



**Murdoch**  
UNIVERSITY

**MURDOCH RESEARCH REPOSITORY**

<http://researchrepository.murdoch.edu.au/9309/>

Best, K. and Lewis, J. (2000) Hacking the democratic mainframe: The Melissa virus and transgressive computing. *Media International Australia*, 95 . pp. 207-226.

It is posted here for your personal use. No further distribution is permitted.

## **Hacking the democratic mainframe: (Dis)Organising transgressive computing**

### **Abstract**

As with many of the other 45 000 computer viruses operating across the globe, the Melissa virus constitutes a significant threat to organisational processes. There are two major readings of the Melissa virus's social and political implications - one rejecting its subversive intent, the other celebrating it. In either case, these readings reflect the inadequacy of current theorisations of the relationship between computer networked communication, organisational theory and democracy. A fuller understanding of this relationship, and in particular the culture of hacking, is needed to mediate significant tensions within contemporary culture and politics.

On March 26, 1999, a virus was posted to the alt.sex discussion group. Reputed to be named after a topless dancer in Florida, the Melissa virus was constituted through a convergence of popular, computer and sexual cultures: a cute computer winkey smile, a reference to popular television icon Bart Simpson, an attached list of pornographic sites, and an insatiable appetite for self-reproduction. The business world was soon geared into hyperdrive, some shutting down their computer email systems to purge the virus, others seizing the opportunity to produce and mass market system-saving security software. Interestingly, the virus did nothing other than replicate itself quickly and widely, accelerating communication processes beyond their systemic capacity. The virus, that is, outstripped the organisation's expediting of time and space through a mischievous mimicry of its own commercial imperative, a sort of accelerated meta-drive which impelled the organisation and its communications beyond the brink of chaos.

This clash of technologies indexes some far more substantive cultural, discursive and ideological tensions. Technology, that is, articulates its meanings in terms of significations that resonate throughout the culture. The Melissa virus, in this sense, has been variously conceived in terms of subversive agency, individual creativity, and industrial terrorism. Certainly, the arrest of the virus creator was exalted in the mainstream, global media, though for the subcultures of hacking and Systems subversion the arrest constituted a sort of martyrdom, an apotheosis by which their own seditions could be measured and inscribed. Of course, this polemic camouflages the multiplicity of discursive 'dictions' that surround and inform computer networked communications (see Lewis, 1998). Even so, the polarity of readings of the virus marshals two fundamentally

oppositional conceptions of organisational communication and contemporary democracy.

The first reading of *Melissa* invokes a utilitarian conception of social and cultural processes; democracy is regarded as delegatory, regulated, variously hierarchical and embedded in the basic imperatives of contemporary capitalism. The discourses of this approach are grounded in corporatist interests and the language of current managerial and organisational theories. The meaning of *Melissa*, and the broader cultures of hacking and virus creation, are inscribed within an understanding of criminality, disorderliness, anti-democracy; the virus constitutes a threat to the prevalent ideal of a globally informed utility. Thus, the liberal-democratic ideal conceives of a society which is organised through greater or lesser nodes of 'bit-work' where computer communication facilitates a more comfortable reconciliation of individual and systematised needs and functions (Negroponte, 1996). The continual time/space concentration of the technological communication of information progressively enhances both the organisation of democracy through increased access to information and participation, and the organisation of capitalism in its eternal drive to compress the processes of value, work and commodification. The new networked communication systems harness and direct these values for the successful mediation of individual merits and privileges within a collective stability. *Melissa* hacks into this global utility and undermines it.

A second reading questions the ideological underpinnings of a view such as this which upholds a system that necessarily validates certain relationships of power and certain formations of privilege, denying configurations, differences and pleasures which do not conform to its assumed utility. In response to these deficiencies, the second reading inscribes the virus and its wider hacking culture into an engagement with a form of personalised (Poster 1997, Giddens 1994) or 'visceral' democracy (Lewis forthcoming b). A visceral reimagining of democracy overwrites traditional democratic investiture in upward representation, orderly conduct and the strictures of a humanist ideology with an intensified investment in multiplicity and multiculturalism, the integrity of individual difference, and new and liberated identities, sexualities and pleasures. *Melissa* redeploys the body within and beyond the system for its own trajectories of freedom.

Inevitably, it would seem, the *Melissa* discourses have resolved themselves into an oppositional, even polemical, relationship. Our aim here is to illuminate these discourses through a framework which identifies the ideologies and language formations which constitute the respective poles; secondly, however, we would also seek to illuminate these ideologies and language formations in terms of the cultural conditions that draw the respective discourses into conflict. In particular, we would wish to locate the polemic

within the broader context of contemporary technological culture, articulated through liberal-humanist progressivism on the one hand, and postmodern progressivism on the other. In this sense, liberal-humanism generally seeks its solutions to the multiplicity of individual and collective interests through a fine balancing of delegated power, individualism and organisational formations; postmodernism claims to liberate particulate experiences and pleasures from the inimical effects of systematisation, political distance and the artifice of social order.

Our own framework seeks to advance these articulations through a more complete acknowledgement of the contradictions and multiplicities of language claims (language wars) which constitute contemporary culture. Computer viruses which attack the organisational constituency of contemporary communicative systems are necessarily implicated in these broader political/ideological disputes. This paper doesn't seek to reconcile these disputes, nor do we seek to expose the true identity of the Melissa virus. Rather, through the deployment of a theory of transculturalism (see Lewis 1994, 1997, 1998) the conceptual parameters of computer networked communication may be extended, most especially through the problematic of contemporary cultural politics and the possibilities of reform, democracy and transgression.

### **Digit-disorderly**

The spread of the Melissa virus has taken place in the context of what Stuart Hall has termed the global postmodern (1991). Various cultural commentators have examined this contemporary configuration, as exemplified for instance in Appadurai's description of five 'scapes', envisaged as the flow and counterflow of peoples, finance, technologies, media and ideologies over the surface of the globe (Appadurai 1990; see also Ang & Stratton 1996, Docker 1995). The increasing propinquity of cultures in this maelstrom of compressed information raises questions about changes and impacts in relationships of power and pleasure, in flows and nodalisations of ideology, in formations and deconstructions of knowledge. The effects of this transculturalism might be positive, negative, or a combination of both, and may be mobilised in a variety of ways, as marked out on the terrain of language wars (Lewis 1998, forthcoming a, forthcoming b). Familiar stabilisations in concentrated power and privilege are surely in evidence, as demonstrated for instance by Hall's signalling of the ceaseless ability of capital to transform and morph itself throughout these global scapes. However, we witness also the withering of these concentrations of meaning in the pull of the individual body towards disruption, resistance and non-meaning, and also in the significant tensions within the systematising of organising itself. In effect then, the Melissa virus and the field in which it unfolds probe at

our very processes of organisation: of social and cultural relationships, of personal and institutional formations, of information and communication, of mediating technology. These questions themselves converge on the central problem of the organising of democracy, and on the tensions intrinsic to democratic configurations, particularly the pivotal tension between the individual and the collective (Laclau 1996, Lewis forthcoming).

That we are in the midst of a transforming global arena of some form is undeniable, and the first and most common reading of the Melissa virus, as exemplified in the coverage by the mass media, has not neglected this. However, in this reading, the global postmodern and its implications for the organisation of democracy differ somewhat from those articulated by cultural commentators such as Hall, Appadurai and Lewis. Rather, 'globalisation' is configured as a primarily economic process, organising is understood to be institutional, and representations of the virus assume a transparency unhindered by processes of power/knowledge (Foucault 1981a, 1981b). In a reading which parallels to a close degree discussions of the putative 'post-industrial era' as discussed by Bell (1973) and popular management literature (Drucker 1992, 1993, 1995, Handy 1990, Belden, Hyatt & Ackley 1993, Bridges 1997, Mariotti 1997, Pedler, Burboyne & Boydell 1991, Stewart 1997) each of the three widely discussed effects of the contemporary condition is articulated within the currently hegemonic discourses of neo-liberalism/neo-utilitarianism (see Giddens 1994, Lewis forthcoming b) and mediated humanism. Cultural contiguity is an opportunity for increased competitiveness; velocity of imaging and information bombardment can be channelled appropriately for the increased functioning of organisational processes; time and space compression signal both the need and the opportunity to increase speed, efficiency and drive within the global utility. And not only do these changes converge with market interests, the confluence of globally networked communication technologies and rapid information transmission upholds humanist impulses. The organisation and mediation of information as a central image in the first reading of the Melissa text resonates overtly with traditional ideas of democracy, linked as they are to the healthy functioning of a representative system that relies on an informed citizenry.

A similar apprehension of the contemporary world platform is obvious within the formations of currently popular theories of organising. Classical management theory as espoused by Taylor (1911) and Fayol (1949), which paralleled organising with the functioning of a machine, is readily criticised for its stagnancy and lack of dynamism in the new world order of instability and change. New versions of systems theory, which rely on a metaphorical link between organisations and living biological systems, argue for an organisation's need to create a symbiosis with its environment by adapting to changes in

its surroundings. The tropes of nature and biology occur regularly within the text of *Melissa*, most obviously in the metaphor of a 'virus', which as Deborah Lupton argues 'has a particular cultural resonance in an epoch obsessed with health, cleanliness and bodily integrity, in which the entry of viruses into the body is viewed as invasion by microscopic alien and contaminating beings intent on causing mayhem' (1994, 558). Organisations have been 'crippled' by the 'fast-breeding' virus (*The Australian* 31/3), as it spreads like 'plague locusts' (*The Age* 31/3), 'threatening a widespread infection of computer systems' (*Reuters* 28/3) to which not even those of high social status, privilege and authority such as 'the governor of North Dakota' are 'immune' (*AP* 30/3b). Risk to the survival, stability and integrity of the system is the menace, and in a discourse closely paralleling Western medicine the solution becomes the apprehension and inoculation of the infectious disease with an 'antidote' (*AP* 28/3), risk-insurance in the form of commodified security so that 'future outbreaks will be less severe' (*The Australian* 13/4). Software therapy for the computer system, like vitamin therapy for the bodily system, becomes the commodified resolution, rather than a longer-term approach to understanding the larger or more complex issues in power, culture and social privilege. The biological apprehension of the virus is likewise evident in the description of the virus as being 'in the wild': that part of nature which is yet untamed by human cultivation.

An equally popular understanding of organisational processes draws on developments within cybernetic theory and likewise incorporates in its theorising an awareness that organisations must adapt and improve in an environment of ever-increasing turbulence and instability: 'In this world, where rapid change and transformation are becoming the norm, organisations face new challenges. In addition to planning and executing tasks in an efficient rational way, they face the challenge of constant learning and, perhaps even more important, of learning to learn' (Morgan 1997). Such a process of 'learning to learn' is made possible through the speedy and efficient flow of information, and a communication system which is self-aware. Originally developed in the 1940's<sup>1</sup>, cybernetics has more recently gained greater prominence due to its theoretical adaptability to the understanding of organisational functioning. Cybernetics, as the science of control and communication in human, animal and machinic systems, posits a metaphor of artificial intelligence as the pinnacle of organisational design, where the system is not only alive and surviving, but continually improving itself, morphing technology, information and speed into a cyborg organisation (Parker & Cooper 1998) that will be fit for an unfathomable future.

These tropes of speed, information and technology enjoy an extremely high currency within textual imaginings of the *Melissa* virus, whose alien presence has 'disrupted the operations of thousands of companies and government agencies' (*BBC* 5/4). The media

lament the impact on organisational time of ‘clogged’ (AP 30/3b) organisational processes where ‘network speeds were reduced by at least 20 per cent’ (The Age 31/3) and the virus ‘slowed some systems to a crawl’ (The Age 5/4): this is a ‘digital age’ (The Australian 4/6) in which time is more financially motivated than ever before. In contrast is the speed of the ‘fast-moving’ (AP 30/3c) virus itself which ‘spreads like lightning’ (The Age 31/3), ‘forcing computers to fire off dozens of infected messages to friends and colleagues and swamping email systems’ (AP 30/3b), ‘in companies around the world’ (BBC 5/4). Organisations abandoned their new communication technologies and resorted to slow and inefficient older communication methods in a reversal of the ideal of progress: handwritten memos, telephone conversations and intra-office shouting (AP 30/3a). An integral part of the Melissa virus in this reading is thus its purported ability to proliferate faster and more widely than any previously known. In a hypersimulation of the processes of globalisation, time and space are compressed beyond previous imaginings, with new computerised technologies at the helm; but the source in this scenario perverts rather than improves system functioning. The tool for smoother, faster, ever more efficient communication has been corrupted, which only increases the desire for that sleek embodiment of the ultimate organisational design.

The language play surrounding the Melissa virus and its dissemination through our democratically ordered societies in this first reading thus mobilises the increasing imbrication of technology into our practices of organising our human lives. The expert knowledge called on to uphold, protect and improve the social order is that of ‘security experts’ (AP 29/3), ‘computer experts’ and ‘cybersleuths’ (Reuters 15/4). The characters in this drama are both corporate, in the form of anti-virus software providers and Internet service providers, and traditional authorities ‘upgraded’ in image through new ‘high-tech’ divisions such as the FBI’s fledgling National Infrastructure Protection Center. Phar Lap Software initiated preliminary investigations, passing on its discoveries to the US Federal Bureau of Investigation, as did the technicians involved in the case at America Online. Thus market-driven, competitive interests and their social, regulatory and ordered counterparts team together to guard, protect and pursue. The system of social order is revalidated as that which maintains law and order, protects individual rights, and fosters freedom competitively: the perfect balance of individual and collective.

### **Hyper-systematic**

However, cracks in the order of the system appear almost immediately. Scarcity and value, the underpinnings of capitalist exchange processes, undermine the collaborative

veneer of the efforts to identify, halt and secure against the Melissa virus. Certain characters enjoy significant benefits in the spread of viruses, not only in the obvious form of anti-virus software companies, who have consistently used Melissa's infamy to propagate their marketing initiatives<sup>2</sup>, but also in that of the 'traditional' authorities whose newly upgraded cybercrime divisions have gained an edge in public image and exposure. Immediate competitive advantages weighed against the majority of losers (300 companies and 100,000 users said to be affected) calls into question the hopes of collaboration in a competitive system.

But even beyond individual instances of the internal contradictions of capital such as these, and their equivocation of Melissa's status, the principles of scarcity and value attack at the very basis of mediated democracy: the partnering of freely flowing information and a healthy democracy. As argued by Mark Poster, we are witnessing the legitimisation of the 'extension of the commodity form to the new realm of information, reversing a longstanding liberal principle that, in a democracy, knowledge and information in general must be freely accessible' (Poster 1990, 27). Melissa evidences this suturing of information to scarcity and value within our growing networked world: everything in this narrative is commodified—security, safety, privacy, information. In this digital era, 'You need to pay to protect your data' (AP 31/3), and 'You'll have as much privacy as you can afford' (Reuters 6/4). The democratic promise of increased capacity of information dissemination through new computer-networked communication is fatally called into question when this principle of free information is conjoined with a market imperative that places a price on all such 'intellectual property.'

The virus creator himself plays with the consumable ambiguity or 'intellectual property' status of his own creation in the notes to the virus which read just like a (software) advertisement, complete with signalling of multiple platforms, appeals to the consumer, and contextualisation within this important 'new age':

WORD/Melissa written by Kwyjibo  
Works in both Word 2000 and Word 97  
Worm? Macro Virus? Word 97 Virus? Word 2000 Virus? You Decide!  
Word—>Email | Word 97—>Word 2000— it's a new age!

That the virus attacks Microsoft products exclusively only intensifies these tensions. The propagated document needs to be opened in Microsoft Word 97 or 2000, and replicates itself in conjunction with the use of Microsoft Outlook, the Internet browser which is at the core of a significant legal battle over the monopoly status of the software giant. The effects engendered by the individual body in the form of the virus creator against the multinational empire of Bill Gates cannot help but symbolically resonate with the plight



of David in the face of Goliath. That letters to the editor in the Age picked up on the central presence of Microsoft in this language war is not surprising.<sup>3</sup>

The first reading of the Melissa text embodies power/knowledge formations which attempt to mediate the technological and democratic organisation of a system undermined by its commodification. Perhaps even more importantly, and certainly very interestingly in the case of this particular virus, is the partial and ongoing crumbling of the system by its own processes of systematisation. The nature of the Melissa virus is significant, in that it does not actually do any 'damage', something which causes significant difficulty for this reading in its attempt to rationalise Melissa's status as threat and crime. The virus does not leave any physical manifestation of dysfunction in its wake such as debilitated *hard* drives; it does not even corrupt information. The impact of the virus is purely to time and space. But these are in fact the ultimate commodities of postmodernity. Thus the realisation that the virus was somehow 'malicious' was rendered ambiguous because 'all [it] did was spread itself as far and as quickly as possible' (The Australian 13/4). The leap from physical and even informational commodities to the pure commodification of time and space has not yet been entirely grasped.

Most notably, Melissa assaults the very idea of the system, creating its effects simply from its play within the systemic. By replicating itself fifty-fold, transmitting itself through established lines of communication, and generating offspring at a 'lightning' speed, the virus demonstrates in fact the ideal in system operation. The Melissa virus hyper-extends, hyper-uses, hyper-activates the system; it compresses time and space to unknown proportions. It is the very essence and demonstration of speed, efficiency, global flow, information transfer, networked communication: all the elements of a model global utility. It is the perfection of systematic desire. Pure system, no purpose. But then how different is that from contemporary systems of work and production, where profit is often the ultimate and only driver, effacing even the shadow of use-value, utility, real worth, true cost, in a market where desire is engendered in and for the insubstantiality of images in an endlessly rapid movement towards dissolution? As Bogard argues, this is the simulation of work, the simulation of utility, the simulation of production itself: 'Simulated work, cyborg "production", is designed to resemble a past when work still meant something, when there were still some real reasons left in working, an end or finality—political, social, economic—that would make sense of it' (1996, 120). Following Baudrillard, Bogard describes contemporary work as 'the pure process of signalisation, a definite apotheosis of production, its elevation to the realm of pure simulacrum' (1996, 109). Melissa is not the threat to the system, it is the future of the system.

Bogard goes on to argue that the computerisation and networking of work not only engenders its perpetual simulation, but it also creates a context of hyper-surveillance, a facilitation for the most minute and intensified disciplinary control. According to his argument, and that of other writers concerned with the increasingly surveyed nature of our societies (e.g. Lyon 1994, Rochlin 1997), Taylorised, machinic, precisely controlled workplaces have not been overwritten with the new, thinking, learning, creative organisation of living or cybernetic systems. Rather, this is the era of the 'transparent worker' and the 'watched workplace' (Lyon 1994, 118-135): 'These methods are not discarded, but reconfigured and totalised by new information technologies and bio-logics' (Bogard 1996, 99). The internalising of surveillance and the proliferation of invisibly pervasive digital tracking practices, coupled together, simulate the ultimate in worker freedom, offering unprecedented choice in self-organisation, when in fact 'Today, we are crossing the threshold of informed labour, which is also hyperdisciplined labour, and the cyborg is its new "body",' (Bogard 1996, 99). And technological surveillance is not merely initiated within the workplace, but is becoming an increasingly important aspect of social organisation. Techniques of virtual tracking, email spying, time-logging, routine monitoring, electronic verification and the ongoing creation and manipulation of 'digital individuals' (Kilger 1994) are mimicked by the daily operations of commercial enterprises in their marketing, forecasting and polling research.

The social concerns engendered by the rise of surveillance in a digital society and its resulting threats to individual freedom have not gone unnoticed by humanist concerns, creating significant disturbance in the cyborganisational desire for technological-organisational systemic balance. Anxious discussions of the rise of a surveillance society point once again to the indelible contradiction between the particular, especially in its competitive manifestation, and the collective/ collaborative. In tracking down the culprit responsible for disrupting organisational systems worldwide, representatives of law, order and responsible government partner with entrepreneurial, creative and insightful commercial interests in a mutually rewarding team for both sides of liberal democratic discourse. However, the tactics used by the FBI to gain access to digital information—the plundering of records archived in Internet service providers, and the trawling through the supposedly public forum of chat groups—have raised concerned eyebrows. One Washington Post article (4/4) quotes a segment from a medical discussion group supposedly posted by the alleged creator of the virus, David Smith, in which he complains about the effects on him of the popularly prescribed drugs Prozac and Serzone, all the way back in 1997! Anxiety about state surveillance parallels and intensifies recent concerns about the Global Unique Identifier (GUID), the serial number or digital 'fingerprint' embedded by Microsoft in every document a user creates. The controversy has primarily been instigated by interests in favour of individual rights to 'privacy' such as privacy

advocates and the Democrats, traditional safeguards of the more humanist side of the liberal democratic merging. Democrat Congressman Anthony Weiner, New York, voiced his uneasiness about the FBI's methods of investigation: 'Would you, in hot pursuit of this virus and the author of it, be permitted to go into my computer?' (Inter@active Week 16/4). Concerns of this sort parallel other worries linked to electronically mediated communication that feature strongly, such as those of child access to pornography, the rise in Internet fraud and computer-facilitated white collar crime, and so on: all of which question the all-embracing, socially-stabilising good of the competitive and productive forces of the market.

This is so, without even considering the surveillance methods discussed above, instigated daily in organisational and marketing procedures, and even in the commodified 'solutions' to Melissa. Not to be outdone by a virus, IBM and Symantec Corp (author of the popular Norton anti-virus software) have teamed up to 'dramatically speed up detection and cure,' with a 'Digital Immune System' which according to IBM's anti-virus laboratory head is 'designed to immunise the world against fast-spreading viruses faster than the virus can spread' (AP 2/4), in an ever-accelerating spiral toward time-space obliteration. The system professes to secure corporate systems by automatically sending suspicious-looking email and files across the Internet to Symantec. SupportNet, a network support and email company, proposes a similar process whereby all email are automatically diverted to the company, allowing for the ongoing monitoring of all incoming and outgoing messages (PR Newswire 13/4). Thus, not only do these automatic software solutions employ tactics which uncannily resemble the Melissa virus's much-derided use of a 'macro' operation, the mini-programs built into Microsoft systems to automatically perform tasks for the user, but these very 'solutions' contribute to our increasingly surveyed society.

Thus, even when the concern rests firmly within liberalist discourse, at the level of individual 'rights' to freedom in the face of state (or large corporate) abuses of power, rather than the broader social impacts investigated by commentators such as Bogard, Lyon and others, the tension between the individual and the collective produces a significant destabilising force within the concept of social order, its functioning, and the current organisation of democracy.

### **Identity hacking**

No-one can legitimately romanticise hackers and virus writers. In an era when we rely on computers and networks, these individuals are a menace. They are nothing more than criminals.

—Graeme Philipson, (1999, April 20). ‘Viromaniacs to strike again’. *The Age*.

The neo-utilitarian or liberalist leanings within this first reading of the Melissa virus, even when mollified somewhat by humanist concerns, is typical of the current political scene. The various attempts to resolve the particular/collective contradiction have seen in recent years a movement towards individual (especially market) rights, at the expense of softer socialist or Fabian-inspired imaginings, a movement which has caused cultural commentators interested in progressive politics significant consternation (see for example Hall & Martin 1989 and the ‘New Times’ project). This has been further exacerbated by the putative collapse of the grand narrative of the Left leading to the fragmentation of the political sphere, and a subsequent aversion to any attempt to subsume or corrupt the particular with artificial, bounded and power-based notions of claims to the collective or universal. From the ashes of a progressive politics grounded in essence and materiality has emerged a proliferation of identity politics, each unstable, subject to deconstruction, knowable only through the wars of language. Such is the genesis of postmodern politics in its various incarnations which, in a move to overturn the domination within language wars wreaked upon the multitude of separate and oppressed identities, denies the universal completely at the hope and political potential of the marginal, the different. Democracy is re-written beyond traditional and mediated conceptions which merely reproduce the representability crisis, both its elite foundations of delegation and its obscuring of power/knowledge processes (see e.g. Featherstone 1988, Boyne & Rattansi 1990, Ross 1988). Instead, a new democracy is envisioned which will reinscribe the individual body with participation, pleasure and personal power, a visceral democracy (Lewis forthcoming b). Individual resistance, transgression and the personal pursuit of pleasure, as microphysical resistances to institutional and oppressive systemity, are valued as the route to political hope in establishing the validity and presence of these fragmented identities.

The first reading of the Melissa virus illustrates the attempt to contain this contemporary destabilisation of identity and political value, in a movement where identity itself becomes the central focus of the struggle to secure signification. The identification of the virus, what it does, how it functions, and how to heal the damage are mobilised to define the social order and its ‘others’. Classification neutralises the irradiatory trajectories of identity by securing its meaning within the parameters of the

system. This very process of lingual organisation, in an insightful movement, is mocked within the code of the virus itself: 'Worm? Macro Virus? Word 97 Virus? Word 2000 Virus? You Decide!.'

The identity of the creator also becomes an object of frenzied desire, driving authorities, corporations and the media through a convoluted pathway of various aliases, handles and computer alter-egos in the struggle to fuse this loose and erratic signifier to the stability of a known signified. Identities are sniffed out, prodded and paraded, from America Online account persona Sky Rokat, to Source of Kaos website contributor VicodinES, and Alternate Virus Mafia handle Alt F11. Finally a name and a face could be inscribed on the empty and unknown other as a suspect was apprehended, computer programmer David Smith, who not surprisingly matched 'Internet sleuths' expectations' (Washington Post 4/4). The organisation of meaning thus reaches beyond mere appellation to the deeper social and political signification of this identity: is he a hacker, a virus-fiend, an artist, a nuisance, or a criminal? The ongoing identification of the penalties faced by the alleged perpetrator indicates a significant anxiety to contain the meaning within the logic of the social order, as a criminal activity; the media coverage unfailingly repeats the mantra that David Smith 'faces charges that include interruption of public communications, conspiracy and theft of computer services—charges that carry a maximum penalty of 40 years in prison and a \$480,000 fine', and New Jersey Attorney General makes it known that 'If he is tried and successfully convicted, he will do hard time' (AP 3/4).

A second reading of the text, by reinscribing Melissa within an understanding of new or visceral versions of democracy, might instead envision the virus as constituting an avenue to personal liberation, to bodily freedom. Rather than investing hope in the sustained and informed contribution to civil society as an avenue to representable interests and rights, freedom in these imaginings is to be found in the redeployment of the body at the periphery for the maintenance of its difference. The creation and spread of the virus in such a reading is an act of transgression, a guerrilla tactic of the weak against the strength of the system. As contemporary society encloses individuals in its web of discipline and surveillance, in the monotony and constraint of social order, these same individuals produce their own trajectories of freedom in their everyday practices, in their creation of space within institutional place, in their disguises such as *la perruque* (the wig) which mimic system conformity while opening up small moments of liberation (de Certeau 1984). William Bogard extends the argument of de Certeau, arguing that in the contemporary situation of highly monitored digitally tracked existence, *la perruque* has been redesigned, taking the form now of 'various hacking and viral strategies, recordings, doublings, the staging of simulated readouts, electronic decoys, and other moves' (1996,

123). Hacking and viruses are ways in which the individual body works with the materials of the system itself, turning their oppressive constraint into a source of strength in this postmodern wasteland.

This conception of the individual body 'making do' with the system's resources is further applied by some theorists to the appropriation of cultural texts. These advocates of cultural subversion include reception theorists (Ang 1990, 1996, Fiske 1987, 1989, Jenkins 1992, Radway 1987) who inscribe political meaning into the everyday uses made of texts which they argue demonstrate the mutation, the massaging of popular culture into experiences of liberation and personal pleasure. The creator of the Melissa virus used the materials of computer code, corporate software and the 'macro' toys of the bourgeois PC user to free himself into difference. He rewrote the text, used it for his own ends and bodily pleasure, subverted the digital pathways and friendly helpmates of the social order. He even fashioned his own identity on the quintessential 'bad boy' of popular culture: Bart Simpson. Not only is 'Melissa written by Kwyjibo', but when the day equals the minute value on a computer affected with the virus, the following text is inserted at the cursor position on the computer, interrupting what might be anything from a secretary's business letter to his/her CEO's strategic plan: 'Twenty-two points, plus triple-word-score, plus fifty points for using all my letters. Game's over. I'm outta here.' Bart himself coined the word 'kwyjibo' in an attempt to subvert a game of scrabble with this father, using the rules to his advantage in a humorous rewriting of the text.

Popular culture is further redeployed by the virus through its use of the computer winking smiley— ;- ) — a friendly 'gesture' in cyberspace. When a user receives the email attached to the document carrying the Melissa virus, the subject line which speaks of an 'important' message heads the body of the text which reads 'Here is the document you asked for—don't show anyone else ;- )'. Thus the playful symbol of computer culture is paired with formal corporate conventions of sending 'important' messages and 'documents', which not only creates a clashing effect with official system functioning, but also motions towards much-maligned but ever-present 'informal' office cultures and practices within organisations. The ongoing attempts, since the birth of the formal division of labour, from Taylorism to Human Resource Management to Corporate Culture programs, to manage and control corporate behaviour for the profit and benefit of the social order and the interests it supports, inevitably face the proliferation of small 'corporate raids' on company time and equipment, including the unofficial communication channels over email between friends and co-workers (de Certeau 1983, Fiske 1989). Employees become corporate raiders when they wear *la perruque*, disguising their everyday practices of pilfering company time and space for their own ends, making these blend into the regular flow of system-sanctioned activities. The use of the Internet

for personal knowledge or visual pleasure is another such example, demonstrated particularly in visits to pornographic websites. The illicit content of the attached list of pornographic sites recognises and exposes the fragility of the gap between corporate regulation of Internet use and the text of the Internet itself, where pornography is by far the most profitable and prolific content, and regularly perused by people at work. The smile winks knowingly at organisations and their contributors, acknowledging the surface appearance on the one hand by warning not to 'show anyone else', while propagating a much more likely reality with the other by sending fifty copies of this pornographic site list to intra- and inter-organisational alliances in the targeted user's address book, who could exist in their physical forms anywhere on the face of the globe.

The computer culture furtively enjoyed by employees is an important aspect of the virus's evolution. The existence, shape and character of computer-mediated communities is a central preoccupation for many cultural commentators interested in the liberational potential of new communication technologies and their uses. The digital convergence of peoples across the world has generated considerable interest among computer enthusiasts, or what Lewis has dubbed 'digitopians' (Lewis 1998). In this postmodern, post-mediated, digitopian democracy, computer-networked communication significantly enhances a freedom where subjectivities are emancipated from the oppressive constraints of their bodily markers and the weight of mass mediation, able to participate in postmodern communities of their own styling (Guattari 1992, Harraway 1991, Poster 1994, Stone 1992). The Melissa virus's creator embodies the idea of such 'virtual communities' (Rheingold 1993), a cyberparticipant whose communities reportedly include chat-groups about art, music, sex and computer viruses. The Internet is the locus of these new configurations of social and cultural relationships, a network of alliances and participation. The virus community is one such configuration, an underground of computer virus creators, an open space for interested participants to share knowledge, convene, discuss. Virus creation, and the wider community of hacking, form a significant counterculture, and new source of freedom for the individual body both as it engages in microphysical nodes of resistance and as it selects and configures its participation within communities of its own choosing.

### **Particulated politics**

The investment in pure bodily freedom through difference and system-subversion is problematic, and never quite manages to overcome those fixities of meaning which previously collapsed a theoretic centred on system utility and humanism, as we saw with

the first reading of Melissa. In this case, the gap between signifier and signified is re-filled through the postmodern theoretical interpretation of freedom, and meaning is reinvested in the activities under analysis. Difference from the social order and the montage of particularity become new stabilities from which to advance a politics, belying instabilities of meaning, order and language. Within the text of the Melissa virus, mutable processes of power and signification are evidenced in a number of movements which converge around the uncertainty of this new digital identity.

The seemingly disjunctive combination of interests pursued digitally by David Smiths serves to illuminate the precarious nature of identity implicit within the conceptual space of hacking and its status as creative or disorderly. Art, music, sex, computer viruses are in fact surprisingly uniform in their articulation of impulses towards the pleasures of release into creativity and bodily gratification. Essentially human in nature, each of these impulses quavers at the border of transgression, where a tiny push could collapse the divide into threat and subversion. Art and music, both highly valued within the humanist tradition, also enjoy a lineage of political inscription aimed at destabilising or rejecting the system of their consumption. Sex, which features prominently in Melissa's narrative, is equally ambiguous; its existence is necessary for the continuation as well as toleration of the human condition, but as Foucault has clearly illustrated, it must be culturally managed in a variety of ways. Topless dancers, one of whom purportedly gave her name to Melissa, and sex discussion groups, from which the virus found its release to the world, are both mildly transgressive while still being nominally accepted if not condoned in our society.

Computer viruses parallel this uncertainty. Are viruses a legitimate form of expression, an artistic pursuit, or an illegitimate and threatening application of knowledge? Ponderings of where to instil the ultimate 'blame' for the Melissa virus illuminate this ambiguity. Within the media, most commentators pushed for Melissa's author to be blamed, and in particular, since evidence suggested that the virus was the work of two individuals, the programmer with the most talent, whose actions were to use genius and elite knowledge for the detriment of human order. A prominent viral community, the Virus Exchange Underground, in a bid to secure the meaning in a different way, released its own press statement which argued that it was not the author, but the discharger of the virus who should be to blame. This defence is based on assumptions of the validity of creative genius, artistry, the pursuit of knowledge and freedom of speech. Debates over the Melissa virus thus converge around the long-standing tension between knowledge for its own sake and the deployment of that knowledge. The precarious line between creativity and transgression, mild amusement and dangerous



destruction, knowledge and its deployment, is the ongoing focus within these language wars.

The unstable organisation of the meaning around these digital activities is further illustrated by the current process by which hackers' expert knowledge of computer systems and their subversion is being harnessed for processes of law, order and regulation. Corporations in the business of supplying digital security for a fee are said to be 'busily trawling for good hackers':

There's a thin line of bits and bytes between the good and the bad hackers [...] Some, like Star Wars' Darth Vader, choose to go over to the dark side and use their powers to bring down governments, multinationals, and corporations. Others, like Luke Skywalker, use their abilities in the service of ISS [Internet Security Systems] to warn subscribers of threats to their operating systems, applications and networks.

(The Age 6/4)

This appropriation of hacking for the privileges of capitalism disrupts easy attempts at categorisation. The commodification of security and the digital rise of surveillance, as discussed above, evidence that the tactics used to obtain knowledge of activities deemed to be detrimental to the social order are indistinguishable from those of virus propagation. Furthermore, as argued by PC Week Online commentator Michael Surkan, the packaging of security in the form of virus-resistant software may in fact contribute more to lost time and profit by crashing systems and producing uncalculated costs, than the viruses themselves in some cases (PC Week Online 14/4). Hacking cannot organise its own meaning around either positive or negative transgression. The line dissolves as the system and its reversal are implicated endlessly in their own processes of identity, in their imbrication within the cultural, social and political processes of capitalism, in their mutual involvement with each other in relationships of power, status, privilege, alliances and pleasure.

Finally, the precarious processes of identifying with and fitting into the social order finds its exemplification in David Smith's intention to return to work. Reportedly, Smith contacted his supervisor at AT&T on Friday morning, the day after his arrest. 'He phoned his boss today to say he wouldn't be in, but added that he'd see him next week,' said AT&T spokesperson Burke Stinson, whose own response was: 'Fat chance. My guess is we won't be seeing much of him in the future.' Thus, even as alleged creator of a virus which had disrupted corporate systems worldwide, sending off illicitly transgressive content in an annoyingly pervasive and rapid fashion, as the object of a combined federal government and corporate man-hunt, David Smith still includes himself within the

imaginings of 'system', and acts within the ordering of its rhythm; he calls his boss and excuses himself from work for the day, hoping to return again the following week.

### **Alternative imaginings**

I've talked to people who, literally, were crying on the telephone—a woman whose poetry book was almost done and completely lost, a man whose doctoral dissertation was lost. They were devastated.

—Mikko Hermanni Hypponen in Helsinki (Reuters 26/5 'Chernobyl Computer Virus Hits a Few Hard')

A month after the Melissa virus was posted to alt.sex, a new computer hazard surfaced, a virus which was set to strike on April 26, the 13<sup>th</sup> anniversary of the nuclear disaster in Chernobyl. The Chernobyl virus erased hard drives of hundreds of thousands of computers around the world, particularly in Asia and the Middle East. Thus, while Melissa may be implicated as a sort of sexually incited postmodern delinquency, the Chernobyl virus is attached to the formidable history of global warfare, death and disease. In either case, the virus may be 'imagined', like any other language war, in terms of freedom-fighting or terrorism, depending on the position of the imaginer. The Internet, therefore, becomes a largely unbordered and somewhat uncontrollable battleground for the playing out of these discursive terrors. Particular discourses become nodalised, forming like weather cells around an intensifying and increasingly powerful cultural claim. These dominant discourses or 'systems' function in loosely formed cultural clusters (local-national-global) which, as Foucault has demonstrated, necessarily impel their own subversion and deconstruction. Commerce, politics, sex, identity, pleasure, information—all attack each other through claims and counterclaims, discursive flows and counterflows. The margins shift, the centres split. A virus becomes a system, then folds away as other systems subsume its power.

Jean François Lyotard (1991) has condemned the formation of the world through systematised 'bits of information', arguing for the re-invigoration of an 'inhuman' and abstract imagination (see also Lyotard, 1993: Ch. 13). Deleuze and Guattari (1983, 1986) have sought an elision of essentialised self-legitimising systems of dominant order through the substitution of 'assemblages'—temporary formations which permit meaning and pleasure without recourse to rationalised systems of order. Ernesto Laclau (Laclau and Mouffe, 1985, Laclau, 1996) has sought to reconcile the problematics of individual and

collective interests through a re-ordering of 'collectivity' as an ungrounded and dependent constitutivity of 'agonism'. When collectivity is shifted out of the zone of privileged system, it becomes available for new modes of political action and emancipation. Identity is precisely that collective imagining which may be mobilised freely and openly against the oppression of externally imposed order, values and obedience.

Computer viruses and computer hacking are not in and of themselves essentially good or bad, but may be mobilised against the external imposition of normative order. The concept of system dissolves as the possibilities of a threateningly chaotic, inhuman imagination is released, and the Internet becomes a revelry of expressive possibilities. Even so, these expressive possibilities are not, as we have indicated, a utopia of creative exigency, but are necessarily implicated in the possibilities of harm. There can be no liberation without the threat of destruction and an inhuman imagining. Thus, the radical potential of networked communication cannot be separated from visceral pleasure and displeasure. Fully acknowledged, however, the multiplicity of claims bridges the space that disconnects individuals from one another, as it presents the opportunity for a radical challenge to the dominating discourses of nodalised media, corporatism, and State and global regulators. The world, that is, will not be divided into margins and centres in perpetuity, but will facilitate the multiplication of claims, the tearing down of monolithic discursive intensities. But these challenges cannot be afforded without the recognition of their perils.

A transcultural theory of democracy and of the digital spaces in which politics will be increasingly played out can neither celebrate nor condemn virus release and hacking. It is not a division between hackers (harmless invaders of secured digital space) and 'crackers' (conquerors or destroyers of that space). Rather, it is a matter of a radical energy that takes up the reform agenda left vacant by Leftist and Marxist critique. Thus, while visceral and postmodern democracy has centralised the experience of bodily pleasure as a focus and reward in political disputation, the question of collective responsibility remains open. Digital and networked communication theory requires more than a solipsistic or celebratory technological progressivism; it deserves more than the evincing of a new political order which privileges quotidian banditry while leaving aside the problematic of random sedition, destructiveness and the displeasures of those people who are outside the visceral thrills of attack or sexual gratification. If the radical potential of the Internet is to be released, then theorists must outline the space in terms of its capacity for hate, oppression and the calumnies which privilege one human group over another. A postmodern utopianism which intensifies further the capitalist individualism of liberal-humanism fails to address adequately the multiplicity of claims, the destructiveness and the social claims of connectedness which the new technologies harbour.

Equally, liberal-humanist-capitalist dichotomies, despite the best intentions, have necessarily produced social differentiations and the increment of one group's power to the detriment of others'. Moreover, the common strategy of resolving multiple social claims — regulation — tends to increment and legitimate the State and State-based discourses as normative rather than expedient. The theorisation of the Internet needs necessarily to confront the question of the State and its capacity to nodalise discourses through regulation, law and punishment. The characterisation of invader software as 'viral', and the demonisation of hackers like David Smith are aspects of State and corporatist hegemony. But a regulatory regime is no longer possible or desirable (if ever it was). This is not to heroise hackers and their invader software; rather, it is to acknowledge that the digital space should neither be the natural inheritance of liberal-humanist-capitalist ideologies, nor the unfettered province of self-interest or self-aggrandisement.

The ambiguity of Mary Shelley's *Dr Frankenstein* is repeated in the new communications technologies, at least inasmuch as utopianism and transcendent creativity necessarily implicate danger and the threat of an inhuman decline. The monstrosity of Chernobyl was not an accident of technological fallibility, but the outcome of an inspired excess, a vile politics which outgrew the genuineness of human dreaming. The Melissa virus has brought into focus the conflicts between a postmodern and sexually inspired dreaming, against the rationalised powers of corporatist and State discourses. There is no outside-inside system, no virtual and experiential divide. Rather, the world shifts uneasily in pursuit of its dreams. David Smith will not be returning to work for a while, but Microsoft continues its surge toward a globally dominant, homogenised discourse — the perfect and universal language about which Descartes dreamed. Our radical rejection and re-creation will necessarily find many modes of expressions.

## References

- Ang, I. (1996). *Living room wars : rethinking media audiences for a postmodern world*. London: Routledge.
- Ang, I., & Stratton, J. (1996). Asianing Australia: Notes Toward a Critical Transnationalism in Cultural Studies. *Cultural Studies*, 10(1), 16-36.
- Appadurai, A. (1990). Disjuncture and difference in the global cultural economy. *Theory, Culture and Society, Special Edition on Global Culture: Nationalism, Globalization and Modernity*, 7, 295-310.
- Belden, G., Hyatt, M., & Ackley, D. (1993). *Toward a Learning Organisation*. Toronto: Institute of Cultural Affairs.
- Bell, D. (1973). *The coming of post-industrial society : a venture in social forecasting*. Harmondsworth, Middlesex: Penguin Books.
- Bogard, W. (1996). Simulation, surveillance and cyborg work, *The Simulation of Surveillance*. Cambridge: Cambridge University Press.
- Boyne, R., & Rattansi, A. (1990). The Theory and Politics of Postmodernism: By Way of an Introduction. In R. Boyne & A. Rattansi (Eds.), *Postmodernism and Society*, . Houndmills: MacMillan Education.
- Bridges, W. (1997). *Creating You and Co.: Learn to think like the CEO of your own career*. Reading: Addison-Welsey.
- Certeau, M. d. (1984). *The practice of everyday life*. Berkeley: University of California Press.
- Deleuze, Gilles and Guattari, Felix, (1983). *Anti-Oedipus: Capitalism and Schizophrenia*, trans. Robert Hurley et al, University of Minnesota Press, Minneapolis.
- Deleuze, Gilles and Guattari, Felix, (1987). *A Thousand Plateaux:*, trans. Brian Massumi, University of Minnesota Press, Minneapolis.
- Docker, J. (1995). Rethinking Postcolonialism and Multiculturalism in the Fin de Siecle. *Cultural Studies*, 9(3), 409-426.
- Drucker, P. (1992). *Managing for the Future*. Oxford: Butterworth-Heinemann.
- Drucker, P. (1993). *Post-Capitalist Society*. New York: Harper Business.
- Drucker, P. (1995). *Managing in a Time of Great Change*. New York: Truman Talley.
- Fayol, H. (1949). *General and Industrial Management*. London: Pitman.
- Featherstone, M. (1988). In Pursuit of the Postmodern: An Introduction. *Theory, Culture and Society, Special Issue on Postmodernism*, 5, 195-215.
- Fiske, J. (1987). *Television culture*. London: Methuen.
- Fiske, J. (1989). *Understanding Popular Culture*. Boston: Unwin Hyman.
- Foucault, M. (1981). *The History of Sexuality, Vol. 1*. Harmondsworth: Penguin.
- Foucault, M. (1981). *Power/knowledge: Selected interviews and other writings*. New York: Pantheon.
- Giddens, A. (1994). *Beyond Left and Right: the Future of Radical Politics*. Cambridge: Polity.
- Guattari, F. (1992). Regimes, Pathways, Subjects. In J. Crary & S. Kwinter (Eds.), *Incorporations*. New York: Zone Books.
- Hall, S. (1991). The Local and the Global: Globalization and Ethnicity. In A. King (Ed.), *Culture, Globalization and the World-System*. Houndmills: MacMillan.
- Hall, S. (1991). Old and New Identities, Old and New Ethnicities. In A. King (Ed.), *Culture, Globalization and the World-System*. Houndmills: MacMillan.
- Hall, S., & Jacques, M. (Eds.). (1989). *New Times: The Changing Face of Politics in the 1990's*. London: Laurence & Wishart.
- Handy, C. (1990). *The Age of Unreason*. Boston: Boston: Harvard Business School Press.
- Harraway, D. J. (1991). *Simians, Cyborgs and Women: The Reinvention of Nature*. London: Free Association Books.
- Jenkins, H. (1992). *Textual poachers : television fans & participatory culture*. New York: Routledge.
- Kilger, M. (1994). The Digital Individual. *The Information Society*, 10, 93-99.
- Laclau, E. (1996). *Emancipation(s)*. London: Verso.

- Lewis, J. (1998). Digitopians: Transculturalism, Computers and the Politics of Hope. *International Journal of Cultural Studies*, 1(3).
- Lewis, J. (forthcoming a). Pure Filth: apocalyptic hedonism and the postmodern surfer.
- Lewis, J. (forthcoming b). Manufacturing Dissent: New Democracy in the Era of Electronic Communication.
- Lupton, D. (1994). Panic Computing: The Viral Metaphor and Computer Technology. *Cultural Studies*, 8(3).
- Lyon, D. (1994). *The Electronic Eye: The Rise of Surveillance Society*. Oxford: Polity Press.
- Lyotard, J-F. 1991, *The Inhuman: Reflections on Time*, trans. Geoffrey Bennington and Rachel Bowlby, Polity, London.
- Mariotti, J. (1997). *The shape-shifters: continuous change for competitive advantage*. New York: Van Nostrand Reinhold.
- Morgan, G. (1997). *Images of Organisation*. (2nd ed.). Thousand Oaks, CA: Sage.
- Parker, M., & Cooper, R. (1998). Cyborgization: Cinema as Nervous System. In J. Hassard & R. Holliday (Eds.), *Organisation Representation: Work and organizations in popular culture*. London: Sage.
- Pedler, M. J., Burboyne, J. A., & Boydell, T. H. (1991). *The Learning Company*. London: McGraw-Hill.
- Poster, M. (1997). CyberDemocracy: Internet and the Public Sphere. In D. Porter (Ed.), *Internet Culture*. New York: Routledge.
- Poster, M. (1994). A Second Media Age? *Arena journal*(3), 49-91.
- Poster, M. (1990). *The mode of information : poststructuralism and social context*. Chicago: University of Chicago Press.
- Radway, J. (1987). *Reading the romance : women, patriarchy and popular literature*. London: Verso.
- Rheingold, H. (1993). *The Virtual Community: Homesteading on the Electronic Frontier*. Reading: Addison-Wesley.
- Rochlin, G. (1997). *Trapped in the Net*. Princeton: Princeton University Press.
- Ross, A. (1988). *Universal Abandon? The Politics of the Postmodern*. Minneapolis: University of Minnesota Press.
- Stewart, T. A. (1997). *Intellectual Capital: The New Wealth of Organizations*. New York: Doubleday/Currency.
- Stone, A. R. (1992). Virtual Systems. In J. Crary & S. Kwinter (Eds.), *Incorporations*. New York: Zone Books.
- Taylor, F. (1911). *The Principles of Scientific Management*. New York: Harper & Row.

## References: Press

- Allbritton, C. (1999, March 30, a). Computers Infected With New Virus. *Associated Press*.
- Allbritton, C. (1999, March 30, b). 'Melissa' Clogs E-Mail System. *Associated Press*.
- Allbritton, C. (1999, March 30, c). 'Melissa' Computer Virus Mutating. *Associated Press*.
- Allbritton, C. (1999, March 29). Taking Steps to Avoid Computer Bug. *Associated Press*.
- Barker, G. (1999, March 31). Melissa and Papa, Net's bad new pair. *The Age*.
- Becker, G. (1999, March 28). Warnings of Computer Virus Issued. *Associated Press*.
- BBC. (1999, April 5). Melissa suspect faces court. *BBC Online Network*.
- Horey, J. (1999, April 13). Take heed of gentle Melissa. *The Australian*.
- Jackson, D. (1999, March 31). Bad girl takes on Aussie e-mails. *The Australian*.
- Kalish, D. E. (1999, April 2). Firms Seek Safer Computer Networks. *Associated Press*.
- Kalita, S. M. (1999, April 3). Virus Suspect Said to Plead Innocent. *Associated Press*.
- Mendoza, M. (1999, March 31). Companies Reap 'Melissa' Benefits. *Associated Press*.
- Philipson, G. (1999, April 20). Viromaniacs to strike again. *The Age*.
- Press, A. (1999, April 5). Hacker didn't intend to do wrong: lawyer. *The Age*.
- Pressman, A. (1999, April 15). Next 'Melissa' virus could be worse, experts warn. *Reuters*.

- Release, C. P. (1999, April 13). Free Protections Against E-mail Viruses Introduced by SupportNet. *PR Newswire*.
- Rodger, W. (1999, April 16). Congressman questions Melissa arrest. *Inter@ctive Week*.
- Satran, D. (1999, April 26). Chernobyl Computer Virus Hits A Few Hard. *Reuters*.
- Satran, D. (1999, March 28). 'Melissa' Virus Hits Internet, May Cause Havoc Monday. *Reuters*.
- Satran, D. (1999, April 6). NetTrends: Marketing Melissa cures, and privacy. *Reuters*.
- Stebbins, J. (1999, April 6). Mad cow first of copycats. *The Australian*.
- Surkan, M. (1999, April 14). The tragedy of Melissa. *PC Week Online*.
- Walker, L. (1999, April 4). 'Melissa' Suspect Matched Internet Sleuths' Expectations. *Washington Post*.
- Yelland, P. (1999, April 6). The good, the bad, and the hackers. *The Age*.

---

<sup>1</sup> MIT mathematician Norbert Wiener was the first to coin the term during this decade.

<sup>2</sup> Some headlines of press releases relating to the virus are as follows: "'Melissa' Virus Triggers Rapid Growth in Virus Detection Software Sales; Virus Warnings Send PC Users Shopping for Protection' (PC Data Inc 14/4), Trend Micro Supports New Security Features in Microsoft Office 2000: Trend Micro to Offer Integrated Antivirus Solutions for Office 2000i (Trend Micro Inc. 13/4), 'Free Protection Against E-mail Viruses Introduced by SupportNet' (SupportNet 13/4), "'Melissa' E-mail Worm no April Fool: Deadly Viruses Prompt PC Users to Find New Ways to Protect Their Computers' (Wild File 1/4), 'Available for Interview: Cyber Crime Investigator on Melissa Virus and Its Impact' (PricewaterhouseCoopers, 5/4).

<sup>3</sup> 'Diversity the best anti-virus weapon' and 'Default disaster', letters to the editor the Australian, 13/4. See also 'TalkBack' to commentary by Michael Surkan 'The tragedy of Melissa', PC Week Online 14/4.