types of methodological thinking and is a challenge to be faced. After all, the last sentence of the paragraph cited earlier from the House of Lords select committee report does imply that the statements are not based upon 'accurate data'.

Demythologising cybercrime

One of the principal reasons why internet myths persist is that major tensions currently exist in the ways that knowledge about cybercrimes is produced and which need to be resolved in knowledge-producing cybercrime research strategies (see further Wall 2007, p. 13; 2008). We find, for example, that there are a number of independent and often conflicting discourses simultaneously talking about cybercrime. Lawyers, administrators, police, criminologists, the many academic disciplines, security experts, computer scientists, information officers and the lay person each have a slightly different take on the subject and each tell their own stories. Furthermore, the way that news is generally disseminated has changed because of networked technologies. There are now so many different networked news sources that it has become disintermediated (see Sambrook 2006). Editors do not exercise the overall level of editorial control over the news process that they once did so that information sources are arguably no longer subjected to the same balances and checks.[12] Similarly, statistics about cybercrime are also disintermediated because there are no

longer any central and formalised points of collection (e.g. police), so there are fewer commonly applied standards with fewer checks on information quality – which can result in misinformation. The primary source of statistical information tends to be specifically produced by the cybercrime security industry for its own purposes and subsequently generalised or simply misinterpreted in the reporting process (see e.g. BBC 2007a; Symantec 2007).

So, there arises the curious phenomenon of, on the one hand, the over-reporting of cybercrime statistics that represent breaches of scientific rules on individual computers that have been identified by proprietary commercial software that returns the data to its central server. Whilst on the other hand there is the simultaneous under-reporting by victims of offences that should ordinarily be reported to police, but are not because of the unique informational, networked and globalised qualities of cybercrimes. The loss of personal information through identity theft, for example, may only be considered a victimisation when an actual financial loss later occurs. Alternatively individuals may be embarrassed to report their victimisation, their loss may be small, the dangers posed may not be immediately evident may not be regarded as serious by the victim, or the loss may genuinely not be serious. Alternatively, it may be the case, as with credit card frauds, that police refer reportees back to their banks who are viewed as the real victims (Wall 2007). Where the victims are corporate entities, such as banks, reporting losses may expose a commercial weakness and threaten their business model, which raises clear conflicts between the private versus public justice interest with regard to cybercrimes.

Conclusions

Social science fiction has, within the space of a few years, excited an information generation, aggressively embraced networked technologies and made them its own. The information generation's resonance with the various 'factional' depictions of cyberspace, cyberpunk and cybercrime has enabled them to define their identity in late-modern society. The internet's global reach, combined with its easy accessibility, made the information generation feel different – as though they were all hackers. It made them feel free to explore, to roam freely, see and experience new things in what seemed to be a new public commons.

The price of that freedom is not cheap, because there has been an inevitable increase in risks to the individual, but also the increasing need for individuals to be more responsible in their dealings with co-users. Another 'cost' of maintaining those freedoms is the need to engage with the various myths outlined earlier that impede progress. The online policing job, for example, is made that much harder by the conceptual flaws outlined earlier, because cybercrimes do certainly exist, but not in the forms that conventional wisdoms about crime dictate. If the myths and distortions currently shaping internet policing and reform debates are

not arrested soon, then the benefits of cyberspace will be lost to us all. The need to correct these distortions is made all the more urgent because of the worrying possibility that the networked technologies which create freedoms might turn into a dystopic super-panopticon that might work against us. Especially as the networked technologies that create virtual worlds are increasingly permeating our physical world. Wireless, ambient (AMI) technologies, for example, are increasingly linking domestic household, business and leisure devices to assist the individual and improve their quality of life by automating many routine chores (Wall 2007, p. 219). These also provide potential new crime opportunities – a fourth generation of cybercrime perhaps?

In this post-cyberpunk world where new technologies shape the social and the social shapes new technologies the lines between science fiction and science fact become more and more blurred. Social science fiction has for a long time provided social analysts with an academically coherent 'dystopic vision of a very near future, which is about to collapse on the present' (Burrows 1997). Of current concern is the observation by Burrows that, whether intentional or not, Gibson's cyberpunk fiction is now coming full circle because it is being read as social and cultural theory, rather than simply reflecting it. Although Gibson writes excellent fiction, it is fiction, and it is Barlow's hybrid vision that arguably provides the more robust 'factional' basis for theory building. This observation emphasises the need for good quality information, because it not only makes for informed debate and policy-making, but it arguably feeds back into the literary process which has a close relationship with the formation of science fiction ideas. We are at the beginning of a new chapter of 'the social' in which hypothetical risk and the culture of fear plays a dominant role, a social in which, to paraphrase Furedi (2002, p. 34), what used to pass for science fiction is now becoming a statement about society's anxieties. Only by engaging directly with these fears and myths can this trend be arrested and the benefits of what is to come be realised.

Notes

1 Not to be confused with Gibson's 1986 book of his short stories called *Burning Chrome*, though the short story is reproduced at p. 176.

2 There exist a number of competing claims over the origination of the various cyber-concepts, which is not surprising since there was much discussion about them during the 1980s and 1990s because they excited authors, readers and other participants in the discourse. Regardless of the actual attribution, the main point here is to identify the cultural formations and the conceptual links that were made between them.

3 The examples of books and films listed here are intended to be illustrative and not exhaustive, and neither is the choice of media. Print media includes

novels, short story anthologies, poetry, graphic novels or comics, conceptual design, non-fiction or critical studies. Audiovisual media includes cyberpunk films, films with cyberpunk elements, documentary films, TV series, Japanese anime, rock bands, computer and video games, online computer games. Choices of particular media can become very personal and tastes will vary. The object of the exercise is to draw conclusions of types that illustrate change. For a very handy index of science fiction books and magazines see *The Locus Index to Science Fiction.* Available at: http://www.locusmag.com/index/ (30 January 2008).

4 Writer Bruce Bethke is accredited with coining the word 'Cyberpunk' in his 1980 story 'Cyberpunk', see Bethke (1997).

5 Neal Stephenson (1992) refers to the virtual environment as the Metaverse.

6 Central to this theory is the contention that the same technologies which create the crimes can also be used to mediate them in policing and prevention (see further Wall 2007, Chapters 8 and 9).

7 H. G. Wells' better known science fiction novels are *The Time Machine* (1895), *The Island of Dr Moreau* (1896), *The Invisible Man* (1897), *The War of the Worlds* (1898), *The First Men in the Moon* (1901).

8 'Governance through crime' is a criminological discourse that locks into the work of Jonathan Simon (2007) and David Garland (2001).

9 I did not look beyond the first 100 hits. Most of the remaining 55 were also reproductions of only a few sources that used the term.

10 Gazprom is the largest Russian business and also the main extractor of natural gas in the world.

11 See further, www.soca.gov.uk. 'The Serious Organised Crime Agency (SOCA) is an Executive Non-Departmental Public Body sponsored by, but operationally independent from, the Home Office. The Agency has been formed from the amalgamation of the National Crime Squad (NCS), National Criminal Intelligence Service (NCIS), that part of HM Revenue and Customs (HMRC) dealing with drug trafficking and associated criminal finance and a part of UK Immigration dealing with organised immigration crime (UKIS). SOCA is an intelligence-led agency with law enforcement powers and harm reduction responsibilities. Harm in this context is the damage caused to people and communities by serious organised crime'.

12 It must be noted, however, that pre-disintermediated news sources were the subject of criticism for the opposite reasons – that the editors exercised too much control and in so doing applied their own value systems!

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