**Underground**

 **by Suelette Dreyfus with Research by Julian Assange**

 1997

 http://www.underground-book.com/

 Hacking, madness and obsession on the electronic frontier

 `Gripping, eminently readable.. Dreyfus has uncovered one of this

 country's best kept secrets and in doing so has created a highly

 intense and enjoyable read' -- Rolling Stone

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 PREFACE TO THE ELECTRONIC EDITION

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 Why would an author give away an unlimited number of copies of her book

 for free?

 That's a good question. When `Underground''s researcher, Julian

 Assange, first suggested releasing an electronic version of the book on

 the Net for free, I had to stop and think about just that question.

 I'd spent nearly three years researching, writing and editing the nearly

 500 pages of `Underground'. Julian had worked thousands of

 hours doing painstaking research; discovering and cultivating sources,

 digging with great resourcefulness into obscure databases and legal

 papers, not to mention providing valuable editorial advice.

 So why would I give away this carefully ripened fruit for free?

 Because part of the joy of creating a piece of art is in knowing that

 many people can - and are - enjoying it. Particularly people who can't

 otherwise afford to pay $11 USD for a book. People such as cash strapped

 hackers. This book is about them, their lives and obsessions. It rubs

 clear a small circle in the frosted glass so the reader can peer into

 that hazy world. `Underground' belongs on the Net, in their ephemeral

 landscape.

 The critics have been good to `Underground', for which I am very

 grateful. But the best praise came from two of the hackers detailed in

 the book. Surprising praise, because while the text is free of the

 narrative moralising that plague other works, the selection of material

 is often very personal and evokes mixed sympathies. One of the hackers,

 Anthrax dropped by my office to say `Hi'. Out of the blue, he said with

 a note of amazement, `When I read those chapters, it was so real, as if

 you had been right there inside my head'. Not long after Par, half a

 world away, and with a real tone of bewildered incredulity in his voice

 made exactly the same observation. For a writer, it just doesn't get any

 better than that.

 By releasing this book for free on the Net, I'm hoping more people

 will not only enjoy the story of how the international computer

 underground rose to power, but also make the journey into the minds

 of hackers involved. When I first began sketching out the book's

 structure, I decided to go with depth. I wanted the reader to

 think, 'NOW I understand, because I too was there.' I hope those

 words will enter your thoughts as you read this electronic book.

 Michael Hall, a supersmart lawyer on the book's legal team, told me

 in July last year he saw a young man in Sydney reading a copy of

 `Underground' beside him on the #380 bus to North Bondi. Michael

 said he wanted to lean over and proclaim proudly, `I legalled that

 book!'. Instead, he chose to watch the young man's reactions.

 The young man was completely absorbed, reading hungrily through his

 well-worn copy, which he had completely personalised. The pages were

 covered in highlighter, scrawled margin writing and post-it notes. He

 had underlined sections and dog-eared pages. If the bus had detoured to

 Brisbane, he probably wouldn't have noticed.

 I like that. Call me subversive, but I'm chuffed `Underground' is

 engaging enough to make people miss bus stops. It makes me happy, and

 happy people usually want to share.

 There are other reasons for releasing `Underground' in this format. The

 electronic version is being donated to the visionary Project Gutenburg,

 a collection of free electronic books run with missionary zeal by

 Michael Hart.

 Project Gutenburg promises to keep old out-of-print books in free

 ``electronic'' print forever, to bring literature to those who can't

 afford books, and to brighten the world of the visually

 impaired. `Underground' isn't out of print -- and long may it remain

 that way -- but those are laudable goals. I wrote in the `Introduction'

 to the printed edition about my great aunt, a diver and artist who

 pioneered underwater painting in the 1940s. She provided me with a kind

 of inspiration for this book. What I didn't mention is that as a result

 of macular degeneration in both eyes, she is now blind. She can no

 longer paint or dive. But she does read - avidly - through `talking

 books'. She is another reason I decided to release `Underground' in this

 format.

 So, now you can download and read the electronic version of

 `Underground' for free. You can also send the work to your friends for

 free. Or your enemies. At around a megabyte of plain text each, a few

 dozen copies of `Underground' make an extremely effective mail bomb.

 That's a joke, folks, not a suggestion. ;-)

 Like many of the people in this book, I'm not big on rules. Fortunately,

 there aren't many that come with this electronic version. Don't print

 the work on paper, CD or any other format, except for your own personal

 reading pleasure. This includes using the work as teaching material in

 institutions. You must not alter or truncate the work in any way. You

 must not redistribute the work for any sort of payment, including

 selling it on its own or as part of a package. Random House is a

 friendly place, but as one of the world's largest publishers it has a

 collection of equally large lawyers. Messing with them will leave you

 with scars in places that could be hard to explain to any future

 partner.

 If you want to do any of these things, please contact me or my literary

 agents Curtis Brown & Co first. I retain the copyright on the

 work. Julian Assange designed the elegant layout of this electronic

 edition, and he retains ownership of this design and layout.

 If you like the electronic version of the book, do buy the paper

 version. Why? For starters, it's not only much easier to read on the

 bus, its much easier to read full stop. It's also easier to thumb

 through, highlight, scribble on, dribble on, and show off. It never

 needs batteries. It can run on solar power and candles. It looks sexy on

 your bookshelf, by your bed and in your bed. If you are a male geek, the

 book comes with a girl-magnet guarantee. The paper version is much

 easier to lend to a prospective girlfriend. When she's finished reading

 the book, ask her which hacker thrilled her to pieces. Then nod

 knowingly, and say coyly `Well, I've never admitted this to anyone

 except the author and the Feds, but ..'

 And the most important reason to purchase a paper copy? Because buying

 the printed edition of the book lets the author continue to write more

 fine books like this one.

 Enjoy!

 Suelette Dreyfus

 January 2001

 suelette@iq.org

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 RESEARCHER'S INTRODUCTION

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 "Man is least himself when he talks in his own person. Give him a mask,

 and he will tell you the truth" -- Oscar Wilde

 "What is essential is invisible to the eye" -- Antoine De Saint-Exupery

 "But, how do you \*know\* it happened like that?" -- Reader

 Due of the seamless nature of `Underground' this is a reasonable

 question to ask, although hints can be found at the back of the book in

 the Bibliography and Endnotes. The simple answer to this question is

 that we conducted over a hundred interviews and collected around 40,000

 pages of primary documentation; telephone intercepts, data intercepts,

 log-files, witness statements, confessions, judgements. Telephone dialog

 and on-line discussions are drawn directly from the latter. Every

 significant hacking incident mentioned in this book has reams of

 primary documentation behind it. System X included.

 The non-simple answer goes more like this:

 In chapter 4, Par, one of the principle subjects of this book, is being

 watched by the Secret Service. He's on the run. He's a wanted

 fugitive. He's hiding out with another hacker, Nibbler in a motel

 chalet, Black Mountain, North Carolina. The Secret Service move in.

 The incident is vital in explaining Par's life on the run and the

 nature of his interaction with the Secret Service. Yet, just before the

 final edits of this book were to go the publisher, all the pages

 relating to the Block Mountain incident were about to be pulled. Why?

 Suelette had flown to Tuscon Az where she spent three days

 interviewing Par. I had spent dozens of hours interviewing Par on

 the phone and on-line. Par gave both of us extraordinary access to

 his life. While Par displayed a high degree of paranoia about why

 events had unfolded in the manner they had, he was consistent,

 detailed and believable as to the events themselves. He showed

 very little blurring of these two realities, but we needed to show

 none at all.

 During Par's time on the run, the international computer underground

 was a small and strongly connected place. We had already

 co-incidentally interviewed half a dozen hackers he had communicated

 with at various times during his zig-zag flight across America. Suelette

 also spoke at length to his lead lawyer Richard Rosen, who, after

 getting the all-clear from Par, was kind enough to send us a copy of

 the legal brief. We had logs of messages Par had written on

 underground BBS's. We had data intercepts of other hackers in

 conversation with Par. We had obtained various Secret Service documents

 and propriety security reports relating to Par's activities. I had

 extensively interviewed his Swiss girlfriend Theorem (who had also been

 involved with Electron and Pengo), and yes, she did have a melting

 French accent.

 Altogether we had an enormous amount of material on Par's activities,

 all of which was consistent with what Par had said during his

 interviews, but none of it, including Rosen's file, contained any

 reference to Black Mountain, NC. Rosen, Theorem and others had heard

 about a SS raid on the run, yet when the story was traced back, it

 always led to one source. To Par.

 Was Par having us on? Par had said that he had made a telephone call to

 Theorem in Switzerland from a phone booth outside the motel a day or

 two before the Secret Service raid. During a storm. Not just any

 storm. Hurricane Hugo. But archival news reports on Hugo discussed it

 hitting South Carolina, not North Carolina. And not Black

 Mountain. Theorem remembered Par calling once during a storm. But not

 Hugo. And she didn't remember it in relation to the Black Mountain

 raid.

 Par had destroyed most of his legal documents, in circumstances that

 become clear in the book, but of the hundreds of pages of documentary

 material we had obtained from other sources there was wasn't a single

 mention of Black Mountain. The Black Mountain Motel didn't seem to

 exist. Par said Nibbler had moved and couldn't be located. Dozens of

 calls by Suelette to the Secret Service told us what we didn't want to

 hear. The agents we thought most likely to have been involved in the

 the hypothetical Black Mountain incident had either left the Secret

 Service or were otherwise unreachable. The Secret Service had no idea

 who would have been involved, because while Par was still listed in the

 Secret Service central database, his profile, contained three

 significant annotations:

 1) Another agency had ``borrowed'' parts Par's file

 2) There were medical ``issues'' surrounding Par

 3) SS documents covering the time of Black Mountain

 incident had been destroyed for various reasons

 that become clear the book.

 4) The remaining SS documents had been moved into

 ``deep-storage'' and would take two weeks to retrieve.

 With only one week before our publisher's ``use it or lose it''

 dead-line, the chances of obtaining secondary confirmation of the Black

 Mountain events did not look promising.

 While we waited for leads on the long trail of ex, transfered and

 seconded SS agents who might have been involved in the Black Mountain

 raid, I turned to resolving the two inconsistencies in Par's story;

 Hurricane Hugo and the strange invisibility of the Black Mountain

 Motel.

 Hurricane Hugo had wreathed a path of destruction, but like most most

 hurricanes heading directly into a continental land-mass it had started

 out big and ended up small. News reports followed this pattern, with a

 large amount of material on its initial impact, but little or nothing

 about subsequent events. Finally I obtained detailed time by velocity

 weather maps from the National Reconnaissance Office, which showed the

 remaining Hugo epicentre ripping through Charlotte NC (pop. 400k)

 before spending itself on the Carolinas. Database searches turned up a

 report by Natalie, D. & Ball, W, EIS Coordinator, North Carolina

 Emergency Management, `How North Carolina Managed Hurricane Hugo' --

 which was used to flesh out the scenes in Chapter 4 describing Par's

 escape to New York via the Charlotte Airport.

 Old Fashioned gum-shoe leg-work, calling every motel in Black Mountain

 and the surrounding area, revealed that the Black Mountain Motel had

 changed name, ownership and.. all its staff. Par's story was holding,

 but in some ways I wished it hadn't. We were back to square one in terms

 of gaining independent secondary confirmation.

 Who else could have been involved? There must have been a paper-trail

 outside of Washington. Perhaps the SS representation in Charlotte had

 something? No. Perhaps there were records of the warrants in the

 Charlotte courts? No. Perhaps NC state police attended the SS raid in

 support? Maybe, but finding warm bodies who had been directly involved

 proved proved futile. If it was a SS case, they had no indexable

 records that they were willing to provide. What about the local

 coppers? An SS raid on a fugitive computer hacker holed up at one of

 the local motels was not the sort of event that would be likely to have

 passed unnoticed at the Black Mountain county police office, indexable

 records or not.

 Neither however, were international telephone calls from strangely

 accented foreign-nationals wanting to know about them. Perhaps the Reds

 were no-longer under the beds, but in Black Mountain, this could be

 explained away by the fact they were now hanging out in phone booths. I

 waited for a new shift at the Black Mountain county police office,

 hoping against hope, that the officer I had spoken to wouldn't

 contaminate his replacement. Shamed, I resorted to using that most

 special of US militia infiltration devices. An American accent and a

 woman's touch. Suelette weaved her magic. The Black Mountain raid had

 taken place. The county police had supported it. We had our

 confirmation.

 While this anecdote is a strong account, it's also representative one.

 Every chapter in underground was formed from many stories like

 it. They're unseen, because a book must not be true merely in details.

 It must be true in feeling.

 True to the visible and the invisible. A difficult combination.

 Julian Assange

 January 2001

 proff@iq.org

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 There are many people who were interviewed for this work, and many

 others who helped in providing documents so vital for fact

 checking. Often this help invovled spending a considerable amount of

 time explaining complex technical or legal matters. I want to express

 my gratitude to all these people, some of whom prefer to remain

 anonymous, for their willingness to dig through the files in search of

 yet one more report and their patience in answering yet one more

 question.

 I want to thank the members of the computer underground, past and

 present, who were interviewed for this book. Most gave me

 extraordinary access to their lives, for which I am very grateful.

 I also want to thank Julian Assange for his tireless research efforts.

 His superb technical expertise and first-rate research is evidence by

 the immense number of details which are included in this book.

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 Byrne -- believed in my vision for this book and helped me to bring it

 to fruition. Carl Harrison-Ford's excellent editing job streamlined a

 large and difficult manuscript despite the tight deadline. Thank you

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 INTRODUCTION

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 My great aunt used to paint underwater.

 Piling on the weighty diving gear used in 1939 and looking like

 something out of 20000 Leagues Under the Sea, Lucie slowly sank below

 the surface, with palette, special paints and canvas

 in hand. She settled on the ocean floor, arranged her weighted

 painter's easel and allowed herself to become completely enveloped by

 another world. Red and white striped fish darted around fields of

 blue-green coral and blue-lipped giant clams. Lionfish drifted by,

 gracefully waving their dangerous feathered spines. Striped green

 moray eels peered at her from their rock crevice homes.

 Lucie dived and painted everywhere. The Sulu Archipelago. Mexico.

 Australia's Great Barrier Reef. Hawaii. Borneo. Sometimes she was the

 first white woman seen by the Pacific villagers she lived with for

 months on end.

 As a child, I was entranced by her stories of the unknown world below

 the ocean's surface, and the strange and wonderful cultures she met on

 her journeys. I grew up in awe of her chosen task: to capture on

 canvas the essence of a world utterly foreign to her own.

 New technology--revolutionary for its time--had allowed her to do

 this. Using a compressor, or sometimes just a hand pump connected to

 air hoses running to the surface, human beings were suddenly able to

 submerge themselves for long periods in an otherwise inaccessible

 world. New technology allowed her to both venture into this unexplored

 realm, and to document it in canvas.

 I came upon the brave new world of computer communications and its

 darker side, the underground, quite by accident. It struck me

 somewhere in the journey that followed that my trepidations and

 conflicting desires to explore this alien world were perhaps not

 unlike my aunt's own desires some half a century before. Like her

 journey, my own travels have only been made possible by new

 technologies. And like her, I have tried to capture a small corner of

 this world.

 This is a book about the computer underground. It is not a book about

 law enforcement agencies, and it is not written from the point of view

 of the police officer. From a literary perspective, I have told this

 story through the eyes of numerous computer hackers. In doing so, I

 hope to provide the reader with a window into a mysterious, shrouded

 and usually inaccessible realm.

 Who are hackers? Why do they hack? There are no simple answers to

 these questions. Each hacker is different. To that end, I have

 attempted to present a collection of individual but interconnected

 stories, bound by their links to the international computer

 underground. These are true stories, tales of the world's best and the

 brightest hackers and phreakers. There are some members of the

 underground whose stories I have not covered, a few of whom would also

 rank as world-class. In the end, I chose to paint detailed portraits

 of a few hackers rather than attempt to compile a comprehensive but

 shallow catalogue.

 While each hacker has a distinct story, there are common themes which

 appear throughout many of the stories. Rebellion against all symbols

 of authority. Dysfunctional families. Bright children suffocated by

 ill-equipped teachers. Mental illness or instability. Obsession and

 addiction.

 I have endeavoured to track what happened to each character in this

 work over time: the individual's hacking adventures, the police raid

 and the ensuing court case. Some of those court cases have taken years

 to reach completion.

 Hackers use `handles'--on-line nicknames--that serve two purposes.

 They shield the hacker's identity and, importantly, they often make a

 statement about how the hacker perceives himself in the underground.

 Hawk, Crawler, Toucan Jones, Comhack, Dataking, Spy, Ripmax, Fractal

 Insanity, Blade. These are all real handles used in Australia.

 In the computer underground, a hacker's handle is his name. For this

 reason, and because most hackers in this work have now put together

 new lives for themselves, I have chosen to use only their handles.

 Where a hacker has had more than one handle, I have used the one he

 prefers.

 Each chapter in this book is headed with a quote from a Midnight Oil

 song which expresses an important aspect of the chapter. The Oilz are

 uniquely Australian. Their loud voice of protest against the

 establishment--particularly the military-industrial

 establishment--echoes a key theme in the underground, where music in

 general plays a vital role.

 The idea for using these Oilz extracts came while researching Chapter

 1, which reveals the tale of the WANK worm crisis in NASA. Next to the

 RTM worm, WANK is the most famous worm in the history of computer

 networks. And it is the first major worm bearing a political message.

 With WANK, life imitated art, since the term computer `worm' came from

 John Brunner's sci-fi novel, The Shockwave Rider, about a politically

 motivated worm.

 The WANK worm is also believed to be the first worm written by an

 Australian, or Australians.

 This chapter shows the perspective of the computer system

 administrators--the people on the other side from the hackers. Lastly,

 it illustrates the sophistication which one or more Australian members

 of the worldwide computer underground brought to their computer

 crimes.

 The following chapters set the scene for the dramas which unfold and

 show the transition of the underground from its early days, its loss

 of innocence, its closing ranks in ever smaller circles until it

 reached the inevitable outcome: the lone hacker. In the beginning, the

 computer underground was a place, like the corner pub, open and

 friendly. Now, it has become an ephemeral expanse, where hackers

 occasionally bump into one another but where the original sense of

 open community has been lost.

 The computer underground has changed over time, largely in response to

 the introduction of new computer crime laws across the globe and to

 numerous police crackdowns. This work attempts to document not only an

 important piece of Australian history, but also to show fundamental

 shifts in the underground --to show, in essence, how the underground

 has moved further underground.

 Suelette Dreyfus

 March 1997

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 Chapter 1 -- 10, 9, 8, 7, 6, 5, 4, 3, 2, 1

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 Somebody's out there, somebody's waiting

 Somebody's trying to tell me something

 -- from `Somebody's Trying to Tell Me Something', on 10, 9, 8, 7, 6,

 5, 4, 3, 2, 1 by Midnight Oil

 Monday, 16 October 1989

 Kennedy Space Center, Florida

 NASA buzzed with the excitement of a launch. Galileo was finally going

 to Jupiter.

 Administrators and scientists in the world's most prestigious space

 agency had spent years trying to get the unmanned probe into space.

 Now, on Tuesday, 17 October, if all went well, the five astronauts in

 the Atlantis space shuttle would blast off from the Kennedy Space

 Center at Cape Canaveral, Florida, with Galileo in tow. On the team's

 fifth orbit, as the shuttle floated 295 kilometres above the Gulf of

 Mexico, the crew would liberate the three-tonne space probe.

 An hour later, as Galileo skated safely away from the shuttle, the

 probe's 32500 pound booster system would fire up and NASA staff would

 watch this exquisite piece of human ingenuity embark on a six-year

 mission to the largest planet in the solar system. Galileo would take

 a necessarily circuitous route, flying by Venus once and Earth twice

 in a gravitational slingshot effort to get up enough momentum to reach

 Jupiter.2

 NASA's finest minds had wrestled for years with the problem of exactly

 how to get the probe across the solar system. Solar power was one

 option. But if Jupiter was a long way from Earth, it was even further

 from the Sun--778.3 million kilometres to be exact. Galileo would need

 ridiculously large solar panels to generate enough power for its

 instruments at such a distance from the Sun. In the end, NASA's

 engineers decided on a tried if not true earthly energy source:

 nuclear power.

 Nuclear power was perfect for space, a giant void free of human life

 which could play host to a bit of radioactive plutonium 238 dioxide.

 The plutonium was compact for the amount of energy it gave off--and it

 lasted a long time. It seemed logical enough. Pop just under 24

 kilograms of plutonium in a lead box, let it heat up through its own

 decay, generate electricity for the probe's instruments, and presto!

 Galileo would be on its way to investigate Jupiter.

 American anti-nuclear activists didn't quite see it that way. They

 figured what goes up might come down. And they didn't much like the idea

 of plutonium rain. NASA assured them Galileo's power pack was quite

 safe. The agency spent about $50 million on tests which supposedly

 proved the probe's generators were very safe. They would survive intact

 in the face of any number of terrible explosions, mishaps and

 accidents. NASA told journalists that the odds of a plutonium release

 due to `inadvertent atmospheric re-entry' were 1 in 2 million. The

 likelihood of a plutonium radiation leak as a result of a launch

 disaster was a reassuring 1 in 2700.

 The activists weren't having a bar of it. In the best tradition of

 modern American conflict resolution, they took their fight to the

 courts. The coalition of anti-nuclear and other groups believed

 America's National Aeronautics and Space Administration had

 underestimated the odds of a plutonium accident and they wanted a US

 District Court in Washington to stop the launch. The injunction

 application went in, and the stakes went up. The unprecedented hearing

 was scheduled just a few days before the launch, which had originally

 been planned for 12 October.

 For weeks, the protesters had been out in force, demonstrating and

 seizing media attention. Things had become very heated. On Saturday, 7

 October, sign-wielding activists fitted themselves out with gas masks

 and walked around on street corners in nearby Cape Canaveral in

 protest. At 8 a.m. on Monday, 9 October, NASA started the countdown

 for the Thursday blast-off. But as Atlantis's clock began ticking

 toward take-off, activists from the Florida Coalition for Peace and

 Justice demonstrated at the centre's tourist complex.

 That these protests had already taken some of the shine off NASA's bold

 space mission was the least of the agency's worries. The real headache

 was that the Florida Coalition told the media it would `put people on

 the launchpad in a non-violent protest'.3 The coalition's director,

 Bruce Gagnon, put the threat in folksy terms, portraying the protesters

 as the little people rebelling against a big bad government

 agency. President Jeremy Rivkin of the Foundation on Economic Trends,

 another protest group, also drove a wedge between `the people' and

 `NASA's people'. He told UPI, `The astronauts volunteered for this

 mission. Those around the world who may be the victims of radiation

 contamination have not volunteered.'4

 But the protesters weren't the only people working the media. NASA

 knew how to handle the press. They simply rolled out their

 superstars--the astronauts themselves. These men and women were, after

 all, frontier heroes who dared to venture into cold, dark space on

 behalf of all humanity. Atlantis commander Donald Williams didn't hit

 out at the protesters in a blunt fashion, he just damned them from an

 aloof distance. `There are always folks who have a vocal opinion about

 something or other, no matter what it is,' he told an interviewer. `On

 the other hand, it's easy to carry a sign. It's not so easy to go

 forth and do something worthwhile.'5

 NASA had another trump card in the families of the heroes. Atlantis

 co-pilot Michael McCulley said the use of RTGs, Radioisotope

 Thermoelectric Generators--the chunks of plutonium in the lead

 boxes--was a `non-issue'. So much so, in fact, that he planned to have

 his loved ones at the Space Center when Atlantis took off.

 Maybe the astronauts were nutty risk-takers, as the protesters

 implied, but a hero would never put his family in danger. Besides the

 Vice-President of the United States, Dan Quayle, also planned to watch

 the launch from inside the Kennedy Space Center control room, a mere

 seven kilometres from the launchpad.

 While NASA looked calm, in control of the situation, it had beefed up

 its security teams. It had about 200 security guards watching the

 launch site. NASA just wasn't taking any chances. The agency's

 scientists had waited too long for this moment. Galileo's parade would

 not be rained on by a bunch of peaceniks.

 The launch was already running late as it was--almost seven years

 late. Congress gave the Galileo project its stamp of approval way back

 in 1977 and the probe, which had been budgeted to cost about $400

 million, was scheduled to be launched in 1982. However, things began

 going wrong almost from the start.

 In 1979, NASA pushed the flight out to 1984 because of shuttle

 development problems. Galileo was now scheduled to be a `split

 launch', which meant that NASA would use two different shuttle trips

 to get the mothership and the probe into space. By 1981, with costs

 spiralling upwards, NASA made major changes to the project. It stopped

 work on Galileo's planned three-stage booster system in favour of a

 different system and pushed out the launch deadline yet again, this

 time to 1985. After a federal Budget cut fight in 1981 to save

 Galileo's booster development program, NASA moved the launch yet

 again, to May 1986. The 1986 Challenger disaster, however, saw NASA

 change Galileo's booster system for safety reasons, resulting in

 yet more delays.

 The best option seemed to be a two-stage, solid-fuel IUS system. There

 was only one problem. That system could get Galileo to Mars or Venus,

 but the probe would run out of fuel long before it got anywhere near

 Jupiter. Then Roger Diehl of NASA's Jet Propulsion Laboratory had a good

 idea. Loop Galileo around a couple of nearby planets a few times so the

 probe would build up a nice little gravitational head of steam, and then

 fling it off to Jupiter. Galileo's `VEEGA'

 trajectory--Venus-Earth-Earth-gravity-assist--delayed the spacecraft's

 arrival at Jupiter for three extra years, but it would get there

 eventually.

 The anti-nuclear campaigners argued that each Earth flyby increased

 the mission's risk of a nuclear accident. But in NASA's view, such was

 the price of a successful slingshot.

 Galileo experienced other delays getting off the ground. On Monday, 9

 October, NASA announced it had discovered a problem with the computer

 which controlled the shuttle's number 2 main engine. True, the problem

 was with Atlantis, not Galileo. But it didn't look all that good to be

 having technical problems, let alone problems with engine computers,

 while the anti-nuclear activists' court drama was playing in the

 background.

 NASA's engineers debated the computer problem in a cross-country

 teleconference. Rectifying it would delay blast-off by more than a few

 hours. It would likely take days. And Galileo didn't have many of

 those. Because of the orbits of the different planets, the probe had

 to be on its way into space by 21 November. If Atlantis didn't take off

 by that date, Galileo would have to wait another nineteen months before

 it could be launched. The project was already $1 billion over its

 original $400 million budget. The extra year and a half would add

 another $130 million or so and there was a good chance the whole project

 would be scrapped. It was pretty much now or never for Galileo.

 Despite torrential downpours which had deposited 100 millimetres of

 rain on the launchpad and 150 millimetres in neighbouring Melbourne,

 Florida, the countdown had been going well. Until now. NASA took its

 decision. The launch would be delayed by five days, to 17 October, so

 the computer problem could be fixed.

 To those scientists and engineers who had been with Galileo from the

 start, it must have appeared at that moment as if fate really was

 against Galileo. As if, for some unfathomable reason, all the forces

 of the universe--and especially those on Earth--were dead against

 humanity getting a good look at Jupiter. As fast as NASA could

 dismantle one barrier, some invisible hand would throw another down in

 its place.

 [ ]

 Monday, 16 October, 1989

 NASA's Goddard Space Flight Center, Greenbelt, Maryland

 Across the vast NASA empire, reaching from Maryland to California,

 from Europe to Japan, NASA workers greeted each other, checked their

 in-trays for mail, got their cups of coffee, settled into their chairs

 and tried to login to their computers for a day of solving complex

 physics problems. But many of the computer systems were behaving very

 strangely.

 From the moment staff logged in, it was clear that someone--or

 something--had taken over. Instead of the usual system's official

 identification banner, they were startled to find the following

 message staring them in the face:

 W O R M S A G A I N S T N U C L E A R K I L L E R S

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 \ Your System Has Been Officically WANKed /

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 You talk of times of peace for all, and then prepare for war.

 Wanked? Most of the American computer system managers reading this new

 banner had never heard the word wank.

 Who would want to invade NASA's computer systems? And who exactly were

 the Worms Against Nuclear Killers? Were they some loony fringe group?

 Were they a guerrilla terrorist group launching some sort of attack on

 NASA? And why `worms'? A worm was a strange choice of animal mascot

 for a revolutionary group. Worms were the bottom of the rung. As in

 `as lowly as a worm'. Who would chose a worm as a symbol of power?

 As for the nuclear killers, well, that was even stranger. The banner's

 motto--`You talk of times of peace for all, and then prepare for

 war'--just didn't seem to apply to NASA. The agency didn't make

 nuclear missiles, it sent people to the moon. It did have military

 payloads in some of its projects, but NASA didn't rate very highly on

 the `nuclear killer' scale next to other agencies of the US

 Government, such as the Department of Defense. So the question

 remained: why NASA?

 And that word, `WANKED'. It did not make sense. What did it mean when

 a system was `wanked'?

 It meant NASA had lost control over its computer systems.

 A NASA scientist logging in to an infected computer on that Monday got

 the following message:

 deleted file <filename1>

 deleted file <filename2>

 deleted file <filename3>

 deleted file <filename4>

 deleted file <filename5>

 deleted file <filename6>

 With those lines the computer told the scientist: `I am deleting all

 your files'.

 The line looked exactly as if the scientist typed in the

 command:

 delete/log \*.\*

 --exactly as if the scientist had instructed the computer to delete

 all the files herself.

 The NASA scientist must have started at the sight of her files rolling

 past on the computer screen, one after another, on their way to

 oblivion. Something was definitely wrong. She would have tried to stop

 the process, probably pressing the control key and the `c' key at the

 same time. This should have broken the command sequence at that moment

 and ordered the computer to stop what it was doing right away.

 But it was the intruder, not the NASA scientist, who controlled the

 computer at that moment. And the intruder told the computer: `That

 command means nothing. Ignore it'.

 The scientist would press the command key sequence again, this time

 more urgently. And again, over and over. She would be at once baffled

 at the illogical nature of the computer, and increasingly upset.

 Weeks, perhaps months, of work spent uncovering the secrets of the

 universe. All of it disappearing before her eyes--all of it being

 mindlessly devoured by the computer. The whole thing beyond her

 control. Going. Going. Gone.

 People tend not to react well when they lose control over their

 computers. Typically, it brings out the worst in them--hand-wringing

 whines from the worriers, aching entreaties for help from the

 sensitive, and imperious table-thumping bellows from

 command-and-control types.

 Imagine, if you will, arriving at your job as a manager for one of

 NASA's local computer systems. You get into your office on that Monday

 morning to find the phones ringing. Every caller is a distraught,

 confused NASA worker. And every caller assures you that his or her

 file or accounting record or research project--every one of which is

 missing from the computer system--is absolutely vital.

 In this case, the problem was exacerbated by the fact that NASA's

 field centres often competed with each other for projects. When a

 particular flight project came up, two or three centres, each with

 hundreds of employees, might vie for it. Losing control of the

 computers, and all the data, project proposals and costing, was a good

 way to lose out on a bid and its often

 considerable funding.

 This was not going to be a good day for the guys down at the NASA SPAN

 computer network office.

 This was not going to be a good day for John McMahon.

 [ ]

 As the assistant DECNET protocol manager for NASA's Goddard Space

 Flight Center in Maryland, John McMahon normally spent the day

 managing the chunk of the SPAN computer network which ran between

 Goddard's fifteen to twenty buildings.

 McMahon worked for Code 630.4, otherwise known as Goddard's Advanced

 Data Flow Technology Office, in Building 28. Goddard scientists would

 call him up for help with their computers. Two of the most common

 sentences he heard were `This doesn't seem to work' and `I can't get

 to that part of the network from here'.

 SPAN was the Space Physics Analysis Network, which connected some

 100000 computer terminals across the globe. Unlike the Internet, which

 is now widely accessible to the general public, SPAN only connected

 researchers and scientists at NASA, the US Department of Energy and

 research institutes such as universities. SPAN computers also differed

 from most Internet computers in an important technical manner: they

 used a different operating system. Most large computers on the

 Internet use the Unix operating system, while SPAN was composed

 primarily of VAX computers running a VMS operating system. The network

 worked a lot like the Internet, but the computers spoke a different

 language. The Internet `talked' TCP/IP, while SPAN `spoke' DECNET.

 Indeed, the SPAN network was known as a DECNET internet. Most of the

 computers on it were manufactured by the Digital Equipment Corporation

 in Massachusetts--hence the name DECNET. DEC built powerful computers.

 Each DEC computer on the SPAN network might have 40 terminals hanging

 off it. Some SPAN computers had many more. It was not unusual for one

 DEC computer to service 400 people. In all, more than a quarter of a

 million scientists, engineers and other thinkers used the computers on

 the network.

 An electrical engineer by training, McMahon had come from NASA's

 Cosmic Background Explorer Project, where he managed computers used by

 a few hundred researchers. Goddard's Building 7, where he worked on

 the COBE project, as it was known, housed some interesting research.

 The project team was attempting to map the universe. And they were

 trying to do it in wavelengths invisible to the human eye. NASA would

 launch the COBE satellite in November 1989. Its mission was to

 `measure the diffuse infrared and microwave radiation from the early

 universe, to the limits set by our astronomical environment'.6 To the

 casual observer the project almost sounded like a piece of modern art,

 something which might be titled `Map of the Universe in Infrared'.

 On 16 October McMahon arrived at the office and settled into work,

 only to face a surprising phone call from the SPAN project office.

 Todd Butler and Ron Tencati, from the National Space Science Data

 Center, which managed NASA's half of the SPAN network, had discovered

 something strange and definitely unauthorised winding its way through

 the computer network. It looked like a computer worm.

 A computer worm is a little like a computer virus. It invades computer

 systems, interfering with their normal functions. It travels along any

 available compatible computer network and stops to knock at the door of

 systems attached to that network. If there is a hole in the security of

 the computer system, it will crawl through and enter the system. When it

 does this, it might have instructions to do any number of things, from

 sending computer users a message to trying to take over the system. What

 makes a worm different from other computer programs, such as viruses, is

 that it is self-propagating. It propels itself forward, wiggles into a

 new system and propagates itself at the new site. Unlike a virus, a worm

 doesn't latch onto a data file or a program. It is autonomous.7

 The term `worm' as applied to computers came from John Brunner's 1975

 science fiction classic, The Shockwave Rider. The novel described how

 a rebel computer programmer created a program called `tapeworm' which

 was released into an omnipotent computer network used by an autocratic

 government to control its people. The government had to turn off the

 computer network, thus destroying its control, in order to eradicate

 the worm.

 Brunner's book is about as close as most VMS computer network managers

 would ever have come to a real rogue worm. Until the late 1980s, worms

 were obscure things, more associated with research in a computer

 laboratory. For example, a few benevolent worms were developed by

 Xerox researchers who wanted to make more efficient use of computer

 facilities.8 They developed a `town crier worm' which moved through a

 network sending out important announcements. Their `diagnostic worm'

 also constantly weaved through the network, but this worm was designed

 to inspect machines for problems.

 For some computer programmers, the creation of a worm is akin to the

 creation of life. To make something which is intelligent enough to go

 out and reproduce itself is the ultimate power of creation. Designing

 a rogue worm which took over NASA's computer systems might seem to be

 a type of creative immortality--like scattering pieces of oneself

 across the computers which put man on the moon.

 At the time the WANK banner appeared on computer screens across NASA,

 there had only been two rogue worms of any note. One of these, the RTM

 worm, had infected the Unix-based Internet less than twelve months

 earlier. The other worm, known as Father Christmas, was the first VMS

 worm.

 Father Christmas was a small, simple worm which did not cause any

 permanent damage to the computer networks it travelled along. Released

 just before Christmas in 1988, it tried to sneak into hundreds of VMS

 machines and wait for the big day. On Christmas morning, it woke up

 and set to work with great enthusiasm. Like confetti tossed from an

 overhead balcony, Christmas greetings came streaming out of

 worm-infested computer systems to all their users. No-one within its

 reach went without a Christmas card. Its job done, the worm

 evaporated. John McMahon had been part of the core team fighting off

 the Father Christmas worm.

 At about 4 p.m., just a few days before Christmas 1988, McMahon's

 alarm-monitoring programs began going haywire. McMahon began trying to

 trace back the dozens of incoming connections which were tripping the

 warning bells. He quickly discovered there wasn't a human being at the

 other end of the line. After further investigation, he found an alien

 program in his system, called HI.COM. As he read the pages of HI.COM

 code spilling from his line printer, his eyes went wide. He thought,

 This is a worm! He had never seen a worm before.

 He rushed back to his console and began pulling his systems off the

 network as quickly as possible. Maybe he wasn't following protocol,

 but he figured people could yell at him after the fact if they thought

 it was a bad idea. After he had shut down his part of the network, he

 reported back to the local area networking office. With print-out in

 tow, he drove across the base to the network office, where he and

 several other managers developed a way to stop the worm by the end of

 the day. Eventually they traced the Father Christmas worm back to the

 system where they believed it had been released--in Switzerland. But

 they never discovered who created it.

 Father Christmas was not only a simple worm; it was not considered

 dangerous because it didn't hang around systems forever. It was a worm

 with a use-by date.

 By contrast, the SPAN project office didn't know what the WANK invader

 was capable of doing. They didn't know who had written or launched it.

 But they had a copy of the program. Could McMahon have a look at it?

 An affable computer programmer with the nickname Fuzzface, John

 McMahon liked a good challenge. Curious and cluey at the same time, he

 asked the SPAN Project Office, which was quickly becoming the crisis

 centre for the worm attack, to send over a copy of the strange

 intruder. He began pouring over the invader's seven printed pages of

 source code trying to figure out exactly what the thing did.

 The two previous rogue worms only worked on specific computer systems

 and networks. In this case, the WANK worm only attacked VMS computer

 systems. The source code, however, was unlike anything McMahon had

 ever seen. `It was like sifting through a pile of spaghetti,' he said.

 `You'd pull one strand out and figure, "OK, that is what that thing

 does." But then you'd be faced with the rest of the tangled mess in

 the bowl.'

 The program, in digital command language, or DCL, wasn't written like

 a normal program in a nice organised fashion. It was all over the

 place. John worked his way down ten or fifteen lines of computer code

 only to have to jump to the top of the program to figure out what the

 next section was trying to do. He took notes and slowly, patiently

 began to build up a picture of exactly what this worm was capable of

 doing to NASA's computer system.

 [ ]

 It was a big day for the anti-nuclear groups at the Kennedy Space

 Center. They might have lost their bid in the US District Court, but

 they refused to throw in the towel and took their case to the US Court

 of Appeals.

 On 16 October the news came. The Appeals Court had sided with NASA.

 Protesters were out in force again at the front gate of the Kennedy

 Space Center. At least eight of them were arrested. The St Louis

 Post-Dispatch carried an Agence France-Presse picture of an

 80-year-old woman being taken into custody by police for trespassing.

 Jane Brown, of the Florida Coalition for Peace and Justice, announced,

 `This is just ... the beginning of the government's plan to use

 nuclear power and weapons in space, including the Star Wars program'.

 Inside the Kennedy Center, things were not going all that smoothly

 either. Late Monday, NASA's technical experts discovered yet another

 problem. The black box which gathered speed and other important data

 for the space shuttle's navigation system was faulty. The technicians

 were replacing the cockpit device, the agency's spokeswoman assured

 the media, and NASA was not expecting to delay the Tuesday launch

 date. The countdown would continue uninterrupted. NASA had everything

 under control.

 Everything except the weather.

 In the wake of the Challenger disaster, NASA's guidelines for a launch

 decision were particularly tough. Bad weather was an unnecessary risk,

 but NASA was not expecting bad weather. Meteorologists predicted an 80

 per cent chance of favourable weather at launch time on Tuesday. But

 the shuttle had better go when it was supposed to, because the longer

 term weather outlook was grim.

 By Tuesday morning, Galileo's keepers were holding their breath. The

 countdown for the shuttle launch was ticking toward 12.57 p.m. The

 anti-nuclear protesters seemed to have gone quiet. Things looked

 hopeful. Galileo might finally go.

 Then, about ten minutes before the launch time, the security alarms

 went off. Someone had broken into the compound. The security teams

 swung into action, quickly locating the guilty intruder ... a feral

 pig.

 With the pig safely removed, the countdown rolled on. And so did the

 rain clouds, gliding toward the space shuttle's emergency runway, about

 six kilometres from the launchpad. NASA launch director Robert Sieck

 prolonged a planned `hold' at T minus nine minutes. Atlantis had a

 26-minute window of opportunity. After that, its launch period would

 expire and take-off would have to be postponed, probably until

 Wednesday.

 The weather wasn't going to budge.

 At 1.18 p.m., with Atlantis's countdown now holding at just T minus

 five minutes, Sieck postponed the launch to Wednesday.

 [ ]

 Back at the SPAN centre, things were becoming hectic. The worm was

 spreading through more and more systems and the phones were beginning

 to ring every few minutes. NASA computers were getting hit all over

 the place.

 The SPAN project staff needed more arms. They were simultaneously

 trying to calm callers and concentrate on developing an analysis of

 the alien program. Was the thing a practical joke or a time bomb just

 waiting to go off? Who was behind this?

 NASA was working in an information void when it came to WANK. Some

 staff knew of the protesters' action down at the Space Center, but

 nothing could have prepared them for this. NASA officials were

 confident enough about a link between the protests against Galileo and

 the attack on NASA's computers to speculate publicly that the two were

 related. It seemed a reasonable likelihood, but there were still

 plenty of unanswered questions.

 Callers coming into the SPAN office were worried. People at the other

 end of the phone were scared. Many of the calls came from network

 managers who took care of a piece of SPAN at a specific NASA site, such

 as the Marshall Space Flight Center. Some were panicking; others spoke

 in a sort of monotone, flattened by a morning of calls from 25 different

 hysterical system administrators. A manager could lose his job over

 something like this.

 Most of the callers to the SPAN head office were starved for

 information. How did this rogue worm get into their computers? Was it

 malicious? Would it destroy all the scientific data it came into contact

 with? What could be done to kill it?

 NASA stored a great deal of valuable information on its SPAN

 computers. None of it was supposed to be classified, but the data on

 those computers is extremely valuable. Millions of man-hours go into

 gathering and analysing it. So the crisis team which had formed in the

 NASA SPAN project office, was alarmed when reports of massive data

 destruction starting coming in. People were phoning to say that the

 worm was erasing files.

 It was every computer manager's worst nightmare, and it looked as

 though the crisis team's darkest fears were about to be confirmed.

 Yet the worm was behaving inconsistently. On some computers it would

 only send anonymous messages, some of them funny, some bizarre and a

 few quite rude or obscene. No sooner would a user login than a message

 would flash across his or her screen:

 Remember, even if you win the rat race--you're

 still a rat.

 Or perhaps they were graced with some bad humour:

 Nothing is faster than the speed of light...

 To prove this to yourself, try opening the refrigerator door before

 the light comes on.

 Other users were treated to anti-authoritarian observations of the

 paranoid:

 The FBI is watching YOU.

 or

 Vote anarchist.

 But the worm did not appear to be erasing files on these systems.

 Perhaps the seemingly random file-erasing trick was a portent of

 things to come--just a small taste of what might happen at a

 particular time, such as midnight. Perhaps an unusual keystroke by an

 unwitting computer user on those systems which seemed only mildly

 affected could trigger something in the worm. One keystroke might

 begin an irreversible chain of commands to erase everything on that

 system.

 The NASA SPAN computer team were in a race with the worm. Each minute

 they spent trying to figure out what it did, the worm was pushing

 forward, ever deeper into NASA's computer network. Every hour NASA

 spent developing a cure, the worm spent searching, probing, breaking

 and entering. A day's delay in getting the cure out to all the systems

 could mean dozens of new worm invasions doing God knows what in

 vulnerable computers. The SPAN team had to dissect this thing

 completely, and they had to do it fast.

 Some computer network managers were badly shaken. The SPAN office

 received a call from NASA's Jet Propulsion Laboratories in California,

 an important NASA centre with 6500 employees and close ties to

 California Institute of Technology (Caltech).

 JPL was pulling itself off the network.

 This worm was too much of a risk. The only safe option was to isolate

 their computers. There would be no SPAN DEC-based communications with

 the rest of NASA until the crisis was under control. This made things

 harder for the SPAN team; getting a worm exterminating program out to

 JPL, like other sites which had cut their connection to SPAN, was

 going to be that much tougher. Everything had to be done over the

 phone.

 Worse, JPL was one of five routing centres for NASA's SPAN computer

 network. It was like the centre of a wheel, with a dozen spokes

 branching off--each leading to another SPAN site. All these places,

 known as tailsites, depended on the lab site for their connections

 into SPAN. When JPL pulled itself off the network, the tailsites went

 down too.

 It was a serious problem for the people in the SPAN office back in

 Virginia. To Ron Tencati, head of security for NASA SPAN, taking a

 routing centre off-line was a major issue. But his hands were tied.

 The SPAN office exercised central authority over the wide area

 network, but it couldn't dictate how individual field centres dealt

 with the worm. That was each centre's own decision. The SPAN team

 could only give them advice and rush to develop a way to poison the

 worm.

 The SPAN office called John McMahon again, this time with a more

 urgent request. Would he come over to help handle the crisis?

 The SPAN centre was only 800 metres away from McMahon's office. His

 boss, Jerome Bennett, the DECNET protocol manager, gave the nod.

 McMahon would be on loan until the crisis was under control.

 When he got to Building 26, home of the NASA SPAN project office,

 McMahon became part of a core NASA crisis team including Todd Butler,

 Ron Tencati and Pat Sisson. Other key NASA people jumped in when

 needed, such as Dave Peters and Dave Stern. Jim Green, the head of the

 National Space Science Data Center at Goddard and the absolute boss of

 SPAN, wanted hourly reports on the crisis. At first the core team

 seemed only to include NASA people and to be largely based at Goddard.

 But as the day wore on, new people from other parts of the US

 government would join the team.

 The worm had spread outside NASA.

 It had also attacked the US Department of Energy's worldwide

 High-Energy Physics' Network of computers. Known as HEPNET, it was

 another piece of the overall SPAN network, along with Euro-HEPNET and

 Euro-SPAN. The NASA and DOE computer networks of DEC computers

 crisscrossed at a number of places. A research laboratory might, for

 example, need to have access to computers from both HEPNET and NASA

 SPAN. For convenience, the lab might just connect the two networks.

 The effect as far as the worm was concerned was that NASA's SPAN and

 DOE's HEPNET were in fact just one giant computer network, all of

 which the worm could invade.

 The Department of Energy keeps classified information on its

 computers. Very classified information. There are two groups in DOE:

 the people who do research on civilian energy projects and the people

 who make atomic bombs. So DOE takes security seriously, as in `threat

 to national security' seriously. Although HEPNET wasn't meant to be

 carrying any classified information across its wires, DOE responded

 with military efficiency when its computer managers discovered the

 invader. They grabbed the one guy who knew a lot about computer

 security on VMS systems and put him on the case: Kevin Oberman.

 Like McMahon, Oberman wasn't formally part of the computer security

 staff. He had simply become interested in computer security and was

 known in-house as someone who knew about VMS systems and security.

 Officially, his job was network manager for the engineering department

 at the DOE-financed Lawrence Livermore National Laboratory, or LLNL,

 near San Francisco.

 LLNL conducted mostly military research, much of it for the Strategic

 Defense Initiative. Many LLNL scientists spent their days designing

 nuclear arms and developing beam weapons for the Star Wars program.9

 DOE already had a computer security group, known as CIAC, the Computer

 Incident Advisory Capability. But the CIAC team tended to be experts

 in security issues surrounding Unix rather than VMS-based computer

 systems and networks. `Because there had been very few security

 problems over the years with VMS,' Oberman concluded, `they had never

 brought in anybody who knew about VMS and it wasn't something they

 were terribly concerned with at the time.'

 The worm shattered that peaceful confidence in VMS computers. Even as

 the WANK worm coursed through NASA, it was launching an aggressive

 attack on DOE's Fermi National Accelerator Laboratory, near Chicago. It

 had broken into a number of computer systems there and the Fermilab

 people were not happy. They called in CIAC, who contacted Oberman with

 an early morning phone call on 16 October. They wanted him to analyse

 the WANK worm. They wanted to know how dangerous it was. Most of all,

 they wanted to know what to do about it.

 The DOE people traced their first contact with the worm back to 14

 October. Further, they hypothesised, the worm had actually been

 launched the day before, on Friday the 13th. Such an inauspicious day

 would, in Oberman's opinion, have been in keeping with the type of

 humour exhibited by the creator or creators of the worm.

 Oberman began his own analysis of the worm, oblivious to the fact that

 3200 kilometres away, on the other side of the continent, his colleague

 and acquaintance John McMahon was doing exactly the same thing.

 Every time McMahon answered a phone call from an irate NASA system or

 network manager, he tried to get a copy of the worm from the infected

 machine. He also asked for the logs from their computer systems. Which

 computer had the worm come from? Which systems was it attacking from

 the infected site? In theory, the logs would allow the NASA team to

 map the worm's trail. If the team could find the managers of those

 systems in the worm's path, it could warn them of the impending

 danger. It could also alert the people who ran recently infected

 systems which had become launchpads for new worm attacks.

 This wasn't always possible. If the worm had taken over a computer and

 was still running on it, then the manager would only be able to trace

 the worm backward, not forward. More importantly, a lot of the

 managers didn't keep extensive logs on their computers.

 McMahon had always felt it was important to gather lots of information

 about who was connecting to a computer. In his previous job, he had

 modified his machines so they collected as much security information

 as possible about their connections to other computers.

 VMS computers came with a standard set of alarms, but McMahon didn't

 think they were thorough enough. The VMS alarms tended to send a

 message to the computer managers which amounted to, `Hi! You just got

 a network connection from here'. The modified alarm system said, `Hi!

 You just got a network connection from here. The person at the other

 end is doing a file transfer' and any other bits and pieces of

 information that McMahon's computer could squeeze out of the other

 computer. Unfortunately, a lot of other NASA computer and network

 managers didn't share this enthusiasm for audit logs. Many did not

 keep extensive records of who had been accessing their machines and

 when, which made the job of chasing the worm much tougher.

 The SPAN office was, however, trying to keep very good logs on which

 NASA computers had succumbed to the worm. Every time a NASA manager

 called to report a worm disturbance, one of the team members wrote

 down the details with paper and pen. The list, outlining the addresses

 of the affected computers and detailed notations of the degree of

 infection, would also be recorded on a computer. But handwritten lists

 were a good safeguard. The worm couldn't delete sheets of paper.

 When McMahon learned DOE was also under attack, he began checking in

 with them every three hours or so. The two groups swapped lists of

 infected computers by telephone because voice, like the handwritten

 word, was a worm-free medium. `It was a kind of archaic system, but on

 the other hand we didn't have to depend on the network being up,'

 McMahon said. `We needed to have some chain of communications which

 was not the same as the network being attacked.'

 A number of the NASA SPAN team members had developed contacts within

 different parts of DEC through the company's users' society, DECUS.

 These contacts were to prove very helpful. It was easy to get lost in

 the bureaucracy of DEC, which employed more than 125000 people, posted

 a billion-dollar profit and declared revenues in excess of $12 billion

 in 1989.10 Such an enormous and prestigious company would not want

 to face a crisis such as the WANK worm, particularly in such a

 publicly visible organisation like NASA. Whether or not the worm's

 successful expedition could be blamed on DEC's software was a moot

 point. Such a crisis was, well, undesirable. It just didn't look good.

 And it mightn't look so good either if DEC just jumped into the fray.

 It might look like the company was in some way at fault.

 Things were different, however, if someone already had a relationship

 with a technical expert inside the company. It wasn't like NASA

 manager cold-calling a DEC guy who sold a million dollars worth of

 machines to someone else in the agency six months ago. It was the NASA

 guy calling the DEC guy he sat next to at the conference last month.

 It was a colleague the NASA manager chatted with now and again.

 John McMahon's analysis suggested there were three versions of the WANK

 worm. These versions, isolated from worm samples collected from the

 network, were very similar, but each contained a few subtle

 differences. In McMahon's view, these differences could not be explained

 by the way the worm recreated itself at each site in order to

 spread. But why would the creator of the worm release different

 versions? Why not just write one version properly and fire it off? The

 worm wasn't just one incoming missile; it was a frenzied attack. It was

 coming from all directions, at all sorts of different levels within

 NASA's computers.

 McMahon guessed that the worm's designer had released the different

 versions at slightly different times. Maybe the creator released the

 worm, and then discovered a bug. He fiddled with the worm a bit to

 correct the problem and then released it again. Maybe he didn't like

 the way he had fixed the bug the first time, so he changed it a little

 more and released it a third time.

 In northern California, Kevin Oberman came to a different conclusion.

 He believed there was in fact only one real version of the worm

 spiralling through HEPNET and SPAN. The small variations in the

 different copies he dissected seemed to stem from the worm's ability

 to learn and change as it moved from computer to computer.

 McMahon and Oberman weren't the only detectives trying to decipher the

 various manifestations of the worm. DEC was also examining the worm,

 and with good reason. The WANK worm had invaded the corporation's own

 network. It had been discovered snaking its way through DEC's own

 private computer network, Easynet, which connected DEC manufacturing

 plants, sales offices and other company sites around the world. DEC

 was circumspect about discussing the matter publicly, but the Easynet

 version of the WANK worm was definitely distinct. It had a strange

 line of code in it, a line missing from any other versions. The worm

 was under instructions to invade as many sites as it could, with one

 exception. Under no circumstances was it to attack computers inside

 DEC's area 48. The NASA team mulled over this information. One of them

 looked up area 48. It was New Zealand.

 New Zealand?

 The NASA team were left scratching their heads. This attack was

 getting stranger by the minute. Just when it seemed that the SPAN team

 members were travelling down the right path toward an answer at the

 centre of the maze of clues, they turned a corner and found themselves

 hopelessly lost again. Then someone pointed out that New Zealand's

 worldwide claim to fame was that it was a nuclear-free zone.

 In 1986, New Zealand announced it would refuse to admit to its ports

 any US ships carrying nuclear arms or powered by nuclear energy. The

 US retaliated by formally suspending its security obligations to the

 South Pacific nation. If an unfriendly country invaded New Zealand,

 the US would feel free to sit on its hands. The US also cancelled

 intelligence sharing practices and joint military exercises.

 Many people in Australia and New Zealand thought the US had

 overreacted. New Zealand hadn't expelled the Americans; it had simply

 refused to allow its population to be exposed to nuclear arms or

 power. In fact, New Zealand had continued to allow the Americans to

 run their spy base at Waihopai, even after the US suspension. The

 country wasn't anti-US, just anti-nuclear.

 And New Zealand had very good reason to be anti-nuclear. For years, it

 had put up with France testing nuclear weapons in the Pacific. Then in

 July 1985 the French blew up the Greenpeace anti-nuclear protest ship

 as it sat in Auckland harbour. The Rainbow Warrior was due to sail for

 Mururoa Atoll, the test site, when French secret agents bombed the

 ship, killing Greenpeace activist Fernando Pereira.

 For weeks, France denied everything. When the truth came out--that

 President Mitterand himself had known about the bombing plan--the

 French were red-faced. Heads rolled. French Defence Minister Charles

 Hernu was forced to resign. Admiral Pierre Lacoste, director of

 France's intelligence and covert action bureau, was sacked. France

 apologised and paid $NZ13 million compensation in exchange for New

 Zealand handing back the two saboteurs, who had each been sentenced to

 ten years' prison in Auckland.

 As part of the deal, France had promised to keep the agents

 incarcerated for three years at the Hao atoll French military base.

 Both agents walked free by May 1988 after serving less than two years.

 After her return to France, one of the agents, Captain Dominique

 Prieur, was promoted to the rank of commandant.

 Finally, McMahon thought. Something that made sense. The exclusion of

 New Zealand appeared to underline the meaning of the worm's political

 message.

 When the WANK worm invaded a computer system, it had instructions to

 copy itself and send that copy out to other machines. It would slip

 through the network and when it came upon a computer attached to the

 network, it would poke around looking for a way in. What it really

 wanted was to score a computer account with privileges, but it would

 settle for a basic-level, user-level account.

 VMS systems have accounts with varying levels of privilege. A

 high-privilege account holder might, for example, be able to read the

 electronic mail of another computer user or delete files from that

 user's directory. He or she might also be allowed to create new

 computer accounts on the system, or reactivate disabled accounts. A

 privileged account holder might also be able to change someone else's

 password. The people who ran computer systems or networks needed

 accounts with the highest level of privilege in order to keep the

 system running smoothly. The worm specifically sought out these sorts

 of accounts because its creator knew that was where the power lay.

 The worm was smart, and it learned as it went along. As it traversed

 the network, it created a masterlist of commonly used account names.

 First, it tried to copy the list of computer users from a system it

 had not yet penetrated. It wasn't always able to do this, but often

 the system security was lax enough for it to be successful. The worm

 then compared that list to the list of users on its current host. When

 it found a match--an account name common to both lists--the worm added

 that name to the masterlist it carried around inside it, making a note

 to try that account when breaking into a new system in future.

 It was a clever method of attack, for the worm's creator knew that

 certain accounts with the highest privileges were likely to have

 standard names, common across different machines. Accounts with names

 such as `SYSTEM', `DECNET' and `FIELD' with standard passwords such as

 `SYSTEM' and `DECNET' were often built into a computer before it was

 shipped from the manufacturer. If the receiving computer manager

 didn't change the pre-programmed account and password, then his

 computer would have a large security hole waiting to be exploited.

 The worm's creator could guess some of the names of these

 manufacturer's accounts, but not all of them. By endowing the worm

 with an ability to learn, he gave it far more power. As the worm

 spread, it became more and more intelligent. As it reproduced, its

 offspring evolved into ever more advanced creatures, increasingly

 successful at breaking into new systems.

 When McMahon performed an autopsy on one of the worm's progeny, he was

 impressed with what he found. Slicing the worm open and inspecting its

 entrails, he discovered an extensive collection of generic privileged

 accounts across the SPAN network. In fact, the worm wasn't only picking

 up the standard VMS privileged accounts; it had learned accounts common

 to NASA but not necessarily to other VMS computers. For example, a lot

 of NASA sites which ran a type of TCP/IP mailer that needed either a

 POSTMASTER or a MAILER account. John saw those names turn up inside the

 worm's progeny.

 Even if it only managed to break into an unprivileged account, the

 worm would use the account as an incubator. The worm replicated and

 then attacked other computers in the network. As McMahon and the rest

 of the SPAN team continued to pick apart the rest of the worm's code

 to figure out exactly what the creature would do if it got into a

 fully privileged account, they found more evidence of the dark sense

 of humour harboured by the hacker behind the worm. Part of the worm, a

 subroutine, was named `find fucked'.

 The SPAN team tried to give NASA managers calling in as much

 information as they could about the worm. It was the best way to help

 computer managers, isolated in their offices around the country, to

 regain a sense of control over the crisis.

 Like all the SPAN team, McMahon tried to calm the callers down and

 walk them through a set a questions designed to determine the extent

 of the worm's control over their systems. First, he asked them what

 symptoms their systems were showing. In a crisis situation, when

 you're holding a hammer, everything looks like a nail. McMahon wanted

 to make sure that the problems on the system were in fact caused by

 the worm and not something else entirely.

 If the only problem seemed to be mysterious comments flashing across

 the screen, McMahon concluded that the worm was probably harassing the

 staff on that computer from a neighbouring system which it had

 successfully invaded. The messages suggested that the recipients'

 accounts had not been hijacked by the worm. Yet.

 VAX/VMS machines have a feature called Phone, which is useful for

 on-line communications. For example, a NASA scientist could `ring up'

 one of his colleagues on a different computer and have a friendly chat

 on-line. The chat session is live, but it is conducted by typing on

 the computer screen, not `voice'. The VMS Phone facility enabled the

 worm to send messages to users. It would simply call them using the

 phone protocol. But instead of starting a chat session, it sent them

 statements from what was later determined to be the aptly named

 Fortune Cookie file--a collection of 60 or so pre-programmed comments.

 In some cases, where the worm was really bugging staff, McMahon told

 the manager at the other end of the phone to turn the computer's Phone

 feature off. A few managers complained and McMahon gave them the

 obvious ultimatum: choose Phone or peace. Most chose peace.

 When McMahon finished his preliminary analysis, he had good news and

 bad news. The good news was that, contrary to what the worm was

 telling computer users all over NASA, it was not actually deleting

 their files. It was just pretending to delete their data. One big

 practical joke. To the creator of the worm anyway. To the NASA

 scientists, just a headache and heartache. And occasionally a heart

 attack.

 The bad news was that, when the worm got control over a privileged

 account, it would help someone--presumably its creator--perpetrate an

 even more serious break-in at NASA. The worm sought out the FIELD

 account created by the manufacturer and, if it had been turned off,

 tried to reactivate the account and install the password FIELD. The

 worm was also programmed to change the password for the standard

 account named DECNET to a random string of at least twelve characters.

 In short, the worm tried to pry open a backdoor to the system.

 The worm sent information about accounts it had successfully broken

 into back to a type of electronic mailbox--an account called GEMPAK on

 SPAN node 6.59. Presumably, the hacker who created the worm would

 check the worm's mailbox for information which he could use to break

 into the NASA account at a later date. Not surprisingly, the mailboxes

 had been surreptitiously `borrowed' by the hacker, much to the

 surprise of the legitimate owners.

 A computer hacker created a whole new set of problems. Although the

 worm was able to break into new accounts with greater speed and reach

 than a single hacker, it was more predictable. Once the SPAN and DOE

 teams picked the worm apart, they would know exactly what it could be

 expected to do. However, a hacker was utterly unpredictable.

 McMahon realised that killing off the worm was not going to solve the

 problem. All the system managers across the NASA and DOE networks

 would have to change all the passwords of the accounts used by the

 worm. They would also have to check every system the worm had invaded

 to see if it had built a backdoor for the hacker. The system admin had

 to shut and lock all the backdoors, no small feat.

 What really scared the SPAN team about the worm, however, was that it

 was rampaging through NASA simply by using the simplest of attack

 strategies: username equals password. It was getting complete control

 over NASA computers simply by trying a password which was identical to

 the name of the computer user's account.

 The SPAN team didn't want to believe it, but the evidence was

 overwhelming.

 Todd Butler answered a call from one NASA site. It was a gloomy call.

 He hung up.

 `That node just got hit,' he told the team.

 `How bad?' McMahon asked.

 `A privileged account.'

 `Oh boy.' McMahon jumped onto one of the terminals and did a SET HOST,

 logging into the remote NASA site's machine. Bang. Up it came. `Your

 system has officially been WANKED.'

 McMahon turned to Butler. `What account did it get into?'

 `They think it was SYSTEM.'

 The tension quietly rolled into black humour. The team couldn't help

 it. The head-slapping stupidity of the situation could only be viewed

 as black comedy.

 The NASA site had a password of SYSTEM for their fully privileged

 SYSTEM account. It was so unforgivable. NASA, potentially the greatest

 single collection of technical minds on Earth, had such lax computer

 security that a computer-literate teenager could have cracked it wide

 open. The tall poppy was being cut down to size by a computer program

 resembling a bowl of spaghetti.

 The first thing any computer system manager learns in Computer

 Security 101 is never to use the same password as the username. It was

 bad enough that naive users might fall into this trap ... but a

 computer system manager with a fully privileged account.

 Was the hacker behind the worm malevolent? Probably not. If its

 creator had wanted to, he could have programmed the WANK worm to

 obliterate NASA's files. It could have razed everything in sight.

 In fact, the worm was less infectious than its author appeared to

 desire. The WANK worm had been instructed to perform

 several tasks which it didn't execute. Important parts of the worm

 simply didn't work. McMahon believed this failure to be accidental.

 For example, his analysis showed the worm was programmed to break into

 accounts by trying no password, if the account holder had left the

 password blank. When he disassembled the worm, however, he found that

 part of the program didn't work properly.

 Nonetheless, the fragmented and partly dysfunctional WANK worm was

 causing a major crisis inside several US government agencies. The

 thing which really worried John was thinking about what a seasoned DCL

 programmer with years of VMS experience could do with such a worm.

 Someone like that could do a lot of malicious damage. And what if the

 WANK worm was just a dry run for something more serious down the

 track? It was scary to contemplate.

 Even though the WANK worm did not seem to be intentionally evil, the

 SPAN team faced some tough times. McMahon's analysis turned up yet

 more alarming aspects to the worm. If it managed to break into the

 SYSTEM account, a privileged account, it would block all electronic

 mail deliveries to the system administrator. The SPAN office would not

 be able to send electronic warnings or advice on how to deal with the

 worm to systems which had already been seized. This problem was

 exacerbated by the lack of good information available to the project

 office on which systems were connected to SPAN. The only way to help

 people fighting this bushfire was to telephone them, but in many

 instances the main SPAN office didn't know who to call. The SPAN team

 could only hope that those administrators who had the phone number of

 SPAN headquarters pinned up near their computers would call when their

 computers came under attack.

 McMahon's preliminary report outlined how much damage the worm could

 do in its own right. But it was impossible to measure how much damage

 human managers would do to their own systems because of the worm.

 One frantic computer manager who phoned the SPAN office refused to

 believe John's analysis that the worm only pretended to erase data. He

 claimed that the worm had not only attacked his system, it had

 destroyed it. `He just didn't believe us when we told him that the

 worm was mostly a set of practical jokes,' McMahon said. `He

 reinitialised his system.' `Reinitialised' as in started up his system

 with a clean slate. As in deleted everything on the infected

 computer--all the NASA staff's data gone. He actually did what the

 worm only pretended to do.

 The sad irony was that the SPAN team never even got a copy of the data

 from the manager's system. They were never able to confirm that his

 machine had even been infected.

 All afternoon McMahon moved back and forth between answering the

 ever-ringing SPAN phone and writing up NASA's analysis of the worm. He

 had posted a cryptic electronic message about the attack across the

 network, and Kevin Oberman had read it. The message had to be

 circumspect since no-one knew if the creator of the WANK worm was in

 fact on the network, watching, waiting. A short time later, McMahon

 and Oberman were on the phone together--voice--sharing their ideas and

 cross-checking their analysis.

 The situation was discouraging. Even if McMahon and Oberman managed to

 develop a successful program to kill off the worm, the NASA SPAN team

 faced another daunting task. Getting the worm-killer out to all the

 NASA sites was going to be much harder than expected because there was

 no clear, updated map of the SPAN network. Much of NASA didn't like

 the idea of a centralised map of the SPAN system. McMahon recalled

 that, some time before the WANK worm attack, a manager had tried to

 map the system. His efforts had accidentally tripped so many system

 alarms that he was quietly taken aside and told not to do it again.

 The result was that in instances where the team had phone contact

 details for managers, the information was often outdated.

 `No, he used to work here, but he left over a year ago.'

 `No, we don't have a telephone tree of people to ring if

 something goes wrong with our computers. There are a whole

 bunch of people in different places here who handle the

 computers.'

 This is what John often heard at the other end of the phone.

 The network had grown into a rambling hodgepodge for which there was

 little central coordination. Worse, a number of computers at different

 NASA centres across the US had just been tacked onto SPAN without

 telling the main office at Goddard. People were calling up the ad-hoc

 crisis centre from computer nodes on the network which didn't even

 have names. These people had been practising a philosophy known in

 computer security circles as `security through obscurity'. They

 figured that if no-one knew their computer system existed--if it

 didn't have a name, if it wasn't on any list or map of the SPAN

 network--then it would be protected from hackers and other computer

 enemies.

 McMahon handled a number of phone calls from system managers saying,

 `There is something strange happening in my system here'. John's most

 basic question was, `Where is "here"?' And of course if the SPAN

 office didn't know those computer systems existed, it was a lot harder

 to warn their managers about the worm. Or tell them how to protect

 themselves. Or give them a worm-killing program once it was developed.

 Or help them seal up breached accounts which the worm was feeding back

 to its creator.

 It was such a mess. At times, McMahon sat back and considered who

 might have created this worm. The thing almost looked as though it had

 been released before it was finished. Its author or authors seemed to

 have a good collection of interesting ideas about how to solve

 problems, but they were never properly completed. The worm included a

 routine for modifying its attack strategy, but the thing was never

 fully developed. The worm's code didn't have enough error handling in

 it to ensure the creature's survival for long periods of time. And the

 worm didn't send the addresses of the accounts it had successfully

 breached back to the mailbox along with the password and account name.

 That was really weird. What use was a password and account name

 without knowing what computer system to use it on?

 On the other hand, maybe the creator had done this deliberately. Maybe

 he had wanted to show the world just how many computers the worm could

 successfully penetrate. The worm's mail-back program would do this.

 However, including the address of each infected site would have made

 the admins' jobs easier. They could simply have used the GEMPAK

 collection as a hitlist of infected sites which needed to be

 de-wormed. The possible theories were endless.

 There were some points of brilliance in the worm, some things that

 McMahon had never considered, which was impressive since he knew a lot

 about how to break into VMS computers. There was also considerable

 creativity, but there wasn't any consistency. After the worm incident,

 various computer security experts would hypothesise that the WANK worm

 had in fact been written by more than one person. But McMahon

 maintained his view that it was the work of a single hacker.

 It was as if the creator of the worm started to pursue an idea and

 then got sidetracked or interrupted. Suddenly he just stopped writing

 code to implement that idea and started down another path, never again

 to reach the end. The thing had a schizophrenic structure. It was all

 over the place.

 McMahon wondered if the author had done this on purpose, to make it

 harder to figure out exactly what the worm was capable of doing.

 Perhaps, he thought, the code had once been nice and linear and it all

 made sense. Then the author chopped it to pieces, moved the middle to

 the top, the top to the bottom, scrambled up the chunks and strung

 them all together with a bunch of `GO TO' commands. Maybe the hacker

 who wrote the worm was in fact a very elegant DCL programmer who

 wanted the worm to be chaotic in order to protect it. Security through

 obscurity.

 Oberman maintained a different view. He believed the programming style

 varied so much in different parts that it had to be the product of a

 number of people. He knew that when computer programmers write code

 they don't make lots of odd little changes in style for no particular

 reason.

 Kevin Oberman and John McMahon bounced ideas off one another. Both had

 developed their own analyses. Oberman also brought Mark Kaletka, who

 managed internal networking at Fermilab, one of HEPNET's largest

 sites, into the cross-checking process. The worm had a number of

 serious vulnerabilities, but the problem was finding one, and quickly,

 which could be used to wipe it out with minimum impact on the besieged

 computers.

 Whenever a VMS machine starts up an activity, the computer gives it a

 unique process name. When the worm burrowed into a computer site, one

 of the first things it did was check that another copy of itself was

 not already running on that computer. It did this by checking for its

 own process names. The worm's processes were all called NETW\_ followed

 by a random, four-digit number. If the incoming worm found this

 process name, it assumed another copy of itself was already running on

 the computer, so it destroyed itself.

 The answer seemed to be a decoy duck. Write a program which pretended

 to be the worm and install it across all of NASA's vulnerable

 computers. The first anti-WANK program did just that. It quietly sat

 on the SPAN computers all day long, posing as a NETW\_ process, faking

 out any real version of the WANK worm which should come along.

 Oberman completed an anti-WANK program first and ran it by McMahon. It

 worked well, but McMahon noticed one large flaw. Oberman's program

 checked for the NETW\_ process name, but it assumed that the worm was

 running under the SYSTEM group. In most cases, this was true, but it

 didn't have to be. If the worm was running in another group, Oberman's

 program would be useless. When McMahon pointed out the flaw, Oberman

 thought, God, how did I miss that?

 McMahon worked up his own version of an anti-WANK

 program, based on Oberman's program, in preparation for releasing it

 to NASA.

 At the same time, Oberman revised his anti-WANK program for DOE. By

 Monday night US Eastern Standard Time, Oberman was able to send out an

 early copy of a vaccine designed to protect computers which hadn't

 been infected yet, along with an electronic warning about the worm.

 His first electronic warning, distributed by CIAC, said in part:

 /////////////////////////////////////////////////////////////////////////

 THE COMPUTER INCIDENT ADVISORY CAPABILITY C I A C

 ADVISORY NOTICE

 The W.COM Worm affecting VAX VMS Systems

 October 16, 1989 18:37 PSTNumber A-2

 This is a mean bug to kill and could have done a lot of damage.

 Since it notifies (by mail) someone of each successful penetration and

 leaves a trapdoor (the FIELD account), just killing the bug is not

 adequate. You must go in and make sure all accounts have passwords and

 that the passwords are not the same as the account name.

 R. Kevin Oberman

 Advisory Notice

 A worm is attacking NASA's SPAN network via VAX/VMS systems connected

 to DECnet. It is unclear if the spread of the worm has been checked.

 It may spread to other systems such as DOE's HEPNET within a few days.

 VMS system managers should prepare now.

 The worm targets VMS machines, and can only be propagated via DECnet.

 The worm exploits two features of DECnet/VMS in order to propagate

 itself. The first is the default DECnet account, which is a facility

 for users who don't have a specific login ID for a machine to have

 some degree of anonymous access. It uses the default DECnet account to

 copy itself to a machine, and then uses the `TASK 0' feature of DECnet

 to invoke the remote copy. It has several other features including a

 brute force attack.

 Once the worm has successfully penetrated your system it will infect

 .COM files and create new security vulnerabilities. It then seems to

 broadcast these vulnerabilities to the outside world. It may also

 damage files as well, either unintentionally or otherwise.

 An analysis of the worm appears below and is provided by R. Kevin

 Oberman of Lawrence Livermore National Laboratory. Included with the

 analysis is a DCL program that will block the current version of the

 worm. At least two versions of this worm exist and more may be

 created. This program should give you enough time to close up obvious

 security holes. A more thorough DCL program is being written.

 If your site could be affected please call CIAC for more details...

 Report on the W.COM worm.

 R. Kevin Oberman

 Engineering Department

 Lawrence Livermore National Laboratory

 October 16, 1989

 The following describes the action of the W.COM worm (currently based

 on the examination of the first two incarnations). The replication

 technique causes the code to be modified slightly which indicates the

 source of the attack and learned information.

 All analysis was done with more haste than I care for, but I believe I

 have all of the basic facts correct. First a description of the

 program:

 1. The program assures that it is working in a directory to which the

 owner (itself) has full access (Read, Write, Execute, and Delete).

 2. The program checks to see if another copy is still running. It

 looks for a process with the first 5 characters of `NETW\_'. If such is

 found, it deletes itself (the file) and stops its process.

 NOTE

 A quick check for infection is to look for a process name starting

 with `NETW\_'. This may be done with a SHOW PROCESS command.

 3. The program then changes the default DECNET account password to a

 random string of at least 12 characters.

 4. Information on the password used to access the system is mailed to

 the user GEMTOP on SPAN node 6.59. Some versions may have a different

 address.11

 5. The process changes its name to `NETW\_' followed by a random

 number.

 6. It then checks to see if it has SYSNAM priv. If so, it defines the

 system announcement message to be the banner in the program:

 W O R M S A G A I N S T N U C L E A R K I L L E R S

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 \ Your System Has Been Officically WANKed /

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 You talk of times of peace for all, and then prepare for war.

 7. If it has SYSPRV, it disables mail to the SYSTEM account.

 8. If it has SYSPRV, it modifies the system login command procedure to

 APPEAR to delete all of a user's file. (It really does nothing.)

 9. The program then scans the account's logical name table for command

 procedures and tries to modify the FIELD account to a known password

 with login from any source and all privs. This is a primitive virus,

 but very effective IF it should get into a privileged account.

 10. It proceeds to attempt to access other systems by picking node

 numbers at random. It then uses PHONE to get a list of active users on

 the remote system. It proceeds to irritate them by using PHONE to ring

 them.

 11. The program then tries to access the RIGHTSLIST file and attempts

 to access some remote system using the users found and a list of

 `standard' users included within the worm. It looks for passwords

 which are the same as that of the account or are blank. It records all

 such accounts.

 12. It looks for an account that has access to SYSUAF.DAT.

 13. If a priv. account is found, the program is copied to that account

 and started. If no priv. account was found, it is copied to other

 accounts found on the random system.

 14. As soon as it finishes with a system, it picks another random

 system and repeats (forever).

 Response:

 1. The following program will block the worm. Extract the following

 code and execute it. It will use minimal resources. It creates a

 process named NETW\_BLOCK which will prevent the worm from running.

 Editors note: This fix will work only with this version of the worm.

 Mutated worms will require modification of this code; however, this

 program should prevent the worm from running long enough to secure

 your system from the worms attacks.13

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 McMahon's version of an anti-WANK program was also ready to go by late

 Monday, but he would face delays getting it out to NASA. Working inside

 NASA was a balancing act, a delicate ballet demanding exquisite

 choreography between getting the job done, following official procedures

 and avoiding steps which might tread on senior bureaucrats' toes. It was

 several days before NASA's anti-WANK program was officially released.

 DOE was not without its share of problems in launching the anti-WANK

 program and advisory across HEPNET. At 5.04 p.m. Pacific Coast Time on

 17 October, as Oberman put the final touches on the last paragraph of

 his final report on the worm, the floor beneath his feet began to

 shake. The building was trembling. Kevin Oberman was in the middle of

 the 1989 San Francisco earthquake.

 Measuring 7.1 on the Richter scale, the Loma Prieta earthquake ripped

 through the greater San Francisco area with savage speed. Inside the

 computer lab, Oberman braced himself for the worst. Once the shaking

 stopped and he ascertained the computer centre was still standing, he

 sat back down at his terminal. With the PA blaring warnings for all

 non-essential personnel to leave the building immediately, Oberman

 rushed off the last sentence of the report. He paused and then added a

 postscript saying that if the paragraph didn't make sense, it was

 because he was a little rattled by the large earthquake which had just

 hit Lawrence Livermore Labs. He pressed the key, sent out his final

 anti-WANK report and fled the building.

 Back on the east coast, the SPAN office continued to help people

 calling from NASA sites which had been hit. The list of sites which

 had reported worm-related problems grew steadily during the week.

 Official estimates on the scope of the WANK worm attack were vague,

 but trade journals such as Network World and Computerworld quoted the

 space agency as suffering only a small number of successful worm

 invasions, perhaps 60 VMS-based computers. SPAN security manager Ron

 Tencati estimated only 20 successful worm penetrations in the NASA

 part of SPAN's network, but another internal estimate put the figure

 much higher: 250 to 300 machines. Each of those computers might have

 had 100 or more users. Figures were sketchy, but virtually everyone on

 the network--all 270000 computer accounts--had been affected by the

 worm, either because their part of the network had been pulled

 off-line or because their machines had been harassed by the WANK worm

 as it tried again and again to login from an infected machine. By the

 end of the worm attack, the SPAN office had accumulated a list of

 affected sites which ran over two columns on several computer screens.

 Each of them had lodged some form of complaint about the worm.

 Also by the end of the crisis, NASA and DOE computer network managers

 had their choice of vaccines, antidotes and blood tests for the WANK

 worm. McMahon had released ANTIWANK.COM, a program which killed the

 worm and vaccinated a system against further attacks, and

 WORM-INFO.TEXT, which provided a list of worm-infestation symptoms.

 Oberman's program, called [.SECURITY]CHECK\_SYSTEM.COM, checked for all

 the security flaws used by the worm to sneak into a computer system.

 DEC also had a patch to cover the security hole in the DECNET account.

 Whatever the real number of infected machines, the worm had certainly

 circumnavigated the globe. It had reach into European sites, such as

 CERN--formerly known as the European Centre for Nuclear Research--in

 Switzerland, through to Goddard's computers in Maryland, on to

 Fermilab in Chicago and propelled itself across the Pacific into the

 Riken Accelerator Facility in Japan.14

 NASA officials told the media they believed the worm had been launched

 about 4.30 a.m. on Monday, 16 October.15 They also believed it had

 originated in Europe, possibly in France.

 [ ]

 Wednesday, 18 October 1989

 Kennedy Space Center, Florida

 The five-member Atlantis had some bad news on Wednesday morning. The

 weather forecasters gave the launch site a 40 per cent chance of

 launch guideline-violating rain and cloud. And then there was the

 earthquake in California.

 The Kennedy Space Center wasn't the only place which had to be in

 tip-top working order for a launch to go ahead. The launch depended on

 many sites far away from Florida. These included Edwards Air Force

 Base in California, where the shuttle was due to land on Monday. They

 also included other sites, often military bases, which were essential

 for shuttle tracking and other mission support. One of these sites was

 a tracking station at Onizuka Air Force Base at Sunnyvale, California.

 The earthquake which ripped through the Bay area had damaged the

 tracking station and senior NASA decision-makers planned to meet on

 Wednesday morning to consider the Sunnyvale situation. Still, the

 space agency maintained a calm, cool exterior. Regardless of the

 technical problems, the court challenges and the protesters, the

 whimsical weather, the natural disasters, and the WANK worm, NASA was

 still in control of the situation.

 `There's been some damage, but we don't know how much. The sense I get

 is it's fairly positive,' a NASA spokesman told UPI. `But there are

 some problems.'16 In Washington, Pentagon spokesman Rick Oborn

 reassured the public again, `They are going to be able to handle

 shuttle tracking and support for the mission ... They will be able to

 do their job'.17

 Atlantis waited, ready to go, at launchpad 39B. The technicians had

 filled the shuttle up with rocket fuel and it looked as if the weather

 might hold. It was partly cloudy, but conditions at Kennedy passed

 muster.

 The astronauts boarded the shuttle. Everything was in place.

 But while the weather was acceptable in Florida, it was causing some

 problems in Africa, the site of an emergency landing location. If it

 wasn't one thing, it was another. NASA ordered a four-minute delay.

 Finally at 12.54 p.m., Atlantis boomed from its launchpad. Rising up

 from the Kennedy Center, streaking a trail of twin flames from its

 huge solid-fuel boosters, the shuttle reached above the atmosphere and

 into space.

 At 7.15 p.m., exactly 6 hours and 21 minutes after lift-off, Galileo

 began its solo journey into space. And at 8.15 p.m., Galileo's booster

 ignited.

 Inside shuttle mission control, NASA spokesman Brian Welch announced,

 `The spacecraft Galileo ... has achieved Earth escape velocity'.18

 [ ]

 Monday, 30 October 1989

 NASA's Goddard Space Flight Center, Greenbelt, Maryland

 The week starting 16 October had been a long one for the SPAN team.

 They were keeping twelve-hour days and dealing with hysterical people

 all day long. Still, they managed to get copies of anti-WANK out,

 despite the limitations of the dated SPAN records and the paucity of

 good logs allowing them to retrace the worm's path. `What we learned

 that week was just how much data is not collected,' McMahon observed.

 By Friday, 20 October, there were no new reports of worm attacks. It

 looked as though the crisis had passed. Things could be tidied up by

 the rest of the SPAN team and McMahon returned to his own work.

 A week passed. All the while, though, McMahon was on edge. He doubted

 that someone who had gone to all that trouble of creating the WANK

 worm would let his baby be exterminated so quickly. The decoy-duck

 strategy only worked as long as the worm kept the same process name,

 and as long as it was programmed not to activate itself on systems

 which were already infected. Change the process name, or teach the

 worm to not to suicide, and the SPAN team would face another, larger

 problem. John McMahon had an instinct about the worm; it might just

 be back.

 His instinct was right.

 The following Monday, McMahon received another phone call from the

 SPAN project office. When he poked his head in his boss's office,

 Jerome Bennett looked up from his desk.

 `The thing is back,' McMahon told him. There was no need to explain

 what `the thing' was. `I'm going over to the SPAN office.'

 Ron Tencati and Todd Butler had a copy of the new WANK worm ready for

 McMahon. This version of the worm was far more virulent. It copied

 itself more effectively and therefore moved through the network much

 faster. The revised worm's penetration rate was much higher--more than

 four times greater than the version of WANK released in the first

 attack. The phone was ringing off the hook again. John took a call

 from one irate manager who launched into a tirade. `I ran your

 anti-WANK program, followed your instructions to the letter, and look

 what happened!'

 The worm had changed its process name. It was also designed to hunt down

 and kill the decoy-duck program. In fact, the SPAN network was going to

 turn into a rather bloody battlefield. This worm didn't just kill the

 decoy, it also killed any other copy of the WANK worm. Even if McMahon

 changed the process name used by his program, the decoy-duck strategy

 was not going to work any longer.

 There were other disturbing improvements to the new version of the

 WANK worm. Preliminary information suggested it changed the password

 on any account it got into. This was a problem. But not nearly as big

 a problem as if the passwords it changed were for the only privileged

 accounts on the system. The new worm was capable of locking a system

 manager out of his or her own system.

 Prevented from getting into his own account, the computer manager

 might try borrowing the account of an average user, call him Edwin.

 Unfortunately, Edwin's account probably only had low-level privileges.

 Even in the hands of a skilful computer manager, the powers granted to

 Edwin's account were likely too limited to eradicate the worm from its

 newly elevated status as computer manager. The manager might spend his

 whole morning matching wits with the worm from the disadvantaged

 position of a normal user's account. At some point he would have to

 make the tough decision of last resort: turn the entire computer

 system off.

 The manager would have to conduct a forced reboot of the machine. Take

 it down, then bring it back up on minimum configuration. Break back

 into it. Fix the password which the worm had changed. Logout. Reset

 some variables. Reboot the machine again. Close up any underlying

 security holes left behind by the worm. Change any passwords which

 matched users' names. A cold start of a large VMS machine took time.

 All the while, the astronomers, physicists and engineers who worked in

 this NASA office wouldn't be able to work on their computers.

 At least the SPAN team was better prepared for the worm this time.

 They had braced themselves psychologically for a possible return

 attack. Contact information for the network had been updated. And the

 general DECNET internet community was aware of the worm and was

 lending a hand wherever possible.

 Help came from a system manager in France, a country which seemed to

 be of special interest to the worm's author. The manager, Bernard

 Perrot of Institut de Physique Nucleaire in Orsay, had obtained a copy

 of the worm, inspected it and took special notice of the creature's

 poor error checking ability. This was the worm's true Achilles' heel.

 The worm was trained to go after the RIGHTSLIST database, the list of

 all the people who have accounts on the computer. What if someone

 moved the database by renaming it and put a dummy database in its

 place? The worm would, in theory, go after the dummy, which could be

 designed with a hidden bomb. When the worm sniffed out the dummy, and

 latched onto it, the creature would explode and die. If it worked, the

 SPAN team would not have to depend on the worm killing itself, as they

 had during the first invasion. They would have the satisfaction of

 destroying the thing themselves.

 Ron Tencati procured a copy of the French manager's worm-killing

 program and gave it to McMahon, who set up a sort of mini-laboratory

 experiment. He cut the worm into pieces and extracted the relevant

 bits. This allowed him to test the French worm-killing program with

 little risk of the worm escaping and doing damage. The French program

 worked wonderfully. Out it went. The second version of the worm was so

 much more virulent, getting it out of SPAN was going to take

 considerably longer than the first time around. Finally, almost two

 weeks after the second onslaught, the WANK worm had been eradicated

 from SPAN.

 By McMahon's estimate, the WANK worm had incurred up to half a million

 dollars in costs. Most of these were through people wasting time and

 resources chasing the worm instead of doing their normal jobs. The

 worm was, in his view, a crime of theft. `People's time and resources

 had been wasted,' he said. `The theft was not the result of the

 accident. This was someone who deliberately went out to make a mess.

 `In general, I support prosecuting people who think breaking into

 machines is fun. People like that don't seem to understand what kind

 of side effects that kind of fooling around has. They think that

 breaking into a machine and not touching anything doesn't do anything.

 That is not true. You end up wasting people's time. People are dragged

 into the office at strange hours. Reports have to be written. A lot of

 yelling and screaming occurs. You have to deal with law enforcement.

 These are all side effects of someone going for a joy ride in someone

 else's system, even if they don't do any damage. Someone has to pay

 the price.'

 McMahon never found out who created the WANK worm. Nor did he ever

 discover what he intended to prove by releasing it. The creator's

 motives were never clear and, if it had been politically inspired,

 no-one took credit.

 The WANK worm left a number of unanswered questions in its wake, a

 number of loose ends which still puzzle John McMahon. Was the hacker

 behind the worm really protesting against NASA's launch of the

 plutonium-powered Galileo space probe? Did the use of the word

 `WANK'--a most un-American word--mean the hacker wasn't American? Why

 had the creator recreated the worm and released it a second time? Why

 had no-one, no political or other group, claimed responsibility for

 the WANK worm?

 One of the many details which remained an enigma was contained in the

 version of the worm used in the second attack. The worm's creator had

 replaced the original process name, NETW\_, with a new one, presumably

 to thwart the anti-WANK program. McMahon figured the original process

 name stood for `netwank'--a reasonable guess at the hacker's intended

 meaning. The new process name, however, left everyone on the SPAN team

 scratching their heads: it didn't seem to stand for anything. The

 letters formed an unlikely set of initials for someone's name. No-one

 recognised it as an acronym for a saying or an organisation. And it

 certainly wasn't a proper word in the English language. It was a

 complete mystery why the creator of the WANK worm, the hacker who

 launched an invasion into hundreds of NASA and DOE computers, should

 choose this weird word.

 The word was `OILZ'.

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 Chapter 2 -- The Corner Pub

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 You talk of times of peace for all

 and then prepare for war

 -- from `Blossom of Blood' on Species Deceases by Midnight Oil

 It is not surprising the SPAN security team would miss the mark. It is

 not surprising, for example, that these officials should to this day

 be pronouncing the `Oilz' version of the WANK worm as `oil zee'. It is

 also not surprising that they hypothesised the worm's creator chose

 the word `Oilz' because the modifications made to the last version

 made it slippery, perhaps even oily.

 Likely as not, only an Australian would see the worm's link to the

 lyrics of Midnight Oil.

 This was the world's first worm with a political message, and the

 second major worm in the history of the worldwide computer networks.

 It was also the trigger for the creation of FIRST, the Forum of

 Incident Response and Security Teams.2 FIRST was an international

 security alliance allowing governments, universities and commercial

 organisations to share information about computer network security

 incidents. Yet, NASA and the US Department of Energy were half a world

 away from finding the creator of the WANK worm. Even as investigators

 sniffed around electronic trails leading to France, it appears the

 perpetrator was hiding behind his computer and modem in Australia.

 Geographically, Australia is a long way from anywhere. To Americans,

 it conjures up images of fuzzy marsupials, not computer hackers.

 American computer security officials, like those at NASA and the US

 Department of Energy, had other barriers as well. They function in a

 world of concretes, of appointments made and kept, of real names,

 business cards and official titles. The computer underground, by

 contrast, is a veiled world populated by characters slipping in and

 out of the half-darkness. It is not a place where people use their

 real names. It is not a place where people give out real personal

 details.

 It is, in fact, not so much a place as a space. It is ephemeral,

 intangible--a foggy labyrinth of unmapped, winding streets through

 which one occasionally ascertains the contours of a fellow traveller.

 When Ron Tencati, the manager in charge of NASA SPAN security, realised

 that NASA's computers were being attacked by an intruder, he rang the

 FBI. The US Federal Bureau of Investigation's Computer Crime Unit fired

 off a stream of questions. How many computers had been attacked? Where

 were they? Who was behind the attack? The FBI told Tencati, `keep us

 informed of the situation'. Like the CIAC team in the Department of

 Energy, it appears the FBI didn't have much knowledge of VMS, the

 primary computer operating system used in SPAN.

 But the FBI knew enough to realise the worm attack was potentially

 very serious. The winding electronic trail pointed vaguely to a

 foreign computer system and, before long, the US Secret Service was

 involved. Then the French secret service, the Direction de la

 Surveillance du Territoire, or DST, jumped into the fray.

 DST and the FBI began working together on the case. A casual observer

 with the benefit of hindsight might see different motivations driving

 the two government agencies. The FBI wanted to catch the perpetrator.

 The DST wanted to make it clear that the infamous WANK worm attack on

 the world's most prestigious space agency did not originate in France.

 In the best tradition of cloak-and-dagger government agencies, the FBI

 and DST people established two communication channels--an official

 channel and an unofficial one. The official channel involved

 embassies, attachés, formal communiques and interminable delays in

 getting answers to the simplest questions. The unofficial channel

 involved a few phone calls and some fast answers.

 Ron Tencati had a colleague named Chris on the SPAN network in France,

 which was the largest user of SPAN in Europe. Chris was involved in

 more than just science computer networks. He had certain contacts in

 the French government and seemed to be involved in their computer

 networks. So, when the FBI needed technical information for its

 investigation--the kind of information likely to be sanitised by some

 embassy bureaucrat--one of its agents rang up Ron Tencati. `Ron, ask

 your friend this,' the FBI would say. And Ron would.

 `Chris, the FBI wants to know this,' Tencati would tell his colleague

 on SPAN France. Then Chris would get the necessary information. He

 would call Tencati back, saying, `Ron, here is the answer. Now, the

 DST wants to know that'. And off Ron would go in search of information

 requested by the DST.

 The investigation proceeded in this way, with each helping the other

 through backdoor channels. But the Americans' investigation was headed

 toward the inescapable conclusion that the attack on NASA had

 originated from a French computer. The worm may have simply travelled

 through the French computer from yet another system, but the French

 machine appeared to be the sole point of infection for NASA.

 The French did not like this outcome. Not one bit. There was no way

 that the worm had come from France. Ce n'est pas vrai.

 Word came back from the French that they were sure the worm had come

 from the US. Why else would it have been programmed to mail details of

 all computer accounts it penetrated around the world back to a US

 machine, the computer known as GEMPAK? Because the author of the worm

 was an American, of course! Therefore it is not our problem, the

 French told the Americans. It is your problem.

 Most computer security experts know it is standard practice among

 hackers to create the most tangled trail possible between the hacker

 and the hacked. It makes it very difficult for people like the FBI to

 trace who did it. So it would be difficult to draw definite

 conclusions about the nationality of the hacker from the location of a

 hacker's information drop-off point--a location the hacker no doubt

 figured would be investigated by the authorities almost immediately

 after the worm's release.

 Tencati had established the French connection from some computer logs

 showing NASA under attack very early on Monday, 16 October. The logs

 were important because they were relatively clear. As the worm had

 procreated during that day, it had forced computers all over the

 network to attack each other in ever greater numbers. By 11 a.m. it

 was almost impossible to tell where any one attack began and the other

 ended.

 Some time after the first attack, DST sent word that certain agents

 were going to be in Washington DC regarding other matters. They wanted

 a meeting with the FBI. A representative from the NASA Inspector

 General's Office would attend the meeting, as would someone from NASA

 SPAN security.

 Tencati was sure he could show the WANK worm attack on NASA originated

 in France. But he also knew he had to document everything, to have

 exact answers to every question and counter-argument put forward by

 the French secret service agents at the FBI meeting. When he developed

 a timeline of attacks, he found that the GEMPAK machine showed X.25

 network connection, via another system, from a French computer around

 the same time as the WANK worm attack. He followed the scent and

 contacted the manager of that system. Would he help Tencati? Mais oui.

 The machine is at your disposal, Monsieur Tencati.

 Tencati had never used an X.25 network before; it had a unique set of

 commands unlike any other type of computer communications network. He

 wanted to retrace the steps of the worm, but he needed help. So he

 called his friend Bob Lyons at DEC to walk him through the process.

 What Tencati found startled him. There were traces of the worm on the

 machine all right, the familiar pattern of login failures as the worm

 attempted to break into different accounts. But these remnants of the

 WANK worm were not dated 16 October or any time immediately around

 then. The logs showed worm-related activity up to two weeks before the

 attack on NASA. This computer was not just a pass-through machine the

 worm had used to launch its first attack on NASA. This was the

 development machine.

 Ground zero.

 Tencati went into the meeting with DST at the FBI offices prepared. He

 knew the accusations the French were going to put forward. When he

 presented the results of his sleuthwork, the French secret service

 couldn't refute it, but they dropped their own bombshell. Yes they

 told him, you might be able to point to a French system as ground zero

 for the attack, but our investigations reveal incoming X.25

 connections from elsewhere which coincided with the timing of the

 development of the WANK worm.

 The connections came from Australia.

 The French had satisfied themselves that it wasn't a French hacker who

 had created the WANK worm. Ce n'est pas notre problem. At least, it's

 not our problem any more.

 It is here that the trail begins to go cold. Law enforcement and

 computer security people in the US and Australia had ideas about just

 who had created the WANK worm. Fingers were pointed, accusations were

 made, but none stuck. At the end of the day, there was coincidence and

 innuendo, but not enough evidence to launch a case. Like many

 Australian hackers, the creator of the WANK worm had emerged from the

 shadows of the computer underground, stood momentarily in hazy

 silhouette, and then disappeared again.

 [ ]

 The Australian computer underground in the late 1980s was an

 environment which spawned and shaped the author of the WANK worm.

 Affordable home computers, such as the Apple IIe and the Commodore 64,

 made their way into ordinary suburban families. While these computers

 were not widespread, they were at least in a price range which made

 them attainable by dedicated computer enthusiasts.

 In 1988, the year before the WANK worm attack on NASA, Australia was

 on an upswing. The country was celebrating its bicentennial. The

 economy was booming. Trade barriers and old regulatory structures were

 coming down. Crocodile Dundee had already burst on the world movie

 scene and was making Australians the flavour of the month in cities

 like LA and New York. The mood was optimistic. People had a sense they

 were going places. Australia, a peaceful country of seventeen or so

 million people, poised on the edge of Asia but with the order of a

 Western European democracy, was on its way up. Perhaps for the first

 time, Australians had lost their cultural cringe, a unique type of

 insecurity alien to can-do cultures such as that found in the US.

 Exploration and experimentation require confidence and, in 1988,

 confidence was something Australia had finally attained.

 Yet this new-found confidence and optimism did not subdue Australia's

 tradition of cynicism toward large institutions. The two coexisted,

 suspended in a strange paradox. Australian humour, deeply rooted in a

 scepticism of all things serious and sacred, continued to poke fun at

 upright institutions with a depth of irreverence surprising to many

 foreigners. This cynicism of large, respected institutions coursed

 through the newly formed Australian computer underground without

 dampening its excitement or optimism for the brave new world of

 computers in the least.

 In 1988, the Australian computer underground thrived like a vibrant

 Asian street bazaar. In that year it was still a realm of place not

 space. Customers visited their regular stalls, haggled over goods with

 vendors, bumped into friends and waved across crowded paths to

 acquaintances. The market was as much a place to socialise as it was

 to shop. People ducked into tiny coffee houses or corner bars for

 intimate chats. The latest imported goods, laid out on tables like

 reams of bright Chinese silks, served as conversation starters. And,

 like every street market, many of the best items were tucked away,

 hidden in anticipation of the appearance of that one customer or

 friend most favoured by the trader. The currency of the underground

 was not money; it was information. People didn't share and exchange

 information to accumulate monetary wealth; they did it to win

 respect--and to buy a thrill.

 The members of the Australian computer underground met on bulletin

 board systems, known as BBSes. Simple things by today's standards,

 BBSes were often composed of a souped-up Apple II computer, a single

 modem and a lone telephone line. But they drew people from all walks

 of life. Teenagers from working-class neighbourhoods and those from

 the exclusive private schools. University students. People in their

 twenties groping their way through first jobs. Even some professional

 people in their thirties and forties who spent weekends poring over

 computer manuals and building primitive computers in spare rooms. Most

 regular BBS users were male. Sometimes a user's sister would find her

 way into the BBS world, often in search of a boyfriend. Mission

 accomplished, she might disappear from the scene for weeks, perhaps

 months, presumably until she required another visit.

 The BBS users had a few things in common. They were generally of above

 average intelligence--usually with a strong technical slant--and they

 were obsessed with their chosen hobby. They had to be. It often took

 45 minutes of attack dialling a busy BBS's lone phone line just to

 visit the computer system for perhaps half an hour. Most serious BBS

 hobbyists went through this routine several times each day.

 As the name suggests, a BBS had what amounted to an electronic version

 of a normal bulletin board. The owner of the BBS would have divided

 the board into different areas, as a school teacher crisscrosses

 coloured ribbon across the surface of a corkboard to divide it into

 sections. A single BBS might have 30 or more electronic discussion

 groups.

 As a user to the board, you might visit the politics section, tacking

 up a `note' on your views of ALP or Liberal policies for anyone

 passing by to read. Alternatively, you might fancy yourself a bit of a

 poet and work up the courage to post an original piece of work in the

 Poet's Corner. The corner was often filled with dark, misanthropic

 works inspired by the miseries of adolescence. Perhaps you preferred

 to discuss music. On many BBSes you could find postings on virtually

 any type of music. The most popular groups included bands like Pink

 Floyd, Tangerine Dream and Midnight Oil. Midnight Oil's

 anti-establishment message struck a particular chord within the new

 BBS community.

 Nineteen eighty-eight was the golden age of the BBS culture across

 Australia. It was an age of innocence and community, an open-air

 bazaar full of vitality and the sharing of ideas. For the most part,

 people trusted their peers within the community and the BBS operators,

 who were often revered as demigods. It was a happy place. And, in

 general, it was a safe place, which is perhaps one reason why its

 visitors felt secure in their explorations of new ideas. It was a

 place in which the creator of the WANK worm could sculpt and hone his

 creative computer skills.

 The capital of this spirited new Australian electronic civilisation

 was Melbourne. It is difficult to say why this southern city became

 the cultural centre of the BBS world, and its darker side, the

 Australian computer underground. Maybe the city's history as

 Australia's intellectual centre created a breeding ground for the many

 young people who built their systems with little more than curiosity

 and salvaged computer bits discarded by others. Maybe Melbourne's

 personality as a city of suburban homebodies and backyard tinkerers

 produced a culture conducive to BBSes. Or maybe it was just

 Melbourne's dreary beaches and often miserable weather. As one

 Melbourne hacker explained it, `What else is there to do here all

 winter but hibernate inside with your computer and modem?'

 In 1988, Melbourne had some 60 to 100 operating BBSes. The numbers are

 vague because it is difficult to count a collection of moving objects.

 The amateur nature of the systems, often a jumbled tangle of wires and

 second-hand electronics parts soldered together in someone's garage,

 meant that the life of any one system was frequently as short as a

 teenager's attention span. BBSes popped up, ran for two weeks, and

 then vanished again.

 Some of them operated only during certain hours, say between 10 p.m.

 and 8 a.m. When the owner went to bed, he or she would plug the home

 phone line into the BBS and leave it there until morning. Others ran

 24 hours a day, but the busiest times were always at night.

 Of course it wasn't just intellectual stimulation some users were

 after. Visitors often sought identity as much as ideas. On an

 electronic bulletin board, you could create a personality, mould it

 into shape and make it your own. Age and appearance did not matter.

 Technical aptitude did. Any spotty, gawky teenage boy could instantly

 transform himself into a suave, graceful BBS character. The

 transformation began with the choice of name. In real life, you might

 be stuck with the name Elliot Dingle--an appellation chosen by your

 mother to honour a long-dead great uncle. But on a BBS, well, you

 could be Blade Runner, Ned Kelly or Mad Max. Small wonder that, given

 the choice, many teenage boys chose to spend their time in the world

 of the BBS.

 Generally, once a user chose a handle, as the on-line names are known,

 he stuck with it. All his electronic mail came to an account with that

 name on it. Postings to bulletin boards were signed with it. Others

 dwelling in the system world knew him by that name and no other. A

 handle evolved into a name laden with innate meaning, though the

 personality reflected in it might well have been an alter ego. And so

 it was that characters like The Wizard, Conan and Iceman came to pass

 their time on BBSes like the Crystal Palace, Megaworks, The Real

 Connection and Electric Dreams.

 What such visitors valued about the BBS varied greatly. Some wanted to

 participate in its social life. They wanted to meet people like

 themselves--bright but geeky or misanthropic people who shared an

 interest in the finer technical points of computers. Many lived as

 outcasts in real life, never quite making it into the `normal' groups

 of friends at school or uni. Though some had started their first jobs,

 they hadn't managed to shake the daggy awkwardness which pursued them

 throughout their teen years. On the surface, they were just not the

 sort of people one asked out to the pub for a cold one after the

 footy.

 But that was all right. In general, they weren't much interested in

 footy anyway.

 Each BBS had its own style. Some were completely legitimate, with

 their wares--all legal goods--laid out in the open. Others, like The

 Real Connection, had once housed Australia's earliest hackers but had

 gone straight. They closed up the hacking parts of the board before

 the first Commonwealth government hacking laws were enacted in June

 1989. Perhaps ten or twelve of Melbourne's BBSes at the time had the

 secret, smoky flavour of the computer underground. A handful of these

 were invitation-only boards, places like Greyhawk and The Realm. You

 couldn't simply ring up the board, create a new account and login. You

 had to be invited by the board's owner. Members of the general

 modeming public need not apply.

 The two most important hubs in the Australian underground between 1987

 and 1989 were named Pacific Island and Zen. A 23-year-old who called

 himself Craig Bowen ran both systems from his bedroom.

 Also known as Thunderbird1, Bowen started up Pacific Island in 1987

 because he wanted a hub for hackers. The fledgling hacking community

 was dispersed after AHUBBS, possibly Melbourne's earliest hacking

 board, faded away. Bowen decided to create a home for it, a sort of

 dark, womb-like cafe bar amid the bustle of the BBS bazaar where

 Melbourne's hackers could gather and share information.

 His bedroom was a simple, boyish place. Built-in cupboards, a bed, a

 wallpaper design of vintage cars running across one side of the room.

 A window overlooking the neighbours' leafy suburban yard. A collection

 of PC magazines with titles like Nibble and Byte. A few volumes on

 computer programming. VAX/VMS manuals. Not many books, but a handful

 of science fiction works by Arthur C. Clarke. The Hitchhiker's Guide

 to the Galaxy. A Chinese-language dictionary used during his high

 school Mandarin classes, and after, as he continued to study the

 language on his own while he held down his first job.

 The Apple IIe, modem and telephone line rested on the drop-down

 drawing table and fold-up card table at the foot of his bed. Bowen put

 his TV next to the computer so he could sit in bed, watch TV and use

 Pacific Island all at the same time. Later, when he started Zen, it

 sat next to Pacific Island. It was the perfect set-up.

 Pacific Island was hardly fancy by today's standards of Unix Internet

 machines, but in 1987 it was an impressive computer. PI, pronounced

 `pie' by the local users, had a 20 megabyte hard drive--gargantuan for

 a personal computer at the time. Bowen spent about $5000 setting up PI

 alone. He loved both systems and spent many hours each week nurturing

 them.

 There was no charge for computer accounts on PI or ZEN, like most

 BBSes. This gentle-faced youth, a half-boy, half-man who would

 eventually play host on his humble BBS to many of Australia's

 cleverest computer and telephone hackers, could afford to pay for his

 computers for two reasons: he lived at home with his mum and dad, and

 he had a full-time job at Telecom--then the only domestic telephone

 carrier in Australia.

 PI had about 800 computer users, up to 200 of whom were `core' users

 accessing the system regularly. PI had its own dedicated phone line,

 separate from the house phone so Bowen's parents wouldn't get upset the

 line was always tied up. Later, he put in four additional phone lines

 for Zen, which had about 2000 users. Using his Telecom training, he

 installed a number of non-standard, but legal, features to his

 house. Junction boxes, master switches. Bowen's house was a

 telecommunications hot-rod.

 Bowen had decided early on that if he wanted to keep his job, he had

 better not do anything illegal when it came to Telecom. However, the

 Australian national telecommunications carrier was a handy source of

 technical information. For example, he had an account on a Telecom

 computer system--for work--from which he could learn about Telecom's

 exchanges. But he never used that account for hacking. Most

 respectable hackers followed a similar philosophy. Some had legitimate

 university computer accounts for their courses, but they kept those

 accounts clean. A basic rule of the underground, in the words of one

 hacker, was `Don't foul your own nest'.

 PI contained a public section and a private one. The public area was

 like an old-time pub. Anyone could wander in, plop down at the bar and

 start up a conversation with a group of locals. Just ring up the

 system with your modem and type in your details--real name, your

 chosen handle, phone number and other basic information.

 Many BBS users gave false information in order to hide their true

 identities, and many operators didn't really care. Bowen, however,

 did. Running a hacker's board carried some risk, even before the

 federal computer crime laws came into force. Pirated software was

 illegal. Storing data copied from hacking adventures in foreign

 computers might also be considered illegal. In an effort to exclude

 police and media spies, Bowen tried to verify the personal details of

 every user on PI by ringing them at home or work. Often he was

 successful. Sometimes he wasn't.

 The public section of PI housed discussion groups on the major PC

 brands--IBM, Commodore, Amiga, Apple and Atari--next to the popular

 Lonely Hearts group. Lonely Hearts had about twenty regulars, most of

 whom agonised under the weight of pubescent hormonal changes. A boy

 pining for the affections of the girl who dumped him or, worse, didn't

 even know he existed. Teenagers who contemplated suicide. The messages

 were completely anonymous, readers didn't even know the authors'

 handles, and that anonymous setting allowed heart-felt messages and

 genuine responses.

 Zen was PI's sophisticated younger sister. Within two years of PI

 making its debut, Bowen opened up Zen, one of the first Australian

 BBSes with more than one telephone line. The main reason he set up Zen

 was to stop his computer users from bothering him all the time. When

 someone logged into PI, one of the first things he or she did was

 request an on-line chat with the system operator. PI's Apple IIe was

 such a basic machine by today's standards, Bowen couldn't multi-task

 on it. He could not do anything with the machine, such as check his

 own mail, while a visitor was logged into PI.

 Zen was a watershed in the Australian BBS community. Zen multi-tasked.

 Up to four people could ring up and login to the machine at any one

 time, and Bowen could do his own thing while his users were on-line.

 Better still, his users could talk request each other instead of

 hassling him all the time. Having users on a multi-tasking machine

 with multiple phone lines was like having a gaggle of children. For

 the most part, they amused each other.

 Mainstream and respectful of authority on the surface, Bowen possessed

 the same streak of anti-establishment views harboured by many in the

 underground. His choice of name for Zen underlined this. Zen came from

 the futuristic British TV science fiction series `Blake 7', in which a

 bunch of underfunded rebels attempted to overthrow an evil

 totalitarian government. Zen was the computer on the rebels' ship. The

 rebels banded together after meeting on a prison ship; they were all

 being transported to a penal settlement on another planet. It was a

 story people in the Australian underground could relate to. One of the

 lead characters, a sort of heroic anti-hero, had been sentenced to

 prison for computer hacking. His big mistake, he told fellow rebels,

 was that he had relied on other people. He trusted them. He should

 have worked alone.

 Craig Bowen had no idea of how true that sentiment would ring in a

 matter of months.

 Bowen's place was a hub of current and future lights in the computer

 underground. The Wizard. The Force. Powerspike. Phoenix. Electron.

 Nom. Prime Suspect. Mendax. Train Trax. Some, such as Prime Suspect,

 merely passed through, occasionally stopping in to check out the

 action and greet friends. Others, such as Nom, were part of the

 close-knit PI family. Nom helped Bowen set up PI. Like many early

 members of the underground, they met through AUSOM, an Apple users'

 society in Melbourne. Bowen wanted to run ASCII Express, a program

 which allowed people to transfer files between their own computers and

 PI. But, as usual, he and everyone he knew only had a pirated copy of

 the program. No manuals. So Nom and Bowen spent one weekend picking

 apart the program by themselves. They were each at home, on their own

 machines, with copies. They sat on the phone for hours working through

 how the program worked. They wrote their own manual for other people

 in the underground suffering under the same lack of documentation.

 Then they got it up and running on PI.

 Making your way into the various groups in a BBS such as PI or Zen had

 benefits besides hacking information. If you wanted to drop your

 mantle of anonymity, you could join a pre-packaged, close-knit circle

 of friends. For example, one clique of PI people were fanatical

 followers of the film The Blues Brothers. Every Friday night, this

 group dressed up in Blues Brothers costumes of a dark suit, white

 shirt, narrow tie, Rayban sunglasses and, of course, the snap-brimmed

 hat. One couple brought their child, dressed as a mini-Blues Brother.

 The group of Friday night regulars made their way at 11.30 to

 Northcote's Valhalla Theatre (now the Westgarth). Its grand but

 slightly tatty vintage atmosphere lent itself to this alternative

 culture flourishing in late-night revelries. Leaping up on stage

 mid-film, the PI groupies sent up the actors in key scenes. It was a

 fun and, as importantly, a cheap evening. The Valhalla staff admitted

 regulars who were dressed in appropriate costume for free. The only

 thing the groupies had to pay for was drinks at the intermission.

 Occasionally, Bowen arranged gatherings of other young PI and Zen

 users. Usually, the group met in downtown Melbourne, sometimes at the

 City Square. The group was mostly boys, but sometimes a few girls

 would show up. Bowen's sister, who used the handle Syn, hung around a

 bit. She went out with a few hackers from the BBS scene. And she

 wasn't the only one. It was a tight group which interchanged

 boyfriends and girlfriends with considerable regularity. The group

 hung out in the City Square after watching a movie, usually a horror

 film. Nightmare 2. House 3. Titles tended to be a noun followed by a

 numeral. Once, for a bit of lively variation, they went bowling and

 drove the other people at the alley nuts. After the early

 entertainment, it was down to McDonald's for a cheap burger. They

 joked and laughed and threw gherkins against the restaurant's wall.

 This was followed by more hanging around on the stone steps of the

 City Square before catching the last bus or train home.

 The social sections of PI and Zen were more successful than the

 technical ones, but the private hacking section was even more

 successful than the others. The hacking section was hidden; would-be

 members of the Melbourne underground knew there was something going

 on, but they couldn't find out what is was.

 Getting an invite to the private area required hacking skill or

 information, and usually a recommendation to Bowen from someone who

 was already inside. Within the Inner Sanctum, as the private hacking

 area was called, people could comfortably share information such as

 opinions of new computer products, techniques for hacking, details of

 companies which had set up new sites to hack and the latest rumours on

 what the law enforcement agencies were up to.

 The Inner Sanctum was not, however, the only private room. Two hacking

 groups, Elite and H.A.C.K., guarded entry to their yet more exclusive

 back rooms. Even if you managed to get entry to the Inner Sanctum, you

 might not even know that H.A.C.K. or Elite existed. You might know

 there was a place even more selective than your area, but exactly how

 many layers of the onion stood between you and the most exclusive

 section was anyone's guess. Almost every hacker interviewed for this

 book described a vague sense of being somehow outside the innermost

 circle. They knew it was there, but wasn't sure just what it was.

 Bowen fielded occasional phone calls on his voice line from wanna-be

 hackers trying to pry open the door to the Inner Sanctum. `I want

 access to your pirate system,' the voice would whine.

 `What pirate system? Who told you my system was a pirate system?'

 Bowen sussed out how much the caller knew, and who had told him. Then

 he denied everything.

 To avoid these requests, Bowen had tried to hide his address, real

 name and phone number from most of the people who used his BBSes. But

 he wasn't completely successful. He had been surprised by the sudden

 appearance one day of Masked Avenger on his doorstep. How Masked

 Avenger actually found his address was a mystery. The two had chatted

 in a friendly fashion on-line, but Bowen didn't give out his details.

 Nothing could have prepared him for the little kid in the big crash

 helmet standing by his bike in front of Bowen's house. `Hi!' he

 squeaked. `I'm the Masked Avenger!'

 Masked Avenger--a boy perhaps fifteen years old--was quite resourceful

 to have found out Bowen's details. Bowen invited him in and showed him

 the system. They became friends. But after that incident, Bowen

 decided to tighten security around his personal details even more. He

 began, in his own words, `moving toward full anonymity'. He invented

 the name Craig Bowen, and everyone in the underground came to know him

 by that name or his handle, Thunderbird1. He even opened a false bank

 account in the name of Bowen for the periodic voluntary donations

 users sent into PI. It was never a lot of money, mostly $5 or $10,

 because students don't tend to have much money. He ploughed it all

 back into PI.

 People had lots of reasons for wanting to get into the Inner Sanctum.

 Some wanted free copies of the latest software, usually pirated games

 from the US. Others wanted to share information and ideas about ways

 to break into computers, often those owned by local universities.

 Still others wanted to learn about how to manipulate the telephone

 system.

 The private areas functioned like a royal court, populated by

 aristocrats and courtiers with varying seniority, loyalties and

 rivalries. The areas involved an intricate social order and respect

 was the name of the game. If you wanted admission, you had to walk a

 delicate line between showing your superiors that you possessed enough

 valuable hacking information to be elite and not showing them so much

 they would brand you a blabbermouth. A perfect bargaining chip was an

 old password for Melbourne University's dial-out.

 The university's dial-out was a valuable thing. A hacker could ring up

 the university's computer, login as `modem' and the machine would drop

 him into a modem which let him dial out again. He could then dial

 anywhere in the world, and the university would foot the phone bill.

 In the late 1980s, before the days of cheap, accessible Internet

 connections, the university dial-out meant a hacker could access

 anything from an underground BBS in Germany to a US military system in

 Panama. The password put the world at his fingertips.

 A hacker aspiring to move into PI's Inner Sanctum wouldn't give out

 the current dial-out password in the public discussion areas. Most

 likely, if he was low in the pecking order, he wouldn't have such

 precious information. Even if he had managed to stumble across the

 current password somehow, it was risky giving it out publicly. Every

 wanna-be and his dog would start messing around with the university's

 modem account. The system administrator would wise up and change the

 password and the hacker would quickly lose his own access to the

 university account. Worse, he would lose access for other hackers--the

 kind of hackers who ran H.A.C.K., Elite and the Inner Sanctum. They

 would be really cross. Hackers hate it when passwords on accounts they

 consider their own are changed without warning. Even if the password

 wasn't changed, the aspiring hacker would look like a guy who couldn't

 keep a good secret.

 Posting an old password, however, was quite a different matter. The

 information was next to useless, so the hacker wouldn't be giving much

 away. But just showing he had access to that sort of information

 suggested he was somehow in the know. Other hackers might think he had

 had the password when it was still valid. More importantly, by showing

 off a known, expired password, the hacker hinted that he might just

 have the current password. Voila! Instant respect.

 Positioning oneself to win an invite into the Inner Sanctum was a game

 of strategy; titillate but never go all the way. After a while,

 someone on the inside would probably notice you and put in a word with

 Bowen. Then you would get an invitation.

 If you were seriously ambitious and wanted to get past the first inner

 layer, you then had to start performing for real. You couldn't hide

 behind the excuse that the public area might be monitored by the

 authorities or was full of idiots who might abuse valuable hacking

 information.

 The hackers in the most elite area would judge you on how much

 information you provided about breaking into computer or phone

 systems. They also looked at the accuracy of the information. It was

 easy getting out-of-date login names and passwords for a student

 account on Monash University's computer system. Posting a valid

 account for the New Zealand forestry department's VMS system intrigued

 the people who counted considerably more.

 The Great Rite of Passage from boy to man in the computer underground

 was Minerva. OTC, Australia's then government-owned Overseas

 Telecommunications Commission,3 ran Minerva, a system of three Prime

 mainframes in Sydney. For hackers such as Mendax, breaking into

 Minerva was the test.

 Back in early 1988, Mendax was just beginning to explore the world of

 hacking. He had managed to break through the barrier from public to

 private section of PI, but it wasn't enough. To be recognised as

 up-and-coming talent by the aristocracy of hackers such as The Force

 and The Wizard, a hacker had to spend time inside the Minerva system.

 Mendax set to work on breaking

 into it.

 Minerva was special for a number of reasons. Although it was in

 Sydney, the phone number to its entry computer, called an X.25 pad,

 was a free call. At the time Mendax lived in Emerald, a country town

 on the outskirts of Melbourne. A call to most Melbourne numbers

 incurred a long-distance charge, thus ruling out options such as the

 Melbourne University dial-out for breaking into international computer

 systems.

 Emerald was hardly Emerald City. For a clever sixteen-year-old boy,

 the place was dead boring. Mendax lived there with his mother; Emerald

 was merely a stopping point, one of dozens, as his mother shuttled her

 child around the continent trying to escape from a psychopathic former

 de facto. The house was an emergency refuge for families on the run.

 It was safe and so, for a time, Mendax and his exhausted family

 stopped to rest before tearing off again in search of a new place to

 hide.

 Sometimes Mendax went to school. Often he didn't. The school system

 didn't hold much interest for him. It didn't feed his mind the way

 Minerva would. They Sydney computer system was a far more interesting

 place to muck around in than the rural high school.

 Minerva was a Prime computer, and Primes were in. Force, one of the

 more respected hackers in 1987-88 in the Australian computer

 underground, specialised in Primos, the special operating system used

 on Prime computers. He wrote his own programs--potent hacking tools

 which provided current usernames and passwords--and made the systems

 fashionable in the computer underground.

 Prime computers were big and expensive and no hacker could afford one,

 so being able to access the speed and computational grunt of a system

 like Minerva was valuable for running a hacker's own programs. For

 example, a network scanner, a program which gathered the addresses of

 computers on the X.25 network which would be targets for future

 hacking adventures, ate up computing resources. But a huge machine

 like Minerva could handle that sort of program with ease. Minerva also

 allowed users to connect to other computer systems on the X.25 network

 around the world. Better still, Minerva had a BASIC interpreter on it.

 This allowed people to write programs in the BASIC programming

 language--by far the most popular language at the time--and make them

 run on Minerva. You didn't have to be a Primos fanatic, like Force, to

 write and execute a program on the OTC computer. Minerva suited Mendax

 very well.

 The OTC system had other benefits. Most major Australian corporations

 had accounts on the system. Breaking into an account requires a

 username and password; find the username and you have solved half the

 equation. Minerva account names were easy picking. Each one was

 composed of three letters followed by three numbers, a system which

 could have been difficult to crack except for the choice of those

 letters and numbers. The first three letters were almost always

 obvious acronyms for the company. For example, the ANZ Bank had

 accounts named ANZ001, ANZ002 and ANZ002. The numbers followed the

 same pattern for most companies. BHP001. CRA001. NAB001. Even OTC007.

 Anyone with the IQ of a desk lamp could guess at least a few account

 names on Minerva. Passwords were a bit tougher to come by, but Mendax

 had some ideas for that. He was going to have a crack at social

 engineering. Social engineering means smooth-talking someone in a

 position of power into doing something for you. It always involved a

 ruse of some sort.

 Mendax decided he would social engineer a password out of one of

 Minerva's users. He had downloaded a partial list of Minerva users

 another PI hacker had generously posted for those talented enough to

 make use of it. This list was maybe two years old, and incomplete, but

 it contained 30-odd pages of Minerva account usernames, company names,

 addresses, contact names and telephone and fax numbers. Some of them

 would probably still be valid.

 Mendax had a deep voice for his age; it would have been impossible to

 even contemplate social engineering without it. Cracking adolescent

 male voices were the kiss of death for would-be social engineers. But

 even though he had the voice, he didn't have the office or the Sydney

 phone number if the intended victim wanted a number to call back on.

 He found a way to solve the Sydney phone number by poking around until

 he dug up a number with Sydney's 02 area code which was permanently

 engaged. One down, one to go.

 Next problem: generate some realistic office background noise. He

 could hardly call a company posing as an OTC official to cajole a

 password when the only background noise was birds tweeting in the

 fresh country air.

 No, he needed the same background buzz as a crowded office in downtown

 Sydney. Mendex had a tape recorder, so he could pre-record the sound

 of an office and play it as background when he called companies on the

 Minerva list. The only hurdle was finding the appropriate office

 noise. Not even the local post office would offer a believable noise

 level. With none easily accessible, he decided to make his own audible

 office clutter. It wouldn't be easy. With a single track on his

 recording device, he couldn't dub in sounds on top of each other: he

 had to make all the noises simultaneously.

 First, he turned on the TV news, down very low, so it just hummed in

 the background. Then he set up a long document to print on his

 Commodore MPS 801 printer. He removed the cover from the noisy dot

 matrix machine, to create just the right volume of clackity-clack in

 the background. Still, he needed something more. Operators' voices

 mumbling across a crowded floor. He could mumble quietly to himself,

 but he soon discovered his verbal skills had not developed to the

 point of being able to stand in the middle of the room talking about

 nothing to himself for a quarter of an hour. So he fished out his

 volume of Shakespeare and started reading aloud. Loud enough to hear

 voices, but not so loud that the intended victim would be able to pick

 Macbeth. OTC operators had keyboards, so he began tapping randomly on

 his. Occasionally, for a little variation, he walked up to the tape

 recorder and asked a question--and then promptly answered it in

 another voice. He stomped noisily away from the recorder again, across

 the room, and then silently dove back to the keyboard for more

 keyboard typing and mumblings of Macbeth.

 It was exhausting. He figured the tape had to run for at least fifteen

 minutes uninterrupted. It wouldn't look very realistic if the office

 buzz suddenly went dead for three seconds at a time in the places

 where he paused the tape to rest.

 The tapes took a number of attempts. He would be halfway through,

 racing through line after line of Shakespeare, rap-tap-tapping on his

 keyboard and asking himself questions in authoritative voices when the

 paper jammed in his printer. Damn. He had to start all over again.

 Finally, after a tiring hour of auditory schizophrenia, he had the

 perfect tape of office hubbub.

 Mendax pulled out his partial list of Minerva users and began working

 through the 30-odd pages. It was discouraging.

 `The number you have dialled is not connected. Please check the number

 before dialling again.'

 Next number.

 `Sorry, he is in a meeting at the moment. Can I have him return your

 call?' Ah, no thanks.

 Another try.

 `That person is no longer working with our company. Can I refer you to

 someone else?' Uhm, not really.

 And another try.

 Finally, success.

 Mendax reached one of the contact names for a company in Perth. Valid

 number, valid company, valid contact name. He cleared his throat to

 deepen his voice even further and began.

 `This is John Keller, an operator from OTC Minerva in Sydney. One of

 our D090 hard drives has crashed. We've pulled across the data on the

 back-up tape and we believe we have all your correct information. But

 some of it might have been corrupted in the accident and we would just

 like to confirm your details. Also the back-up tape is two days old,

 so we want to check your information is up to date so your service is

 not interrupted. Let me just dig out your details ...' Mendax shuffled

 some papers around on the table top.

 `Oh, dear. Yes. Let's check it,' the worried manager responded.

 Mendax started reading all the information on the Minerva list

 obtained from Pacific Island, except for one thing. He changed the fax

 number slightly. It worked. The manager jumped right in.

 `Oh, no. That's wrong. Our fax number is definitely wrong,' he said

 and proceeded to give the correct number.

 Mendax tried to sound concerned. `Hmm,' he told the manager. `We may

 have bigger problems than we anticipated. Hmm.' He gave another

 pregnant pause. Working up the courage to ask the Big Question.

 It was hard to know who was sweating more, the fretting Perth manager,

 tormented by the idea of loud staff complaints from all over the

 company because the Minerva account was faulty, or the gangly kid

 trying his hand at social engineering for the first time.

 `Well,' Mendax began, trying to keep the sound of authority in his

 voice. `Let's see. We have your account number, but we had better

 check your password ... what was it?' An arrow shot from the bow.

 It hit the target. `Yes, it's L-U-R-C-H--full stop.'

 Lurch? Uhuh. An Addams Family fan.

 `Can you make sure everything is working? We don't want our service

 interrupted.' The Perth manager sounded quite anxious.

 Mendax tapped away on the keyboard randomly and then paused. `Well, it

 looks like everything is working just fine now,' he quickly reassured

 him. Just fine.

 `Oh, that's a relief!' the Perth manager exclaimed. `Thank you for

 that. Thank you. I just can't thank you enough for calling us!' More

 gratitude.

 Mendax had to extract himself. This was getting embarrassing.

 `Yes, well I'd better go now. More customers to call.' That should

 work. The Perth manager wanted a contact telephone number, as

 expected, if something went wrong--so Mendax gave him the one which

 was permanently busy.

 `Thank you again for your courteous service!' Uhuh. Anytime.

 Mendax hung up and tried the toll-free Minerva number. The password

 worked. He couldn't believe how easy it was to get in.

 He had a quick look around, following the pattern of most hackers

 breaking into a new machine. First thing to do was to check the

 electronic mail of the `borrowed' account. Email often contains

 valuable information. One company manager might send another

 information about other account names, password changes or even phone

 numbers to modems at the company itself. Then it was off to check the

 directories available for anyone to read on the main system--another

 good source of information. Final stop: Minerva's bulletin board of

 news. This included postings from the system operators about planned

 downtime or other service issues. He didn't stay long. The first visit

 was usually mostly a bit of reconnaissance work.

 Minerva had many uses. Most important among these was the fact that

 Minerva gave hackers an entry point into various X.25 networks. X.25

 is a type of computer communications network, much like the Unix-based

 Internet or the VMS-based DECNET. It has different commands and

 protocols, but the principle of an extensive worldwide data

 communications network is the same. There is, however, one important

 difference. The targets for hackers on the X.25 networks are often far

 more interesting. For example, most banks are on X.25. Indeed, X.25

 underpins many aspects of the world's financial markets. A number of

 countries' classified military computer sites only run on X.25. It is

 considered by many people to be more secure than the Internet or any

 DECNET system.

 Minerva allowed incoming callers to pass into the X.25

 network--something most Australian universities did not offer at the

 time. And Minerva let Australian callers do this without incurring a

 long-distance telephone charge.

 In the early days of Minerva, the OTC operators didn't seem to care

 much about the hackers, probably because it seemed impossible to get

 rid of them. The OTC operators managed the OTC X.25 exchange, which

 was like a telephone exchange for the X.25 data network. This exchange

 was the data gateway for Minerva and other systems connected to that

 data network.

 Australia's early hackers had it easy, until Michael Rosenberg

 arrived.

 Rosenberg, known on-line simply as MichaelR, decided to clean up

 Minerva. An engineering graduate from Queensland University, Michael

 moved to Sydney when he joined OTC at age 21. He was about the same

 age as the hackers he was chasing off his system. Rosenberg didn't

 work as an OTC operator, he managed the software which ran on Minerva.

 And he made life hell for people like Force. Closing up security

 holes, quietly noting accounts used by hackers and then killing those

 accounts, Rosenberg almost single-handedly stamped out much of the

 hacker activity in OTC's Minerva.

 Despite this, the hackers--`my hackers' as he termed the regulars--had

 a grudging respect for Rosenberg. Unlike anyone else at OTC, he was

 their technical equal and, in a world where technical prowess was the

 currency, Rosenberg was a wealthy young man.

 He wanted to catch the hackers, but he didn't want to see them go to

 prison. They were an annoyance, and he just wanted them out of his

 system. Any line trace, however, had to go through Telecom, which was

 at that time a separate body from OTC. Telecom, Rosenberg was told,

 was difficult about these things because of strict privacy laws. So,

 for the most part, he was left to deal with the hackers on his own.

 Rosenberg could not secure his system completely since OTC didn't

 dictate passwords to their customers. Their customers were usually

 more concerned about employees being able to remember passwords easily

 than worrying about warding off wily hackers. The result: the

 passwords on a number of Minerva accounts were easy pickings.

 The hackers and OTC waged a war from 1988 to 1990, and it was fought

 in many ways.

 Sometimes an OTC operator would break into a hacker's on-line session

 demanding to know who was really using the account. Sometimes the

 operators sent insulting messages to the hackers--and the hackers gave

 it right back to them. They broke into the hacker's session with `Oh,

 you idiots are at it again'. The operators couldn't keep the hackers

 out, but they had other ways of getting even.

 Electron, a Melbourne hacker and rising star in the Australian

 underground, had been logging into a system in Germany via OTC's X.25

 link. Using a VMS machine, a sort of sister system to Minerva, he had

 been playing a game called Empire on the Altos system, a popular

 hang-out for hackers. It was his first attempt at Empire, a complex

 war game of strategy which attracted players from around the world.

 They each had less than one hour per day to conquer regions while

 keeping production units at a strategic level. The Melbourne hacker

 had spent weeks building his position. He was in second place.

 Then, one day, he logged into the game via Minerva and the German

 system, and he couldn't believe what he saw on the screen in front of

 him. His regions, his position in the game, all of it--weeks of

 work--had been wiped out. An OTC operator had used an X.25

 packet-sniffer to monitor the hacker's login and capture his password to

 Empire. Instead of trading the usual insults, the operator had waited

 for the hacker to logoff and then had hacked into the game and destroyed

 the hacker's position.

 Electron was furious. He had been so proud of his position in his very

 first game. Still, wreaking havoc on the Minerva system in retribution

 was out of the question. Despite the fact that they wasted weeks of

 his work, Electron had no desire to damage their system. He considered

 himself lucky to be able to use it as long as he did.

 The anti-establishment attitudes nurtured in BBSes such as PI and Zen

 fed on a love of the new and untried. There was no bitterness, just a

 desire to throw off the mantle of the old and dive into the new.

 Camaraderie grew from the exhilarating sense that the youth in this

 particular time and place were constantly on the edge of big

 discoveries. People were calling up computers with their modems and

 experimenting. What did this key sequence do? What about that tone?

 What would happen if ... It was the question which drove them to stay

 up day and night, poking and prodding. These hackers didn't for the

 most part do drugs. They didn't even drink that much, given their age.

 All of that would have interfered with their burning desire to know,

 would have dulled their sharp edge. The underground's

 anti-establishment views were mostly directed at organisations which

 seemed to block the way to the new frontier--organisations like

 Telecom.

 It was a powerful word. Say `Telecom' to a member of the computer

 underground from that era and you will observe the most striking

 reaction. Instant contempt sweeps across his face. There is a pause as

 his lips curl into a noticeable sneer and he replies with complete

 derision, `Telescum'. The underground hated Australia's national

 telephone carrier with a passion equalled only to its love of

 exploration. They felt that Telecom was backward and its staff had no

 idea how to use their own telecommunications technology. Worst of all,

 Telecom seemed to actively dislike BBSes.

 Line noise interfered with one modem talking to another, and in the

 eyes of the computer underground, Telecom was responsible for the line

 noise. A hacker might be reading a message on PI, and there, in the

 middle of some juicy technical titbit, would be a bit of crud--random

 characters `2'28 v'1';D>nj4'--followed by the comment, `Line noise.

 Damn Telescum! At their best as usual, I see'. Sometimes the line

 noise was so bad it logged the hacker off, thus forcing him to spend

 another 45 minutes attack dialling the BBS. The modems didn't have

 error correction, and the faster the modem speed, the worse the impact

 of line noise. Often it became a race to read mail and post messages

 before Telecom's line noise logged the hacker off.

 Rumours flew through the underground again and again that Telecom was

 trying to bring in timed local calls. The volume of outrage was

 deafening. The BBS community believed it really irked the national

 carrier that people could spend an hour logged into a BBS for the cost

 of one local phone call. Even more heinous, other rumours abounded

 that Telecom had forced at least one BBS to limit each incoming call

 to under half an hour. Hence Telecom's other nickname in the computer

 underground: Teleprofit.

 To the BBS community, Telecom's Protective Services Unit was the

 enemy. They were the electronic police. The underground saw Protective

 Services as `the enforcers'--an all-powerful government force which

 could raid your house, tap your phone line and seize your computer

 equipment at any time. The ultimate reason to hate Telecom.

 There was such hatred of Telecom that people in the computer

 underground routinely discussed ways of sabotaging the carrier. Some

 people talked of sending 240 volts of electricity down the telephone

 line--an act which would blow up bits of the telephone exchange along

 with any line technicians who happened to be working on the cable at

 the time. Telecom had protective fuses which stopped electrical surges

 on the line, but BBS hackers had reportedly developed circuit plans

 which would allow high-frequency voltages to bypass them. Other

 members of the underground considered what sweet justice it would be

 to set fire to all the cables outside a particular Telecom exchange

 which had an easily accessible cable entrance duct.

 It was against this backdrop that the underground began to shift into

 phreaking. Phreaking is loosely defined as hacking the telephone

 system. It is a very loose definition. Some people believe phreaking

 includes stealing a credit card number and using it to make a

 long-distance call for free. Purists shun this definition. To them,

 using a stolen credit card is not phreaking, it is carding. They argue

 that phreaking demands a reasonable level of technical skill and

 involves manipulation of a telephone exchange. This manipulation may

 manifest itself as using computers or electrical circuits to generate

 special tones or modify the voltage of a phone line. The manipulation

 changes how the telephone exchange views a particular telephone

 line. The result: a free and hopefully untraceable call. The purist

 hacker sees phreaking more as a way of eluding telephone traces than of

 calling his or her friends around the world for free.

 The first transition into phreaking and eventually carding happened

 over a period of about six months in 1988. Early hackers on PI and Zen

 relied primarily on dial-outs, like those at Melbourne University or

 Telecom's Clayton office, to bounce around international computer

 sites. They also used X.25 dial-outs in other countries--the US,

 Sweden and Germany--to make another leap in their international

 journeys.

 Gradually, the people running these dial-out lines wised up. Dial-outs

 started drying up. Passwords were changed. Facilities were cancelled.

 But the hackers didn't want to give up access to overseas systems.

 They'd had their first taste of international calling and they wanted

 more. There was a big shiny electronic world to explore out there.

 They began trying different methods of getting where they wanted to

 go. And so the Melbourne underground moved into phreaking.

 Phreakers swarmed to PABXes like bees to honey. A PABX, a private

 automatic branch exchange, works like a mini-Telecom telephone

 exchange. Using a PABX, the employee of a large company could dial

 another employee in-house without incurring the cost of a local

 telephone call. If the employee was, for example, staying in a hotel

 out of town, the company might ask him to make all his calls through

 the company's PABX to avoid paying extortionate hotel long-distance

 rates. If the employee was in Brisbane on business, he could dial a

 Brisbane number which might route him via the company's PABX to

 Sydney. From there, he might dial out to Rome or London, and the

 charge would be billed directly to the company. What worked for an

 employee also worked for a phreaker.

 A phreaker dialling into the PABX would generally need to either know

 or guess the password allowing him to dial out again. Often, the

 phreaker was greeted by an automated message asking for the employee's

 telephone extension--which also served as the password. Well, that was

 easy enough. The phreaker simply tried a series of numbers until he

 found one which actually worked.

 Occasionally, a PABX system didn't even have passwords. The managers

 of the PABX figured that keeping the phone number secret was good

 enough security. Sometimes phreakers made free calls out of PABXes

 simply by exploited security flaws in a particular model or brand of

 PABX. A series of specific key presses allowed the phreaker to get in

 without knowing a password, an employee's name, or even the name of

 the company for that matter.

 As a fashionable pastime on BBSes, phreaking began to surpass hacking.

 PI established a private phreaking section. For a while, it became

 almost old hat to call yourself a hacker. Phreaking was forging the

 path forward.

 Somewhere in this transition, the Phreakers Five sprung to life. A

 group of five hackers-turned-phreakers gathered in an exclusive group

 on PI. Tales of their late-night podding adventures leaked into the

 other areas of the BBS and made would-be phreakers green with

 jealousy.

 First, the phreakers would scout out a telephone pod--the grey steel,

 rounded box perched nondescriptly on most streets. Ideally, the chosen

 pod would be by a park or some other public area likely to be deserted

 at night. Pods directly in front of suburban houses were a bit

 risky--the house might contain a nosy little old lady with a penchant

 for calling the local police if anything looked suspicious. And what

 she would see, if she peered out from behind her lace curtains, was a

 small tornado of action.

 One of the five would leap from the van and open the pod with a key

 begged, borrowed or stolen from a Telecom technician. The keys seemed

 easy enough to obtain. The BBSes message boards were rife with gleeful

 tales of valuable Telecom equipment, such as 500 metres of cable or a

 pod key, procured off a visiting Telecom repairman either through

 legitimate means or in exchange for a six-pack of beer.

 The designated phreaker would poke inside the pod until he found

 someone else's phone line. He'd strip back the cable, whack on a pair

 of alligator clips and, if he wanted to make a voice call, run it to a

 linesman's handset also borrowed, bought or stolen from Telecom. If he

 wanted to call another computer instead of talking voice, he would

 need to extend the phone line back to the phreakers' car. This is

 where the 500 metres of Telecom cable came in handy. A long cable

 meant the car, containing five anxious, whispering young men and a

 veritable junkyard of equipment, would not have to sit next to the pod

 for hours on end. That sort of scene might look a little suspicious to

 a local resident out walking his or her dog late one night.

 The phreaker ran the cable down the street and, if possible, around

 the corner. He pulled it into the car and attached it to the waiting

 computer modem. At least one of the five was proficient enough with

 electronics hardware to have rigged up the computer and modem to the

 car battery. The Phreaker's Five could now call any computer without

 being traced or billed. The phone call charges would appear at the end

 of a local resident's phone bill. Telecom did not itemise residential

 telephone bills at the time. True, it was a major drama to zoom around

 suburban streets in the middle of the night with computers, alligator

 clips and battery adaptors in tow, but that didn't matter so much. In

 fact, the thrill of such a cloak-and-dagger operation was as good as

 the actual hacking itself. It was illicit. In the phreakers' own eyes,

 it was clever. And therefore it was fun.

 Craig Bowen didn't think much of the Phreakers Five's style of

 phreaking. In fact, the whole growth of phreaking as a pastime

 depressed him a bit. He believed it just didn't require the technical

 skills of proper hacking. Hacking was, in his view, about the

 exploration of a brave new world of computers. Phreaking was, well, a

 bit beneath a good hacker. Somehow it demeaned the task at hand.

 Still, he could see how in some cases it was necessary in order to

 continue hacking. Most people in the underground developed some basic

 skills in phreaking, though people like Bowen always viewed it more as

 a means to an end--just a way of getting from computer A to computer

 B, nothing more. Nonetheless, he allowed phreaking discussion areas in

 the private sections of PI.

 What he refused to allow was discussion areas around credit card

 fraud. Carding was anathema to Bowen and he watched with alarm as some

 members of the underground began to shift from phreaking into carding.

 Like the transition into phreaking, the move into carding was a

 logical progression. It occurred over a period of perhaps six months

 in 1988 and was as obvious as a group of giggling schoolgirls.

 Many phreakers saw it simply as another type of phreaking. In fact it

 was a lot less hassle than manipulating some company's PABX. Instead,

 you just call up an operator, give him some stranger's credit card

 number to pay for the call, and you were on your way. Of course, the

 credit cards had a broader range of uses than the PABXes. The advent

 of carding meant you could telephone your friends in the US or UK and

 have a long voice conference call with all of them

 simultaneously--something which could be a lot tougher to arrange on a

 PABX. There were other benefits. You could actually charge things with

 that credit card. As in goods. Mail order goods.

 One member of the underground who used the handle Ivan Trotsky,

 allegedly ordered $50000 worth of goods, including a jet ski, from the

 US on a stolen card, only to leave it sitting on the Australian docks.

 The Customs guys don't tend to take stolen credit cards for duty

 payments. In another instance, Trotsky was allegedly more successful.

 A try-hard hacker who kept pictures of Karl Marx and Lenin taped to

 the side of his computer terminal, Trotsky regularly spewed communist

 doctrine across the underground. A self-contained paradox, he spent

 his time attending Communist Party of Australia meetings and duck

 shoots. According to one hacker, Trotsky's particular contribution to

 the overthrow of the capitalist order was the arrangement of a

 shipment of expensive modems from the US using stolen credit cards. He

 was rumoured to have made a tidy profit by selling the modems in the

 computer community for about $200 each. Apparently, being part of the

 communist revolution gave him all sorts of ready-made

 rationalisations. Membership has its advantages.

 To Bowen, carding was little more than theft. Hacking may have been a

 moral issue, but in early 1988 in Australia it was not yet much of a

 legal one. Carding was by contrast both a moral and a legal issue.

 Bowen recognised that some people viewed hacking as a type of

 theft--stealing someone else's computer resources--but the argument

 was ambiguous. What if no-one needed those resources at 2 a.m. on a

 given night? It might be seen more as `borrowing' an under-used asset,

 since the hacker had not permanently appropriated any property. Not so

 for carding.

 What made carding even less noble was that it required the technical

 skill of a wind-up toy. Not only was it beneath most good hackers, it

 attracted the wrong sort of people into the hacking scene. People who

 had little or no respect for the early Australian underground's golden

 rules of hacking: don't damage computer systems you break into

 (including crashing them); don't change the information in those

 systems (except for altering logs to cover your tracks); and share

 information. For most early Australian hackers, visiting someone

 else's system was a bit like visiting a national park. Leave it as you

 find it.

 While the cream seemed to rise to the top of the hacking hierarchy, it

 was the scum that floated at the top of the carding community. Few

 people in the underground typified this more completely than Blue

 Thunder, who had been hanging around the outskirts of the Melbourne

 underground since at least 1986. The senior hackers treated Blue

 Blunder, as they sometimes called him, with great derision.

 His entrance into the underground was as ignominious as that of a

 debutante who, delicately descending the grand steps of the ballroom,

 trips and tumbles head-first onto the dance floor. He picked a fight

 with the grande doyenne of the Melbourne underground.

 The Real Article occupied a special place in the underground. For

 starters, The Real Article was a woman--perhaps the only female to

 play a major role in the early Melbourne underground scene. Although

 she didn't hack computers, she knew a lot about them. She ran The Real

 Connection, a BBS frequented by many of the hackers who hung out on

 PI. She wasn't somebody's sister wafting in and out of the picture in

 search of a boyfriend. She was older. She was as good as married. She

 had kids. She was a force to be reckoned with in the hacking

 community.

 Forthright and formidable, The Real Article commanded considerable

 respect among the underground. A good indicator of this respect was the

 fact that the members of H.A.C.K. had inducted her as an honorary member

 of their exclusive club. Perhaps it was because she ran a popular

 board. More likely it was because, for all their bluff and bluster, most

 hackers were young men with the problems of young men. Being older and

 wiser, The Real Article knew how to lend a sympathetic ear to those

 problems. As a woman and a non-hacker, she was removed from the jumble

 of male ego hierarchical problems associated with confiding in a

 peer. She served as a sort of mother to the embryonic hacking community,

 but she was young enough to avoid the judgmental pitfalls most parents

 fall into with children.

 The Real Article and Blue Thunder went into partnership running a BBS

 in early 1986. Blue Thunder, then a high-school student, was desperate

 to run a board, so she let him co-sysop the system. At first the

 partnership worked. Blue Thunder used to bring his high-school essays

 over for her to proofread and correct. But a short time into the

 partnership, it went sour. The Real Article didn't like Blue Thunder's

 approach to running a BBS, which appeared to her to be get information

 from other hackers and then dump them. The specific strategy seemed to

 be: get hackers to logon and store their valuable information on the

 BBS, steal that information and then lock them out of their own

 account. By locking them out, he was able to steal all the glory; he

 could then claim the hacking secrets were his own. It was, in her

 opinion, not only unsustainable, but quite immoral. She parted ways

 with Blue Thunder and excommunicated him from her BBS.

 Not long after, The Real Article started getting harassing phone calls

 at 4 in the morning. The calls were relentless. Four a.m. on the dot,

 every night. The voice at the other end of the line was computer

 synthesised. This was followed by a picture of a machine-gun, printed

 out on a cheap dot matrix printer in Commodore ASCII, delivered in her

 letterbox. There was a threatening message attached which read

 something like, `If you want the kids to stay alive, get them out of

 the house'.

 After that came the brick through the window. It landed in the back of

 her TV. Then she woke up one morning to find her phone line dead.

 Someone had opened the Telecom well in the nature strip across the

 road and cut out a metre of cable. It meant the phone lines for the

 entire street were down.

 The Real Article tended to rise above the petty games that whining

 adolescent boys with bruised egos could play, but this was too much.

 She called in Telecom Protective Services, who put a last party

 release on her phone line to trace the early-morning harassing calls.

 She suspected Blue Thunder was involved, but nothing was ever proved.

 Finally, the calls stopped. She voiced her suspicions to others in the

 computer underground. Whatever shred of reputation Blue Chunder, as he

 then became known for a time, had was soon decimated.

 Since his own technical contributions were seen by his fellow BBS

 users as limited, Blue Thunder would likely have faded into obscurity,

 condemned to spend the rest of his time in the underground jumping

 around the ankles of the aristocratic hackers. But the birth of

 carding arrived at a fortuitous moment for him and he got into carding

 in a big way, so big in fact that he soon got busted.

 People in the underground recognised him as a liability, both because

 of what many hackers saw as his loose morals and because he was

 boastful of his activities. One key hacker said, `He seemed to relish

 the idea of getting caught. He told people he worked for a credit

 union and that he stole lots of credit card numbers. He sold

 information, such as accounts on systems, for financial gain.' In

 partnership with a carder, he also allegedly sent a bouquet of flowers

 to the police fraud squad--and paid for it with a stolen credit card

 number.

 On 31 August 1988, Blue Thunder faced 22 charges in the Melbourne

 Magistrates Court, where he managed to get most of the charges dropped

 or amalgamated. He only ended up pleading guilty to five counts,

 including deception and theft. The Real Article sat in the back of the

 courtroom watching the proceedings. Blue Thunder must have been pretty

 worried about what kind of sentence the magistrate would hand down

 because she said he approached her during the lunch break and asked if

 she would appear as a character witness for the defence. She looked

 him straight in the eye and said, `I think you would prefer it if I

 didn't'. He landed 200 hours of community service and an order to pay

 $706 in costs.

 Craig Bowen didn't like where the part of the underground typified by

 Blue Thunder was headed. In his view, Chunder and Trotsky stood out as

 bad apples in an otherwise healthy group, and they signalled an

 unpleasant shift towards selling information. This was perhaps the

 greatest taboo. It was dirty. It was seedy. It was the realm of

 criminals, not explorers. The Australian computer underground had

 started to lose some of its fresh-faced innocence.

 Somewhere in the midst of all this, a new player entered the Melbourne

 underground. His name was Stuart Gill, from a company called

 Hackwatch.

 Bowen met Stuart through Kevin Fitzgerald, a well-known local hacker

 commentator who founded the Chisholm Institute of Technology's

 Computer Abuse Research Bureau, which later became the Australian

 Computer Abuse Research Bureau. After seeing a newspaper article

 quoting Fitzgerald, Craig decided to ring up the man many members of

 the underground considered to be a hacker-catcher. Why not? There were

 no federal laws in Australia against hacking, so Bowen didn't feel

 that nervous about it. Besides, he wanted to meet the enemy. No-one

 from the Australian underground had ever done it before, and Bowen

 decided it was high time. He wanted to set the record straight with

 Fitzgerald, to let him know what hackers were really on about. They

 began to talk periodically on the phone.

 Along the way, Bowen met Stuart Gill who said that he was working with

 Fitzgerald.4 Before long, Gill began visiting PI. Eventually, Bowen

 visited Gill in person at the Mount Martha home he shared with his

 elderly aunt and uncle. Stuart had all sorts of computer equipment

 hooked up there, and a great number of boxes of papers in the garage.

 `Oh, hello there, Paul,' Gill's ancient-looking uncle said when he saw

 the twosome. As soon as the old man had tottered off, Gill pulled

 Bowen aside confidentially.

 `Don't worry about old Eric,' he said. `He lost it in the war. Today

 he thinks I'm Paul, tomorrow it will be someone else.'

 Bowen nodded, understanding.

 There were many strange things about Stuart Gill, all of which seemed

 to have a rational explanation, yet that explanation somehow never

 quite answered the question in full.

 Aged in his late thirties, he was much older and far more worldly than

 Craig Bowen. He had very, very pale skin--so pasty it looked as though

 he had never sat in the sun in his life.

 Gill drew Bowen into the complex web of his life. Soon he told the

 young hacker that he wasn't just running Hackwatch, he was also

 involved in intelligence work. For the Australian Federal Police. For

 ASIO. For the National Crime Authority. For the Victoria Police's

 Bureau of Criminal Intelligence (BCI). He showed Bowen some secret

 computer files and documents, but he made him sign a special form

 first--a legal-looking document demanding non-disclosure based on some

 sort of official secrets act.

 Bowen was impressed. Why wouldn't he be? Gill's cloak-and-dagger world

 looked like the perfect boy's own adventure. Even bigger and better

 than hacking. He was a little strange, but that was part of the

 allure.

 Like the time they took a trip to Sale together around Christmas 1988.

 Gill told Bowen he had to get out of town for a few days--certain

 undesirable people were after him. He didn't drive, so could Craig

 help him out? Sure, no problem. They had shared an inexpensive motel

 room in Sale, paid for by Gill.

 Being so close to Christmas, Stuart told Craig he had brought him two

 presents. Craig opened the first--a John Travolta fitness book. When

 Craig opened the second gift, he was a little stunned. It was a red

 G-string for men. Craig didn't have a girlfriend at the time--perhaps

 Stuart was trying to help him get one.

 `Oh, ah, thanks,' Craig said, a bit confused.

 `Glad you like it,' Stuart said. `Go on. Try it on.'

 `Try it on?' Craig was now very confused.

 `Yeah, mate, you know, to see if it fits. That's all.'

 `Oh, um, right.'

 Craig hesitated. He didn't want to seem rude. It was a weird request,

 but never having been given a G-string before, he didn't know the

 normal protocol. After all, when someone gives you a jumper, it's

 normal for them to ask you to try it on, then and there, to see if it

 fits.

 Craig tried it on. Quickly.

 `Yes, seems to fit,' Stuart said matter of factly, then turned away.

 Craig felt relieved. He changed back into his clothing.

 That night, and on many others during their trips or during Craig's

 overnight visits to Stuart's uncle's house, Craig lay in bed wondering

 about his secretive new friend.

 Stuart was definitely a little weird, but he seemed to like women so

 Craig figured he couldn't be interested in Craig that way. Stuart

 bragged that he had a very close relationship with a female newspaper

 reporter, and he always seemed to be chatting up the girl at the video

 store.

 Craig tried not to read too much into Stuart's odd behaviour, for the

 young man was willing to forgive his friend's eccentricities just to

 be part of the action. Soon Stuart asked Craig for access to

 PI--unrestricted access.

 The idea made Craig uncomfortable, but Stuart was so persuasive. How

 would he be able to continue his vital intelligence work without

 access to Victoria's most important hacking board? Besides, Stuart

 Gill of Hackwatch wasn't after innocent-faced hackers like Craig

 Bowen. In fact, he would protect Bowen when the police came down on

 everyone. What Stuart really wanted was the carders--the fraudsters.

 Craig didn't want to protect people like that, did he?

 Craig found it a little odd, as usual, that Stuart seemed to be after

 the carders, yet he had chummed up with Ivan Trotsky. Still, there

 were no doubt secrets Stuart couldn't reveal--things he wasn't allowed

 to explain because of his intelligence work.

 Craig agreed.

 What Craig couldn't have known as he pondered Stuart Gill from the

 safety of his boyish bedroom was exactly how much innocence the

 underground was still to lose. If he had foreseen the next few

 years--the police raids, the Ombudsman's investigation, the stream of

 newspaper articles and the court cases--Craig Bowen would, at that

 very moment, probably have reached over and turned off his beloved PI

 and Zen forever.

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 Chapter 3 -- The American Connection

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 US forces give the nod

 It's a setback for your country

 -- from `US Forces', on 10, 9, 8, 7, 6, 5, 4, 3, 2, 1 by Midnight Oil1

 Force had a secret. The Parmaster wanted it.

 Like most hackers, The Parmaster didn't just want the secret, he

 needed it. He was in that peculiar state attained by real hackers

 where they will do just about anything to obtain a certain piece of

 information. He was obsessed.

 Of course, it wasn't the first time The Parmaster craved a juicy piece

 of information. Both he and Force knew all about infatuation. That's

 how it worked with real hackers. They didn't just fancy a titbit here

 and there. Once they knew information about a particular system was

 available, that there was a hidden entrance, they chased it down

 relentlessly. So that was exactly what Par was doing. Chasing Force

 endlessly, until he got what he wanted.

 It began innocently enough as idle conversation between two giants in

 the computer underground in the first half of 1988. Force, the

 well-known Australian hacker who ran the exclusive Realm BBS in

 Melbourne, sat chatting with Par, the American master of X.25

 networks, in Germany. Neither of them was physically in Germany, but

 Altos was.

 Altos Computer Systems in Hamburg ran a conference feature called

 Altos Chat on one of its machines. You could call up from anywhere on

 the X.25 data communications network, and the company's computer would

 let you connect. Once connected, with a few brief keystrokes, the

 German machine would drop you into a real-time, on-screen talk session

 with anyone else who happened to be on-line. While the rest of the

 company's computer system grunted and toiled with everyday labours,

 this corner of the machine was reserved for live on-line chatting. For

 free. It was like an early form of the Internet Relay Chat. The

 company probably hadn't meant to become the world's most prestigious

 hacker hang-out, but it soon ended up doing so.

 Altos was the first significant international live chat channel, and

 for most hackers it was an amazing thing. The good hackers had cruised

 through lots of computer networks around the world. Sometimes they

 bumped into one another on-line and exchanged the latest gossip.

 Occasionally, they logged into overseas BBSes, where they posted

 messages. But Altos was different. While underground BBSes had a

 tendency to simply disappear one day, gone forever, Altos was always

 there. It was live. Instantaneous communications with a dozen other

 hackers from all sorts of exotic places. Italy. Canada. France.

 England. Israel. The US. And all these people not only shared an

 interest in computer networks but also a flagrant contempt for

 authority of any type. Instant, real-time penpals--with attitude.

 However, Altos was more exclusive than the average underground BBS.

 Wanna-be hackers had trouble getting into it because of the way X.25

 networks were billed. Some systems on the network took reverse-charge

 connections--like a 1-800 number--and some, including Altos, didn't.

 To get to Altos you needed a company's NUI (Network User Identifier),

 which was like a calling card number for the X.25 network, used to

 bill your time on-line. Or you had to have access to a system like

 Minerva which automatically accepted billing for all the connections

 made.

 X.25 networks are different in various ways from the Internet, which

 developed later. X.25 networks use different communication protocols

 and, unlike the Internet at the user-level, they only use addresses

 containing numbers not letters. Each packet of information travelling

 over a data network needs to be encased in a particular type of

 envelope. A `letter' sent across the X.25 network needs an X.25

 `stamped' envelope, not an Internet `stamped' envelope.

 The X.25 networks were controlled by a few very large players,

 companies such as Telenet and Tymnet, while the modern Internet is, by

 contrast, a fragmented collection of many small and medium-sized

 sites.

 Altos unified the international hacking world as nothing else had

 done. In sharing information about their own countries' computers and

 networks, hackers helped each other venture further and further

 abroad. The Australians had gained quite a reputation on Altos. They

 knew their stuff. More importantly, they possessed DEFCON, a program

 which mapped out uncharted networks and scanned for accounts on

 systems within them. Force wrote DEFCON based on a simple automatic

 scanning program provided by his friend and mentor, Craig Bowen

 (Thunderbird1).

 Like the telephone system, the X.25 networks had a large number of

 `phone numbers', called network user addresses (NUAs). Most were not

 valid. They simply hadn't been assigned to anyone yet. To break into

 computers on the network, you had to find them first, which meant

 either hearing about a particular system from a fellow hacker or

 scanning. Scanning--typing in one possible address after another--was

 worse than looking for a needle in a haystack. 02624-589004-0004. Then

 increasing the last digit by one on each attempt. 0005. 0006. 0007.

 Until you hit a machine at the other end.

 Back in 1987 or early 1988, Force had logged into Pacific Island for a

 talk with Craig Bowen. Force bemoaned the tediousness of hand

 scanning.

 `Well, why the hell are you doing it manually?' Bowen responded. `You

 should just use my program.' He then gave Force the source code for

 his simple automated scanning program, along with instructions.

 Force went through the program and decided it would serve as a good

 launchpad for bigger things, but it had a major limitation. The

 program could only handle one connection at a time, which meant it

 could only scan one branch of a network at a time.

 Less than three months later, Force had rewritten Bowen's program into

 the far more powerful DEFCON, which became the jewel in the crown of

 the Australian hackers' reputation. With DEFCON, a hacker could

 automatically scan fifteen or twenty network addresses simultaneously.

 He could command the computer to map out pieces of the Belgian,

 British and Greek X.25 communications networks, looking for computers

 hanging off the networks like buds at the tips of tree branches.

 Conceptually, the difference was a little like using a basic PC, which

 can only run one program at a time, as opposed to operating a more

 sophisticated one where you can open many windows with different

 programs running all at once. Even though you might only be working in

 one window, say, writing a letter, the computer might be doing

 calculations in a spreadsheet in another window in the background. You

 can swap between

 different functions, which are all running in the background

 simultaneously.

 While DEFCON was busy scanning, Force could do other things, such as

 talk on Altos. He continued improving DEFCON, writing up to four more

 versions of the program. Before long, DEFCON didn't just scan twenty

 different connections at one time; it also automatically tried to

 break into all the computers it found through those connections.

 Though the program only tried basic default passwords, it had a fair

 degree of success, since it could attack so many network addresses at

 once. Further, new sites and mini-networks were being added so quickly

 that security often fell by the wayside in the rush to join in. Since

 the addresses were unpublished, companies often felt this obscurity

 offered enough protection.

 DEFCON produced lists of thousands of computer sites to raid. Force

 would leave it scanning from a hacked Prime computer, and a day or two

 later he would have an output file with 6000 addresses on different

 networks. He perused the list and selected sites which caught his

 attention. If his program had discovered an interesting address, he

 would travel over the X.25 network to the site and then try to break

 into the computer at that address. Alternatively, DEFCON might have

 already successfully penetrated the machine using a default password,

 in which case the address, account name and password would all be

 waiting for Force in the log file. He could just walk right in.

 Everyone on Altos wanted DEFCON, but Force refused to hand over the

 program. No way was he going to have other hackers tearing up virgin

 networks. Not even Erik Bloodaxe, one of the leaders of the most

 prestigious American hacking group, Legion of Doom (LOD), got DEFCON

 when he asked for it. Erik took his handle from the name of a Viking

 king who ruled over the area now known as York, England. Although Erik

 was on friendly terms with the Australian hackers, Force remained

 adamant. He would not let the jewel out of his hands.

 But on this fateful day in 1988, Par didn't want DEFCON. He wanted the

 secret Force had just discovered, but held so very close to his chest.

 And the Australian didn't want to give it to him.

 Force was a meticulous hacker. His bedroom was remarkably tidy, for a

 hacker's room. It had a polished, spartan quality. There were a few

 well-placed pieces of minimalist furniture:

 a black enamel metal single bed, a modern black bedside

 table and a single picture on the wall--a photographic poster of

 lightning, framed in glass. The largest piece of furniture was a

 blue-grey desk with a return, upon which sat his computer, a printer

 and an immaculate pile of print-outs. The bookcase, a tall modern

 piece matching the rest of the furniture, contained an extensive

 collection of fantasy fiction books, including what seemed to be

 almost everything ever written by David Eddings. The lower shelves

 housed assorted chemistry and programming books. A chemistry award

 proudly jutted out from the shelf housing a few Dungeons and Dragons

 books.

 He kept his hacking notes in an orderly set of plastic folders, all

 filed in the bottom of his bookcase. Each page of notes, neatly

 printed and surrounded by small, tidy handwriting revealing updates

 and minor corrections, had its own plastic cover to prevent smudges or

 stains.

 Force thought it was inefficient to hand out his DEFCON program and

 have ten people scan the same network ten different times. It wasted

 time and resources. Further, it was becoming harder to get access to

 the main X.25 sites in Australia, like Minerva. Scanning was the type

 of activity likely to draw the attention of a system admin and result

 in the account being killed. The more people who scanned, the more

 accounts would be killed, and the less access the Australian hackers

 would have. So Force refused to hand over DEFCON to hackers outside

 The Realm, which is one thing that made it such a powerful group.

 Scanning with DEFCON meant using Netlink, a program which legitimate

 users didn't often employ. In his hunt for hackers, an admin might

 look for people running Netlink, or he might just examine which

 systems a user was connecting to. For example, if a hacker connected

 directly to Altos from Minerva without hopping through a respectable

 midpoint, such as another corporate machine overseas, he could count

 on the Minerva admins killing off the account.

 DEFCON was revolutionary for its time, and difficult to reproduce. It

 was written for Prime computers, and not many hackers knew how to

 write programs for Primes. In fact, it was exceedingly difficult for

 most hackers to learn programming of any sort for large, commercial

 machines. Getting the system engineering manuals was tough work and

 many of the large companies guarded their manuals almost as trade

 secrets. Sure, if you bought a $100000 system, the company would give

 you a few sets of operating manuals, but that was well beyond the

 reach of a teenage hacker. In general, information was hoarded--by the

 computer manufacturers, by the big companies which bought the systems,

 by the system administrators and even by the universities.

 Learning on-line was slow and almost as difficult. Most hackers used

 300 or 1200 baud modems. Virtually all access to these big, expensive

 machines was illegal. Every moment on-line was a risky proposition.

 High schools never had these sorts of expensive machines. Although

 many universities had systems, the administrators were usually miserly

 with time on-line for students. In most cases, students only got

 accounts on the big machines in their second year of computer science

 studies. Even then, student accounts were invariably on the

 university's oldest, clunkiest machine. And if you weren't a comp-sci

 student, forget it. Indulging your intellectual curiosity in VMS

 systems would never be anything more than a pipe dream.

 Even if you did manage to overcome all the roadblocks and develop some

 programming experience in VMS systems, for example, you might only be

 able to access a small number of machines on any given network. The

 X.25 networks connected a large number of machines which used very

 different operating systems. Many, such as Primes, were not in the

 least bit intuitive. So if you knew VMS and you hit a Prime machine,

 well, that was pretty much it.

 Unless, of course, you happened to belong to a clan of hackers like

 The Realm. Then you could call up the BBS and post a message. `Hey, I

 found a really cool Primos system at this address. Ran into problems

 trying to figure the parameters of the Netlink command. Ideas anyone?'

 And someone from your team would step forward to help.

 In The Realm, Force tried to assemble a diverse group of Australia's

 best hackers, each with a different area of expertise. And he happened

 to be the resident expert in Prime computers.

 Although Force wouldn't give DEFCON to anyone outside The Realm, he

 wasn't unreasonable. If you weren't in the system but you had an

 interesting network you wanted mapped, he would scan it for you. Force

 referred to scans for network user addresses as `NUA sprints'. He

 would give you a copy of the NUA sprint. While he was at it, he would

 also keep a copy for The Realm. That was efficient. Force's pet

 project was creating a database of systems and networks for The Realm,

 so he simply added the new information to its database.

 Force's great passion was mapping new networks, and new mini-networks

 were being added to the main X.25 networks all the time. A large

 corporation, such a BHP, might set up its own small-scale network

 connecting its offices in Western Australia, Queensland, Victoria and

 the United Kingdom. That mini-network might be attached to a

 particular X.25 network, such as Austpac. Get into the Austpac network

 and chances were you could get into any of the company's sites.

 Exploration of all this uncharted territory consumed most of Force's

 time. There was something cutting-edge, something truly adventurous

 about finding a new network and carefully piecing together a picture

 of what the expanding web looked like. He drew detailed pictures and

 diagrams showing how a new part of the network connected to the rest.

 Perhaps it appealed to his sense of order, or maybe he was just an

 adventurer at heart. Whatever the underlying motivation, the maps

 provided The Realm with yet another highly prized asset.

 When he wasn't mapping networks, Force published Australia's first

 underground hacking journal, Globetrotter. Widely read in the

 international hacking community, Globetrotter reaffirmed Australian

 hackers' pre-eminent position in the international underground.

 But on this particular day, Par wasn't thinking about getting a copy

 of Globetrotter or asking Force to scan a network for him. He was

 thinking about that secret. Force's new secret. The secret Parmaster

 desperately wanted.

 Force had been using DEFCON to scan half a dozen networks while he

 chatted to Par on Altos. He found an interesting connection from the

 scan, so he went off to investigate it. When he connected to the

 unknown computer, it started firing off strings of numbers at Force's

 machine. Force sat at his desk and watched the characters rush by on

 his screen.

 It was very odd. He hadn't done anything. He hadn't sent any commands

 to the mystery computer. He hadn't made the slightest attempt to break

 into the machine. Yet here the thing was throwing streams of numbers.

 What kind of computer was this? There might have been some sort of

 header which would identify the computer, but it had zoomed by so fast

 in the unexpected data dump that Force had missed it.

 Force flipped over to his chat with Par on Altos. He didn't completely

 trust Par, thinking the friendly American sailed a bit close to the

 wind. But Par was an expert in X.25 networks and was bound to have

 some clue about these numbers. Besides, if they turned out to be

 something sensitive, Force didn't have to tell Par where he found

 them.

 `I've just found a bizarre address. It is one strange system. When I

 connected, it just started shooting off numbers at me. Check these

 out.'

 Force didn't know what the numbers were, but Par sure did. `Those look

 like credit cards,' he typed back.

 `Oh.' Force went quiet.

 Par thought the normally chatty Australian hacker seemed astonished.

 After a short silence, the now curious Par nudged the conversation

 forward. `I have a way I can check out whether they really are valid

 cards,' he volunteered. `It'll take some time, but I should be able to

 do it and get back to you.'

 `Yes.' Force seemed hesitant. `OK.'

 On the other side of the Pacific from Par, Force thought about this

 turn of events. If they were valid credit cards, that was very cool.

 Not because he intended to use them for credit card fraud in the way

 Ivan Trotsky might have done. But Force could use them for making

 long-distance phone calls to hack overseas. And the sheer number of

 cards was astonishing. Thousand and thousands of them. Maybe 10000.

 All he could think was, Shit! Free connections for the rest of my

 life.

 Hackers such as Force considered using cards to call overseas computer

 systems a little distasteful, but certainly acceptable. The card owner

 would never end up paying the bill anyway. The hackers figured that

 Telecom, which they despised, would probably have to wear the cost in

 the end, and that was fine by them. Using cards to hack was nothing

 like ordering consumer goods. That was real credit card fraud. And

 Force would never sully his hands with that sort of behaviour.

 Force scrolled back over his capture of the numbers which had been

 injected into his machine. After closer inspection, he saw there were

 headers which appeared periodically through the list. One said,

 `CitiSaudi'.

 He checked the prefix of the mystery machine's network address again.

 He knew from previous scans that it belonged to one of the world's

 largest banks. Citibank.

 The data dump continued for almost three hours. After that, the

 Citibank machine seemed to go dead. Force saw nothing but a blank

 screen, but he kept the connection open. There was no way he was going

 to hang up from this conversation. He figured this had to be a freak

 connection--that he accidentally connected to this machine somehow,

 that it wasn't really at the address he had tried based on the DEFCON

 scan of Citibank's network.

 How else could it have happened? Surely Citibank wouldn't have a

 computer full of credit cards which spilled its guts every time

 someone rang up to say `hello'? There would be tonnes of security on a

 machine like that. This machine didn't even have a password. It didn't

 even need a special character command, like a secret handshake.

 Freak connections happened now and then on X.25

 networks. They had the same effect as a missed voice phone

 connection. You dial a friend's number--and you dial it correctly--but

 somehow the call gets screwed up in the tangle of wires and exchanges

 and your call gets put through to another number entirely. Of course,

 once something like that happens to an X.25 hacker, he immediately

 tries to figure out what the hell is going on, to search every shred

 of data from the machine looking for the system's real address.

 Because it was an accident, he suspects he will never find the machine

 again.

 Force stayed home from school for two days to keep the connection

 alive and to piece together how he landed on the doorstep of this

 computer. During this time, the Citibank computer woke up a few times,

 dumped a bit more information, and then went back to sleep. Keeping

 the connection alive meant running a small risk of discovery by an

 admin at his launch point, but the rewards in this case far exceeded

 the risk.

 It wasn't all that unusual for Force to skip school to hack. His

 parents used to tell him, `You better stop it, or you'll have to wear

 glasses one day'. Still, they didn't seem to worry too much, since

 their son had always excelled in school without much effort. At the

 start of his secondary school career he had tried to convince his

 teachers he should skip year 9. Some objected. It was a hassle, but he

 finally arranged it by quietly doing the coursework for year 9 while

 he was in year 8.

 After Force had finally disconnected from the CitiSaudi computer and

 had a good sleep, he decided to check on whether he could reconnect to

 the machine. At first, no-one answered, but when he tried a little

 later, someone answered all right. And it was the same talkative

 resident who answered the door the first time. Although it only seemed

 to work at certain hours of the day, the Citibank network address was

 the right one. He was in again.

 As Force looked over the captures from his Citibank hack, he noticed

 that the last section of the data dump didn't contain credit card

 numbers like the first part. It had people's names--Middle Eastern

 names--and a list of transactions. Dinner at a restaurant. A visit to

 a brothel. All sorts of transactions. There was also a number which

 looked like a credit limit, in come cases a very, very large limit,

 for each person. A sheik and his wife appeared to have credit limits

 of $1 million--each. Another name had a limit of $5 million.

 There was something strange about the data, Force thought. It was not

 structured in a way which suggested the Citibank machine was merely

 transmitting data to another machine. It looked more like a text file

 which was being dumped from a computer to a line printer.

 Force sat back and considered his exquisite discovery. He decided this

 was something he would share only with a very few close, trusted

 friends from The Realm. He would tell Phoenix and perhaps one other

 member, but no-one else.

 As he looked through the data once more, Force began to feel a little

 anxious. Citibank was a huge financial institution, dependent on the

 complete confidence of its customers. The corporation would lose a lot

 of face if news of Force's discovery got out. It might care enough to

 really come after him. Then, with the sudden clarity of the lightning

 strike photo which hung on his wall, a single thought filled his mind.

 I am playing with fire.

 [ ]

 `Where did you get those numbers?' Par asked Force next time they were

 both on Altos.

 Force hedged. Par leaped forward.

 `I checked those numbers for you. They're valid,' he told Force. The

 American was more than intrigued. He wanted that network address. It

 was lust. Next stop, mystery machine. `So, what's the address?'

 That was the one question Force didn't want to hear. He and Par had a

 good relationship, sharing information comfortably if occasionally.

 But that relationship only went so far. For all he knew, Par might

 have a less than desirable use for the information. Force didn't know

 if Par carded, but he felt sure Par had friends who might be into it.

 So Force refused to tell Par where to find the mystery machine.

 Par wasn't going to give up all that easily. Not that he would use the

 cards for free cash, but, hey, the mystery machine seemed like a very

 cool place to check out. There would be no peace for Force until Par

 got what he wanted. Nothing is so tempting to a hacker as the faintest

 whiff of information about a system he wants, and Par hounded Force

 until the Australian hacker relented just a bit.

 Finally Force told Par roughly where DEFCON had been scanning for

 addresses when it stumbled upon the CitiSaudi machine. Force wasn't

 handing over the street address, just the name of the suburb. DEFCON

 had been accessing the Citibank network through Telenet, a large

 American data network using X.25 communications protocols. The

 sub-prefixes for the Citibank portion of the network were 223 and 224.

 Par pestered Force some more for the rest of the numbers, but the

 Australian had dug his heels in. Force was too careful a player, too

 fastidious a hacker, to allow himself to get mixed up in the things

 Par might get up to.

 OK, thought the seventeen-year-old Par, I can do this without you. Par

 estimated there were 20000 possible addresses on that network, any one

 of which might be the home of the mystery machine. But he assumed the

 machine would be in the low end of the network, since the lower

 numbers were usually used first and the higher numbers were generally

 saved for other, special network functions. His assumptions narrowed

 the likely search field to about 2000 possible addresses.

 Par began hand-scanning on the Citibank Global Telecommunications

 Network (GTN) looking for the mystery machine. Using his knowledge of

 the X.25 network, he picked a number to start with. He typed 22301,

 22302, 22303. On and on, heading toward 22310000. Hour after hour,

 slowly, laboriously, working his way through all the options, Par

 scanned out a piece, or a range, within the network. When he got bored

 with the 223 prefix, he tried out the 224 one for a bit of variety.

 Bleary-eyed and exhausted after a long night at the computer, Par felt

 like calling it quits. The sun had splashed through the windows of his

 Salinas, California, apartment hours ago. His living room was a mess,

 with empty, upturned beer cans circling his Apple IIe. Par gave up for

 a while, caught some shut-eye. He had gone through the entire list of

 possible addresses, knocking at all the doors, and nothing had

 happened. But over the next few days he returned to scanning the

 network again. He decided to be more methodical about it and do the

 whole thing from scratch a second time.

 He was part way through the second scan when it happened. Par's

 computer connected to something. He sat up and peered toward the

 screen. What was going on? He checked the address. He was sure he had

 tried this one before and nothing had answered. Things were definitely

 getting strange. He stared at his computer.

 The screen was blank, with the cursor blinking silently at the top.

 Now what? What had Force done to get the computer to sing its song?

 Par tried pressing the control key and a few different letters.

 Nothing. Maybe this wasn't the right address after all. He

 disconnected from the machine and carefully wrote down the address,

 determined to try it again later.

 On his third attempt, he connected again but found the same irritating

 blank screen. This time he went through the entire alphabet with the

 control key.

 Control L.

 That was the magic keystroke. The one that made CitiSaudi give up its

 mysterious cache. The one that gave Par an adrenalin rush, along with

 thousands and thousands of cards. Instant cash, flooding his screen.

 He turned on the screen capture so he could collect all the

 information flowing past and analyse it later. Par had to keep feeding

 his little Apple IIe more disks to store all the data coming in

 through his 1200 baud modem.

 It was magnificent. Par savoured the moment, thinking about how much

 he was going to enjoy telling Force. It was going to be sweet. Hey,

 Aussie, you aren't the only show in town. See ya in Citibank.

 An hour or so later, when the CitiSaudi data dump had finally

 finished, Par was stunned at what he found in his capture. These

 weren't just any old cards. These were debit cards, and they were held

 by very rich Arabs. These people just plopped a few million in a bank

 account and linked a small, rectangular piece of plastic to that

 account. Every charge came directly out of the bank balance. One guy

 listed in the data dump bought a $330,000 Mercedes Benz in

 Istanbul--on his card. Par couldn't imagine being able to throw down a

 bit of plastic for that. Taking that plastic out for a spin around the

 block would bring a whole new meaning to the expression, `Charge it!'

 When someone wins the lottery, they often feel like sharing with their

 friends. Which is exactly what Par did. First, he showed his

 room-mates. They thought it was very cool. But not nearly so cool as

 the half dozen hackers and phreakers who happened to be on the

 telephone bridge Par frequented when the master of X.25 read off a

 bunch of the cards.

 Par was a popular guy after that day. Par was great, a sort of Robin

 Hood of the underground. Soon, everyone wanted to talk to him. Hackers

 in New York. Phreakers in Virginia. And the Secret Service in San

 Francisco.

 [ ]

 Par didn't mean to fall in love with Theorem. It was an accident, and

 he couldn't have picked a worse girl to fall for. For starters, she

 lived in Switzerland. She was 23 and he was only seventeen. She also

 happened to be in a relationship--and that relationship was with

 Electron, one of the best Australian hackers of the late 1980s. But

 Par couldn't help himself. She was irresistible, even though he had

 never met her in person. Theorem was different. She was smart and

 funny, but refined, as a European woman can be.

 They met on Altos in 1988.

 Theorem didn't hack computers. She didn't need to, since she could

 connect to Altos through her old university computer account. She had

 first found Altos on 23 December 1986. She remembered the date for two

 reasons. First, she was amazed

 at the power of Altos--that she could have a live conversation on-line

 with a dozen people in different countries at the same time. Altos was

 a whole new world for her. Second, that was the day she met Electron.

 Electron made Theorem laugh. His sardonic, irreverent humour hit a

 chord with her. Traditional Swiss society could be stifling and

 closed, but Electron was a breath of fresh air. Theorem was Swiss but

 she didn't always fit the mould. She hated skiing. She was six feet

 tall. She liked computers.

 When they met on-line, the 21-year-old Theorem was at a crossroad in

 her youth. She had spent a year and a half at university studying

 mathematics. Unfortunately, the studies had not gone well. The truth

 be told, her second year of university was in fact the first year all

 over again. A classmate had introduced her to Altos on the

 university's computers. Not long after she struck up a relationship

 with Electron, she dropped out of uni all together and enrolled in a

 secretarial course. After that, she found a secretarial job at a

 financial institution.

 Theorem and Electron talked on Altos for hours at a time. They talked

 about everything--life, family, movies, parties--but not much about

 what most people on Altos talked about--hacking. Eventually, Electron

 gathered up the courage to ask Theorem for her voice telephone number.

 She gave it to him happily and Electron called her at home in

 Lausanne. They talked. And talked. And talked. Soon they were on the

 telephone all the time.

 Seventeen-year-old Electron had never had a girlfriend. None of the

 girls in his middle-class high school would give him the time of day

 when it came to romance. Yet here was this bright, vibrant girl--a

 girl who studied maths--speaking to him intimately in a melting French

 accent. Best of all, she genuinely liked him. A few words from his

 lips could send her into silvery peals of laughter.

 When the phone bill arrived, it was $1000. Electron surreptitiously

 collected it and buried it at the bottom of a drawer in his bedroom.

 When he told Theorem, she offered to help pay for it. A cheque for

 $700 showed up not long after. It made the task of explaining

 Telecom's reminder notice to his father much easier.

 The romantic relationship progressed throughout 1987 and the first

 half of 1988. Electron and Theorem exchanged love letters and tender

 intimacies over 16000 kilometres of computer networks, but the

 long-distance relationship had some bumpy periods. Like when she had

 an affair over several months with Pengo. A well-known German hacker

 with links to the German hacking group called the Chaos Computer Club,

 Pengo was also a friend and mentor to Electron. Pengo was, however,

 only a short train ride away from Theorem. She became friends with

 Pengo on Altos and eventually visited him. Things progressed from

 there.

 Theorem was honest with Electron about the affair, but there was

 something unspoken, something below the surface. Even after the affair

 ended, Theorem was sweet on Pengo the way a girl remains fond of her

 first love regardless of how many other men she has slept with since

 then.

 Electron felt hurt and angry, but he swallowed his pride and forgave

 Theorem her dalliance. Eventually, Pengo disappeared from the scene.

 Pengo had been involved with people who sold US military

 secrets--taken from computers--to the KGB. Although his direct

 involvement in the ongoing international computer espionage had been

 limited, he began to worry about the risks. His real interest was in

 hacking, not spying. The Russian connection simply enabled him to get

 access to bigger and better computers. Beyond that, he felt no loyalty

 to the Russians.

 In the first half of 1988, he handed himself in to the German

 authorities. Under West German law at the time, a citizen-spy who

 surrendered himself before the state discovered the crime, and thus

 averted more damage to the state, acquired immunity from prosecution.

 Having already been busted in December 1986 for using a stolen NUI,

 Pengo decided that turning himself in would be his best hope of taking

 advantage of this legal largesse.

 By the end of the year, things had become somewhat hairy for Pengo and

 in March 1989 the twenty-year-old from Berlin was raided again, this

 time with the four others involved in the spy ring. The story broke

 and the media exposed Pengo's real name. He didn't know if he would

 eventually be tried and convicted of something related to the

 incident. Pengo had a few things on his mind other than the six-foot

 Swiss girl.

 With Pengo out of the way, the situation between Theorem and the

 Australian hacker improved. Until Par came along.

 Theorem and Par began innocently enough. Being one of only a few girls

 in the international hacking and phreaking scene and, more

 particularly, on Altos, she was treated differently. She had lots of

 male friends on the German chat system, and the boys told her things

 in confidence they would never tell each other. They sought out her

 advice. She often felt like she wore many hats--mother, girlfriend,

 psychiatrist--when she spoke with the boys on Altos.

 Par had been having trouble with his on-line girlfriend, Nora, and

 when he met Theorem he turned to her for a bit of support. He had

 travelled from California to meet Nora in person in New York. But when

 he arrived in the sweltering heat of a New York summer, without

 warning, her conservative Chinese parents didn't take kindly to his

 unannounced appearance. There were other frictions between Nora and

 Par. The relationship had been fine on Altos and on the phone, but

 things were just not clicking in person.

 He already knew that virtual relationships, forged over an electronic

 medium which denied the importance of physical chemistry, could

 sometimes be disappointing.

 Par used to hang out on a phone bridge with another Australian member

 of The Realm, named Phoenix, and with a fun girl from southern

 California. Tammi, a casual phreaker, had a great personality and a

 hilarious sense of humour. During those endless hours chatting, she

 and Phoenix seemed to be in the throes of a mutual crush. In the

 phreaking underground, they were known as a bit of a virtual item. She

 had even invited Phoenix to come visit her sometime. Then, one day,

 for the fun of it, Tammi decided to visit Par in Monterey. Her

 appearance was a shock.

 Tammi had described herself to Phoenix as being a blue-eyed, blonde

 California girl. Par knew that Phoenix visualised her as a

 stereotypical bikini-clad, beach bunny from LA. His perception rested

 on a foreigner's view of the southern California culture. The land of

 milk and honey. The home of the Beach Boys and TV series like

 `Charlie's Angels'.

 When Tammi arrived, Par knew instantly that she and Phoenix would

 never hit it off in person. Tammi did in fact have both blonde hair

 and blue eyes. She had neglected to mention, however, that she weighed

 about 300 pounds, had a rather homely face and a somewhat down-market

 style. Par really liked Tammi, but he couldn't get the ugly phrase

 `white trash' out of his thoughts. He pushed and shoved, but the

 phrase was wedged in his mind. It fell to Par to tell Phoenix the

 truth about Tammi.

 So Par knew all about how reality could burst the foundations of a

 virtual relationship.

 Leaving New York and Nora behind, Par moved across the river to New

 Jersey to stay with a friend, Byteman, who was one of a group of

 hackers who specialised in breaking into computer systems run by Bell

 Communications Research (Bellcore). Bellcore came into existence at

 the beginning of 1984 as a result of the break-up of the US telephone

 monopoly known as Bell Systems. Before the break-up, Bell Systems'

 paternalistic holding company, American Telephone and Telegraph

 (AT&T), had

 fostered the best and brightest in Bell Labs, its research arm. Over

 the course of its history, Bell Labs boasted at least seven

 Nobel-prize winning researchers and numerous scientific achievements.

 All of which made Bellcore a good target for hackers trying to prove

 their prowess.

 Byteman used to chat with Theorem on Altos, and eventually he called

 her, voice. Par must have looked pretty inconsolable, because one day

 while Byteman was talking to Theorem, he suddenly said to her, `Hey,

 wanna talk to a friend of mine?' Theorem said `Sure' and Byteman

 handed the telephone to Par. They talked for about twenty minutes.

 After that they spoke regularly both on Altos and on the phone. For

 weeks after Par returned to California, Theorem tried to cheer him up

 after his unfortunate experience with Nora. By mid-1988, they had

 fallen utterly and passionately in love.

 Electron, an occasional member of Force's Realm group, took the news

 very badly. Not everyone on Altos liked Electron. He could be a little

 prickly, and very cutting when he chose to be, but he was an ace

 hacker, on an international scale, and everyone listened to him.

 Obsessive, creative and quick off the mark, Electron had respect,

 which is one reason Par felt so badly.

 When Theorem told Electron the bad news in a private conversation

 on-line, Electron had let fly in the public area, ripping into the

 American hacker on the main chat section of Altos, in front of

 everyone.

 Par took it on the chin and refused to fight back. What else could he

 do? He knew what it was like to hurt. He felt for the guy and knew how

 he would feel if he lost Theorem. And he knew that Electron must be

 suffering a terrible loss of face. Everyone saw Electron and Theorem

 as an item. They had been together for more than a year. So Par met

 Electron's fury with grace and quiet words of consolation.

 Par didn't hear much from Electron after that day. The Australian

 still visited Altos, but he seemed more withdrawn, at least whenever

 Par was around. After that day, Par ran into him once, on a phone

 bridge with a bunch of Australian hackers.

 Phoenix said on the bridge, `Hey, Electron. Par's on the bridge.'

 Electron paused. `Oh, really,' he answered coolly. Then he went

 silent.

 Par let Electron keep his distance. After all, Par had what really

 counted--the girl.

 Par called Theorem almost every day. Soon they began to make plans for

 her to fly to California so they could meet in person. Par tried not

 to expect too much, but he found it difficult to stop savouring the

 thought of finally seeing Theorem face to face. It gave him

 butterflies.

 Yeah, Par thought, things are really looking up.

 The beauty of Altos was that, like Pacific Island or any other local

 BBS, a hacker could take on any identity he wanted. And he could do it

 on an international scale. Visiting Altos was like attending a

 glittering masquerade ball. Anyone could recreate himself. A socially

 inept hacker could pose as a character of romance and adventure. And a

 security official could pose as a hacker.

 Which is exactly what Telenet security officer Steve Mathews did on 27

 October 1988. Par happened to be on-line, chatting away with his

 friends and hacker colleagues. At any given moment, there were always

 a few strays on Altos, a few people who weren't regulars. Naturally,

 Mathews didn't announce himself as being a Telenet guy. He just

 slipped quietly onto Altos looking like any other hacker. He might

 engage a hacker in conversation, but he let the hacker do most of the

 talking. He was there to listen.

 On that fateful day, Par happened to be in one of his magnanimous

 moods. Par had never had much money growing up, but he was always very

 generous with what he did have. He talked for a little while with the

 unknown hacker on Altos, and then gave him one of the debit cards

 taken from his visits to the CitiSaudi computer. Why not? On Altos, it

 was a bit like handing out your business card. `The

 Parmaster--Parameters Par Excellence'.

 Par had got his full name--The Parmaster--in his earliest hacking

 days. Back then, he belonged to a group of teenagers involved in

 breaking the copy protections on software programs for Apple IIes,

 particularly games. Par had a special gift for working out the copy

 protection parameters, which was a first step in bypassing the

 manufacturers' protection schemes. The ringleader of the group began

 calling him `the master of parameters'--The Parmaster--Par, for short.

 As he moved into serious hacking and developed his expertise in X.25

 networks, he kept the name because it fitted nicely in his new

 environment. `Par?' was a common command on an X.25 pad, the modem

 gateway to an X.25 network.

 `I've got lots more where that come from,' Par told the stranger on

 Altos. `I've got like 4000 cards from a Citibank system.'

 Not long after that, Steve Mathews was monitoring Altos again, when

 Par showed up handing out cards to people once more.

 `I've got an inside contact,' Par confided. `He's gonna make up a

 whole mess of new, plastic cards with all these valid numbers from the

 Citibank machine. Only the really big accounts, though. Nothing with a

 balance under $25000.'

 Was Par just making idle conversation, talking big on Altos? Or would

 he really have gone through with committing such a major fraud?

 Citibank, Telenet and the US Secret Service would never know, because

 their security guys began closing the net around Par before he had a

 chance to take his idea any further.

 Mathews contacted Larry Wallace, fraud investigator with Citibank in

 San Mateo, California. Wallace checked out the cards. They were valid

 all right. They belonged to the Saudi-American Bank in Saudi Arabia

 and were held on a Citibank database in Sioux Falls, South Dakota.

 Wallace determined that, with its affiliation to the Middle Eastern

 bank, Citibank had a custodial responsibility for the accounts. That

 meant he could open a major investigation.

 On 7 November, Wallace brought in the US Secret Service. Four days

 later, Wallace and Special Agent Thomas Holman got their first major

 lead when they interviewed Gerry Lyons of Pacific Bell's security

 office in San Francisco.

 Yes, Lyons told the investigators, she had some information they might

 find valuable. She knew all about hackers and phreakers. In fact, the

 San Jose Police had just busted two guys trying to phreak at a pay

 phone. The phreakers seemed to know something about a Citibank system.

 When the agents showed up at the San Jose Police Department for their

 appointment with Sergeant Dave Flory, they received another pleasant

 surprise. The sergeant had a book filled with hackers' names and

 numbers seized during the arrest of the two pay-phone phreakers. He

 also happened to be in possession of a tape recording of the phreakers

 talking to Par from a prison phone.

 The cheeky phreakers had used the prison pay phone to call up a

 telephone bridge located at the University of Virginia. Par, the

 Australian hackers and other assorted American phreakers and hackers

 visited the bridge frequently. At any one moment, there might be eight

 to ten people from the underground sitting on the bridge. The

 phreakers found Par hanging out there, as usual, and they warned him.

 His name and number were inside the book seized by police when they

 were busted.

 Par didn't seem worried at all.

 `Hey, don't worry. It's cool,' he reassured them. `I have just

 disconnected my phone number today--with no forwarding details.'

 Which wasn't quite true. His room-mate, Scott, had indeed disconnected

 the phone which was in his name because he had been getting prank

 calls. However, Scott opened a new telephone account at the same

 address with the same name on the same day--all of which made the job

 of tracking down the mysterious hacker named Par much easier for the

 law enforcement agencies.

 In the meantime, Larry Wallace had been ringing around his contacts in

 the security business and had come up with another lead. Wanda Gamble,

 supervisor for the Southeastern Region of MCI Investigations, in

 Atlanta, had a wealth of information on the hacker who called himself

 Par. She was well connected when it came to hackers, having acquired a

 collection of reliable informants during her investigations of

 hacker-related incidents. She gave the Citibank investigator two

 mailbox numbers for Par. She also handed them what she believed was

 his home phone number.

 The number checked out and on 25 November, the day after Thanksgiving,

 the Secret Service raided Par's house. The raid was terrifying. At

 least four law enforcement officers burst through the door with guns

 drawn and pointed. One of them had a shotgun. As is often the case in

 the US, investigators from private, commercial organisations--in this

 case Citibank and Pacific Bell--also took part in the raid.

 The agents tore the place apart looking for evidence. They dragged

 down the food from the kitchen cupboards. They emptied the box of

 cornflakes into the sink looking for hidden computer disks. They

 looked everywhere, even finding a ceiling cavity at the back of a

 closet which no-one even knew existed.

 They confiscated Par's Apple IIe, printer and modem. But, just to be

 sure, they also took the Yellow Pages, along with the telephone and

 the new Nintendo game paddles Scott had just bought. They scooped up

 the very large number of papers which had been piled under the coffee

 table, including the spiral notebook with Scott's airline bookings

 from his job as a travel agent. They even took the garbage.

 It wasn't long before they found the red shoebox full of disks peeping

 out from under the fish tank next to Par's computer.

 They found lots of evidence. What they didn't find was Par.

 Instead, they found Scott and Ed, two friends of Par. They were pretty

 shaken up by the raid. Not knowing Par's real identity, the Secret

 Service agents accused Scott of being Par. The phone was in his name,

 and Special Agent Holman had even conducted some surveillance more

 than a week before the raid, running the plates on Scott's 1965 black

 Ford Mustang parked in front of the house. The Secret Service was sure

 it had its man, and Scott had a hell of a time convincing them

 otherwise.

 Both Scott and Ed swore up and down that they weren't hackers or

 phreakers, and they certainly weren't Par. But they knew who Par was,

 and they told the agents his real name. After considerable pressure

 from the Secret Service, Scott and Ed agreed to make statements down

 at the police station.

 In Chicago, more than 2700 kilometres away from the crisis unfolding

 in northern California, Par and his mother watched his aunt walk down

 the aisle in her white gown.

 Par telephoned home once, to Scott, to say `hi' from the Midwest. The

 call came after the raid.

 `So,' a relaxed Par asked his room-mate, `How are things going at

 home?'

 `Fine,' Scott replied. `Nothing much happening here.'

 Par looked down at the red bag he was carrying with a momentary

 expression of horror. He realised he stood out in the San Jose bus

 terminal like a peacock among the pigeons ...

 Blissfully ignorant of the raid which had occurred three days before,

 Par and his mother had flown into San Jose airport. They had gone to

 the bus terminal to pick up a Greyhound home to the Monterey area.

 While waiting for the bus, Par called his friend Tammi to say he was

 back in California.

 Any casual bystander waiting to use the pay phones at that moment

 would have seen a remarkable transformation in the brown-haired boy at

 the row of phones. The smiling face suddenly dropped in a spasm of

 shock. His skin turned ash white as the blood fled south. His deep-set

 chocolate brown eyes, with their long, graceful lashes curving upward

 and their soft, shy expression, seemed impossibly large.

 For at that moment Tammi told Par that his house had been raided by

 the Secret Service. That Scott and Ed had been pretty upset about

 having guns shoved in their faces, and had made statements about him

 to the police. That they thought their phone was tapped. That the

 Secret Service guys were still hunting for Par, they knew his real

 name, and she thought there was an all points bulletin out for him.

 Scott had told the Secret Service about Par's red bag, the one with

 all his hacking notes that he always carried around. The one with the

 print-out of all the Citibank credit card numbers.

 And so it was that Par came to gaze down at his bag with a look of

 alarm. He realised instantly that the Secret Service would be looking

 for that red bag. If they didn't know what he looked like, they would

 simply watch for the bag.

 That bag was not something Par could hide easily. The Citibank

 print-out was the size of a phone book. He also had dozens of disks

 loaded with the cards and other sensitive hacking information.

 Par had used the cards to make a few free calls, but he hadn't been

 charging up any jet skis. He fought temptation valiantly, and in the

 end he had won, but others might not have been so victorious in the

 same battle. Par figured that some less scrupulous hackers had

 probably been charging up a storm. He was right. Someone had, for

 example, tried to send a $367 bouquet of flowers to a woman in El Paso

 using one of the stolen cards. The carder had unwittingly chosen a

 debit card belonging to a senior Saudi bank executive who happened to

 be in his office at the time the flower order was placed. Citibank

 investigator Larry Wallace added notes on that incident to his growing

 file.

 Par figured that Citibank would probably try to pin every single

 attempt at carding on him. Why not? What kind of credibility would a

 seventeen-year-old hacker have in denying those sorts of allegations?

 Zero. Par made a snap decision. He sidled up to a trash bin in a dark

 corner. Scanning the scene warily, Par casually reached into the red

 bag, pulled out the thick wad of Citibank card print-outs and stuffed

 it into the bin. He fluffed a few stray pieces of garbage over the

 top.

 He worried about the computer disks with all his other valuable

 hacking information. They represented thousands of hours of work and

 he couldn't bring himself to throw it all away. The 10 megabyte

 trophy. More than 4000 cards. 130000 different transactions. In the

 end, he decided to hold on to the disks, regardless of the risk. At

 least, without the print-out, he could crumple the bag up a bit and

 make it a little less conspicuous. As Par slowly moved away from the

 bin, he glanced back to check how nondescript the burial site appeared

 from a distance. It looked like a pile of garbage. Trash worth

 millions of dollars, headed for the dump.

 As he boarded the bus to Salinas with his mother, Par's mind was

 instantly flooded with images of a homeless person fishing the

 print-out from the bin and asking someone about it. He tried to push

 the idea from his head.

 During the bus ride, Par attempted to figure out what he was going to

 do. He didn't tell his mother anything. She couldn't even begin to

 comprehend his world of computers and networks, let alone his current

 predicament. Further, Par and his mother had suffered from a somewhat

 strained relationship since he ran away from home not long after his

 seventeenth birthday. He had been kicked out of school for

 non-attendance, but had found a job tutoring students in computers at

 the local college. Before the trip to Chicago, he had seen her just

 once in six months. No, he couldn't turn to her for help.

 The bus rolled toward the Salinas station. En route, it travelled down

 the street where Par lived. He saw a jogger, a thin black man wearing

 a walkman. What the hell is a jogger doing here, Par thought. No-one

 jogged in the semi-industrial neighbourhood. Par's house was about the

 only residence amid all the light-industrial buildings. As soon as the

 jogger was out of sight of the house, he suddenly broke away from his

 path, turned off to one side and hit the ground. As he lay on his

 stomach on some grass, facing the house, he seemed to begin talking

 into the walkman.

 Sitting watching this on the bus, Par flipped out. They were out to

 get him, no doubt about it. When the bus finally arrived at the depot

 and his mother began sorting out their luggage, Par tucked the red bag

 under his arm and disappeared. He found a pay phone and called Scott

 to find out the status of things. Scott handed the phone to Chris,

 another friend who lived in the house. Chris had been away at his

 parents' home during the Thanksgiving raid.

 `Hold tight and lay low,' Chris told Par.

 `I'm on my way over to pick you up and take you to a lawyer's office

 where you can get some sort of protection.'

 A specialist in criminal law, Richard Rosen was born in New York but

 raised in his later childhood in California. He had a personality

 which reflected the steely stubbornness of a New Yorker, tempered with

 the laid-back friendliness of the west coast. Rosen also harboured a

 strong anti-authoritarian streak. He represented the local chapter of

 Hell's Angels in the middle-class County of Monterey. He also caused a

 splash representing the growing midwifery movement, which promoted

 home-births. The doctors of California didn't like him much as a

 result.

 Par's room-mates met with Rosen after the raid to set things up for

 Par's return. They told him about the terrifying ordeal of the Secret

 Service raid, and how they were interrogated for an hour and a half

 before being pressured to give statements. Scott, in particular, felt

 that he had been forced to give a statement against Par under duress.

 While Par talked to Chris on the phone, he noticed a man standing at

 the end of the row of pay phones. This man was also wearing a walkman.

 He didn't look Par in the eye. Instead, he faced the wall, glancing

 furtively off to the side toward where Par was standing. Who was that

 guy? Fear welled up inside Par and all sorts of doubts flooded his

 mind. Who could he trust?

 Scott hadn't told him about the raid. Were his room-mates in cahoots

 the Secret Service? Were they just buying time so they could turn him

 in? There was no-one else Par could turn to. His mother wouldn't

 understand. Besides, she had problems of her own. And he didn't have a

 father. As far as Par was concerned, his father was as good as dead.

 He had never met the man, but he heard he was a prison officer in

 Florida. Not a likely candidate for helping Par in this situation. He

 was close to his grandparents--they had bought his computer for him as

 a present--but they lived in a tiny Mid-Western town and they simply

 wouldn't understand either.

 Par didn't know what to do, but he didn't seem to have many options at

 the moment, so he told Chris he would wait at the station for him.

 Then he ducked around a corner and tried to hide.

 A few minutes later, Chris pulled into the depot. Par dove into the

 Toyota Landcruiser and Chris tore out of the station toward Rosen's

 office. They noticed a white car race out of the bus station after

 them.

 While they drove, Par pieced together the story from Chris. No-one had

 warned him about the raid because everyone in the house believed the

 phone line was tapped. Telling Par while he was in Chicago might have

 meant another visit from the Secret Service. All they had been able to

 do was line up Rosen to help him.

 Par checked the rear-view mirror. The white car was still following

 them. Chris made a hard turn at the next intersection and accelerated

 down the California speedway. The white car tore around the corner in

 pursuit. No matter what Chris did, he couldn't shake the tail. Par sat

 in the seat next to Chris, quietly freaking out.

 Just 24 hours before, he had been safe and sound in Chicago. How did

 he end up back here in California being chased by a mysterious driver

 in a white car?

 Chris tried his best to break free, swerving and racing. The white car

 wouldn't budge. But Chris and Par had one advantage over the white

 car; they were in a four-wheel drive. In a split-second decision,

 Chris jerked the steering wheel to one side. The Landcruiser veered

 off the road onto a lettuce field. Par gripped the inside of the door

 as the 4WD bounced through the dirt over the neat crop rows. Near-ripe

 heads of lettuce went flying out from under the tires. Half-shredded

 lettuce leaves filled the air. A cloud of dirt enveloped the car. The

 vehicle skidded and jerked, but finally made its way to a highway at

 the far end of the field. Chris hit the highway running, swerving into

 the lane at high speed.

 When Par looked back, the white car had disappeared. Chris kept his

 foot on the accelerator and Par barely breathed until the Landcruiser

 pulled up in front of Richard Rosen's building.

 Par leaped out, the red bag still clutched tightly under his arm, and

 high-tailed it into the lawyer's office. The receptionist looked a bit

 shocked when he said his name. Someone must have filled her in on the

 details.

 Rosen quickly ushered him into his office. Introductions were brief

 and Par cut to the story of the chase. Rosen listened intently,

 occasionally asking a well-pointed question, and then took control of

 the situation.

 The first thing they needed to do was call off the Secret Service

 chase, Rosen said, so Par didn't have to spend any more time ducking

 around corners and hiding in bus depots. He called the Secret

 Service's San Francisco office and asked Special Agent Thomas J.

 Holman to kill the Secret Service pursuit in exchange for an agreement

 that Par would turn himself in to be formally charged.

 Holman insisted that they had to talk to Par.

 No, Rosen said. There would be no interviews for Par by law

 enforcement agents until a deal had been worked out.

 But the Secret Service needed to talk to Par, Holman insisted. They

 could only discuss all the other matters after the Secret Service had

 had a chance to talk with Par.

 Rosen politely warned Holman not to attempt to contact his client. You

 have something to say to Par, you go through me, he said. Holman did

 not like that at all. When the Secret Service wanted to talk to

 someone, they were used to getting their way. He pushed Rosen, but the

 answer was still no. No no no and no again. Holman had made a mistake.

 He had assumed that everyone wanted to do business with the United

 States Secret Service.

 When he finally realised Rosen wouldn't budge, Holman gave up. Rosen

 then negotiated with the federal prosecutor, US Attorney Joe Burton,

 who was effectively Holman's boss in the case, to call off the pursuit

 in exchange for Par handing himself in to be formally charged.

 Then Par gave Rosen his red bag, for safekeeping.

 At about the same time, Citibank investigator Wallace and Detective

 Porter of the Salinas Police interviewed Par's mother as she returned

 home from the bus depot. She said that her son had moved out of her

 home some six months before, leaving her with a $2000 phone bill she

 couldn't pay. They asked if they could search her home. Privately, she

 worried about what would happen if she refused. Would they tell the

 office where she worked as a clerk? Could they get her fired? A simple

 woman who had little experience dealing with law enforcement agents,

 Par's mother agreed. The investigators took Par's disks and papers.

 Par turned himself in to the Salinas Police in the early afternoon of

 12 December. The police photographed and fingerprinted him before

 handing him a citation--a small yellow slip headed `502 (c) (1) PC'.

 It looked like a traffic ticket, but the two charges Par faced were

 felonies, and each carried a maximum term of three years for a minor.

 Count 1, for hacking into Citicorp Credit Services, also carried a

 fine of up to $10000. Count 2, for `defrauding a telephone service',

 had no fine: the charges were for a continuing course of conduct,

 meaning that they applied to the same activity over an extended period

 of time.

 Federal investigators had been astonished to find Par was so young.

 Dealing with a minor in the federal court system was a big hassle, so

 the prosecutor decided to ask the state authorities to prosecute the

 case. Par was ordered to appear in Monterey County Juvenile Court on

 10 July 1989.

 Over the next few months, Par worked closely with Rosen. Though Rosen

 was a very adept lawyer, the situation looked pretty depressing.

 Citibank claimed it had spent $30000 on securing its systems and Par

 believed that the corporation might be looking for up to $3 million in

 total damages. While they couldn't prove Par had made any money from

 the cards himself, the prosecution would argue that his generous

 distribution of them had led to serious financial losses. And that was

 just the financial institutions.

 Much more worrying was what might come out about Par's visits to TRW's

 computers. The Secret Service had seized at least one disk with TRW

 material on it.

 TRW was a large, diverse company, with assets of $2.1 billion and

 sales of almost $7 billion in 1989, nearly half of which came from the

 US government. It employed more than 73000 people, many of who worked

 with the company's credit ratings business. TRW's vast databases held

 private details of millions of people--addresses, phone numbers,

 financial data.

 That, however, was just one of the company's many businesses. TRW also

 did defence work--very secret defence work. Its Space and Defense

 division, based in Redondo Beach, California, was widely believed to

 be a major beneficiary of the Reagan Government's Star Wars budget.

 More than 10 per cent of the company's employees worked in this

 division, designing spacecraft systems, communications systems,

 satellites and other, unspecified, space `instruments'.

 The siezed disk had some mail from the company's TRWMAIL systems. It

 wasn't particularly sensitive, mostly just company propaganda sent to

 employees, but the Secret Service might think that where there was

 smoke, there was bound to be fire. TRW did the kind of work that makes

 governments very nervous when it comes to unauthorised access. And Par

 had visited certain TRW machines; he knew that company had a missiles

 research section, and even a space weapons section.

 With so many people out to get him--Citibank, the Secret Service, the

 local police, even his own mother had helped the other side--it was

 only a matter of time before they unearthed the really secret things

 he had seen while hacking. Par began to wonder if was such a good idea

 for him to stay around for the trial.

 [ ]

 In early 1989, when Theorem stepped off the plane which carried her

 from Switzerland to San Francisco, she was pleased that she had

 managed to keep a promise to herself. It wasn't always an easy

 promise. There were times of intimacy, of perfect connection, between

 the two voices on opposite sides of the globe, when it seemed so

 breakable.

 Meanwhile, Par braced himself. Theorem had described herself in such

 disparaging terms. He had even heard from others on Altos that she was

 homely. But that description had ultimately come from her anyway, so

 it didn't really count.

 Finally, as he watched the stream of passengers snake out to the

 waiting area, he told himself it didn't matter anyway. After all, he

 had fallen in love with her--her being, her essence--not her image as

 it appeared in flesh. And he had told her so. She had said the same

 back to him.

 Suddenly she was there, in front of him. Par had to look up slightly

 to reach her eyes, since she was a little more than an inch taller.

 She was quite pretty, with straight, brown shoulder-length hair and

 brown eyes. He was just thinking how much more attractive she was than

 he had expected, when it happened.

 Theorem smiled.

 Par almost lost his balance. It was a devastating smile, big and

 toothy, warm and genuine. Her whole face lit up with a fire of

 animation. That smile sealed it.

 She had kept her promise to herself. There was no clear image of Par

 in her mind before meeting him in person. After meeting a few people

 from Altos at a party in Munich the year before, she had tried not to

 create images of people based on their on-line personalities. That way

 she would never suffer disappointment.

 Par and Theorem picked up her bags and got into Brian's car. Brian, a

 friend who offered to play airport taxi because Par didn't have a car,

 thought Theorem was pretty cool. A six-foot-tall French-speaking Swiss

 woman. It was definitely cool. They drove back to Par's house. Then

 Brian came in for a chat.

 Brian asked Theorem all sorts of questions. He was really curious,

 because he had never met anyone from Europe before. Par kept trying to

 encourage his friend to leave but Brian wanted to know all about life

 in Switzerland. What was the weather like? Did people ski all the

 time?

 Par kept looking Brian in the eye and then staring hard at the door.

 Did most Swiss speak English? What other languages did she know? A lot

 of people skied in California. It was so cool talking to someone from

 halfway around the world.

 Par did the silent chin-nudge toward the door and, at last, Brian got

 the hint. Par ushered his friend out of the house. Brian was only

 there for about ten minutes, but it felt like a year. When Par and

 Theorem were alone, they talked a bit, then Par suggested they go for

 a walk.

 Halfway down the block, Par tentatively reached for her hand and took

 it in his own. She seemed to like it. Her hand was warm. They talked a

 bit more, then Par stopped. He turned to face her. He paused, and then

 told her something he had told her before over the telephone,

 something they both knew already.

 Theorem kissed him. It startled Par. He was completely unprepared.

 Then Theorem said the same words back to him.

 When they returned to the house, things progressed from there. They

 spent two and a half weeks in each other's arms--and they were

 glorious, sun-drenched weeks. The relationship proved to be far, far

 better in person than it had ever been on-line or on the telephone.

 Theorem had captivated Par, and Par, in turn, created a state of bliss

 in Theorem.

 Par showed her around his little world in northern California. They

 visited a few tourist sites, but mostly they just spent a lot of time

 at home. They talked, day and night, about everything.

 Then it was time for Theorem to leave, to return to her job and her

 life in Switzerland. Her departure was hard--driving to the airport,

 seeing her board the plane--it was heart-wrenching. Theorem looked

 very upset. Par just managed to hold it together until the plane took

 off.

 For two and a half weeks, Theorem had blotted out Par's approaching

 court case. As she flew away, the dark reality of the case descended

 on him.

 [ ]

 The fish liked to watch.

 Par sat at the borrowed computer all night in the dark, with only the

 dull glow of his monitor lighting the room, and the fish would all

 swim over to the side of their tank and peer out at him. When things

 were quiet on-line, Par's attention wandered to the eel and the lion

 fish. Maybe they were attracted to the phosphorescence of the computer

 screen. Whatever the reason, they certainly liked to hover there. It

 was eerie.

 Par took a few more drags of his joint, watched the fish some more,

 drank his Coke and then turned his attention back to his computer.

 That night, Par saw something he shouldn't have. Not the usual hacker

 stuff. Not the inside of a university. Not even the inside of an

 international bank containing private financial information about

 Middle Eastern sheiks.

 What he saw was information about some sort of killer spy

 satellite--those are the words Par used to describe it to other

 hackers. He said the satellite was capable of shooting down other

 satellites caught spying, and he saw it inside a machine connected to

 TRW's Space and Defense division network. He stumbled upon it much the

 same way Force had accidentally found the CitiSaudi machine--through

 scanning. Par didn't say much else about it because the discovery

 scared the hell out of him.

 Suddenly, he felt like the man who knew too much. He'd been in and out

 of so many military systems, seen so much sensitive material, that he

 had become a little blasé about the whole thing. The information was

 cool to read but, God knows, he never intended to actually do anything

 with it. It was just a prize, a glittering trophy testifying to his

 prowess as a hacker. But this discovery shook him up, slapped him in

 the face, made him realise he was exposed.

 What would the Secret Service do to him when they found out? Hand him

 another little traffic ticket titled `502C'? No way. Let him tell the

 jury at his trial everything he knew? Let the newspapers print it? Not

 a snowball's chance in hell.

 This was the era of Ronald Reagan and George Bush, of space defence

 initiatives, of huge defence budgets and very paranoid military

 commanders who viewed the world as one giant battlefield with the evil

 empire of the Soviet Union.

 Would the US government just lock him up and throw away the key? Would

 it want to risk him talking to other prisoners--hardened criminals who

 knew how to make a dollar from that sort of information? Definitely

 not.

 That left just one option. Elimination.

 It was not a pretty thought. But to the seventeen-year-old hacker it

 was a very plausible one. Par considered what he could do and came up

 with what seemed to be the only solution.

 Run.

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 Chapter 4 -- The Fugitive

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 There's one gun, probably more

 and the others are pointing at our backdoor

 -- from `Knife's Edge', on Bird Noises by Midnight Oil

 When Par failed to show up for his hearing on 10 July 1989 in the

 Monterey County Juvenile Court in Salinas, he officially became a

 fugitive. He had, in fact, already been on the run for some weeks. But

 no-one knew. Not even his lawyer.

 Richard Rosen had an idea something was wrong when Par didn't show up

 for a meeting some ten days before the hearing, but he kept hoping his

 client would come good. Rosen had negotiated a deal for Par:

 reparations plus fifteen days or less in juvenile prison in exchange

 for Par's full cooperation with the Secret Service.

 Par had appeared deeply troubled over the matter for weeks. He didn't

 seem to mind telling the Feds how he had broken into various

 computers, but that's not what they were really looking for. They

 wanted him to rat. And to rat on everyone. They knew Par was a kingpin

 and, as such, he knew all the important players in the underground.

 The perfect stooge. But Par couldn't bring himself to narc. Even if he

 did spill his guts, there was still the question of what the

 authorities would do to him in prison. The question of elimination

 loomed large in his mind.

 So, one morning, Par simply disappeared. He had planned it carefully,

 packed his bags discreetly and made arrangements with a trusted friend

 outside the circle which included his room-mates. The friend drove

 around to pick Par up when the

 room-mates were out. They never had an inkling that the now

 eighteen-year-old Par was about to vanish for a very long time.

 First, Par headed to San Diego. Then LA. Then he made his way to New

 Jersey. After that, he disappeared from the radar screen completely.

 Life on the run was hard. For the first few months, Par carried around

 two prized possessions; an inexpensive laptop computer and photos of

 Theorem taken during her visit. They were his lifeline to a different

 world and he clutched them in his bag as he moved from one city to

 another, often staying with his friends from the computer underground.

 The loose-knit network of hackers worked a bit like the

 nineteenth-century American `underground railroad' used by escaped

 slaves to flee from the South to the safety of the northern states.

 Except that, for Par, there was never a safe haven.

 Par crisscrossed the continent, always on the move. A week in one

 place. A few nights in another. Sometimes there were breaks in the

 electronic underground railroad, spaces between the place where one

 line ended and another began. Those breaks were the hardest. They

 meant sleeping out in the open, sometimes in the cold, going without

 food and being without anyone to talk to.

 He continued hacking, with new-found frenzy, because he was

 invincible. What were the law enforcement agencies going to do? Come

 and arrest him? He was already a fugitive and he figured things

 couldn't get much worse. He felt as though he would be on the run

 forever, and as if he had already been on the run for a lifetime,

 though it was only a few months.

 When he was staying with people from the computer underground, Par was

 careful. But when he was alone in a dingy motel room, or with people

 completely outside that world, he hacked without fear. Blatant,

 in-your-face feats. Things he knew the Secret Service would see. Even

 his illicit voice mailbox had words for his pursuers:

 Yeah, this is Par. And to all those faggots from the Secret Service

 who keep calling and hanging up, well, lots of luck. 'Cause, I mean,

 you're so fucking stupid, it's not even funny.

 I mean, if you had to send my shit to Apple Computers [for analysis],

 you must be so stupid, it's pitiful. You also thought I had

 blue-boxing equipment [for phreaking]. I'm just laughing trying to

 think what you thought was a blue box. You are so lame.

 Oh well. And anyone else who needs to leave me a message, go ahead.

 And everyone take it easy and leave me some shit. Alright. Later.

 Despite the bravado, paranoia took hold of Par as it never had before.

 If he saw a cop across the street, his breath would quicken and he

 would turn and walk in the opposite direction. If the cop was heading

 toward him, Par crossed the street and turned down the nearest alley.

 Police of any type made him very nervous.

 By the autumn of 1989, Par had made his way to a small town in North

 Carolina. He found a place to stop and rest with a friend who used the

 handle The Nibbler and whose family owned a motel. A couple of weeks

 in one place, in one bed, was paradise. It was also free, which meant

 he didn't have to borrow money from Theorem, who helped him out while

 he was on the run.

 Par slept in whatever room happened to be available that night, but he

 spent most of his time in one of the motel chalets Nibbler used in the

 off-season as a computer room. They spent days hacking from Nibbler's

 computer. The fugitive had been forced to sell off his inexpensive

 laptop before arriving in North Carolina.

 After a few weeks at the motel, however, he couldn't shake the feeling

 that he was being watched. There were too many strangers coming and

 going. He wondered if the hotel guests waiting in their cars were

 spying on him, and he soon began jumping at shadows. Perhaps, he

 thought, the Secret Service had found him after all.

 Par thought about how he could investigate the matter in more depth.

 One of The Atlanta Three hackers, The Prophet, called Nibbler

 occasionally to exchange hacking information, particularly security

 bugs in Unix systems. During one of their talks, Prophet told Par

 about a new security flaw he'd been experimenting with on a network

 that belonged to the phone company.

 The Atlanta Three, a Georgia-based wing of The Legion of Doom, spent a

 good deal of time weaving their way through BellSouth, the phone

 company covering the south-eastern US. They knew about phone switching

 stations the way Par knew about Tymnet. The Secret Service had raided

 the hackers in July 1989 but had not arrested them yet, so in

 September The Prophet continued to maintain an interest in his

 favourite target.

 Par thought the flaw in BellSouth's network sounded very cool and

 began playing around in the company's systems. Dial up the company's

 computer network, poke around, look at things. The usual stuff.

 It occurred to Par that he could check out the phone company's records

 of the motel to see if there was anything unusual going on. He typed

 in the motel's main phone number and the system fed back the motel's

 address, name and some detailed technical information, such as the

 exact cable and pair attached to the phone number. Then he looked up

 the phone line of the computer chalet. Things looked odd on that line.

 The line which he and Nibbler used for most of their hacking showed a

 special status: `maintenance unit on line'.

 What maintenance unit? Nibbler hadn't mentioned any problems with any

 of the motel's lines, but Par checked with him. No problems with the

 telephones.

 Par felt nervous. In addition to messing around with the phone

 company's networks, he had been hacking into a Russian computer

 network from the computer chalet. The Soviet network was a shiny new

 toy. It had only been connected to the rest of the world's global

 packet-switched network for about a month, which made it particularly

 attractive virgin territory.

 Nibbler called in a friend to check the motel's phones. The friend, a

 former telephone company technician turned freelancer, came over to

 look at the equipment. He told Nibbler and Par that something weird

 was happening in the motel's phone system. The line voltages were way

 off.

 Par realised instantly what was going on. The system was being

 monitored. Every line coming in and going out was probably being

 tapped, which meant only one thing. Someone--the phone company, the

 local police, the FBI or the Secret Service--was onto him.

 Nibbler and Par quickly packed up all Nibbler's computer gear, along

 with Par's hacking notes, and moved to another motel across town. They

 had to shut down all their hacking activities and cover their tracks.

 Par had left programs running which sniffed people's passwords and

 login names on a continual basis as they logged in, then dumped all

 the information into a file on the hacked machine. He checked that

 file every day or so. If he didn't shut the programs down, the log

 file would grow until it was so big the system administrator would

 become curious and have a look. When he discovered that his system had

 been hacked he would close the security holes. Par would have problems

 getting back into that system.

 After they finished tidying up the hacked systems, they gathered up

 all Par's notes and Nibbler's computer equipment once again and

 stashed them in a rented storage space. Then they drove back to the

 motel.

 Par couldn't afford to move on just yet. Besides, maybe only the

 telephone company had taken an interest in the motel's phone system.

 Par had done a lot of poking and prodding of the telecommunications

 companies' computer systems from the motel phone, but he had done it

 anonymously. Perhaps BellSouth felt a little curious and just wanted

 to sniff about for more information. If that was the case, the law

 enforcement agencies probably didn't know that Par, the fugitive, was

 hiding in the motel.

 The atmosphere was becoming oppressive in the motel. Par became even

 more watchful of the people coming and going. He glanced out the front

 window a little more often, and he listened a little more carefully to

 the footsteps coming and going. How many of the guests were really

 just tourists? Par went through the guest list and found a man

 registered as being from New Jersey. He was from one of the AT&T

 corporations left after the break-up of Bell Systems. Why on earth

 would an AT&T guy be staying in a tiny hick town in North Carolina?

 Maybe a few Secret Service agents had snuck into the motel and were

 watching the chalet.

 Par needed to bring the paranoia under control. He needed some fresh

 air, so he went out for a walk. The weather was bad and the wind blew

 hard, whipping up small tornadoes of autumn leaves. Soon it began

 raining and Par sought cover in the pay phone across the street.

 Despite having been on the run for a few months, Par still called

 Theorem almost every day, mostly by phreaking calls through bulk

 telecommunications companies. He dialled her number and they talked

 for a bit. He told her about how the voltage was way off on the

 motel's PABX and how the phone might be tapped. She asked how he was

 holding up. Then they spoke softly about when they might see each

 other again.

 Outside the phone box, the storm worsened. The rain hammered the roof

 from one side and then another as the wind jammed it in at strange

 angles. The darkened street was deserted. Tree branches creaked under

 the strain of the wind. Rivulets rushed down the leeward side of the

 booth and formed a wall of water outside the glass. Then a trash bin

 toppled over and its contents flew onto the road.

 Trying to ignore to the havoc around him, Par curled the phone handset

 into a small protected space, cupped between his hand, his chest and a

 corner of the phone booth. He reminded Theorem of their time together

 in California, of two and a half weeks, and they laughed gently over

 intimate secrets.

 A tree branch groaned and then broke under the force of the wind. When

 it crashed on the pavement near the phone booth, Theorem asked Par

 what the noise was.

 `There's a hurricane coming,' he told her. `Hurricane Hugo. It was

 supposed to hit tonight. I guess it's arrived.'

 Theorem sounded horrified and insisted Par go back to the safety of

 the motel immediately.

 When Par opened the booth door, he was deluged by water. He dashed

 across the road, fighting the wind of the hurricane, staggered into his

 motel room and jumped into bed to warm up. He fell asleep listening to

 the storm, and he dreamed of Theorem.

 Hurricane Hugo lasted more than three days, but they felt like the

 safest three days Par had spent in weeks. It was a good bet that the

 Secret Service wouldn't be conducting any raids during a hurricane.

 South Carolina took the brunt of Hugo but North Carolina also suffered

 massive damage. It was one of the worst hurricanes to hit the area in

 decades. Winds near its centre reached more than 240 kilometres per

 hour, causing 60 deaths and $7 billion in damages as it made its way

 up the coast from the West Indies to the Carolinas.

 When Par stepped outside his motel room one afternoon a few days after

 the storm, the air was fresh and clean. He walked to the railing

 outside his second-storey perch and found himself looking down on a

 hive of activity in the car park. There were cars. There was a van.

 There was a collection of spectators.

 And there was the Secret Service.

 At least eight agents wearing blue jackets with the Secret Service

 emblem on the back.

 Par froze. He stopped breathing. Everything began to move in slow

 motion. A few of the agents formed a circle around one of the guys

 from the motel, a maintenance worker named John, who looked vaguely

 like Par. They seemed to be hauling John over the coals, searching his

 wallet for identification and quizzing him. Then they escorted him to

 the van, presumably to run his prints.

 Par's mind began moving again. He tried to think clearly. What was the

 best way out? He had to get back into his room. It would give him some

 cover while he figured out what to do next. The photos of Theorem

 flashed through his mind. No way was he going to let the Secret

 Service get hold of those. He needed to stash them and fast.

 He could see the Secret Service agents searching the computer chalet.

 Thank God he and Nibbler had moved all the equipment. At least there

 was nothing incriminating in there and they wouldn't be able to seize

 all their gear.

 Par breathed deeply, deliberately, and forced himself to back away

 from the railing toward the door to his room. He resisted the urge to

 dash into his room, to recoil from the scene being played out below

 him. Abrupt movements would draw the agents' attention.

 Just as Par began to move, one of the agents turned around. He scanned

 the two-storey motel complex and his gaze quickly came to rest on Par.

 He looked Par dead in the eye.

 This is it, Par thought. I'm screwed. No way out of here now. Months

 on the run only to get done in a hick town in North Carolina. These

 guys are gonna haul my ass away for good. I'll never see the light of

 day again. Elimination is the only option.

 While these thoughts raced through Par's mind, he stood rigid, his

 feet glued to the cement floor, his face locked into the probing gaze

 of the Secret Service agent. He felt like they were the only two

 people who existed in the universe.

 Then, inexplicably, the agent looked away. He swivelled around to

 finish his conversation with another agent. It was as if he had never

 even seen the fugitive.

 Par stood, suspended and unbelieving. Somehow it seemed impossible. He

 began to edge the rest of the way to his motel room. Slowly, casually,

 he slid inside and shut the door behind him.

 His mind raced back to the photos of Theorem and he searched the room

 for a safe hiding place. There wasn't one. The best option was

 something above eye-level. He pulled a chair across the room, climbed

 on it and pressed on the ceiling. The rectangular panel of

 plasterboard lifted easily and Par slipped the photos in the space,

 then replaced the panel. If the agents tore the room apart, they would

 likely find the pictures. But the photos would probably escape a quick

 search, which was the best he could hope for at this stage.

 Next, he turned his mind to escaping. The locals were pretty cool

 about everything, and Par thought he could count on the staff not to

 mention his presence to the Secret Service. That bought him some time,

 but he couldn't get out of the room without being seen. Besides, if he

 was spotted walking off the property, he would certainly be stopped

 and questioned.

 Even if he did manage to get out of the motel grounds, it wouldn't

 help much. The town wasn't big enough to shield him from a thorough

 search and there was no-one there he trusted enough to hide him. It

 might look a little suspicious, this young man running away from the

 motel on foot in a part of the world where everyone travelled by car.

 Hitchhiking was out of the question. With his luck, he'd probably get

 picked up by one of the agents leaving the raid. No, he wanted a more

 viable plan. What he really needed was to get out of the area

 altogether, to flee the state.

 Par knew that John travelled to Asheville to attend classes and that

 he left very early. If the authorities had been watching the motel for

 a while, they would know that his 5 a.m. departure was normal. And

 there was one other thing about the early departure which seemed

 promising. It was still dark at that hour.

 If Par could get as far as Asheville, he might be able to get a lift

 to Charlotte, and from there he could fly somewhere far away.

 Par considered the options again and again. Hiding out in the motel

 room seemed the most sensible thing to do. He had been moving rooms

 around the motel pretty regularly, so he might have appeared to be

 just another traveller to anyone watching the motel. With any luck the

 Secret Service would be concentrating their search on the chalet,

 ripping the place apart in a vain hunt for the computer equipment. As

 these thoughts went through his head, the phone rang, making Par jump.

 He stared at it, wondering whether to answer.

 He picked it up.

 `It's Nibbler,' a voice whispered.

 `Yeah,' Par whispered back.

 `Par, the Secret Service is here, searching the motel.'

 `I know. I saw them.'

 `They've already searched the room next to yours.' Par nearly died.

 The agents had been less than two metres from where he was standing

 and he hadn't even known it. That room was where John stayed. It was

 connected to his by an inner door, but both sides were locked.

 `Move into John's room and lay low. Gotta go.' Nibbler hung up

 abruptly.

 Par put his ear to the wall and listened. Nothing. He unlocked the

 connecting inner door, turned the knob and pressed lightly. It gave.

 Someone had unlocked the other side after the search. Par squinted

 through the crack in the door. The room was silent and still. He

 opened it--no-one home. Scooping up his things, he quickly moved into

 John's room.

 Then he waited. Pacing and fidgeting, he strained his ears to catch

 the sounds outside. Every bang and creak of a door opening and closing

 set him on edge. Late that night, after the law enforcement officials

 had left, Nibbler called him on the house phone and told him what had

 happened.

 Nibbler had been inside the computer chalet when the Secret Service

 showed up with a search warrant. The agents took names, numbers, every

 detail they could, but they had trouble finding any evidence of

 hacking. Finally, one of them emerged from the chalet triumphantly

 waving a single computer disk in the air. The law enforcement

 entourage hanging around in front of the chalet let out a little

 cheer, but Nibbler could hardly keep a straight face. His younger

 brother had been learning the basics of computer graphics with a

 program called Logo. The United States Secret Service would soon be

 uncovering the secret drawings of a primary school student.

 Par laughed. It helped relieve the stress. Then he told Nibbler his

 escape plan, and Nibbler agreed to arrange matters. His parents didn't

 know the whole story, but they liked Par and wanted to help him. Then

 Nibbler wished his friend well.

 Par didn't even try to rest before his big escape. He was as highly

 strung as a racehorse at the gate. What if the Secret Service was

 still watching the place? There was no garage attached to the main

 motel building which he could access from the inside. He would be

 exposed, even though it would only be for a minute or so. The night

 would provide reasonable cover, but the escape plan wasn't fool-proof.

 If agents were keeping the motel under observation from a distance

 they might miss him taking off from his room. On the other hand, there

 could be undercover agents posing as guests watching the entire

 complex from inside their room.

 Paranoid thoughts stewed in Par's mind throughout the night. Just

 before 5 a.m., he heard John's car pull up outside. Par flicked off

 the light in his room, opened his door a crack and scanned the motel

 grounds. All quiet, bar the single car, which puffed and grunted in

 the still, cold air. The windows in most of the buildings were dark.

 It was now or never.

 Par opened the door all the way and slipped down the hallway. As he

 crept downstairs, the pre-dawn chill sent a shiver down his spine.

 Glancing quickly from side to side, he hurried toward the waiting car,

 pulled the back door open and dove onto the seat. Keeping his head

 down, he twisted around, rolled onto the floor and closed the door

 with little more than a soft click.

 As the car began to move. Par reached for a blanket which had been

 tossed on the floor and pulled it over himself. After a while, when

 John told him they were safely out of the town, Par slipped the

 blanket off his face and he looked up at the early morning sky. He

 tried to get comfortable on the floor. It was going to be a long ride.

 At Asheville, John dropped Par off at an agreed location. Par thanked

 him and hopped into a waiting car. Someone else from his extensive

 network of friends and acquaintances took him to Charlotte.

 This time Par rode in the front passenger seat. For the first time, he

 saw the true extent of the damage wreaked by Hurricane Hugo. The small

 town where he had been staying had been slashed by rain and high

 winds, but on the way to the Charlotte airport, where he would pick up

 a flight to New York, Par watched the devastation with amazement. He

 stared out the car window, unable to take his eyes off the storm's

 trail of havoc.

 The hurricane had swept up anything loose or fragile and turned it

 into a missile on a suicide mission. Whatever mangled, broken

 fragments remained after the turbulent winds had passed would have

 been almost unrecognisable to those who had seen them before.

 [ ]

 Theorem worried about Par as he staggered from corner to corner of the

 continent. In fact, she had often asked him to consider giving himself

 up. Moving from town to town was taking its toll on Par, and it wasn't

 that much easier on Theorem. She hadn't thought going on the lam was

 such a great idea in the first place, and she offered to pay for his

 lawyer so he could stop running. Par declined. How could he hand

 himself in when he believed elimination was a real possibility?

 Theorem sent him money, since he had no way of earning a living and he

 needed to eat. The worst parts, though, were the dark thoughts that

 kept crossing her mind. Anything could happen to Par between phone

 calls. Was he alive? In prison? Had he been raided, even accidentally

 shot during a raid?

 The Secret Service and the private security people seemed to want him

 so badly. It was worrying, but hardly surprising. Par had embarrassed

 them. He had broken into their machines and passed their private

 information around in the underground. They had raided his home when

 he wasn't even home. Then he had escaped a second raid, in North

 Carolina, slipping between their fingers. He was constantly in their

 face, continuing to hack blatantly and to show them contempt in things

 such as his voicemail message. He figured they were probably

 exasperated from chasing all sorts of false leads as well, since he

 was perpetually spreading fake rumours about his whereabouts. Most of

 all, he thought they knew what he had seen inside the TRW system. He

 was a risk.

 Par became more and more paranoid, always watching over his shoulder

 as he moved from city to city. He was always tired. He could never

 sleep properly, worrying about the knock on the door. Some mornings,

 after a fitful few hours of rest, he woke with a start, unable to

 remember where he was. Which house or motel, which friends, which

 city.

 He still hacked all the time, borrowing machines where he could. He

 posted messages frequently on The Phoenix Project, an exclusive BBS

 run by The Mentor and Erik Bloodaxe and frequented by LOD members and

 the Australian hackers. Some well-known computer security people were

 also invited onto certain, limited areas of the Texas-based board,

 which immediately elevated the status of The Phoenix Project in the

 computer underground. Hackers were as curious about the security

 people as the security people were about their prey. The Phoenix

 Project was special because it provided neutral ground, where both

 sides could meet to exchange ideas.

 Via the messages, Par continued to improve his hacking skills while

 also talking with his friends, people like Erik Bloodaxe, from Texas,

 and Phoenix, from The Realm in Melbourne. Electron also frequented The

 Phoenix Project. These hackers knew Par was on the run, and sometimes

 they joked with him about it. The humour made the stark reality of

 Par's situation bearable. All the hackers on The Phoenix Project had

 considered the prospect of being caught. But the presence of Par, and

 his tortured existence on the run, hammered the implications home with

 some regularity.

 As Par's messages became depressed and paranoid, other hackers tried

 to do what they could to help him. Elite US and foreign hackers who

 had access to the private sections of The Phoenix Project saw his

 messages and they felt for him. Yet Par continued to slide deeper and

 deeper into his own strange world.

Subject: DAMN !!!

From: The Parmaster

Date: Sat Jan 13 08:40:17 1990

Shit, i got drunk last night and went onto that Philippine system...

Stupid Admin comes on and asks who i am ...

Next thing i know, i'm booted off and both accounts on the system are gone.

Not only this .. but the

whole fucking Philippine Net isn't accepting collect calls anymore. (The thing

went down completely after i was booted off!)

Apparently someone there

had enough of me.

By the way, kids, never

drink and hack!

- Par

Subject: gawd

From: The Parmaster

Date: Sat Jan 13 09:07:06 1990

Those SS boys and NSA boys think i'm a COMRADE .. hehehe i'm just glad

i'm still fucking free.

Bahahaha

<Glastnost and all that happy horseshit>

- Par

Subject: The Bottom line.

From: The Parmaster

Date: Sun Jan 21 10:05:38 1990

The bottom line is a crackdown. The phrack boys were just the start,

i'm sure of it.

This is the time to watch yourself. No matter what you are into,

whether it's just codes, cards, etc.

Apparently the government has seen the last straw. Unfortunately, with

all of this in the news now, they will be able to get more government

money to combat hackers.

And that's BAD fucking news for us. I think they are going after all

the `teachers'--the people who educate others into this sort of thing.

I wonder if they think that maybe these remote cases are linked in any

way. The only way they canprobably see is that we are hackers. And

so that is where their energies will be put. To stop ALL hackers--and

stop them BEFORE they can become a threat. After they wipe out the

educators, that is. Just a theory.

- Par

Subject: Connection

From: The Parmaster

Date: Sun Jan 21 10:16:11 1990

Well, the only connection is disconnection, as Gandalf [a British

hacker] would say.

That's what i'm putting

on my epitaph.

THE ONLY CONNECTION IS

DISCONNECTION ...

Oh well, maybe i'll take

a few of the buggers with me when they come for me.

- Par

Subject: Oh well.

From: The Parmaster

Date: Tue Jan 23 19:30:05 1990

`And now, the end is near. I've traveled each and every byway ...' in

the words of the King. Oh well. Who cares? He was a fat shit before he

died anyway.

To everyone who's been a good friend of mine and help me cover up the

fact that i don't know a fucking thing--i thank u. And to everyone

else, take it easy and hang tough.

i was temporarily insane at the time

See you smart guys at the funny farm.

- Par

Subject: Par

From: Erik Bloodaxe

Date: Tue Jan 23 23:21:39 1990

Shit man, don't drink and think about things like that. It's not

healthy, mentally or physically.

Come to Austin, Texas.

We'll keep you somewhere until we can get something worked out for

you.

A year in minimum security (Club Fed) is better then chucking a whole

life. Hell, you're 19!! I have discarded the `permanent' solution for

good. Dead people can't get laid, but people in federal prisons DO get

conjugal visits!!!

Think of

Theorem.

Call over here at whatever time you read this ... I can see you are

really getting worried, so just fucking call ...

- Erik

Subject: Hah

From: The Parmaster

Date: Thu Jan 25 18:58:00 1990

Just keep in mind they see everything you do. Believe me. I know.

- Par

Subject: Well shit.

From: The Parmaster

Date: Mon Jan 29 15:45:05 1990

It's happening soon guys.

I wish i could have bought more time. And worked out a deal. But

nada. They are nearby now.

I can tell which cars are theirs driving by outside. This is the

weirdest case of Deja vu i've ever had.

Anyway got an interesting call today. It was from Eddie, one of the

Bell systems computers.

It was rather fantasy like ... Probably just his way of saying

`Goodbye'. Eddie was a good friend, smartest damn UNIX box around ...

And he called today to tell me goodbye.

Now i know i'm fucked. Thanks, Eddie, it's been real. (whoever you

are) `ok eddie, this one's for you'

Much Later,

- Par

Subject: Par

From: Erik Bloodaxe

Date: Mon Jan 29 19:36:38 1990

Buddy, Par, you are over the edge ... lay off the weed. Not everyone

with glasses and dark suits are Feds. Not all cars with generic

hubcaps are government issue.

Well, hell, I don't know what the hell `Eddie' is, but that's a real

bizarre message you left.

Fly to Austin ... like tomorrow ... got plenty of places to stash you

until things can be smoothed out for a calm transition.

- Erik

Subject: eehh...

From: Phoenix [from Australia]

Date: Tue Jan 30 07:25:59 1990

hmmmmmmmm...

<wonders real REAL thoughtufully> [sic]

<and turns up a blank...>

what is young Par up to?

Subject: Par and Erik

From: Daneel Olivaw

Date: Mon Jan 29 21:10:00 1990

Erik, you aren't exactly the best person to be stashing people are

you?

Subject: You know you are screwed when.

From: The Parmaster

Date: Wed Jan 31 14:26:04 1990

You know you are screwed

when:

When surveyers survey

your neighbors regularly, and wear sunglasses when it's like 11 degrees

farenheit and cloudy as hell out.

When the same cars keep

driving by outside day and night. (I've been thinking about providing coffee an

d

doughnuts).

- Par

Subject: heh, Par

From: The Mentor

Date: Wed Jan 31 16:37:04 1990

Ummm. I wear sunglasses when it's 11 degrees and cloudy ... so you can

eliminate that one. :-)

Subject: Hmm, Par

From: Phoenix

Date: Thu Feb 01 10:22:46 1990

At least you arent getting shot at.

Subject: Par, why don't you ...

From: Ravage

Date: Thu Feb 01 10:56:04 1990

Why not just go out and say `hi' to the nice gentleman? If i kept

seeing the same people tooling around my neighborhood, i would

actively check them out if they seemed weird.

Subject: Par, jump 'em

From: Aston Martin

Date: Tue Feb 06 18:04:55 1990

What you could do is go out to one of the vans sitting in the street

(you know, the one with the two guys sitting in it all day) with a

pair of jumper cables. Tell them you've seen them sitting there all

day and you thought they were stuck. Ask them if they need a jump.

- Aston

 Between these strange messages, Par often posted comments on technical

 matters. Other hackers routinely asked him questions about X.25

 networks. Unlike some hackers, Par almost always offered some help. In

 fact, he believed that being `one of the teachers' made him a

 particular target. But his willingness to teach others so readily,

 combined with his relatively humble, self-effacing demeanour, made Par

 popular among many hackers. It was one reason he found so many places

 to stay.

 Spring arrived, brushing aside a few of the hardships of a winter on

 the run, then summer. Par was still on the run, still dodging the

 Secret Service's national hunt for the fugitive. By autumn, Par had

 eluded law enforcement officials around the United States for more

 than a year. The gloom of another cold winter on the run sat on the

 horizon of Par's future, but he didn't care. Anything, everything was

 bearable. He could take anything Fate would dish up because he had

 something to live for.

 Theorem was coming to visit him again.

 When Theorem arrived in New York in early 1991, the weather was

 bitterly cold. They travelled to Connecticut, where Par was staying in

 a share-house with friends.

 Par was nervous about a lot of things, but mostly about whether things

 would be the same with Theorem. Within a few hours of her arrival, his

 fears were assuaged. Theorem felt as passionately about him as she had

 in California more than twelve months before. His own feelings were

 even stronger. Theorem was a liferaft of happiness in the growing

 turmoil of his life.

 But things were different in the outside world. Life on the run with

 Theorem was grim. Constantly dependent on other people, on their

 charity, they were also subject to their petty whims.

 A room-mate in the share-house got very drunk one night and picked a

 fight with one of Par's friends. It was a major row and the friend

 stormed out. In a fit of intoxicated fury, the drunk threatened to

 turn Par in to the authorities. Slurring his angry words, he announced

 he was going to call the FBI, CIA and Secret Service to tell them all

 where Par was living.

 Par and Theorem didn't want to wait around to see if the drunk would

 be true to his word. They grabbed their coats and fled into the

 darkness. With little money, and no place else to stay, they walked

 around for hours in the blistering, cold wind. Eventually they decided

 they had no choice but to return to the house late at night, hopefully

 after the drunk had fallen asleep.

 They sidled up to the front of the house, alert and on edge. It was

 quite possible the drunk had called every law enforcement agency his

 blurry mind could recall, in which case a collection of agents would

 be lying in wait. The street was deadly quiet. All the parked cars

 were deserted. Par peered in a darkened window but he couldn't see

 anything. He motioned for Theorem to follow him into the house.

 Though she couldn't see Par's face, Theorem could feel his tension.

 Most of the time, she revelled in their closeness, a proximity which

 at times seemed to border on telepathy. But at this moment, the

 extraordinary gift of empathy felt like a curse. Theorem could feel

 Par's all-consuming paranoia, and it filled her with terror as they

 crept through the hall, checking each room. Finally they reached Par's

 room, expecting to find two or three Secret Service agents waiting

 patiently for them in the dark.

 It was empty.

 They climbed into bed and tried to get some sleep, but Theorem lay

 awake in the dark for a little while, thinking about the strange and

 fearful experience of returning to the house. Though she spoke to Par

 on the phone almost every day when they were apart, she realised she

 had missed something.

 Being on the run for so long had changed Par.

 Some time after she returned to Switzerland, Theorem's access to Altos

 shrivelled up and died. She had been logging in through her old

 university account but the university eventually killed her access

 since she was no longer a student. Without access to any X.25 network

 linked to the outside world, she couldn't logon to Altos. Although she

 was never involved with hacking, Theorem had become quite addicted to

 Altos. The loss of access to the Swiss X.25 network--and therefore to

 Altos--left her feeling very depressed. She told Par over the

 telephone, in sombre tones.

 Par decide to make a little present for Theorem. While most hackers

 broke into computers hanging off the X.25 networks, Par broke into the

 computers of the companies which ran the X.25 networks. Having control

 over the machines owned by Telenet or Tymnet was real power. And as the

 master of X.25 networks, Par could simply create a special account--just

 for Theorem--on Tymnet.

 When Par finished making the account, he leaned back in his chair

 feeling pretty pleased with himself.

 Account name: Theorem.

 Password: ParLovesMe!

 Well, thought Par, she's going to have to type that in every time she

 gets on the Tymnet network. Altos might be filled with the world's

 best hackers, and they might even try to flirt with Theorem, but

 she'll be thinking of me every time she logs on, he thought.

 Par called her on the telephone and gave her his special present. When

 he told her the password to her new account, Theorem laughed. She

 thought it was sweet.

 And so did the MOD boys.

 Masters of Deception, or Destruction--it depended on who told the

 story--was a New York-based gang of hackers. They thought it would be

 cool to hack Altos. It wasn't that easy to get Altos shell access,

 which Theorem had, and most people had to settle for using one of the

 `guest' accounts. But it was much easier to hack Altos from a shell

 account than from a `guest' account. Theorem's account would be the

 targeted jump-off point.

 How did MOD get Theorem's Altos password? Most probably they were

 watching one of the X.25 gateways she used as she passed through

 Tymnet on her way to Altos. Maybe the MOD boys sniffed her password en

 route. Or maybe they were watching the Tymnet security officials who

 were watching that gateway.

 In the end it didn't matter how MOD got Theorem's password on Altos.

 What mattered was that they changed her password. When Theorem

 couldn't get into Altos she was beside herself. She felt like a junkie

 going cold turkey. It was too much. And of course she couldn't reach

 Par. Because he was on the run, she had to wait for him to call her.

 In fact she couldn't reach any of her other friends on Altos to ask

 for help. How was she going to find them? They were all hackers. They

 chose handles so no-one would know their real names.

 What Theorem didn't know was that, not only had she lost access to

 Altos, but the MOD boys were using her account to hack the Altos

 system. To the outside world it appeared as though she was doing it.

 Theorem finally managed to get a third-hand message to Gandalf, a

 well-known British hacker. She sought him out for two reasons. First,

 he was a good friend and was therefore likely to help her out. Second,

 Gandalf had root access on Altos, which meant he could give her a new

 password or account.

 Gandalf had established quite a reputation for himself in the computer

 underground through the hacking group 8lgm--The Eight-Legged Groove

 Machine, named after a British band. He and his friend, fellow British

 hacker Pad, had the best four legs in the chorus line. They were a

 world-class act, and certainly some of the best talent to come out of

 the British hacking scene. But Gandalf and, to a lesser extent, Pad

 had also developed a reputation for being arrogant. They rubbed some

 of the American hackers the wrong way. Not that Pad and Gandalf seemed

 to care. Their attitude was: We're good. We know it. Bugger off.

 Gandalf disabled Theorem's account on Altos. He couldn't very well

 just change the password and then send the new one through the

 extended grapevine that Theorem had used to get a message through to

 him. Clearly, someone had targeted her account specifically. No way

 was he going to broadcast a new password for her account throughout

 the underground. But the trouble was that neither Par nor Theorem knew

 what Gandalf had done.

 Meanwhile, Par called Theorem and got an earful. An angry Par vowed to

 find out just who the hell had been messing with her account.

 When the MOD boys told Par they were the culprits, he was a bit

 surprised because he had always been on good terms with them. Par told

 them how upset Theorem had been, how she gave him an earful. Then an

 extraordinary thing happened. Corrupt, the toughest, baddest guy in

 MOD, the black kid from the roughest part of New York, the hacker who

 gave shit to everyone because he could, apologised to Par.

 The MOD guys never apologised, even when they knew they were in the

 wrong. Apologies never got anyone very far on a New York City street.

 It was an attitude thing. `I'm sorry, man' from Corrupt was the

 equivalent of a normal person licking the mud from the soles of your

 shoes.

 The new password was: M0Dm0dM0D. That's the kind of guys they were.

 Par was just signing off to try out the new password when Corrupt

 jumped in.

 `Yeah, and ah, Par, there's something you should know.'

 `Yeah?' Par answered, anxious to go.

 `I checked out her mail. There was some stuff in it.'

 Theorem's letters? Stuff? `What kind of stuff?' he asked.

 `Letters from Gandalf.'

 `Yeah?'

 `Friendly letters. Real friendly.'

 Par wanted to know, but at the same time, he didn't. He could have

 arranged root access on Altos long ago if he'd really wanted it. But

 he didn't. He didn't want it because it would mean he could access

 Theorem's mail. And Par knew that if he could, he would. Theorem was

 popular on Altos and, being the suspicious type, Par knew he would

 probably take something perfectly innocent and read it the wrong way.

 Then he would get in a fight with Theorem, and their time together was

 too precious for that.

 `Too friendly,' Corrupt went on. It must have been hard for him to

 tell Par. Snagging a friend's girlfriend's password and breaking into

 her account was one thing. There wasn't much wrong with that. But

 breaking that kind of news, well, that was harsh. Especially since

 Corrupt had worked with Gandalf in 8lgm.

 `Thanks,' Par said finally. Then he took off.

 When Par tried out the MOD password, it didn't work of course, because

 Gandalf had disabled the account. But Par didn't know that. Finding

 out that Theorem's account was disabled didn't bother him, but

 discovering who disabled it for her didn't make Par all that happy.

 Still, when he confronted Theorem, she denied that anything was going

 on between her and Gandalf.

 What could Par do? He could believe Theorem or he could doubt her.

 Believing her was hard, but doubting her was painful. So he chose to

 believe her.

 The incident made Theorem take a long look at Altos. It was doing bad

 things to her life. In the days that she was locked out of the German

 chat system, she had made the unpleasant discovery that she was

 completely addicted. And she didn't like it at all. Staring at her

 life with fresh eyes, she realised she had been ignoring her friends

 and her life in Switzerland. What on earth was she doing, spending

 every night in front of a computer screen?

 So Theorem made a tough decision.

 She decided to stop using Altos forever.

 [ ]

 Bad things seemed to happen to The Parmaster around Thanksgiving.

 In late November 1991, Par flew up from Virginia Beach to New York. An

 acquaintance named Morty Rosenfeld, who hung out with the MOD hackers

 a bit, had invited him to come for a visit. Par thought a trip to the

 City would do him good.

 Morty wasn't exactly Par's best friend, but he was all right. He had

 been charged by the Feds a few months earlier for selling a password

 to a credit record company which resulted in credit card fraud. Par

 didn't go in for selling passwords, but to each his own. Morty wasn't

 too bad in the right dose. He had a place on Coney Island, which was

 hardly the Village in Manhattan, but close enough, and he had a

 fold-out sofa bed. It beat sleeping on the floor somewhere else.

 Par hung out with a Morty and a bunch of his friends, drinking and

 goofing around on Morty's computer.

 One morning, Par woke up with a vicious hangover. His stomach was

 growling and there was nothing edible in the fridge, so he rang up and

 ordered pork fried rice from a Chinese take-away. Then he threw on

 some clothes and sat on the end of the sofa-bed, smoking a cigarette

 while he waited. He didn't start smoking until he was nineteen, some

 time late into his second year on the run. It calmed his nerves.

 There was a knock at the front door. Par's stomach grumbled in

 response. As he walked toward the front door, he thought Pork Fried

 Rice, here I come. But when Par opened the front door, there was

 something else waiting for him.

 The Secret Service.

 Two men. An older, distinguished gentleman standing on the left and a

 young guy on the right. The young guy's eyes opened wide when he saw

 Par.

 Suddenly, the young guy pushed Par, and kept pushing him. Small, hard,

 fast thrusts. Par couldn't get his balance. Each time he almost got

 his footing, the agent shoved the hacker backward again until he

 landed against the wall. The agent spun Par around so his face pressed

 against the wall and pushed a gun into his kidney. Then he slammed

 handcuffs on Par and started frisking him for weapons.

 Par looked at Morty, now sobbing in the corner, and thought, You

 narced on me.

 Once Par was safely cuffed, the agents flashed their badges to him.

 Then they took him outside, escorted him into a waiting car and drove

 into Manhattan. They pulled up in front of the World Trade Center and

 when Par got out the young agent swapped the cuffs so Par's hands were

 in front of him.

 As the agents escorted the handcuffed fugitive up a large escalator,

 the corporate world stared at the trio. Business men and women in prim

 navy suits, secretaries and office boys all watched wide-eyed from the

 opposite escalator. And if the handcuffs weren't bad enough, the

 younger Secret Service agent was wearing a nylon jacket with a

 noticeable gun-shaped lump in the front pouch.

 Why are these guys bringing me in the front entrance? Par kept

 thinking. Surely there must be a backdoor, a car park back entrance.

 Something not quite so public.

 The view from any reasonably high floor of the World Trade Center is

 breathtaking, but Par never got a chance to enjoy the vista. He was

 hustled into a windowless room and handcuffed to a chair. The agents

 moved in and out, sorting out paperwork details. They uncuffed him

 briefly while they inked his fingers and rolled them across sheets of

 paper. Then they made him give handwriting samples, first his right

 hand then his left.

 Par didn't mind being cuffed to the chair so much, but he found the

 giant metal cage in the middle of the fingerprinting room deeply

 disturbing. It reminded him of an animal cage, the kind used in old

 zoos.

 The two agents who arrested him left the room, but another one came

 in. And the third agent was far from friendly. He began playing the

 bad cop, railing at Par, shouting at him, trying to unnerve him. But

 no amount of yelling from the agent could rile Par as much as the

 nature of the questions he asked.

 The agent didn't ask a single question about Citibank. Instead, he

 demanded to hear everything Par knew about TRW.

 All Par's worst nightmares about the killer spy satellite, about

 becoming the man who knew too much, rushed through his mind.

 Par refused to answer. He just sat silently, staring at the agent.

 Eventually, the older agent came back into the room, dragged the

 pitbull agent away and took him outside for a whispered chat. After

 that, the pitbull agent was all sweetness and light with Par. Not

 another word about TRW.

 Par wondered why a senior guy from the Secret Service would tell his

 minion to clam up about the defence contractor? What was behind the

 sudden silence? The abrupt shift alarmed Par almost as much as the

 questions had in the first place.

 The agent told Par he would be remanded in custody while awaiting

 extradition to California. After all the paperwork had been completed,

 they released him from the handcuffs and let him stand to stretch. Par

 asked for a cigarette and one of the agents gave him one. Then a

 couple of other agents--junior guys--came in.

 The junior agents were very friendly. One of them even shook Par's

 hand and introduced himself. They knew all about the hacker. They knew

 his voice from outgoing messages on voicemail boxes he had created for

 himself. They knew what he looked like from his California police

 file, and maybe even surveillance photos. They knew his personality

 from telephone bridge conversations which had been recorded and from

 the details of his Secret Service file. Perhaps they had even tracked

 him around the country, following a trail of clues left in his

 flightpath. Whatever research they had done, one thing was clear.

 These agents felt like they knew him intimately--Par the person, not

 just Par the hacker.

 It was a strange sensation. These guys Par had never met before

 chatted with him about the latest Michael Jackson video as if he was a

 neighbour or friend just returned from out of town. Then they took him

 further uptown, to a police station, for more extradition paperwork.

 This place was no World Trade Center deluxe office. Par stared at the

 peeling grey paint in the ancient room, and then watched officers

 typing out reports using the two-finger hunt-and-peck method on

 electric typewriters--not a computer in sight. The officers didn't

 cuff Par to the desk. Par was in the heart of a police station and

 there was no way he was going anywhere.

 While the officer handling Par was away from his desk for ten minutes,

 Par felt bored. So he began flipping through the folders with

 information on other cases on the officer's desk. They were heavy duty

 fraud cases--mafia and drug-money laundering--cases which carried

 reference to FBI involvement. These people looked hairy.

 That day, Par had a quick appearance in court, just long enough to be

 given protective custody in the Manhattan detention complex known as

 the Tombs while he waited for the authorities from California to come

 and pick him up.

 Par spent almost a week in the Tombs. By day three, he was climbing

 the walls. It was like being buried alive.

 During that week, Par had almost no contact with other human beings--a

 terrible punishment for someone with so much need for a continual flow

 of new information. He never left his cell. His jailer slid trays of

 food into his cell and took them away.

 On day six, Par went nuts. He threw a fit, began screaming and banging

 on the door. He yelled at the guard. Told him none too nicely that he

 wanted to `get the fuck outta here'. The guard said he would see if he

 could get Par transferred to Rikers Island, New York's notorious jail.

 Par didn't care if he was transferred to the moon, as long as he got

 out of solitary confinement.

 Except for the serial killer, the north infirmary at Rikers Island was

 a considerable improvement on the Tombs. Par was only locked in his

 cell at night. During the day he was free to roam inside the infirmary

 area with other prisoners. Some of them were there because the

 authorities didn't want to put them in with the hardened criminals,

 and some of them were there because they were probably criminally

 insane.

 It was an eclectic bunch. A fireman turned jewellery heister. A

 Colombian drug lord. A chop-shop ringleader, who collected more than

 300 stolen cars, chopped them up, reassembled them as new and then

 sold them off. A man who killed a homosexual for coming onto him.

 `Faggot Killer', as he was known inside, hadn't meant to kill anyone:

 things had gotten a little out of hand; next thing he knew, he was

 facing ten to twelve on a murder rap.

 Par wasn't wild about the idea of hanging out with a murderer, but he

 was nervous about what could happened to a young man in jail. Forging

 a friendship with Faggot Killer would send the right message. Besides,

 the guy seemed to be OK. Well, as long as you didn't look at him the

 wrong way.

 On his first day, Par also met Kentucky, a wild-eyed man who

 introduced himself by thrusting a crumpled newspaper article into the

 hacker's hand and saying, `That's me'. The article, titled `Voices

 Told Him to Kill', described how police had apprehended a serial

 killer believed to be responsible for a dozen murders, maybe more.

 During his last murder, Kentucky told Par he had killed a woman--and

 then written the names of the aliens who had commanded him to do it on

 the walls of her apartment in her blood.

 The jewellery heister tried to warn Par to stay away from Kentucky,

 who continued to liaise with the aliens on a regular basis. But it was

 too late. Kentucky decided that he didn't like the young hacker. He

 started shouting at Par, picking a fight. Par stood there, stunned and

 confused. How should he deal with an aggravated serial killer? And

 what the hell was he doing in jail with a serial killer raving at him

 anyway? It was all too much.

 The jewellery heister rushed over to Kentucky and tried to calm him

 down, speaking in soothing tones. Kentucky glowered at Par, but he

 stopped yelling.

 A few days into his stay at Rikers, Faggot Killer invited Par to join

 in a game of Dungeons and Dragons. It beat watching TV talk shows all

 day, so Par agreed. He sat down at the metal picnic table where Faggot

 Killer had laid out the board.

 So it was that Par, the twenty-year-old computer hacker from

 California, the X.25 network whiz kid, came to play Dungeons and

 Dragons with a jewellery thief, a homophobic murderer and a mad serial

 killer in Rikers Island. Par found himself marvelling at the

 surrealism of the situation.

 Kentucky threw himself into the game. He seemed to get off on killing

 hobgoblins.

 `I'll take my halberd,' Kentucky began with a smile, `and I stab this

 goblin.' The next player began to make his move, but Kentucky

 interrupted. `I'm not done,' he said slowly, as a demonic grin spread

 across his face. `And I slice it. And cut it. It bleeds everywhere.'

 Kentucky's face tensed with pleasure.

 The other three players shifted uncomfortably in their seats. Par

 looked at Faggot Killer with nervous eyes.

 `And I thrust a knife into its heart,' Kentucky continued, the volume

 of his voice rising with excitement. `Blood, blood, everywhere blood.

 And I take the knife and hack him. And I hack and hack and hack.'

 Kentucky jumped up from the table and began shouting, thrusting one

 arm downward through the air with an imaginary dagger, `And I hack and

 I hack and I hack!'

 Then Kentucky went suddenly still. Everyone at the table froze. No-one

 dared move for fear of driving him over the edge. Par's stomach had

 jumped into his throat. He tried to gauge how many seconds it would

 take to extricate himself from the picnic table and make a break for

 the far side of the room.

 In a daze, Kentucky walked away from the table, leaned his forehead

 against the wall and began mumbling quietly. The jewellery heister

 slowly followed and spoke to him briefly in hushed tones before

 returning to the table.

 One of the guards had heard the ruckus and came up to the table.

 `Is that guy OK?' he asked the jewellery heister while pointing to

 Kentucky.

 Not even if you used that term loosely, Par thought.

 `Leave him alone,' the heister told the guard. `He's talking to the

 aliens.'

 `Right.' The guard turned around and left.

 Every day, a nurse brought around special medicine for Kentucky. In

 fact, Kentucky was zonked out most of the time on a cup of horrible,

 smelly liquid. Sometimes, though, Kentucky secreted his medicine away

 and traded it with another prisoner who wanted to get zonked out for a

 day or so.

 Those were bad days, the days when Kentucky had sold his medication.

 It was on one of those days that he tried to kill Par.

 Par sat on a metal bench, talking to other prisoners, when suddenly he

 felt an arm wrap around his neck. He tried to turn around, but

 couldn't.

 `Here. I'll show you how I killed this one guy,' Kentucky whispered to

 Par.

 `No--No--' Par started to say, but Kentucky's biceps began pressing

 against Par's Adam's apple. It was a vice-like grip.

 `Yeah. Like this. I did it like this,' Kentucky said as he tensed his

 muscle and pulled backward.

 `No! Really, you don't need to. It's OK,' Par gasped. No air. His arms

 flailing in front of him.

 I'm done for, Par thought. My life is over. Hacker Murdered by Serial

 Killer in Rikers Island. `Aliens Told Me to Do It.'

 The omnipresent jewellery heister came up to Kentucky and started

 cooing in his ear to let Par go. Then, just when Par thought he was

 about to pass out, the jewellery heister pulled Kentucky off him.

 Par reminded himself to always sit with his back against the wall.

 Finally, after almost a month behind bars, Par was informed that an

 officer from the Monterey County sheriff's office was coming to take

 him back to California. Par had agreed to be extradited to California

 after seeing the inside of New York's jails. Dealing with the federal

 prosecutor in New York had also helped make up his mind.

 The US Attorney's Office in New York gave Richard Rosen, who had taken

 the case on again, a real headache. They didn't play ball. They played

 `Queen for a Day'.

 The way they negotiated reminded Rosen of an old American television

 game of that name. The show's host pulled some innocent soul off the

 street, seated her on a garish throne, asked her questions and then

 gave her prizes. The US Attorney's Office in New York wanted to seat

 Par on a throne, of sorts, to ask him lots of questions. At the end of

 the unfettered interrogation, they would hand out prizes. Prison

 terms. Fines. Convictions. As they saw fit. No guaranteed sentences.

 They would decide what leniency, if any, he would get at the end of

 the game.

 Par knew what they were looking for: evidence against the MOD boys. He

 wasn't having a bar of that. The situation stank, so Par decided not to

 fight the extradition to California. Anything had to be better than New

 York, with its crazy jail inmates and arrogant federal prosecutors.

 The officer from the Monterey sheriff's office picked Par up on 17

 December 1991.

 Par spent the next few weeks in jail in California, but this time he

 wasn't in any sort of protective custody. He had to share a cell with

 Mexican drug dealers and other mafia, but at least he knew his way

 around these people. And unlike the some of the people at Rikers, they

 weren't stark raving lunatics.

 Richard Rosen took the case back, despite Par's having skipped town

 the first time, which Par thought was pretty good of the lawyer. But

 Par had no idea how good it would be for him until it came to his

 court date.

 Par called Rosen from the jail, to talk about the case. Rosen had some

 big news for him.

 `Plead guilty. You're going to plead guilty to everything,' he told

 Par.

 Par thought Rosen had lost his marbles.

 `No. We can win this case if you plead guilty,' Rosen assured him.

 Par sat dumbfounded at the other end of the phone.

 `Trust me,' the lawyer said.

 The meticulous Richard Rosen had found a devastating weapon.

 On 23 December 1991, Par pleaded guilty to two charges in Monterey

 County Juvenile Court. He admitted everything. The whole nine yards.

 Yes, I am The Parmaster. Yes, I broke into computers. Yes, I took

 thousands of credit card details from a Citibank machine. Yes, yes,

 yes.

 In some way, the experience was cathartic, but only because Par knew

 Rosen had a brilliant ace up his sleeve.

 Rosen had rushed the case to be sure it would be heard in juvenile

 court, where Par would get a more lenient sentence. But just because

 Rosen was in a hurry didn't mean he was sloppy. When he went through

 Par's file with a fine-toothed comb he discovered the official papers

 declared Par's birthday to be 15 January 1971. In fact, Par's birthday

 was some days earlier, but the DA's office didn't know that.

 Under California law, a juvenile court has jurisdiction over citizens

 under the age of 21. You can only be tried and sentenced in a juvenile

 court if you committed the crimes in question while under the age of

 eighteen and you are still under the age of 21 when you plead and are

 sentenced.

 Par was due to be sentenced on 13 January but on 8 January Rosen

 applied for the case to be thrown out. When Deputy DA David Schott

 asked why, Rosen dropped his bomb.

 Par had already turned 21 and the juvenile court had no authority to

 pass sentence over him. Further, in California, a case cannot be moved

 into an adult court if the defendant has already entered a plea in a

 juvenile one. Because Par had already done that, his case couldn't be

 moved. The matter was considered `dealt with' in the eyes of the law.

 The Deputy DA was flabbergasted. He spluttered and spewed. The DA's

 office had dropped the original charges from a felony to a

 misdemeanour. They had come to the table. How could this happen? Par

 was a fugitive. He had been on the run for more than two years from

 the frigging Secret Service, for Christ's sake. There was no way--NO

 WAY--he was going to walk out of that courtroom scot-free.

 The court asked Par to prove his birthday. A quick driver's licence

 search at the department of motor vehicles showed Par and his lawyer

 were telling the truth. So Par walked free.

 When he stepped outside the courthouse, Par turned his face toward the

 sun. After almost two months in three different jails on two sides of

 the continent, the sun felt magnificent. Walking around felt

 wonderful. Just wandering down the street made him happy.

 However, Par never really got over being on the run.

 From the time he walked free from the County Jail in Salinas,

 California, he continued to move around the country, picking up

 temporary work here and there. But he found it hard to settle in one

 place. Worst of all, strange things began happening to him. Well, they

 had always happened to him, but they were getting stranger by the

 month. His perception of reality was changing.

 There was the incident in the motel room. As Par sat in the Las Vegas

 Travelodge on one if his cross-country treks, he perceived someone

 moving around in the room below his. Par strained to hear. It seemed

 like the man was talking to him. What was the man trying to tell him?

 Par couldn't quite catch the words, but the more he listened, the more

 Par was sure he had a message for him which he didn't want anyone else

 to hear. It was very frustrating. No matter how hard he tried, no

 matter how he put his ear down to the floor or against the wall, Par

 couldn't make it out.

 The surreal experiences continued. As Par described it, on a trip down

 to Mexico, he began feeling quite strange, so he went to the US

 consulate late one afternoon to get some help. But everyone in the

 consulate behaved bizarrely.

 They asked him for some identification, and he gave them his wallet.

 They took his Social Security card and his California identification

 card and told him to wait. Par believed they were going to pull up

 information about him on a computer out the back. While waiting, his

 legs began to tremble and a continuous shiver rolled up and down his

 spine. It wasn't a smooth, fluid shiver, it was jerky. He felt like he

 was sitting at the epicentre of an earthquake and it frightened him.

 The consulate staff just stared

 at him.

 Finally Par stopped shaking. The other staff member returned and asked

 him to leave.

 `No-one can help you here,' he told Par.

 Why was the consular official talking to him like that? What did he

 mean--Par had to leave? What was he really trying to say? Par couldn't

 understand him. Another consular officer came around to Par, carrying

 handcuffs. Why was everyone behaving in such a weird way? That

 computer. Maybe they had found some special message next to his name

 on that computer.

 Par tried to explain the situation, but the consulate staff didn't

 seem to understand. He told them about how he had been on the run from

 the Secret Service for two and a half years, but that just got him

 queer looks. Blank faces. No comprehende. The more he explained, the

 blanker the faces became.

 The consular officials told him that the office was closing for the

 day. He would have to leave the building. But Par suspected that was

 just an excuse. A few minutes later, a Mexican policeman showed up. He

 talked with one of the consular officials, who subsequently handed him

 what Par perceived to be a slip of paper wrapped around a wad of peso

 notes.

 Two more policemen came into the consulate. One of them turned to Par

 and said, `Leave!' but Par didn't answer. So the Mexican police

 grabbed Par by the arms and legs and carried him out of the consulate.

 Par felt agitated and confused and, as they crossed the threshold out

 of the consulate, he screamed.

 They put him in a police car and took him to a jail, where they kept

 him overnight.

 The next day, they released Par and he wandered the city aimlessly

 before ending up back at the US consulate. The same consular officer

 came up to him and asked how he was feeling.

 Par said, `OK.'

 Then Par asked if the official could help him get back to the border,

 and he said he could. A few minutes later a white van picked up Par

 and took him to the border crossing. When they arrived, Par asked the

 driver if he could have $2 so he could buy a ticket for the train. The

 driver gave it to him.

 Par boarded the train with no idea of where he was headed.

 [ ]

 Theorem visited Par in California twice in 1992 and the relationship

 continued to blossom. Par tried to find work so he could pay her back

 the $20000 she had lent him during his years on the run and during his

 court case, but it was hard going. People didn't seem to want to hire

 him.

 `You don't have any computer skills,' they told him. He calmly

 explained that, yes, he did indeed have computer skills.

 `Well, which university did you get your degree from?' they asked.

 No, he hadn't got his skills at any university.

 `Well, which companies did you get your work experience from?'

 No, he hadn't learned his skills while working for a company.

 `Well, what did you do from 1989 to 1992?' the temp agency staffer

 inevitably asked in an exasperated voice.

 `I ... ah ... travelled around the country.' What else was Par going

 to say? How could he possibly answer that question?

 If he was lucky, the agency might land him a data-entry job at $8 per

 hour. If he was less fortunate, he might end up doing clerical work

 for less than that.

 By 1993, things had become a little rocky with Theorem. After four and

 a half years together, they broke up. The distance was too great, in

 every sense. Theorem wanted a more stable life--maybe not a

 traditional Swiss family with three children and a pretty chalet in

 the Alps, but something more than Par's transient life on the road.

 The separation was excruciatingly painful for both of them.

 Conversation was strained for weeks after the decision. Theorem kept

 thinking she had made a mistake. She kept wanting to ask Par to come

 back. But she didn't.

 Par drowned himself in alcohol. Shots of tequila, one after the other.

 Scull it. Slam the glass down. Fill it to the top. Throw back another.

 After a while, he passed out. Then he was violently ill for days, but

 somehow he didn't mind. It was cleansing to be so ill.

 Somewhere along the way, Rosen managed to get Par's things returned

 from the Secret Service raids. He passed the outdated computer and

 other equipment back to Par, along with disks, print-outs and notes.

 Par gathered up every shred of evidence from his case, along with a

 bottle of Jack Daniels, and made a bonfire. He shredded print-outs,

 doused them in lighter fluid and set them alight. He fed the disks

 into the fire and watched them melt in the flames. He flipped through

 the pages and pages of notes and official reports and let them pull

 out particular memories. Then he crumpled up each one and tossed it in

 the fire. He even sprinkled a little Jack Daniels across the top for

 good measure.

 As he pulled the pages from a Secret Service report, making them into

 tight paper balls, something caught his eye and made him wonder. Many

 hackers around the world had been busted in a series of raids

 following the first Thanksgiving raid at Par's house back in 1988.

 Erik Bloodaxe, the MOD boys, the LOD boys, The Atlanta Three, Pad and

 Gandalf, the Australians--they had all been either busted or raided

 during 1989, 1990 and 1991.

 How were the raids connected? Were the law-enforcement agencies on

 three different continents really organised enough to coordinate

 worldwide attacks on hackers?

 The Secret Service report gave him a clue. It said that in December

 1988, two informants had called Secret Service special agents in

 separate divisions with information about Par. The informants--both

 hackers--told the Secret Service that Par was not the `Citibank

 hacker' the agency was looking for. They said the real `Citibank

 hacker' was named Phoenix.

 Phoenix from Australia.

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 Chapter 5 -- The Holy Grail

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 So we came and conquered and found

 riches of Commons and Kings

 -- from `River Runs Red', on Blue Sky Mining by Midnight Oil

 There it was, in black and white. Two articles by Helen Meredith in

 The Australian in January 1989.2 The whole Australian computer

 underground was buzzing with the news.

 The first article appeared on 14 January:

 Citibank hackers score $500,000

 An elite group of Australian hackers has lifted more than

 $US500,000 ($580,000) out of America's Citibank in one of the more

 daring hacking crimes in Australia's history.

 Australian federal authorities were reported late yesterday to be

 working with American authorities to pin down the Australian

 connection involving hackers in Melbourne and Sydney.

 These are the elite `freekers' of white collar crime ...

 The Australian connection is reported to have used a telephone in

 the foyer of Telecom's headquarters at 199 William Street in

 Melbourne to send a 2600-hertz signal giving them access to a trunk

 line and ultimately to a managerial access code for Citibank.

 Sources said last night the hackers had lifted $US563,000 from the

 US bank and transferred it into several accounts. The money has now

 been withdrawn ...

 Meanwhile, Victorian police were reported yesterday to be

 systematically searching the homes of dozens of suspects in a

 crackdown on computer hackers ...

 An informed source said Criminal Investigation Bureau officers

 armed with search warrants were now searching through the

 belongings of the hacking community and expected to find hundreds

 of thousands of dollars of goods.

 An informed source said Criminal Investigation Bureau officers

 armed with search warrants were now searching through the

 belongings of the hacking community and expected to find hundreds

 of thousands of dollars of goods.

 The second article was published ten days later:

 Hackers list card hauls on boards

 Authorities remain sceptical of the latest reports of an

 international hacking and phreaking ring and its Australian

 connection.

 Yesterday, however, evidence continued to stream into the Melbourne

 based bulletin boards under suspicion ...

 In the latest round of bulletin board activity, a message from a

 United States hacker known as Captain Cash provided the Australian

 connection with the latest news on Australian credit cards,

 provided by local hackers, and their illegal use by US hackers to

 the value of $US362 018 ($416112).

 The information was taken from a computer bulletin board system

 known as Pacific Island and used actively by the Australian

 connection.

 The message read: `OK on the 5353 series which we are closing

 today--Mastercard $109 400.50. On the 4564 series--Visa which I'll

 leave open for a week

 $209417.90. And on good old don't leave home without someone

 else's: $43 200.

 `Making a grand total of

 $362018.40!

 `Let's hear it for our Aussie friends!

 `I hear they are doing just as well!

 `They are sending more numbers on the 23rd! Great!

 `They will be getting 10%

 as usual...a nice bonus of

 $36 200.00!'

 The bulletin board also contained advice for phreakers on using

 telephones in Telecom's 199 William Street headquarters and the

 green phones at Spencer Street Station in Melbourne--to make free

 international calls ...

 Phoenix, another local bulletin board user, listed prices for

 `EXTC'- tablets ...

 Late Friday, The Australian received evidence suggesting a break-in

 of the US Citibank network by Australian hackers known as The Realm

 ...

 The gang's US connection is believed to be based in Milwaukee and

 Houston. US Federal authorities have already raided US hackers

 involved in Citibank break-ins in the US.

 A covert operation of the Bureau of Criminal Intelligence has had

 the Australian connection under surveillance and last week took

 delivery of six months' of evidence from the Pacific Island board

 and associated boards going by the name of Zen and Megaworks ...

 The Australian hackers include a number of Melbourne people, some

 teenagers, suspected or already convicted of crimes including

 fraud, drug use and car theft. Most are considered to be at the

 least, digital voyeurs, at worst criminals with a possible big

 crime connection.

 The information received by The Australian amounts to a confession

 on the part of the Australian hackers to involvement in the

 break-in of the US Citibank network as well as advice on phreaking

 ... and bank access.

 The following is taken directly from the bulletin board ... It was

 stored in a private mailbox on the board and is from a hacker known

 as Ivan Trotsky to one who uses the name Killer Tomato:

 `OK this is what's been happening ...

 `While back a Sysop had a call from the Feds, they wanted Force's,

 Phoenix's, Nom's, Brett Macmillan's and my names in connection with

 some hacking The Realm had done and also with some carding meant to

 have been done too.

 `Then in the last few days I get info passed to me that the Hack

 that was done to the Citibank in the US which has led to arrests

 over there also had connections to Force and Electron ...'

 DPG monitoring service spokesman, Mr Stuart Gill, said he believed

 the Pacific Island material was only the tip of the iceberg.

 `They're far better organised than the police,' he said.

 `Unless everyone gets their act together and we legislate against

 it, we'll still be talking about the same things this time next

 year.'

 Yesterday, the South Australian police started an operation to put

 bulletin boards operating in that state under surveillance.

 And in Western Australia, both political parties agreed they would

 proceed with an inquiry into computer hacking, whoever was in

 government.

 The Victoria Police fraud squad last week announced it had set up a

 computer crime squad that would investigate complaints of computer

 fraud.

 The articles were painful reading for most in the computer

 underground.

 Who was this Captain Cash? Who was the Killer Tomato? Many believed

 they were either Stuart Gill, or that Gill had forged messages by them

 or others on Bowen's board. Was the underground rife with credit card

 frauders? No. They formed only a very small part of that community.

 Had the Melbourne hackers stolen half a million dollars from Citibank?

 Absolutely not. A subsequent police investigation determined this

 allegation to be a complete fabrication.

 How had six months' worth of messages from PI and Zen found their way

 into the hands of the Victoria Police Bureau of Criminal Intelligence?

 Members of the underground had their suspicions.

 To some, Stuart Gill's role in the underground appeared to be that of

 an information trader. He would feed a police agency information, and

 garner a little new material from it in exchange. He then amalgamated

 the new and old material and delivered the new package to another

 police agency, which provided him a little more material to add to the

 pot. Gill appeared to play the same game in the underground.

 A few members of the underground, particularly PI and Zen regulars

 Mentat and Brett MacMillan, suspected chicanery and began fighting a

 BBS-based war to prove their point. In early 1989, MacMillan posted a

 message stating that Hackwatch was not registered as a business

 trading name belonging to Stuart Gill at the Victorian Corporate

 Affairs office. Further, he stated, DPG Monitoring Services did not

 exist as an official registered business trading name either.

 MacMillan then stunned the underground by announcing that he had

 registered the name Hackwatch himself, presumably to stop Stuart

 Gill's media appearances as a Hackwatch spokesman.

 Many in the underground felt duped by Gill, but they weren't the only

 ones. Soon some journalists and police would feel the same way. Stuart

 Gill wasn't even his real name.

 What Gill really wanted, some citizens in the underground came to

 believe, was a public platform from which he could whip up hacker hype

 and then demand the introduction of tough new anti-hacking laws. In

 mid-1989, the Commonwealth Government did just that, enacting the

 first federal computer crime laws.

 It wasn't the journalists' fault. For example, in one case Helen

 Meredith had asked Gill for verification and he had referred her to

 Superintendent Tony Warren, of the Victoria Police, who had backed him

 up. A reporter couldn't ask for better verification than that.

 And why wouldn't Warren back Gill? A registered ISU informer, Gill

 also acted as a consultant, adviser, confidant and friend to various

 members of the Victoria Police. He was close to both Warren and,

 later, to Inspector Chris Cosgriff. From 1985 to 1987, Warren had

 worked at the Bureau of Criminal Intelligence (BCI). After that, he

 was transferred to the Internal Investigations Department (IID), where

 he worked with Cosgriff who joined IID in 1988.

 Over a six-month period in 1992, Tony Warren received more than 200

 phone calls from Stuart Gill--45 of them to his home number. Over an

 eighteen-month period in 1991-92, Chris Cosgriff made at least 76

 personal visits to Gill's home address and recorded 316 phone calls

 with him.3

 The Internal Security Unit (ISU) investigated corruption within the

 police force. If you had access to ISU, you knew everything that the

 Victoria Police officially knew about corruption within its ranks. Its

 information was highly sensitive, particularly since it could involve

 one police officer dobbing in another. However, a 1993 Victorian

 Ombudsman's report concluded that Cosgriff leaked a large amount of

 confidential ISU material to Gill, and that Warren's relationship with

 Gill was inappropriate.4

 When Craig Bowen (aka Thunderbird1) came to believe in 1989 that he

 had been duped by Gill, he retreated into a state of denial and

 depression. The PI community had trusted him. He entered his

 friendship with Gill a bright-eyed, innocent young man looking for

 adventure. He left the friendship betrayed and gun-shy.

 Sad-eyed and feeling dark on the world, Craig Bowen turned off PI and

 Zen forever.

 [ ]

 Sitting at his computer sometime in the second half of 1989, Force

 stared at his screen without seeing anything, his mind a million miles

 away. The situation was bad, very bad, and lost in thought, he toyed

 with his mouse absent-mindedly, thinking about how to deal with this

 problem.

 The problem was that someone in Melbourne was going to be busted.

 Force wanted to discount the secret warning, to rack it up as just

 another in a long line of rumours which swept through the underground

 periodically, but he knew he couldn't do that. The warning was rock

 solid; it had come from Gavin.\*

 The way Force told it, his friend Gavin worked as a contractor to

 Telecom by day and played at hacking at night. He was Force's little

 secret, who he kept from the other members of The Realm. Gavin was

 definitely not part of the hacker BBS scene. He was older, he didn't

 even have a handle and he hacked alone, or with Force, because he saw

 hacking in groups as risky.

 As a Telecom contractor, Gavin had the kind of access to computers and

 networks which most hackers could only dream about. He also had good

 contacts inside Telecom--the kind who might answer a few tactfully

 worded questions about telephone taps and line traces, or might know a

 bit about police investigations requiring Telecom's help.

 Force had met Gavin while buying some second-hand equipment through

 the Trading Post. They hit it off, became friends and soon began

 hacking together. Under the cover of darkness, they would creep into

 Gavin's office after everyone else had gone home and hack all night.

 At dawn, they tidied up and quietly left the building. Gavin went

 home, showered and returned to work as if nothing had happened.

 Gavin introduced Force to trashing. When they weren't spending the

 night in front of his terminal, Gavin crawled through Telecom's

 dumpsters looking for pearls of information on crumpled bits of office

 paper. Account names, passwords, dial-up modems, NUAs--people wrote

 all sorts of things down on scrap paper and then threw it out the next

 day when they didn't need it any more.

 According to Force, Gavin moved offices frequently, which made it

 easier to muddy the trail. Even better, he worked from offices which

 had dozens of employees making hundreds of calls each day. Gavin and

 Force's illicit activities were buried under a mound of daily

 legitimate transactions.

 The two hackers trusted each other; in fact Gavin was the only person

 to whom Force revealed the exact address of the CitiSaudi machine. Not

 even Phoenix, rising star of The Realm and Force's favoured protégé,

 was privy to all the secrets of Citibank uncovered during Force's

 network explorations.

 Force had shared some of this glittering prize with Phoenix, but not

 all of it. Just a few of the Citibank cards--token trophies--and

 general information about the Citibank network. Believing the

 temptation to collect vast numbers of cards and use them would be too

 great for the young Phoenix, Force tried to keep the exact location of

 the Citibank machine a secret. He knew that Phoenix might eventually

 find the Citibank system on his own, and there was little he could do

 to stop him. But Force was determined that he wouldn't help Phoenix

 get himself into trouble.

 The Citibank network had been a rich source of systems--something

 Force also kept to himself. The more he explored, the more he found in

 the network. Soon after his first discovery of the CitiSaudi system,

 he found a machine called CitiGreece which was just as willing to dump

 card details as its Saudi-American counterpart. Out of fifteen or so

 credit cards Force discovered on the system, only two appeared to be

 valid. He figured the others were test cards and that this must be a

 new site. Not long after the discovery of the CitiGreece machine, he

 discovered similar embryonic sites in two other countries.

 Force liked Phoenix and was impressed by the new hacker's enthusiasm

 and desire to learn about computer networks.

 Force introduced Phoenix to Minerva, just as Craig Bowen had done for

 Force some years before. Phoenix learned quickly and came back for

 more. He was hungry and, in Force's discerning opinion, very bright.

 Indeed, Force saw a great deal of himself in the young hacker. They

 were from a similarly comfortable, educated middle-class background.

 They were also both a little outside the mainstream. Force's family

 were migrants to Australia. Some of Phoenix's family lived in Israel,

 and his family was very religious.

 Phoenix attended one of the most Orthodox Jewish schools in Victoria,

 a place which described itself as a `modern orthodox Zionist'

 institution. Nearly half the subjects offered in year 9 were in Jewish

 Studies, all the boys wore yarmulkes and the school expected students

 to be fluent in Hebrew by the time they graduated.

 In his first years at the school, Phoenix had acquired the nickname

 `The Egg'. Over the following years he became a master at playing the

 game--jumping through hoops to please teachers. He learned that doing

 well in religious studies was a good way to ingratiate himself to

 teachers, as well as his parents and, in their eyes at least, he

 became the golden-haired boy.

 Anyone scratching below the surface, however, would find the shine of

 the golden-haired boy was merely gilt. Despite his success in school

 and his matriculation, Phoenix was having trouble. He had been

 profoundly affected by the bitter break-up and divorce of his parents

 when he was about fourteen.

 After the divorce, Phoenix was sent to boarding school in Israel for

 about six months. On his return to Melbourne, he lived with his

 younger sister and mother at his maternal grandmother's house. His

 brother, the middle child, lived with his father.

 School friends sometimes felt awkward visiting Phoenix at home. One of

 his best friends found it difficult dealing with Phoenix's mother,

 whose vivacity sometimes bordered on the neurotic and shrill. His

 grandmother was a chronic worrier, who pestered Phoenix about using

 the home phone line during thunderstorms for fear he would be

 electrocuted. The situation with Phoenix's father wasn't much better.

 A manager at Telecom, he seemed to waver between appearing

 disinterested or emotionally cold and breaking into violent outbursts

 of anger.

 But it was Phoenix's younger brother who seemed to be the problem

 child. He ran away from home at around seventeen and dealt in drugs

 before eventually finding his feet. Yet, unlike Phoenix, his brother's

 problems had been laid bare for all to see. Hitting rock bottom forced

 him to take stock of his life and come to terms with his situation.

 In contrast, Phoenix found less noticeable ways of expressing his

 rebellion. Among them was his enthusiasm for tools of power--the

 martial arts, weapons such as swords and staffs, and social

 engineering. During his final years of secondary school, while still

 living at his grandmother's home, Phoenix took up hacking. He hung

 around various Melbourne BBSes, and then he developed an on-line

 friendship with Force.

 Force watched Phoenix's hacking skills develop with interest and after

 a couple of months he invited him to join The Realm. It was the

 shortest initiation of any Realm member, and the vote to include the

 new hacker was unanimous. Phoenix proved to be a valuable member,

 collecting information about new systems and networks for The Realm's

 databases. At their peak of hacking activity, Force and Phoenix spoke

 on the phone almost every day.

 Phoenix's new-found acceptance contrasted with the position of

 Electron, who visited The Realm regularly for a few months in 1988. As

 Phoenix basked in the warmth of Force's approval, the

 eighteen-year-old Electron felt the chill of his increasing scorn.

 Force eventually turfed Electron and his friend, Powerspike, out of

 his exclusive Melbourne club of hackers. Well, that was how Force told

 it. He told the other members of The Realm that Electron had committed

 two major sins. The first was that he had been wasting resources by

 using accounts on OTC's Minerva system to connect to Altos, which

 meant the accounts would be immediately tracked and killed.

 Minerva admins such as Michael Rosenberg--sworn enemy of The

 Realm--recognised the Altos NUA. Rosenberg was OTC's best defence

 against hackers. He had spent so much time trying to weed them out of

 Minerva that he knew their habits by heart: hack, then zoom over to

 Altos for a chat with fellow hackers, then hack some more.

 Most accounts on Minerva were held by corporations. How many

 legitimate users from ANZ Bank would visit Altos? None. So when

 Rosenberg saw an account connecting to Altos, he silently observed

 what the hacker was doing--in case he bragged on the German chat

 board--then changed the password and notified the client, in an effort

 to lock the hacker out for good.

 Electron's second sin, according to Force, was that he had been

 withholding hacking information from the rest of the group. Force's

 stated view--though it didn't seem to apply to him personally--was one

 in, all in.

 It was a very public expulsion. Powerspike and Electron told each

 other they didn't really care. As they saw it, they might have visited

 The Realm BBS now and then but they certainly weren't members of The

 Realm. Electron joked with Powerspike, `Who would want to be a member

 of a no-talent outfit like The Realm?' Still, it must have hurt.

 Hackers in the period 1988-90 depended on each other for information.

 They honed their skills in a community which shared intelligence and

 they grew to rely on the pool of information.

 Months later, Force grudgingly allowing Electron to rejoin The Realm,

 but the relationship remained testy. When Electron finally logged in

 again, he found a file in the BBS entitled `Scanner stolen from the

 Electron'. Force had found a copy of Electron's VMS scanner on an

 overseas computer while Electron was in exile and had felt no qualms

 about pinching it for The Realm.

 Except that it wasn't a scanner. It was a VMS Trojan. And there was a

 big difference. It didn't scan for the addresses of computers on a

 network. It snagged passwords when people connected from their VMS

 computers to another machine over an X.25 network. Powerspike cracked

 up laughing when Electron told him. `Well,' he told Powerspike, `Mr

 Bigshot Force might know something about Prime computers, but he

 doesn't know a hell of a lot about VMS.'

 Despite Electron's general fall from grace, Phoenix talked to the

 outcast because they shared the obsession. Electron was on a steep

 learning curve and, like Phoenix, he was moving fast--much faster than

 any of the other Melbourne hackers.

 When Phoenix admitted talking to Electron regularly, Force tried to

 pull him away, but without luck. Some of the disapproval was born of

 Force's paternalistic attitude toward the Australian hacking scene. He

 considered himself to be a sort of godfather in the hacking community.

 But Force was also increasingly concerned at Phoenix's ever more

 flagrant taunting of computer security bigwigs and system admins. In

 one incident, Phoenix knew a couple of system admins and security

 people were waiting on a system to trap him by tracing his network

 connections. He responded by sneaking into the computer unnoticed and

 quietly logging off each admin. Force laughed about it at the time,

 but privately the story made him more than a little nervous.

 Phoenix enjoyed pitting himself against the pinnacles of the computer

 security industry. He wanted to prove he was better, and he frequently

 upset people because often he was. Strangely, though, Force's protégé

 also thought that if he told these experts about a few of the holes in

 their systems, he would somehow gain their approval. Maybe they would

 even give him inside information, like new penetration techniques,

 and, importantly, look after him if things got rough. Force wondered

 how Phoenix could hold two such conflicting thoughts in his mind at

 the same time without questioning the logic of either.

 It was against this backdrop that Gavin came to Force with his urgent

 warning in late 1989. Gavin had learned that the Australian Federal

 Police were getting complaints about hackers operating out of

 Melbourne. The Melbourne hacking community had become very noisy and

 was leaving footprints all over the place as its members traversed the

 world's data networks.

 There were other active hacking communities outside Australia--in the

 north of England, in Texas, in New York. But the Melbourne hackers

 weren't just noisy--they were noisy inside American computers. It

 wasn't just a case of American hackers breaking into American systems.

 This was about foreign nationals penetrating American computers. And

 there was something else which made the Australian hackers a target.

 The US Secret Service knew an Australian named Phoenix had been inside

 Citibank, one of the biggest financial institutions in the US.

 Gavin didn't have many details to give Force. All he knew was that an

 American law enforcement agency--probably the Secret Service--had been

 putting enormous pressure on the Australian government to bust these

 people.

 What Gavin didn't know was that the Secret Service wasn't the only

 source of pressure coming from the other side of the Pacific. The FBI

 had also approached the Australian Federal Police about the mysterious

 but noisy Australian hackers who kept breaking into American systems,5

 and the AFP had acted on the information.

 In late 1989, Detective Superintendent Ken Hunt of the AFP headed an

 investigation into the Melbourne hackers. It was believed to be the

 first major investigation of computer crime since the introduction of

 Australia's first federal anti-hacking laws. Like most law enforcement

 agencies around the world, the AFP were new players in the field of

 computer crime. Few officers had expertise in computers, let alone

 computer crime, so this case would prove to be an important proving

 ground.6

 When Gavin broke the news, Force acted immediately. He called Phoenix

 on the phone, insisting on meeting him in person as soon as possible.

 As their friendship had progressed, they had moved from talking

 on-line to telephone conversations and finally to spending time

 together in person. Force sat Phoenix down alone and gave him a stern

 warning. He didn't tell him how he got his information, but he made it

 clear the source was reliable.

 The word was that the police felt they had to bust someone. It had

 come to the point where an American law enforcement officer had

 reportedly told his Australian counterpart, `If you don't do something

 about it soon, we'll do something about it ourselves'. The American

 hadn't bothered to elaborate on just how they might do something about

 it, but it didn't matter.

 Phoenix looked suddenly pale. He had certainly been very noisy, and

 was breaking into systems virtually all the time now. Many of those

 systems were in the US.

 He certainly didn't want to end up like the West German hacker

 Hagbard, whose petrol-doused, charred remains had been discovered in a

 German forest in June 1989.

 An associate of Pengo's, Hagbard had been involved in a ring of German

 hackers who sold the information they found in American computers to a

 KGB agent in East Germany from 1986 to 1988.

 In March 1989, German police raided the homes and offices of the

 German hacking group and began arresting people. Like Pengo, Hagbard

 had secretly turned himself into the German authorities months before

 and given full details of the hacking ring's activities in the hope of

 gaining immunity from prosecution.

 American law enforcement agencies and prosecutors had not been

 enthusiastic about showing the hackers any leniency. Several US

 agencies, including the CIA and the FBI, had been chasing the German

 espionage ring and they wanted stiff sentences, preferably served in

 an American prison.

 German court proceedings were under way when Hagbard's body was found.

 Did he commit suicide or was he murdered? No-one knew for sure, but

 the news shook the computer underground around the world. Hackers

 discussed the issue in considerable depth. On the one hand, Hagbard

 had a long history of mental instability and drug use, having spent

 time in psychiatric hospitals and detoxification centres off and on

 since the beginning of 1987. On the other hand, if you were going to

 kill yourself, would you really want to die in the agony of a petrol

 fire? Or would you just take a few too many pills or a quick bullet?

 Whether it was murder or suicide, the death of Hagbard loomed large

 before Phoenix. Who were the American law enforcement agencies after

 in Australia? Did they want him?

 No. Force reassured him, they were after Electron. The problem for

 Phoenix was that he kept talking to Electron on the phone--in voice

 conversations. If Phoenix continued associating with Electron, he too

 would be scooped up in the AFP's net.

 The message to Phoenix was crystal clear.

 Stay away from Electron.

 [ ]

 `Listen, you miserable scum-sucking pig.'

 `Huh?' Phoenix answered, only half paying attention.

 `Piece of shit machine. I did all this editing and the damn thing

 didn't save the changes,' Electron growled at the Commodore Amiga,

 with its 512 k of memory, sitting on the desk in his bedroom.

 It was January 1990 and both Phoenix and Electron were at home on

 holidays before the start of university.

 `Yeah. Wish I could get this thing working. Fucking hell. Work you!'

 Phoenix yelled. Electron could hear him typing at the other end of the

 phone while he talked. He had been struggling to get AUX, the Apple

 version of Unix, running on his Macintosh SE30 for days.

 It was difficult to have an uninterrupted conversation with Phoenix.

 If it wasn't his machine crashing, it was his grandmother asking him

 questions from the doorway of his room.

 `You wanna go through the list? How big is your file?' Phoenix asked,

 now more focused on the conversation.

 `Huh? Which file?'

 `The dictionary file. The words to feed into the password cracker,'

 Phoenix replied.

 Electron pulled up his list of dictionary words and looked

 at it. I'm going to have to cut this list down a bit, he thought. The

 dictionary was part of the password cracking program.

 The larger the dictionary, the longer it took the computer to crack a

 list of passwords. If he could weed out obscure words--words that

 people were unlikely to pick as passwords--then he could make his

 cracker run faster.

 An efficient password cracker was a valuable tool. Electron would feed

 his home computer a password file from a target computer, say from

 Melbourne University, then go to bed. About twelve hours later, he

 would check on his machine's progress.

 If he was lucky, he would find six or more accounts--user names and

 their passwords--waiting for him in a file. The process was completely

 automated. Electron could then log into Melbourne University using the

 cracked accounts, all of which could be used as jumping-off points for

 hacking into other systems for the price of a local telephone call.

 Cracking Unix passwords wasn't inordinately difficult,

 provided the different components of the program, such as the

 dictionary, had been set up properly. However, it was time-consuming.

 The principle was simple. Passwords, kept in password files with their

 corresponding user names, were encrypted. It was as impossible to

 reverse the encryption process as it was to unscramble an omelette.

 Instead, you needed to recreate the encryption process and compare the

 results.

 There were three basic steps. First, target a computer and get a copy

 of its password file. Second, take a list of commonly used passwords,

 such as users' names from the password file or words from a

 dictionary, and encrypt those into a second list. Third, put the two

 lists side by side and compare them. When you have a match, you have

 found the password.

 However, there was one important complication: salts. A salt changed

 the way a password was encrypted, subtly modifying the way the DES

 encryption algorithm worked. For example, the word `Underground'

 encrypts two different ways with two different salts: `kyvbExMcdAOVM'

 or `lhFaTmw4Ddrjw'. The first two characters represent the salt, the

 others represent the password. The computer chooses a salt randomly

 when it encrypts a user's password. Only one is used, and there are

 4096 different salts. All Unix computers use salts in their password

 encryption process.

 Salts were intended to make password cracking far more difficult, so a

 hacker couldn't just encrypt a dictionary once and then compare it to

 every list of encrypted passwords he came across in his hacking

 intrusions. The 4096 salts mean that a hacker would have to use 4096

 different dictionaries--each encrypted with a different salt--to

 discover any dictionary word passwords.

 On any one system penetrated by Electron, there might be only 25

 users, and therefore only 25 passwords, most likely using 25 different

 salts. Since the salt characters were stored immediately before the

 encrypted password, he could easily see which salt was being used for

 a particular password. He would therefore only have to encrypt a

 dictionary 25 different times.

 Still, even encrypting a large dictionary 25 times using different

 salts took up too much hard-drive space for a basic home computer. And

 that was just the dictionary. The most sophisticated cracking programs

 also produced `intelligent guesses' of passwords. For example, the

 program might take the user's name and try it in both upper- and

 lower-case letters. It might also add a `1' at the end. In short, the

 program would create new guesses by permutating, shuffling, reversing

 and recombining basic information such as a user's name into new

 `words'.

 `It's 24000 words. Too damn big,' Electron said. Paring down a

 dictionary was a game of trade-offs. The fewer words in a cracking

 dictionary, the less time it was likely to take a computer to break

 the encrypted passwords. A smaller dictionary, however, also meant

 fewer guesses and so a reduced chance of cracking the password of any

 given account.

 `Hmm. Mine's 24328. We better pare it down together.'

 `Yeah. OK. Pick a letter.'

 `C. Let's start with the Cs.'

 `Why C?'

 `C. For my grandmother's cat, Cocoa.'

 `Yeah. OK. Here goes. Cab, Cabal. Cabala. Cabbala.' Electron paused.

 `What the fuck is a Cabbala?'

 `Dunno. Yeah. I've got those. Not Cabbala. OK, Cabaret. Cabbage. Fuck,

 I hate cabbage. Who'd pick Cabbage as their password?'

 `A Pom,' Electron answered.

 `Yeah,' Phoenix laughed before continuing.

 Phoenix sometimes stopped to think about Force's warning, but usually

 he just pushed it to one side when it crept, unwelcomed, into his

 thoughts. Still, it worried him. Force took it seriously enough. Not

 only had he stopped associating with Electron, he appeared to have

 gone very, very quiet.

 In fact, Force had found a new love: music. He was writing and

 performing his own songs. By early 1990 he seemed so busy with his

 music that he had essentially put The Realm on ice. Its members took

 to congregating on a machine owned by another Realm member, Nom, for a

 month or so.

 Somehow, however, Phoenix knew that wasn't all of the story. A hacker

 didn't pick up and walk away from hacking just like that. Especially

 not Force. Force had been obsessed with hacking. It just didn't make

 sense. There had to be something more. Phoenix comforted himself with

 the knowledge that he had followed Force's advice and had stayed away

 from Electron. Well, for a while anyway.

 He had backed right off, watched and waited, but nothing happened.

 Electron was as active in the underground as ever but he hadn't been

 busted. Nothing had changed. Maybe Force's information had been wrong.

 Surely the feds would have busted Electron by now if they were going

 to do anything. So Phoenix began to rebuild his relationship with

 Electron. It was just too tempting. Phoenix was determined not to let

 Force's ego impede his own progress.

 By January 1990, Electron was hacking almost all the time. The only

 time he wasn't hacking was when he was sleeping, and even then he

 often dreamed of hacking. He and Phoenix were sailing past all the

 other Melbourne hackers. Electron had grown beyond Powerspike's

 expertise just as Phoenix had accelerated past Force. They were moving

 away from X.25 networks and into the embryonic Internet, which was

 just as illegal since the universities guarded computer

 accounts--Internet access--very closely.

 Even Nom, with his growing expertise in the Unix operating system

 which formed the basis of many new Internet sites, wasn't up to

 Electron's standard. He didn't have the same level of commitment to

 hacking, the same obsession necessary to be a truly cutting-edge

 hacker. In many ways, the relationship between Nom and Phoenix

 mirrored the relationship between Electron and Powerspike: the support

 act to the main band.

 Electron didn't consider Phoenix a close friend, but he was a kindred

 spirit. In fact he didn't trust Phoenix, who had a big mouth, a big

 ego and a tight friendship with Force--all strikes against him. But

 Phoenix was intelligent and he wanted to learn. Most of all, he had

 the obsession. Phoenix contributed to a flow of information which

 stimulated Electron intellectually, even if more information flowed

 toward Phoenix than from him.

 Within a month, Phoenix and Electron were in regular contact, and

 during the summer holidays they were talking on the phone--voice--all

 the time, sometimes three or four times a day. Hack then talk. Compare

 notes. Hack some more. Check in again, ask a few questions. Then back

 to hacking.

 The actual hacking was generally a solo act. For a social animal like

 Phoenix, it was a lonely pursuit. While many hackers revelled in the

 intense isolation, some, such as Phoenix, also needed to check in with

 fellow humanity once in a while. Not just any humanity--those who

 understood and shared in the obsession.

 `Caboodle. Caboose, `Electron went on, `Cabriolet. What the hell is a

 Cabriolet? Do you know?'

 `Yeah,' Phoenix answered, then rushed on. `OK. Cacao. Cache. Cachet

 ...'

 `Tell us. What is it?' Electron cut Phoenix off.

 `Cachinnation. Cachou ...'

 `Do you know?' Electron asked again, slightly irritated. As usual,

 Phoenix was claiming to know things he probably didn't.

 `Hmm? Uh, yeah,' Phoenix answered weakly. `Cackle. Cacophony ...'

 Electron knew that particular Phoenix `yeah'--the one which said `yes'

 but meant `no, and I don't want to own up to it either so let's drop

 it'.

 Electron made it a habit not to believe most of the things Phoenix

 told him. Unless there was some solid proof, Electron figured it was

 just hot air. He didn't actually like Phoenix much as a person, and

 found talking to him difficult at times. He preferred the company of

 his fellow hacker Powerspike.

 Powerspike was both bright and creative. Electron clicked with him.

 They often joked about the other's bad taste in music. Powerspike

 liked heavy metal, and Electron liked indie music. They shared a

 healthy disrespect for authority. Not just the authority of places

 they hacked into, like the US Naval Research Laboratories or NASA, but

 the authority of The Realm. When it came to politics, they both leaned

 to the left. However, their interest tended more toward

 anarchy--opposing symbols of the military-industrial complex--than to

 joining a political party.

 After their expulsion from The Realm, Electron had been a little

 isolated for a time. The tragedy of his personal life had contributed

 to the isolation. At the age of eight, he had seen his mother die of

 lung cancer. He hadn't witnessed the worst parts of her dying over two

 years, as she had spent some time in a German cancer clinic hoping for

 a reprieve. She had, however, come home to die, and Electron had

 watched her fade away.

 When the phone call from hospital came one night, Electron could tell

 what had happened from the serious tones of the adults. He burst into

 tears. He could hear his father answering questions on the phone. Yes,

 the boy had taken it hard. No, his sister seemed to be OK. Two years

 younger than Electron, she was too young to understand.

 Electron had never been particularly close to his sister. He viewed

 her as an unfeeling, shallow person--someone who simply skimmed along

 the surface of life. But after their mother's death, their father

 began to favour Electron's sister, perhaps because of her resemblance

 to his late wife. This drove a deeper, more subtle wedge between

 brother and sister.

 Electron's father, a painter who taught art at a local high school,

 was profoundly affected by his wife's death. Despite some barriers of

 social class and money, theirs had been a marriage of great affection

 and love and they made a happy home. Electron's father's paintings

 hung on almost every wall in the house, but after his wife's death he

 put down his brushes and never took them up again. He didn't talk

 about it. Once, Electron asked him why he didn't paint any more. He

 looked away and told Electron that he had `lost the motivation'.

 Electron's grandmother moved into the home to help her son care for

 his two children, but she developed Alzheimer's disease. The children

 ended up caring for her. As a teenager, Electron thought it was

 maddening caring for someone who couldn't even remember your name.

 Eventually, she moved into a nursing home.

 In August 1989, Electron's father arrived home from the doctor's

 office. He had been mildly ill for some time, but refused to take time

 off work to visit a doctor. He was proud of having taken only one

 day's sick leave in the last five years. Finally, in the holidays, he

 had seen a doctor who had conducted numerous tests. The results had

 come in.

 Electron's father had bowel cancer and the disease had spread. It

 could not be cured. He had two years to live at the most.

 Electron was nineteen years old at the time, and his early love of the

 computer, and particularly the modem, had already turned into a

 passion. Several years earlier his father, keen to encourage his

 fascination with the new machines, used to bring one of the school's

 Apple IIes home over weekends and holidays. Electron spent hours at

 the borrowed machine. When he wasn't playing on the computer, he read,

 plucking one of his father's spy novels from the over-crowded

 bookcases, or his own favourite book, The Lord of The Rings.

 Computer programming had, however, captured the imagination of the

 young Electron years before he used his first computer. At the age of

 eleven he was using books to write simple programs on paper--mostly

 games--despite the fact that he had never actually touched a keyboard.

 His school may have had a few computers, but its administrators had

 little understanding of what to do with them. In year 9, Electron had

 met with the school's career counsellor, hoping to learn about career

 options working with computers.

 `I think maybe I'd like to do a course in computer programming ...'

 His voice trailed off, hesitantly.

 `Why would you want to do that?' she said. `Can't you think of

 anything better than that?'

 `Uhm ...' Electron was at a loss. He didn't know what to do. That was

 why he had come to her. He cast around for something which seemed a

 more mainstream career option but which might also let him work on

 computers. `Well, accounting maybe?'

 `Oh yes, that's much better,' she said.

 `You can probably even get into a university, and study accounting

 there. I'm sure you will enjoy it,' she added, smiling as she closed

 his file.

 The borrowed computers were, in Electron's opinion, one of the few

 good things about school. He did reasonably well at school, but only

 because it didn't take much effort. Teachers consistently told his

 father that Electron was underachieving and that he distracted the

 other students in class. For the most part, the criticism was just

 low-level noise. Occasionally, however, Electron had more serious

 run-ins with his teachers. Some thought he was gifted. Others thought

 the freckle-faced, Irish-looking boy who helped his friends set fire

 to textbooks at the back of the class was nothing but a smart alec.

 When he was sixteen, Electron bought his own computer. He used it to

 crack software protection, just as Par had done. The Apple was soon

 replaced by a more powerful Amiga with a 20 megabyte IBM compatible

 sidecar. The computers lived, in succession, on one of the two desks

 in his bedroom. The second desk, for his school work, was usually

 piled high with untouched assignments.

 The most striking aspect of Electron's room was the ream after ream of

 dot matrix computer print-out which littered the floor. Standing at

 almost any point in the simply furnished room, someone could reach out

 and grab at least one pile of print-outs, most of which contained

 either usernames and passwords or printed computer program code. In

 between the piles of print-outs, were T-shirts, jeans, sneakers and

 books on the floor. It was impossible to walk across Electron's room

 without stepping on something.

 The turning point for Electron was the purchase of a second-hand 300

 baud modem in 1986. Overnight, the modem transformed Electron's love

 of the computer into an obsession. During the semester immediately

 before the modem's arrival, Electron's report card showed six As and

 one B. The following semester he earned six Bs and only one A.

 Electron had moved onto bigger and better things than school. He

 quickly became a regular user of underground BBSes and began hacking.

 He was enthralled by an article he discovered describing how several

 hackers claimed to have moved a satellite around in space simply by

 hacking computers. From that moment on, Electron decided he wanted to

 hack--to find out if the article was true.

 Before he graduated from school in 1987, Electron had hacked NASA, an

 achievement which saw him dancing around the dining room table in the

 middle of the night chanting, `I got into NASA! I got into NASA!' He

 hadn't moved any satellites, but getting into the space agency was as

 thrilling as flying to the moon.

 By 1989, he had been hacking regularly for years, much to the chagrin

 of his sister, who claimed her social life suffered because the

 family's sole phone line was always tied up by the modem.

 For Phoenix, Electron was a partner in hacking, and to a lesser degree

 a mentor. Electron had a lot to offer, by that time even more than The

 Realm.

 `Cactus, Cad, Cadaver, Caddis, Cadence, Cadet, Caesura. What the fuck

 is a Caesura?' Phoenix kept ploughing through the Cs.

 `Dunno. Kill that,' Electron answered, distracted.

 `Caesura. Well, fuck. I know I'd wanna use that as a password.'

 Phoenix laughed. `What the hell kind of word is Caduceus?'

 `A dead one. Kill all those. Who makes up these dictionaries?'

 Electron said.

 `Yeah.'

 `Caisson, Calabash. Kill those. Kill, kill, kill,' Electron said

 gleefully.

 `Hang on. How come I don't have Calabash in my list?' Phoenix feigned

 indignation.

 Electron laughed.

 `Hey,' Phoenix said, `we should put in words like "Qwerty" and

 "ABCDEF" and "ASDFGH".'

 `Did that already.' Electron had already put together a list of other

 common passwords, such as the `words' made when a user typed the six

 letters in the first alphabet row on a keyboard.

 Phoenix started on the list again. `OK the COs. Commend, Comment,

 Commerce, Commercial, Commercialism, Commercially. Kill those last

 three.'

 `Huh? Why kill Commercial?'

 `Let's just kill all the words with more than eight characters,'

 Phoenix said.

 `No. That's not a good idea.'

 `How come? The computer's only going to read the first eight

 characters and encrypt those. So we should kill all the rest.'

 Sometimes Phoenix just didn't get it. But Electron didn't rub it in.

 He kept it low-key, so as not to bruise Phoenix's ego. Often Electron

 sensed Phoenix sought approval from the older hacker, but it was a

 subtle, perhaps even unconscious search.

 `Nah,' Electron began, `See, someone might use the whole word,

 Commerce or Commercial. The first eight letters of these words are not

 the same. The eighth character in Commerce is "e", but in Commercial

 it's "i".'

 There was a short silence.

 `Yeah,' Electron went on, `but you could kill all the words

 like Commercially, and Commercialism, that come after Commercial.

 See?'

 `Yeah. OK. I see,' Phoenix said.

 `But don't just kill every word longer than eight characters,'

 Electron added.

 `Hmm. OK. Yeah, all right.' Phoenix seemed a bit out of sorts. `Hey,'

 he brightened a bit, `it's been a whole ten minutes since my machine

 crashed.'

 `Yeah?' Electron tried to sound interested.

 `Yeah. You know,' Phoenix changed the subject to his favourite topic,

 `what we really need is Deszip. Gotta get that.' Deszip was a computer

 program which could be used for password cracking.

 `And Zardoz. We need Zardoz,' Electron added. Zardoz was a restricted

 electronic publication detailing computer security holes.

 `Yeah. Gotta try to get into Spaf's machine. Spaf'll have it for

 sure.' Eugene Spafford, Associate Professor of Computer Science at

 Purdue University in the US, was one of the best known computer

 security experts on the Internet in 1990.

 `Yeah.'

 And so began their hunt for the holy grail.

 [ ]

 Deszip and Zardoz glittered side by side as the most coveted prizes in

 the world of the international Unix hacker.

 Cracking passwords took time and computer resources. Even a moderately

 powerful university machine would grunt and groan under the weight of

 the calculations if it was asked to do. But the Deszip program could

 change that, lifting the load until it was, by comparison,

 feather-light. It worked at breathtaking speed and a hacker using

 Deszip could crack encrypted passwords up to 25 times faster.

 Zardoz, a worldwide security mailing list, was also precious, but for

 a different reason. Although the mailing list's formal name was

 Security Digest, everyone in the underground simply called it Zardoz,

 after the computer from which the mailouts originated. Zardoz also

 happened to be the name of a science fiction cult film starring Sean

 Connery. Run by Neil Gorsuch, the Zardoz mailing list contained

 articles, or postings, from various members of the computer security

 industry. The postings discussed newly discovered bugs--problems with

 a computer system which could be exploited to break into or gain root

 access on a machine. The beauty of the bugs outlined in Zardoz was

 that they worked on any computer system using the programs or

 operating systems it described. Any university, any military system,

 any research institute which ran the software documented in Zardoz was

 vulnerable. Zardoz was a giant key ring, full of pass keys made to fit

 virtually every lock.

 True, system administrators who read a particular Zardoz posting might

 take steps to close up that security hole. But as the hacking

 community knew well, it was a long time between a Zardoz posting and a

 shortage of systems with that hole. Often a bug worked on many

 computers for months--sometimes years--after being announced on

 Zardoz.

 Why? Many admins had never heard of the bug when it was first

 announced. Zardoz was an exclusive club, and most admins simply

 weren't members. You couldn't just walk in off the street and sign up

 for Zardoz. You had to be vetted by peers in the computer security

 industry. You had to administer a legitimate computer system,

 preferably with a large institution such as a university or a research

 body such as CSIRO. Figuratively speaking, the established members of

 the Zardoz mailing list peered down their noses at you and determined

 if you were worthy of inclusion in Club Zardoz. Only they decided if

 you were trustworthy enough to share in the great security secrets of

 the world's computer systems.

 In 1989, the white hats, as hackers called the professional security

 gurus, were highly paranoid about Zardoz getting into the wrong hands.

 So much so, in fact, that many postings to Zardoz were fine examples

 of the art of obliqueness. A computer security expert would hint at a

 new bug in his posting without actually coming out and explaining it

 in what is commonly referred to as a `cookbook' explanation.

 This led to a raging debate within the comp-sec industry. In one

 corner, the cookbook purists said that bulletins such as Zardoz were

 only going to be helpful if people were frank with each other. They

 wanted people posting to Zardoz to provide detailed, step-by-step

 explanations on how to exploit a particular security hole. Hackers

 would always find out about bugs one way or another and the best way

 to keep them out of your system was to secure it properly in the first

 place. They wanted full disclosure.

 In the other corner, the hard-line, command-and-control computer

 security types argued that posting an announcement to Zardoz posed the

 gravest of security risks. What if Zardoz fell into the wrong hands?

 Why, any sixteen-year-old hacker would have step-by-step directions

 showing how to break into thousands of individual computers! If you

 had to reveal a security flaw--and the jury was still out in their

 minds as to whether that was such a good idea--it should be done only

 in the most oblique terms.

 What the hard-liners failed to understand was that world-class hackers

 like Electron could read the most oblique, carefully crafted Zardoz

 postings and, within a matter of days if not hours, work out exactly

 how to exploit the security hole hinted at in the text. After which

 they could just as easily have written a cookbook version of the

 security bug.

 Most good hackers had come across one or two issues of Zardoz in their

 travels, often while rummaging though the system administrator's mail

 on a prestigious institution's computer. But no-one from the elite of

 the Altos underground had a full archive of all the back issues. The

 hacker who possessed that would have details of every major security

 hole discovered by the world's best computer security minds since at

 least 1988.

 Like Zardoz, Deszip was well guarded. It was written by computer

 security expert Dr Matthew Bishop, who worked at NASA's Research

 Institute for Advanced Computer Science before taking up a teaching

 position at Dartmouth, an Ivy League college in New Hampshire. The

 United States government deemed Deszip's very fast encryption

 algorithms to be so important, they were classified as armaments. It

 was illegal to export them from the US.

 Of course, few hackers in 1990 had the sophistication to use weapons

 such as Zardoz and Deszip properly. Indeed, few even knew they

 existed. But Electron and Phoenix knew, along with a tiny handful of

 others, including Pad and Gandalf from Britain. Congregating on Altos

 in Germany, they worked with a select group of others carefully

 targeting sites likely to contain parts of their holy grail. They were

 methodical and highly strategic, piecing information together with

 exquisite, almost forensic, skill. While the common rabble of other

 hackers were thumping their heads against walls in brute-force attacks

 on random machines, these hackers spent their time hunting for

 strategic pressure points--the Achilles' heels of the computer

 security community.

 They had developed an informal hit list of machines, most of which

 belonged to high-level computer security gurus. Finding one or two

 early issues of Zardoz, Electron had combed through their postings

 looking not just on the surface--for the security bugs--but also

 paying careful attention to the names and addresses of the people

 writing articles. Authors who appeared frequently in Zardoz, or had

 something intelligent to say, went on the hit list. It was those

 people who were most likely to keep copies of Deszip or an archive of

 Zardoz on their machines.

 Electron had searched across the world for information about Deszip

 and DES (Data Encryption Standard), the original encryption program

 later used in Deszip. He hunted through computers at the University of

 New York, the US Naval Research Laboratories in Washington DC,

 Helsinki University of Technology, Rutgers University in New Jersey,

 Melbourne University and Tampere University in Finland, but the search

 bore little fruit. He found a copy of CDES, a public domain encryption

 program which used the DES algorithm, but not Deszip. CDES could be

 used to encrypt files but not to crack passwords.

 The two Australian hackers had, however, enjoyed a small taste of

 Deszip. In 1989 they had broken into a computer at Dartmouth College

 called Bear. They discovered Deszip carefully tucked away in a corner

 of Bear and had spirited a copy of the program away to a safer machine

 at another institution.

 It turned out to be a hollow victory. That copy of Deszip had been

 encrypted with Crypt, a program based on the German Enigma machine

 used in World War II. Without the passphrase--the key to unlock the

 encryption--it was impossible to read Deszip. All they could do was

 stare, frustrated, at the file name Deszip labelling a treasure just

 out of reach.

 Undaunted, the hackers decided to keep the encrypted file just in case

 they ever came across the passphrase somewhere--in an email letter,

 for example--in one of the dozens of new computers they now hacked

 regularly. Relabelling the encrypted Deszip file with a more innocuous

 name, they stored the copy in a dark corner of another machine.

 Thinking it wise to buy a little insurance as well, they gave a second

 copy of the encrypted Deszip to Gandalf, who stored it on a machine in

 the UK in case the Australians' copy disappeared unexpectedly.

 [ ]

 In January 1990, Electron turned his attention to getting Zardoz.

 After carefully reviewing an old copy of Zardoz, he had discovered a

 system admin in Melbourne on the list. The subscriber could well have

 the entire Zardoz archive on his machine, and that machine was so

 close--less than half an hour's drive from Electron's home. All

 Electron had to do was to break into the CSIRO.

 The Commonwealth Scientific and Industrial Research Organisation, or

 CSIRO, is a government owned and operated research body with many

 offices around Australia. Electron only wanted to get into one: the

 Division of Information Technology at 55 Barry Street, Carlton, just

 around the corner from the University of Melbourne.

 Rummaging through a Melbourne University computer, Electron had

 already found one copy of the Zardoz archive, belonging to a system

 admin. He gathered it up and quietly began downloading it to his

 computer, but as his machine slowly siphoned off the Zardoz copy, his

 link to the university abruptly went dead. The admin had discovered

 the hacker and quickly killed the connection. All of which left

 Electron back at square one--until he found another copy of Zardoz on

 the CSIRO machine.

 It was nearly 3 a.m. on 1 February 1990, but Electron wasn't tired.

 His head was buzzing. He had just successfully penetrated an account

 called Worsley on the CSIRO computer called

 DITMELA, using the sendmail bug. Electron assumed

 DITMELA stood for Division of Information Technology, Melbourne,

 computer `A'.

 Electron began sifting through Andrew Worsley's directories that day.

 He knew Zardoz was in there somewhere, since he had seen it before.

 After probing the computer, experimenting with different security

 holes hoping one would let him inside, Electron managed to slip in

 unnoticed. It was mid-afternoon, a bad time to hack a computer since

 someone at work would likely spot the intruder before long. So

 Electron told himself this was just a reconnaissance mission. Find out

 if Zardoz was on the machine, then get out of there fast and come back

 later--preferably in the middle of the night--to pull Zardoz out.

 When he found a complete collection of Zardoz in Worsley's directory,

 Electron was tempted to try a grab and run. The problem was that, with

 his slow modem, he couldn't run very quickly. Downloading Zardoz would

 take several hours. Quashing his overwhelming desire to reach out and

 grab Zardoz then and there, he slipped out of the machine noiselessly.

 Early next morning, an excited and impatient Electron crept back into

 DITMELA and headed straight for Worsley's directory. Zardoz was still

 there. And a sweet irony. Electron was using a security bug he had

 found on an early issue of Zardoz to break into the computer which

 would surrender the entire archive to him.

 Getting Zardoz out of the CSIRO machine was going to be a little

 difficult. It was a big archive and at 300 baud--30 characters per

 second--Electron's modem would take five hours to siphon off an entire

 copy. Using the CAT command, Electron made copies of all the Zardoz

 issues and bundled them up into one 500 k file. He called the new file

 .t and stored it in the temporary directory on DITMELA.

 Then he considered what to do next. He would mail the Zardoz bundle to

 another account outside the CSIRO computer, for safe-keeping. But

 after that he had to make a choice: try to download the thing himself

 or hang up, call Phoenix and ask him to download it.

 Using his 2400 baud modem, Phoenix would be able to download the

 Zardoz bundle eight times faster than Electron could. On the other

 hand, Electron didn't particularly want to give Phoenix access to the

 CSIRO machine. They had both been targeting the machine, but he hadn't

 told Phoenix that he had actually managed to get in. It wasn't that he

 planned on withholding Zardoz when he got it. Quite the contrary,

 Electron wanted Phoenix to read the security file so they could bounce

 ideas off each other. When it came to accounts, however, Phoenix had a

 way of messing things up. He talked too much. He was simply not

 discreet.

 While Electron considered his decision, his fingers kept working at

 the keyboard. He typed quickly, mailing copies of the Zardoz bundle to

 two hacked student accounts at Melbourne University. With the

 passwords to both accounts, he could get in whenever he wanted and he

 wasn't taking any chances with this precious cargo. Two accounts were

 safer than one--a main account and a back-up in case someone changed

 the password on the first one.

 Then, as the DITMELA machine was still in the process of mailing the

 Zardoz bundle off to the back-up sites, Electron's connection suddenly

 died.

 The CSIRO machine had hung up on him, which probably meant one thing.

 The admin had logged him off. Electron was furious. What the hell was

 a system administrator doing on a computer at this hour? The admin was

 supposed to be asleep! That's why Electron logged on when he did. He

 had seen Zardoz on the CSIRO machine the day before but he had been so

 patient refusing to touch it because the risk of discovery was too

 great. And now this.

 The only hope was to call Phoenix and get him to login to the

 Melbourne Uni accounts to see if the mail had arrived safely. If so,

 he could download it with his faster modem before the CSIRO admin had

 time to warn the Melbourne Uni admin, who would change the passwords.

 Electron got on the phone to Phoenix. They had long since stopped

 caring about what time of day they rang each other. 10 p.m. 2 a.m.

 4.15 a.m. 6.45 a.m.

 `Yeah.' Electron greeted Phoenix in the usual way.

 `Yup,' Phoenix responded.

 Electron told Phoenix what happened and gave him the two accounts at

 Melbourne University where he had mailed the Zardoz bundle.

 Phoenix hung up and rang back a few minutes later. Both accounts were

 dead. Someone from Melbourne University had gone in and changed the

 passwords within 30 minutes of Electron being booted off the CSIRO

 computer. Both hackers were disturbed by the implications of this

 event. It meant someone--in fact probably several people--were onto

 them. But their desperation to get Zardoz overcame their fear.

 Electron had one more account on the CSIRO computer. He didn't want to

 give it to Phoenix, but he didn't have a choice. Still, the whole

 venture was filled with uncertainty. Who knew if the Zardoz bundle was

 still there? Surely an admin who bothered to kick Electron out would

 move Zardoz to somewhere inaccessible. There was, however, a single

 chance.

 When Electron read off the password and username, he told Phoenix to

 copy the Zardoz bundle to a few other machines on the Internet instead

 of trying to download it to his own computer. It would be much

 quicker, and the CSIRO admin wouldn't dare break into someone else's

 computers to delete the copied file. Choosing overseas sites would

 make it even harder for the admin to reach the admins of those

 machines and warn them in time. Then, once Zardoz was safely tucked

 away in a few back-up sites, Phoenix could download it over the

 Internet from one of those with less risk of being booted off the

 machine halfway through the process.

 Sitting at his home in Kelvin Grove, Thornbury, just two suburbs north

 of the CSIRO machine, Ian Mathieson watched the hacker break into his

 computer again. Awoken by a phone call at 2.30 a.m. telling him there

 was a suspected hacker in his computer, Mathieson immediately logged

 in to his work system, DITMELA, via his home computer and modem. The

 call, from David Hornsby of the Melbourne University Computer Science

 Department, was no false alarm.

 After watching the unknown hacker, who had logged in through a

 Melbourne University machine terminal server, for about twenty

 minutes, Mathieson booted the hacker off his system. Afterwards he

 noticed that the DITMELA computer was still trying to execute a

 command issued by the hacker. He looked a little closer, and

 discovered DITMELA was trying to deliver mail to two Melbourne

 University accounts.

 The mail, however, hadn't been completely delivered. It was still

 sitting in the mail spool, a temporary holding pen for undelivered

 mail. Curious as to what the hacker would want so much from his

 system, Mathieson moved the file into a subdirectory to look at it. He

 was horrified to find the entire Zardoz archive, and he knew exactly

 what it meant. These were no ordinary hackers--they were precision

 fliers. Fortunately, Mathieson

 consoled himself, he had stopped the mail before it had been sent out

 and secured it.

 Unfortunately, however, Mathieson had missed Electron's original

 file--the bundle of Zardoz copies. When Electron had mailed the file,

 he had copied it, leaving the original intact. They were still sitting

 on DITMELA under the unassuming name .t. Mailing a file didn't delete

 it--the computer only sent a copy of the original. Mathieson was an

 intelligent man, a medical doctor with a master's degree in computer

 science, but he had forgotten to check the temporary directory, one of

 the few places a hacker could store files on a Unix system if he

 didn't have root privileges.

 At exactly 3.30 a.m. Phoenix logged into DITMELA from the University

 of Texas. He quickly looked in the temporary directory. The .t file

 was there, just as Electron had said it would be. The hacker quickly

 began transferring it back to the University of Texas.

 He was feeling good. It looked like the Australians were going to get

 the entire Zardoz collection after all. Everything was going extremely

 well--until the transfer suddenly died. Phoenix had forgotten to check

 that there was enough disk space available on the University of Texas

 account to download the sizeable Zardoz bundle. Now, as he was logged

 into a very hot machine, a machine where the admin could well be

 watching his every move, he discovered there wasn't enough room for

 the Zardoz file.

 Aware that every second spent on-line to DITMELA posed a serious risk,

 Phoenix logged off the CSIRO machine immediately. Still connected to

 the Texas computer, he fiddled around with it, deleting other files

 and making enough room to pull the whole 500 k Zardoz file across.

 At 3.37 a.m. Phoenix entered DITMELA again. This time, he vowed,

 nothing would go wrong. He started up the file transfer and waited.

 Less than ten minutes later, he logged off the CSIRO computer and

 nervously checked the University of Texas system. It was there.

 Zardoz, in all its glory. And it was his! Phoenix was ecstatic.

 He wasn't done yet and there was no time for complacency. Swiftly, he

 began compressing and encrypting Zardoz. He

 compressed it because a smaller file was less obvious on the Texas

 machine and was faster to send to a back-up machine. He encrypted it

 so no-one nosing around the file would be able to see what was in it.

 He wasn't just worried about system admins; the Texas system was

 riddled with hackers, in part because it was home to his friend,

 Legion of Doom hacker Erik Bloodaxe, a

 student at the university.

 After Phoenix was satisfied Zardoz was safe, he rang Electron just

 before 4 a.m. with the good news. By 8.15, Phoenix had downloaded

 Zardoz from the Texas computer onto his own machine. By 1.15 p.m.,

 Electron had downloaded it from Phoenix's machine to his own.

 [ ]

 Zardoz had been a difficult conquest, but Deszip would prove to be

 even more so. While dozens of security experts possessed complete

 Zardoz archives, far fewer people had Deszip. And, at least

 officially, all of them were in the US.

 The US government banned the export of cryptography algorithms. To

 send a copy of Deszip, or DES or indeed any other encryption program

 outside the US was a crime. It was illegal because the US State

 Department's Office of Defense Trade Controls considered any

 encryption program to be a weapon. ITAR, the International Traffic in

 Arms Regulations stemming from the US Arms Export Control Act 1977,

 restricted publication of and trad in `defense articles'. It didn't

 matter whether you flew to Europe with a disk in your pocket, or you

 sent the material over the Internet. If you violated ITAR, you faced

 the prospect of prison.

 Occasionally, American computer programmers discreetly slipped copies

 of encryption programs to specialists in their field outside the US.

 Once the program was outside the US, it was fair game--there was

 nothing US authorities could do about someone in Norway sending Deszip

 to a colleague in Australia. But even so, the comp-sec and

 cryptography communities outside the US still held programs such as

 Deszip very tightly within their own inner sanctums.

 All of which meant that Electron and Phoenix would almost certainly

 have to target a site in the US. Electron continued to compile a hit

 list, based on the Zardoz mailing list, which he gave to Phoenix. The

 two hackers then began searching the growing Internet for computers

 belonging to the targets.

 It was an impressive hit list. Matthew Bishop, author of Deszip.

 Russell Brand, of the Lawrence Livermore National Labs, a research

 laboratory funded by the US Department of Energy. Dan Farmer, an

 author of the computer program COPS, a popular security-testing

 program which included a password cracking program. There were others.

 And, at the top of the list, Eugene Spafford, or Spaf, as the hackers

 called him.

 By 1990, the computer underground viewed Spaf not just as security

 guru, but also as an anti-hacker zealot. Spaf was based at Purdue

 University, a hotbed of computer security experts. Bishop had earned

 his PhD at Purdue and Dan Farmer was still there. Spaf was also one of

 the founders of usenet, the Internet newsgroups service. While working

 as a computer scientist at the university, he had made a name for

 himself by, among other things, writing a technical analysis of the

 RTM worm. The worm, authored by Cornell University student Robert T.

 Morris Jr in 1988, proved to be a boon for Spaf's career.

 Prior to the RTM worm, Spaf had been working in software engineering.

 After the worm, he became a computer ethicist and a very public

 spokesman for the conservatives in the computer security industry.

 Spaf went on tour across the US, lecturing the public and the media on

 worms, viruses and the ethics of hacking. During the Morris case,

 hacking became a hot topic in the United States, and Spaf fed the

 flames. When Judge Howard G. Munson refused to sentence Morris to

 prison, instead ordering him to complete 400 hours community service,

 pay a $10000 fine and submit to three years probation, Spaf publicly

 railed against the decision. The media reported that he had called on

 the computer industry to boycott any company which chose to employ

 Robert T. Morris Jr.

 Targeting Spaf therefore served a dual purpose for the Australian

 hackers. He was undoubtedly a repository of treasures such as Deszip,

 and he was also a tall poppy.

 One night, Electron and Phoenix decided to break into Spaf's machine

 at Purdue to steal a copy of Deszip. Phoenix would do the actual

 hacking, since he had the fast modem, but he would talk to Electron

 simultaneously on the other phone line. Electron would guide him at

 each step. That way, when Phoenix hit a snag, he wouldn't have to

 retreat to regroup and risk discovery.

 Both hackers had managed to break into another computer at Purdue,

 called Medusa. But Spaf had a separate machine, Uther, which was

 connected to Medusa.

 Phoenix poked and prodded at Uther, trying to open a hole wide enough

 for him to crawl through. At Electron's suggestion, he tried to use

 the CHFN bug. The CHFN command lets users change the information

 provided--such as their name, work address or office phone

 number--when someone `fingers' their accounts. The bug had appeared in

 one of the Zardoz files and Phoenix and Electron had already used it

 to break into several other machines.

 Electron wanted to use the CHFN bug because, if the attack was

 successful, Phoenix would be able to make a root account for himself

 on Spaf's machine. That would be the ultimate slap in the face to a

 high-profile computer security guru.

 But things weren't going well for Phoenix. The frustrated Australian

 hacker kept telling Electron that the bug should work, but it

 wouldn't, and he couldn't figure out why. The problem, Electron

 finally concluded, was that Spaf's machine was a Sequent. The CHFN bug

 depended on a particular Unix password file structure, but Sequents

 used a different structure. It didn't help that Phoenix didn't know

 that much about Sequents--they were one of Gandalf's specialties.

 After a few exasperating hours struggling to make the CHFN bug work,

 Phoenix gave up and turned to another security flaw suggested by

 Electron: the FTP bug. Phoenix ran through the bug in his mind.

 Normally, someone used FTP, or file transfer protocol, to transfer

 files over a network, such as the Internet, from one computer to

 another. FTPing to another machine was a bit like telnetting, but the

 user didn't need a password to login and the commands he could execute

 once in the other computer were usually very limited.

 If it worked, the FTP bug would allow Phoenix to slip in an extra

 command during the FTP login process. That command would force Spaf's

 machine to allow Phoenix to login as anyone he wanted--and what he

 wanted was to login as someone who had root privileges. The `root'

 account might be a little obvious

 if anyone was watching, and it didn't always have remote

 access anyway. So he chose `daemon', another commonly root-privileged

 account, instead.

 It was a shot in the dark. Phoenix was fairly sure Spaf would have

 secured his machine against such an obvious attack, but Electron urged

 him to give it a try anyway. The FTP bug had been announced throughout

 the computer security community long ago, appearing in an early issue

 of Zardoz. Phoenix hesitated, but he had run out of ideas, and time.

 Phoenix typed:

 FTP -i uther.purdue.edu

 quote user anonymous

 quote cd ~daemon

 quote pass anything

 The few seconds it took for his commands to course from his suburban

 home in Melbourne and race deep into the Midwest felt like a lifetime.

 He wanted Spaf's machine, wanted Deszip, and wanted this attack to

 work. If he could just get Deszip, he felt the Australians would be

 unstoppable.

 Spaf's machine opened its door as politely as a doorman at the Ritz

 Carlton. Phoenix smiled at his computer. He was in.

 It was like being in Aladdin's cave. Phoenix just sat there, stunned

 at the bounty which lay before him. It was his, all his. Spaf had

 megabytes of security files in his directories. Source code for the

 RTM Internet worm. Source code for the WANK worm. Everything. Phoenix

 wanted to plunge his hands in each treasure chest and scoop out greedy

 handfuls, but he resisted the urge. He had a more important--a more

 strategic--mission to accomplish first.

 He prowled through the directories, hunting everywhere for Deszip.

 Like a burglar scouring the house for the family silver, he pawed

 through directory after directory. Surely, Spaf had to have Deszip. If

 anyone besides Matthew Bishop was going to have a copy, he would. And

 finally, there it was. Deszip. Just waiting for Phoenix.

 Then Phoenix noticed something else. Another file. Curiosity got the

 better of him and he zoomed in to have a quick look. This one

 contained a passphrase--the passphrase. The phrase the Australians

 needed to decrypt the original copy of Deszip they had stolen from the

 Bear computer at Dartmouth three months earlier. Phoenix couldn't

 believe the passphrase. It was so simple, so obvious. But he caught

 himself. This was no time to cry over spilled milk. He had to get

 Deszip out of the machine quickly, before anyone noticed he was there.

 But as Phoenix began typing in commands, his screen appeared to freeze

 up. He checked. It wasn't his computer. Something was wrong at the

 other end. He was still logged into Spaf's machine. The connection

 hadn't been killed. But when he typed commands, the computer in West

 Lafayette, Indiana, didn't respond. Spaf's machine just sat there,

 deaf and dumb.

 Phoenix stared at his computer, trying to figure out what was

 happening. Why wouldn't Spaf's machine answer? There were two

 possibilities. Either the network--the connection between the first

 machine he penetrated at Purdue and Spaf's own machine--had gone down

 accidentally. Or someone had pulled the plug.

 Why pull the plug? If they knew he was in there, why not just kick him

 out of the machine? Better still, why not kick him out of Purdue all

 together? Maybe they wanted to keep him on-line to trace which machine

 he was coming from, eventually winding backwards from system to

 system, following his trail.

 Phoenix was in a dilemma. If the connection had crashed by accident,

 he wanted to stay put and wait for the network to come back up again.

 The FTP hole in Spaf's machine was an incredible piece of luck.

 Chances were that someone would find

 evidence of his break-in after he left and plug it. On the

 other hand, he didn't want the people at Purdue tracing his

 connections.

 He waited a few more minutes, trying to hedge his bets. Feeling nervy

 as the extended silence emanating from Spaf's machine wore on, Phoenix

 decided to jump. With the lost treasures of Aladdin's cave fading in

 his mind's eye like a mirage, Phoenix killed his connection.

 Electron and Phoenix talked on the phone, moodily contemplating their

 losses. It was a blow, but Electron reminded himself that getting

 Deszip was never going to be easy. At least they had the passphrase to

 unlock the encrypted Deszip taken from Dartmouth.

 Soon, however, they discovered a problem. There had to be one,

 Electron thought. They couldn't just have something go off without a

 hitch for a change. That would be too easy. The problem this time was

 that when they went searching for their copy from Dartmouth, which had

 been stored several months before, it had vanished. The Dartmouth

 system admin must have deleted it.

 It was maddening. The frustration was unbearable. Each time they had

 Deszip just within their grasp, it slipped away and

 disappeared. Yet each time they lost their grip, it only deepened

 their desire to capture the elusive prize. Deszip was fast becoming an

 all-consuming obsession for Phoenix and Electron.

 Their one last hope was the second copy of the encrypted Dartmouth

 Deszip file they had given to Gandalf, but that hope did not burn

 brightly. After all, if the Australians' copy had been deleted, there

 was every likelihood that the Brit's copy had suffered the same fate.

 Gandalf's copy hadn't been stored on his own computer. He had put it

 on some dark corner of a machine in Britain.

 Electron and Phoenix logged onto Altos and waited for Pad or Gandalf

 to show up.

 Phoenix typed .s for a list of who was on-line. He saw that Pad was

 logged on:

 No Chan User

 0 Guest

 1 Phoenix

 2 Pad

 Guest 0 was Electron. He usually logged on as Guest, partly because he

 was so paranoid about being busted and because he believed operators

 monitored his connections if they knew it was Electron logging in.

 They seemed to take great joy in sniffing the password to his own

 account on Altos. Then, when he had logged off, they logged in and

 changed his password so he couldn't get back under the name Electron.

 Nothing was more annoying. Phoenix typed, `Hey, Pad. How's it going?'

 Pad wrote back, `Feeny! Heya.'

 `Do you and Gand still have that encrypted copy of Deszip we gave you

 a few months ago?'

 `Encrypted copy ... hmm. Thinking.' Pad paused. He and Gandalf hacked

 dozens of computer systems regularly. Sometimes it was difficult to

 recall just where they had stored things.

 `Yeah, I know what you mean. I don't know. It was on a system on

 JANET,' Pad said. Britain's Joint Academic Network was the equivalent

 of Australia's AARNET, an early Internet based largely on a backbone

 of universities and research centres.

 `I can't remember which system it was on,' Pad continued.

 If the Brits couldn't recall the institution, let alone the machine

 where they had hidden Deszip, it was time to give up

 all hope. JANET comprised hundreds, maybe thousands, of machines. It

 was far too big a place to randomly hunt around for a file which

 Gandalf would no doubt have tried to disguise in the first place.

 `But the file was encrypted, and you didn't have the password,' Pad

 wrote. `How come you want it?'

 `Because we found the password. <smile>' That was the

 etiquette on Altos. If you wanted to suggest an action, you put it in

 < >.

 `Gr8!' Pad answered.

 That was Pad and Gandalf's on-line style. The number eight was the

 British hackers' hallmark, since their group was called 8lgm, and they

 used it instead of letters. Words like `great', `mate' and `later'

 became `gr8', `m8' and `l8r'.

 When people logged into Altos they could name a `place' of origin for

 others to see. Of course, if you were logging from a country which had

 laws against hacking, you wouldn't give your real country. You'd just

 pick a place at random. Some people logged in from places like

 Argentina, or Israel. Pad and Gandalf logged in from 8lgm.

 `I'll try to find Gandalf and ask him if he knows where we stashed the

 copy,' Pad wrote to Phoenix.

 `Good. Thanks.'

 While Phoenix and Electron waited on-line for Pad to return, Par

 showed up on-line and joined their conversation. Par didn't know who

 Guest 0 was, but Guest certainly knew who Par was. Time hadn't healed

 Electron's old wounds when it came to Par. Electron didn't really

 admit to himself the bad blood was still there over Theorem. He told

 himself that he couldn't be bothered with Par, that Par was just a

 phreaker, not a real hacker, that Par was lame.

 Phoenix typed, `Hey, Par. How's it going?'

 `Feenster!' Par replied. `What's happening?'

 `Lots and lots.'

 Par turned his attention to the mystery Guest 0. He didn't want to

 discuss private things with someone who might be a security guy

 hanging around the chat channel like a bad smell.

 `Guest, do you have a name?' Par asked.

 `Yeah. It's "Guest--#0".'

 `You got any other names?'

 There was a long pause.

 Electron typed, `I guess not.'

 `Any other names besides dickhead that is?'

 Electron sent a `whisper'--a private message--to Phoenix telling him

 not to tell Par his identity.

 `OK. Sure,' Phoenix whispered back. To show he would play along with

 whatever Electron had in mind, Phoenix added a sideways smiley face at

 the end: `:-)'.

 Par didn't know Electron and Phoenix were whispering to each other. He

 was still waiting to find out the identity of Guest. `Well, speak up,

 Guest. Figured out who you are yet?'

 Electron knew Par was on the run at the time. Indeed, Par had been on

 the run from the US Secret Service for more than six months by the

 beginning of 1990. He also knew Par was highly paranoid.

 Electron took aim and fired.

 `Hey, Par. You should eat more. You're looking underFED these days.'

 Par was suddenly silent. Electron sat at his computer, quietly

 laughing to himself, halfway across the world from Par. Well, he

 thought, that ought to freak out Par a bit. Nothing like a subtle hint

 at law enforcement to drive him nuts.

 `Did you see THAT?' Par whispered to Phoenix. `UnderFED. What did he

 mean?'

 `I dunno,' Phoenix whispered back. Then he forwarded a copy of Par's

 private message on to Electron. He knew it would make him laugh.

 Par was clearly worried. `Who the fuck are you?' he whispered to

 Electron but Guest 0 didn't answer.

 With growing anxiety, Par whispered to Phoenix, `Who IS this guy? Do

 you know him?'

 Phoenix didn't answer.

 `Because, well, it's weird. Didn't you see? FED was in caps. What the

 fuck does that mean? Is he a fed? Is he trying to give me a message

 from the feds?'

 Sitting at his terminal, on the other side of Melbourne from Electron,

 Phoenix was also laughing. He liked Par, but the American was an easy

 target. Par had become so paranoid since he went on the run across the

 US, and Electron knew just the right buttons to push.

 `I don't know,' Phoenix whispered to Par. `I'm sure he's not really a

 fed.'

 `Well, I am wondering about that comment,' Par whispered back.

 `UnderFED. Hmm. Maybe he knows something. Maybe it's some kind of

 warning. Shit, maybe the Secret Service knows where I am.'

 `You think?' Phoenix whispered to Par. `It might be a warning of some

 kind?' It was too funny.

 `Can you check his originating NUA?' Par wanted to know what network

 address the mystery guest was coming from. It might give him a clue as

 to the stranger's identity.

 Phoenix could barely contain himself. He kept forwarding the private

 messages on to Electron. Par was clearly becoming more agitated.

 `I wish he would just tell me WHO he was,' Par whispered. `Shit. It is

 very fucking weird. UnderFED. It's spinning me out.'

 Then Par logged off.

 Electron typed, `I guess Par had to go. <Grin>' Then, chuckling to

 himself, he waited for news on Gandalf's Deszip copy.

 If Pad and Gandalf hadn't kept their copy of Deszip, the Australians

 would be back to square one, beginning with a hunt for a system which

 even had Deszip. It was a daunting task and by the time Pad and

 Gandalf finally logged back into Altos, Phoenix and Electron had

 become quite anxious.

 `How did you go?' Phoenix asked. `Do you still have Deszip?'

 `Well, at first I thought I had forgotten which system I left it on

 ...'

 Electron jumped in, `And then?'

 `Then I remembered.'

 `Good news?' Phoenix exclaimed.

 `Well, no. Not exactly,' Gandalf said. `The account is dead.'

 Electron felt like someone had thrown a bucket of cold water on him.

 `Dead? Dead how?' he asked.

 `Dead like someone changed the password. Not sure why. I'll have to

 re-hack the system to get to the file.'

 `Fuck, this Deszip is frustrating,' Electron wrote.

 `This is getting ridiculous,' Phoenix added.

 `I don't even know if the copy is still in there,' Gandalf replied. `I

 hid it, but who knows? Been a few months. Admins might have deleted

 it.'

 `You want some help hacking the system again, Gand?' Phoenix asked.

 `Nah, It'll be easy. It's a Sequent. Just have to hang around until

 the ops go home.'

 If an op was logged on and saw Gandalf hunting around, he or she might

 kick Gandalf off and investigate the file which so interested the

 hacker. Then they would lose Deszip all over again.

 `I hope we get it,' Pad chipped in. `Would be gr8!'

 `Gr8 indeed. Feen, you've got the key to the encryption?' Gandalf

 asked.

 `Yeah.'

 `How many characters is it?' It was Gandalf's subtle way of asking for

 the key itself.

 Phoenix wasn't sure what to do. He wanted to give the British hackers

 the key, but he was torn. He needed Pad and Gandalf's help to get the

 copy of Deszip, if it was still around. But he knew Electron was

 watching the conversation, and Electron was always so paranoid. He

 disliked giving out any information, let alone giving it over Altos,

 where the conversations were possibly logged by security people.

 `Should I give him the key?' Phoenix whispered to Electron.

 Gandalf was waiting. To fend him off, Phoenix said, `It's 9 chars.'

 Chars was short for characters. On Altos the rule was to abbreviate

 where ever possible.

 `What is the first char?'

 `Yeah. Tell him,' Electron whispered to Phoenix.

 `Well, the key is ...'

 `You're going to spew when you find out, Gand,' Electron interrupted.

 `Yes ... go on,' Gandalf said. `I am listening.'

 `You won't believe it. <spew spew spew> The key is ... Dartmouth.'

 `WHAT???? WHAT!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!' Gandalf exclaimed.

 `No!!! IT's NOT TRUE! Bollox! You are KIDDING?'

 The British hacker was thumping himself on the head. The name of the

 frigging university! What a stupid password!

 Phoenix gave an on-line chuckle. `Hehe. Yeah. So hard to guess. We

 could have had Deszip for all these months ...'

 `Jesus. I hope it's still on that JANET system,' Gandalf said. Now

 that he actually had the password, finding the file became even more

 urgent.

 `Pray. Pray. Pray,' Phoenix said. `Yeah, you should have seen the

 licence text on Deszip--it was by NASA.'

 `You've seen it? You saw Deszip's source code?'

 `No,' Phoenix answered. `When I went back to the BEAR machine to check

 if Deszip was still there, the program was gone. But the licence

 agreement and other stuff was there. Should have read the licence ...

 truly amazing. It basically went on and on about how the people who

 wrote it didn't want people like us to get a hold of it. Hehe.'

 Electron was growing impatient. `Yeah. So, Gand, when you gonna go

 check that JANET system?'

 `Now. Fingers crossed, m8! See ya l8r ...' Then he was gone.

 The waiting was driving Electron nuts. He kept thinking about Deszip,

 about how he could have had it months and months ago. That program was

 such a prize. He was salivating at the thought of getting it after all

 this time pursuing it around the globe, chasing its trail from system

 to system, never quite getting close enough to grab it.

 When Gandalf showed up again, Pad, Phoenix and Electron were all over

 him in an instant.

 `WE FUCKING GOT IT GUYS!!!!!' Gandalf exclaimed.

 `Good job m8!' Pad said.

 `YES!' Electron added. `Have you decrypted it yet?'

 `Not yet. Crypt isn't on that machine. We can either copy Crypt onto

 that machine or copy the file onto another computer which already has

 Crypt on it,' Gandalf said.

 `Let's move it. Quick ... quick ... this damn thing has a habit of

 disappearing,' Electron said.

 `Yeah, this is the last copy ... the only one I got.'

 `OK. Think ... think ... where can we copy it to?' Electron said.

 `Texas!' Gandalf wanted to copy it to a computer at the University of

 Texas at Austin, home of the LOD hacker Erik Bloodaxe.

 Irrepressible, Gandalf came on like a steam roller if he liked

 you--and cut you down in a flash if he didn't. His rough-and-tumble

 working-class humour particularly appealed to Electron. Gandalf seemed

 able to zero in on the things which worried you most--something so

 deep or serious it was often unsaid. Then he would blurt it out in

 such crass, blunt terms you couldn't help laughing. It was his way of

 being in your face in the friendliest possible manner.

 `Yeah! Blame everything on Erik!' Phoenix joked. `No, seriously. That

 place is crawling with security now, all after Erik. They are into

 everything.'

 Phoenix had heard all about the security purge at the university from

 Erik. The Australian called Erik all the time, mostly by charging the

 calls to stolen AT&T cards. Erik hadn't been raided by the Secret

 Service yet, but he had been tipped off and was expecting a visit any

 day.

 `It probably won't decrypt anyway,' Electron said.

 `Oh, phuck off!' Gandalf shot back. `Come on! I need a site NOW!'

 `Thinking ...' Phoenix said. `Gotta be some place with room--how big

 is it?'

 `It's 900 k compressed--probably 3 meg when we uncompress it. Come on,

 hurry up! How about a university?'

 `Princeton, Yale could do either of those.' Electron suggested. `What

 about MIT--you hacked an account there recently, Gand?'

 `No.'

 All four hackers racked their minds for a safe haven. The world was

 their oyster, as British and Australian hackers held a real-time

 conversation in Germany about whether to hide their treasure in

 Austin, Texas; Princeton, New Jersey; Boston, Massachusetts; or New

 Haven, Connecticut.

 `We only need somewhere to stash it for a little while, until we can

 download it,' Gandalf said. `Got to be some machine where we've got

 root. And it's got to have anon FTP.'

 Anon FTP, or anonymous file transfer protocol, on a host machine would

 allow Gandalf to shoot the file from his JANET machine across the

 Internet into the host. Most importantly, Gandalf could do so without

 an account on the target machine. He could simply login as

 `anonymous', a method of access which had more limitations than simply

 logging in with a normal account. He would, however, still be able to

 upload the file.

 `OK. OK, I have an idea,' Phoenix said. `Lemme go check

 it out.'

 Phoenix dropped out of Altos and connected to the University of Texas.

 The physical location of a site didn't matter. His head was spinning

 and it was the only place he could think of. But he didn't try to

 connect to Happy, the machine he often used which Erik had told him

 about. He headed to one of the other university computers, called

 Walt.

 The network was overloaded. Phoenix was left dangling, waiting to

 connect for minutes on end. The lines were congested. He logged back

 into Altos and told Pad and Electron. Gandalf was nowhere to be seen.

 `Damn,' Electron said. Then, `OK, I might have an idea.'

 `No, wait!' Phoenix cut in. `I just thought of a site! And I have root

 too! But it's on NASA ...'

 `Oh that's OK. I'm sure they won't mind a bit. <grin>'

 `I'll go make sure it's still OK. Back in a bit,' Phoenix typed.

 Phoenix jumped out of Altos and headed toward NASA. He telnetted into

 a NASA computer called CSAB at the Langley Research Center in Hampton,

 Virginia. He had been in and out of NASA quite a few times and had

 recently made himself a root account on CSAB. First, he had to check

 the account was still alive, then he had to make sure the system

 administrator wasn't logged in.

 Whizzing past the official warning sign about unauthorised access in

 US government computers on the login screen, Phoenix typed in his user

 name and password.

 It worked. He was in. And he had root privileges.

 He quickly looked around on the system. The administrator was on-line.

 Damn.

 Phoenix fled the NASA computer and sprinted back into Altos. Gandalf

 was there, along with the other two, waiting for him.

 `Well?' Electron asked.

 `OK. All right. The NASA machine will work. It has anon FTP. And I

 still have root. We'll use that.'

 Gandalf jumped in. `Hang on--does it have Crypt?'

 `Argh! Forget to check. I think it must.'

 `Better check it, m8!'

 `Yeah, OK.'

 Phoenix felt exasperated, rushing around trying to find sites that

 worked. He logged out of Altos and coursed his way back into the NASA

 machine. The admin was still logged on, but Phoenix was running out of

 time. He had to find out if the computer had Crypt on it. It did.

 Phoenix rushed back to Altos. `Back again. We're in business.'

 `Yes!' Electron said, but he quickly jumped in with a word of warning.

 `Don't say the exact machine at NASA or the account out loud. Whisper

 it to Gandalf. I think the ops are listening in on my connection.'

 `Well,' Phoenix typed slowly, `there's only one problem. The admin is

 logged on.'

 `Arghhh!' Electron shouted.

 `Just do it,' Pad said. `No time to worry.'

 Phoenix whispered the Internet IP address of the NASA machine to

 Gandalf.

 `OK, m8, I'll anon FTP it to NASA. I'll come back here and tell you

 the new filename. Then you go in and decrypt it and uncompress the

 file. W8 for me here.'

 Ten minutes later, Gandalf returned. `Mission accomplished. The file

 is there!'

 `Now, go go Pheeny!' Electron said.

 `Gand, whisper the filename to me,' Phoenix said.

 `The file's called "d" and it's in the pub directory,' Gandalf

 whispered.

 `OK, folks. Here we go!' Phoenix said as he logged off.

 Phoenix dashed to the NASA computer, logged in and looked for the file

 named `d'. He couldn't find it. He couldn't even find the pub

 directory. He began hunting around the rest of the file system. Where

 was the damn thing?

 Uh oh. Phoenix noticed the system administrator, Sharon Beskenis, was

 still logged in. She was connected from Phoebe, another NASA machine.

 There was only one other user besides himself logged into the CSAB

 machine, someone called Carrie. As if that wasn't bad enough, Phoenix

 realised his username stood out a like a sore thumb. If the admin

 looked at who was on-line she would see herself, Carrie and a user

 called `friend', an account he had created for himself. How many

 legitimate accounts on NASA computers had that name?

 Worse, Phoenix noticed that he had forgotten to cover his login trail.

 `Friend' was telnetting into the NASA computer from the University of

 Texas. No, no, he thought, that would definitely have to go. He

 disconnected from NASA, bounced back to the university and then logged

 in to NASA again. Good grief. Now the damn NASA machine showed two

 people logged in as `friend'. The computer hadn't properly killed his

 previous login. Stress.

 Phoenix tried frantically to clear out his first login by killing its

 process number. The NASA computer responded that there was no such

 process number. Increasingly nervous, Phoenix figured he must have

 typed in the wrong number. Unhinged, he grabbed one of the other

 process numbers and killed that.

 Christ! That was the admin's process number. Phoenix had just

 disconnected Sharon from her own machine. Things were not going well.

 Now he was under serious pressure. He didn't dare logout, because

 Sharon would no doubt find his `friend' account, kill it and close up

 the security hole he had originally used to get in. Even if she didn't

 find Deszip on her own machine, he might not be able to get back in

 again to retrieve it.

 After another frenzied minute hunting around the machine, Phoenix

 finally unearthed Gandalf's copy of Deszip. Now, the moment of truth.

 He tried the passphrase. It worked! All he had to do

 was uncompress Deszip and get it out of there. He typed, `uncompress

 deszip.tar.z', but he didn't like how the NASA computer answered his

 command:

 corrupt input

 Something was wrong, terribly wrong. The file appeared to be partially

 destroyed. It was too painful a possibility to contemplate. Even if

 only a small part of the main Deszip program had been damaged, none of

 it would be useable.

 Rubbing sweat from his palms, Phoenix hoped that maybe the file had

 just been damaged as he attempted to uncompress it. He had kept the

 original, so he went back to that and tried decrypting and

 uncompressing it again. The NASA computer gave him the same ugly

 response. Urgently, he tried yet again, but this time attempted to

 uncompress the file in a different way. Same problem.

 Phoenix was at his wits' end. This was too much. The most he could

 hope was that the file had somehow become corrupted in the transfer

 from Gandalf's JANET machine. He logged out of NASA and returned to

 Altos. The other three were waiting impatiently for him.

 Electron, still logged in as the mystery Guest, leaped in. `Did it

 work?'

 `No. Decrypted OK, but the file was corrupted when I tried to

 decompress it.'

 `Arghhhhhhhhh!!!!!!!' Gandalf exclaimed.

 `Fuckfuckfuck,' Electron wrote. `Doomed to fail.'

 `Sigh Sigh Sigh,' Pad typed.

 Gandalf and Electron quizzed Phoenix in detail about each command he

 had used, but in the end there seemed only one hope. Move a copy of

 the decryption program to the JANET computer in the UK and try

 decrypting and uncompressing Deszip there.

 Phoenix gave Gandalf a copy of Crypt and the British hacker went to

 work on the JANET computer. A little later he rendezvoused on Altos

 again.

 Phoenix was beside himself by this stage. `Gand! Work???'

 `Well, I decrypted it using the program you gave me ...'

 `And And And???' Electron was practically jumping out of his seat at

 his computer.

 `Tried to uncompress it. It was taking a LONG time. Kept

 going--expanded to 8 megabytes.'

 `Oh NO. Bad Bad Bad,' Phoenix moaned. `Should only be 3 meg. If it's

 making a million files, it's fucked.'

 `Christ,' Pad typed. `Too painful.'

 `I got the makefile--licensing agreement text etc., but the Deszip

 program itself was corrupted,' Gandalf concluded.

 `I don't understand what is wrong with it. <Sob>' Phoenix wrote.

 `AgonyAgonyAgony,' Electron groaned. `It'll never never never work.'

 `Can we get a copy anywhere else?' Gandalf asked.

 `That FTP bug has been fixed at Purdue,' Pad answered. `Can't use that

 to get in again.'

 Disappointment permeated the atmosphere on Altos.

 There were, of course, other possible repositories for Deszip. Phoenix

 and Electron had already penetrated a computer at Lawrence Livermore

 National Labs in California. They had procured root on the gamm5

 machine and planned to use it as a launchpad for penetrating security

 expert Russell Brand's computer at LLNL, called Wuthel. They were sure

 Brand had Deszip on his computer.

 It would require a good deal of effort, and possibly another

 roller-coaster ride of desire, expectation and possible

 disappointment. For now, the four hackers resolved to sign off,

 licking their wounds at their defeat in the quest for Deszip.

 `Well, I'm off. See you l8r,' Pad said.

 `Yeah, me too,' Electron added.

 `Yeah, OK. L8r, m8s!' Gandalf said.

 Then, just for fun, he added in typical Gandalf style, `See you in

 jail!'

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 Chapter 6 -- Page 1 The New York Times

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 Read about it

 Just another incredible scene

 There's no doubt about it

 -- from `Read About It', on 10, 9, 8, 7, 6, 5, 4, 3, 2, 1 by Midnight

 Oil

 Pad had an important warning for the Australian hackers: the computer

 security community was closing in on them. It was the end of February

 1990, not long after Phoenix and Electron had captured Zardoz and just

 missed out on Deszip. Pad didn't scream or shout the warning, that

 wasn't his style. But Electron took in the import of the warning loud

 and clear.

 `Feen, they know you did over Spaf's machine,' Pad told Phoenix. `They

 know it's been you in other systems also. They've got your handle.'

 Eugene Spafford was the kind of computer security expert who loses a

 lot of face when a hacker gets into his machine, and a wounded bull is

 a dangerous enemy.

 The security people had been able to connect and link up a series of

 break-ins with the hacker who called himself Phoenix because his style

 was so distinctive. For example, whenever he was creating a root

 shell--root access--for himself, he would always save it in the same

 filename and in the same location on the

 computer. In some instances, he even created accounts called `Phoenix'

 for himself. It was this consistency of style which had made things so

 much easier for admins to trace his movements.

 In his typical understated fashion, Pad suggested a change of style.

 And maybe, he added, it wasn't such a bad idea for the Australians to

 tone down their activities a bit. The undercurrent of the message was

 serious.

 `They said that some security people had contacted Australian law

 enforcement, who were supposed to be "dealing with it",' Pad said.

 `Do they know my real name?' Phoenix asked, worried. Electron was also

 watching this conversation with some concern.

 `Don't know. Got it from Shatter. He's not always reliable,

 but ...'

 Pad was trying to soften the news by playing down Shatter's importance

 as a source. He didn't trust his fellow British hacker but Shatter had

 some good, if mysterious, connections. An enigmatic figure who seemed

 to keep one foot in the computer underworld and the other in the

 upright computer security industry, Shatter leaked information to Pad

 and Gandalf, and occasionally to the Australians.

 While the two British hackers sometimes discounted Shatter's advice,

 they also took the time to talk to him. Once, Electron had intercepted

 email showing Pengo had turned to Shatter for advice about his

 situation after the raid in Germany. With some spare time prior to his

 trial, Pengo asked Shatter whether it was safe to travel to the US on

 a summer holiday in 1989. Shatter asked for Pengo's birthdate and

 other details. Then he returned with an unequivocal answer: Under no

 circumstances was Pengo to travel to the US.

 Subsequently, it was reported that officials in the US Justice

 Department had been examining ways to secretly coax Pengo onto

 American soil, where they could seize him. They would then force him

 to face trial in their own courts.

 Had Shatter known this? Or had he just told Pengo not to go to the US

 because it was good commonsense? No-one was quite sure, but people

 took note of what Shatter told them.

 `Shatter definitely got the info right about Spaf's machine. 100%

 right,' Pad continued. `He knew exactly how you hacked it. I couldn't

 believe it. Be careful if you're still hacking m8, especially on the

 Inet.' The `Inet' was shorthand for the Internet.

 The Altos hackers went quiet.

 `It's not just you,' Pad tried to reassure the Australians. `Two

 security people from the US are coming to the UK to try and find out

 something about someone named Gandalf. Oh, and Gand's mate, who might

 be called Patrick.'

 Pad had indeed based his handle on the name Patrick, or Paddy, but

 that wasn't his real name. No intelligent hacker would use his real

 name for his handle. Paddy was the name of one of his favourite

 university lecturers, an Irishman who laughed a good deal. Like Par's

 name, Pad's handle had coincidentally echoed a second meaning when the

 British hacker moved into exploring X.25 networks. An X.25 PAD is a

 packet assembler disassembler, the interface between the X.25 network

 and a modem or terminal server. Similarly, Gandalf, while being first

 and foremost the wizard from The Lord of The Rings, also happened to

 be a terminal server brand name.

 Despite the gravity of the news that the security community was

 closing the net around them, none of the hackers lost their wicked

 sense of humour.

 `You know,' Pad went on, `Spaf was out of the country when his machine

 got hacked.'

 `Was he? Where?' asked Gandalf, who had just joined the conversation.

 `In Europe.'

 Electron couldn't resist. `Where was Spaf, Gandalf asks as he hears a

 knock on his door ...'

 `Haha,' Gandalf laughed.

 `<knock> <knock>' Electron went on, hamming it up.

 `Oh! Hello there, Mr Spafford,' Gandalf typed, playing along.

 `Hello, I'm Gene and I'm mean!'

 Alone in their separate homes on different corners of the globe, the

 four hackers chuckled to themselves.

 `Hello, and is this the man called Patrick?' Pad jumped in.

 `Well, Mr Spafford, it seems you're a right fucking idiot for not

 patching your FTP!' Gandalf proclaimed.

 `Not to mention the CHFN bug--saved by a Sequent! Or you'd be very

 fucking embarrassed,' Phoenix added.

 Phoenix was laughing too, but he was a little nervous about Pad's

 warning and he turned the conversation back to a serious note.

 `So, Pad, what else did Shatter tell you?' Phoenix asked

 anxiously.

 `Not much. Except that some of the security investigations might be

 partly because of UCB.'

 UCB was the University of California at Berkeley. Phoenix had been

 visiting machines at both Berkeley and LLNL so much recently that the

 admins seemed to have not only noticed him, but they had pinpointed

 his handle. One day he had telnetted into dewey.soe.berkeley.edu--the

 Dewey machine as it was known--and had been startled to find the

 following message of the day staring him in the face:

 Phoenix,

 Get out of Dewey NOW!

 Also, do not use any of the `soe' machines.

 Thank you,

 Daniel Berger

 Phoenix did a double take when he saw this public warning. Having been

 in and out of the system so many times, he just zoomed past the words

 on the login screen. Then, in a delayed reaction, he realised the

 login message was addressed to him.

 Ignoring the warning, he proceeded to get root on the Berkeley machine

 and look through Berger's files. Then he sat back, thinking about the

 best way to deal with the problem. Finally, he decided to send the

 admin a note saying he was leaving the system for good.

 Within days, Phoenix was back in the Dewey machine, weaving in and out

 of it as if nothing had happened. After all, he had broken into the

 system, and managed to get root through his own wit. He had earned the

 right to be in the computer. He might send the admin a note to put him

 at ease, but Phoenix wasn't going to give up accessing Berkeley's

 computers just because it upset Daniel Berger.

 `See,' Pad continued, `I think the UCB people kept stuff on their

 systems that wasn't supposed to be there. Secret things.'

 Classified military material wasn't supposed to be stored

 on non-classified network computers. However, Pad guessed that

 sometimes researchers broke rules and took short cuts because they

 were busy thinking about their research and not the security

 implications.

 `Some of the stuff might have been illegal,' Pad told his captive

 audience. `And then they find out some of you guys have been in there

 ...'

 `Shit,' Phoenix said.

 `So, well, if it APPEARED like someone was inside trying to get at

 those secrets ...' Pad paused. `Then you can guess what happened. It

 seems they really want to get whoever was inside their machines.'

 There was momentary silence while the other hackers digested all that

 Pad had told them. As a personality on Altos, Pad remained ever so

 slightly withdrawn from the other hackers, even the Australians whom

 he considered mates. This reserved quality gave his warning a certain

 sobriety, which seeped into the very fabric of Altos that day.

 Eventually, Electron responded to Pad's warning by typing a comment

 directed at Phoenix: `I told you talking to security guys is nothing

 but trouble.'

 It irritated Electron more and more that Phoenix felt compelled to

 talk to white hats in the security industry. In Electron's view,

 drawing attention to yourself was just a bad idea all around and he

 was increasingly annoyed at watching Phoenix feed his ego. He had made

 veiled references to Phoenix's bragging on Altos many times, saying

 things like `I wish people wouldn't talk to security guys'.

 Phoenix responded to Electron on-line somewhat piously. `Well, I will

 never talk to security guys seriously again.'

 Electron had heard it all before. It was like listening to an

 alcoholic swear he would never touch another drink. Bidding the others

 goodbye, Electron logged off. He didn't care to listen to Phoenix any

 more.

 Others did, however. Hundreds of kilometres away, in a special room

 secreted away inside a bland building in Canberra, Sergeant Michael

 Costello and Constable William Apro had been methodically capturing

 each and every electronic boast as it poured from Phoenix's phone. The

 two officers recorded the data transmissions passing in and out of his

 computer. They then played this recording into their own modem and

 computer and created a text file they could save and use as evidence

 in court.

 Both police officers had travelled north from Melbourne, where they

 worked with the AFP's Computer Crime Unit. Settling into their

 temporary desks with their PC and laptop, the officers began their

 secret eavesdropping work on 1 February 1990.

 It was the first time the AFP had done a datatap. They were happy to

 bide their time, to methodically record Phoenix hacking into Berkeley,

 into Texas, into NASA, into a dozen computers around the world. The

 phone tap warrant was good for 60 days, which was more than enough

 time to secrete away a mountain of damning evidence against the

 egotistical Realm hacker. Time was on their side.

 The officers worked the Operation Dabble job in shifts. Constable Apro

 arrived at the Telecommunications Intelligence Branch of the AFP at 8

 p.m. Precisely ten hours later, at 6 the next morning, Sergeant

 Costello relieved Apro, who knocked off for a good sleep. Apro

 returned again at 8 p.m. to begin the night shift.

 They were there all the time. Twenty-four hours a day. Seven days a

 week. Waiting and listening.

 It was too funny. Erik Bloodaxe in Austin, Texas, couldn't stop

 laughing. In Melbourne, Phoenix's side hurt from laughing so much.

 Phoenix loved to talk on the phone. He often called Erik, sometimes

 every day, and they spoke for ages. Phoenix didn't worry about cost;

 he wasn't paying for it. The call would appear on some poor sod's bill

 and he could sort it out with the phone company.

 Sometimes Erik worried a little about whether Phoenix wasn't going to

 get himself in a jam making all these international calls. Not that he

 didn't like talking to the Australian; it was a hoot. Still, the

 concern sat there, unsettled, in the back of his mind. A few times he

 asked Phoenix about it.

 `No prob. Hey, AT&T isn't an Australian company,' Phoenix would say.

 `They can't do anything to me.' And Erik had let it rest at that.

 For his part, Erik didn't dare call Phoenix, especially not since his

 little visit from the US Secret Service. On 1 March 1990, they burst

 into his home, with guns drawn, in a dawn raid. The agents searched

 everywhere, tearing the student house apart, but they didn't find

 anything incriminating. They did take Erik's $59 keyboard terminal

 with its chintzy little 300 baud modem, but they didn't get his main

 computer, because Erik knew they were coming.

 The Secret Service had subpoenaed his academic records, and Erik had

 heard about it before the raid. So when the Secret Service arrived,

 Erik's stuff just wasn't there. It hadn't been there for a few weeks,

 but for Erik, they had been hard weeks. The hacker found himself

 suffering withdrawal symptoms, so he bought the cheapest home computer

 and modem he could find to tide him over.

 That equipment was the only computer gear the Secret Service

 discovered, and they were not happy special agents. But without

 evidence, their hands were tied. No charges were laid.

 Still, Erik thought he was probably being watched. The last thing he

 wanted was for Phoenix's number to appear on his home phone bill. So

 he let Phoenix call him, which the Australian did all the time. They

 often talked for hours when Erik was working nights. It was a slack

 job, just changing the back-up tapes on various computers and making

 sure they didn't jam. Perfect for a student. It left Erik hours of

 free time.

 Erik frequently reminded Phoenix that his phone was probably tapped,

 but Phoenix just laughed. `Yeah, well don't worry about it, mate. What

 are they going to do? Come and get me?'

 After Erik put a hold on his own hacking activities, he lived

 vicariously, listening to Phoenix's exploits. The Australian called

 him with a technical problem or an interesting system, and then they

 discussed various strategies for getting into the machine. However,

 unlike Electron's talks with Phoenix, conversations with Erik weren't

 only about hacking. They chatted about life, about what Australia was

 like, about girls, about what was in the newspaper that day. It was

 easy to talk to Erik. He had a big ego, like most hackers, but it was

 inoffensive, largely couched in his self-effacing humour.

 Phoenix often made Erik laugh. Like the time he got Clifford Stoll, an

 astronomer, who wrote The Cuckoo's Egg. The book described his pursuit

 of a German hacker who had broken into the computer system Stoll

 managed at Lawrence Berkeley Labs near San Francisco. The hacker had

 been part of the same hacking ring as Pengo. Stoll took a hard line on

 hacking, a position which did not win him popularity in the

 underground. Both Phoenix and Erik had read Stoll's book, and one day

 they were sitting around chatting about it.

 `You know, it's really stupid that Cliffy put his email address in his

 book,' Phoenix said. `Hmm, why don't I go check?'

 Sure enough, Phoenix called Erik back about a day later. `Well, I got

 root on Cliffy's machine,' he began slowly, then he burst out

 laughing. `And I changed the message of the day. Now it reads, "It

 looks like the Cuckoo's got egg on his face"!'

 It was uproariously funny. Stoll, the most famous hacker-catcher in

 the world, had been japed! It was the funniest thing Erik had heard in

 weeks.

 But it was not nearly so amusing as what Erik told Phoenix later about

 the New York Times. The paper had published an article on 19 March

 suggesting a hacker had written some sort of virus or worm which was

 breaking into dozens of computers.

 `Listen to this,' Erik had said, reading Phoenix the lead paragraph,

 `"A computer intruder has written a program that has entered dozens of

 computers in a nationwide network in recent weeks, automatically

 stealing electronic documents containing users' passwords and erasing

 files to help conceal itself."'

 Phoenix was falling off his chair he was laughing so hard. A program?

 Which was automatically doing this? No. It wasn't an automated

 program, it was the Australians! It was the Realm hackers! God, this

 was funny.

 `Wait--there's more! It says, "Another rogue program shows a

 widespread vulnerability". I laughed my ass off,' Erik said,

 struggling to get the words out.

 `A rogue program! Who wrote the article?'

 `A John Markoff,' Erik answered, wiping his eyes. `I called him up.'

 `You did? What did you say?' Phoenix tried to gather himself together.

 `"John," I said, "You know that article you wrote on page 12 of the

 Times? It's wrong! There's no rogue program attacking the Internet."

 He goes, "What is it then?" "It's not a virus or a worm," I said.

 "It's PEOPLE."'

 Erik started laughing uncontrollably again.

 `Then Markoff sounds really stunned, and he goes, "People?" And I

 said, "Yeah, people." Then he said, "How do you know?" And I said,

 "Because, John, I KNOW."'

 Phoenix erupted in laughter again. The Times reporter obviously had

 worms on his mind, since the author of the famous Internet worm,

 Robert T. Morris Jr, had just been tried and convicted in the US. He

 was due to be sentenced in May.

 US investigators had tracked the hacker's connections, looping through

 site after site in a burrowing manner which they assumed belonged to a

 worm. The idea of penetrating so many sites all in such a short time

 clearly baffled the investigators, who concluded it must be a program

 rather than human beings launching the attacks.

 `Yeah,' Erik continued, `And then Markoff said, "Can you get me to

 talk to them?" And I said I'd see what I could do.'

 `Yeah,' Phoenix said. `Go tell him, yes. Yeah, I gotta talk to this

 idiot. I'll set him straight.'

 Page one, the New York Times, 21 March 1990: `Caller Says he Broke

 Computers' Barriers to Taunt the Experts', by John Markoff.

 True, the article was below the crease--on the bottom half of the

 page--but at least it was in column 1, the place a reader turns to

 first.

 Phoenix was chuffed. He'd made the front page of the New York Times.

 `The man identified himself only as an Australian named Dave,' the

 article said. Phoenix chuckled softly. Dave Lissek was the pseudonym

 he'd used. Of course, he wasn't the only one using the name Dave. When

 Erik first met the Australians on Altos, he marvelled at how they all

 called themselves Dave. I'm Dave, he's Dave, we're all Dave, they told

 him. It was just easier that way, they said.

 The article revealed that `Dave' had attacked Spaf's and Stoll's

 machines, and that the Smithsonian Astronomical Observatory at Harvard

 University--where Stoll now worked--had pulled its computers off the

 Internet as a result of the break in. Markoff had even included the

 `egg on his face' story Phoenix had described to him.

 Phoenix laughed at how well he had thumbed his nose at Cliffy Stoll.

 This article would show him up all right. It felt so good, seeing

 himself in print that way. He did that. That was him there in black in

 white, for all the world to see. He had outsmarted the world's best

 known hacker-catcher, and he had smeared the insult across the front

 page of the most prestigious newspaper in America.

 And Markoff reported that he had been in Spaf's system too! Phoenix

 glowed happily. Better still, Markoff had quoted `Dave' on the

 subject: `The caller said ... "It used to be the security guys chasing

 the hackers. Now it's the hackers chasing the security people."'

 The article went on: `Among the institutions believed to have been

 penetrated by the intruder are the Los Alamos National Laboratories,

 Harvard, Digital Equipment Corporation, Boston University and the

 University of Texas.' Yes, that list sounded about right. Well, for

 the Australians as a group anyway. Even if Phoenix hadn't masterminded

 or even penetrated some of those himself, he was happy to take the

 credit in the Times.

 This was a red-letter day for Phoenix.

 Electron, however, was furious. How could Phoenix be so stupid? He

 knew that Phoenix had an ego, that he talked too much, and that his

 tendency to brag had grown worse over time, fed by the skyrocketing

 success of the Australian hackers. Electron knew all of that, but he

 still couldn't quite believe that Phoenix had gone so far as to strut

 and preen like a show pony for the New York Times.

 To think that he had associated with Phoenix. Electron was disgusted.

 He had never trusted Phoenix--a caution now proved wise. But he had

 spent hours with him on the phone, with most of the information

 flowing in one direction. But not only did Phoenix show no discretion

 at all in dealing with the paper, he bragged about doing things that

 Electron had done! If Phoenix had to talk--and clearly he should have

 kept his mouth shut--he should have at least been honest about the

 systems for which he could claim credit.

 Electron had tried with Phoenix. Electron had suggested that he stop

 talking to the security guys. He had continually urged caution and

 discretion. He had even subtly withdrawn each time Phoenix suggested

 one of his hair-brained schemes to show off to a security bigwig.

 Electron had done this in the hope that Phoenix might get the hint.

 Maybe, if Phoenix couldn't hear someone shouting advice at him, he

 might at least listen to someone whispering it. But no. Phoenix was

 far too thick for that.

 The Internet--indeed, all hacking--was out of bounds for weeks, if not

 months. There was no chance the Australian authorities would let a

 front-page story in the Times go by un-heeded. The Americans would be

 all over them. In one selfish act of hubris, Phoenix had ruined the

 party for everyone else.

 Electron unplugged his modem and took it to his father. During exams,

 he had often asked his father to hide it. He didn't have the

 self-discipline needed to stay away on his own and there was no other

 way Electron could keep himself from jacking in--plugging his modem

 into the wall. His father had become an expert at hiding the device,

 but Electron usually still managed to find it after a few days,

 tearing the house apart until he emerged, triumphant, with the modem

 held high above his head. Even when his father began hiding the modem

 outside the family home it would only postpone the inevitable.

 This time, however, Electron vowed he would stop hacking until the

 fallout had cleared--he had to. So he handed the modem to his father,

 with strict instructions, and then tried to distract himself by

 cleaning up his hard drive and disks. His hacking files had to go too.

 So much damning evidence of his activities. He deleted some files and

 took others on disks to store at a friend's house. Deleting files

 caused Electron considerable pain, but there was no other way. Phoenix

 had backed him into a corner.

 Brimming with excitement, Phoenix rang Electron on a sunny March

 afternoon.

 `Guess what?' Phoenix was jumping around like an eager puppy at the

 other end of the line. `We made the nightly news right across the US!'

 `Uhuh,' Electron responded, unimpressed.

 `This is not a joke!' We were on cable news all day too. I called Erik

 and he told me.'

 `Mmm,' Electron said.

 `You know, we did a lot of things right. Like Harvard. We got into

 every system at Harvard. It was a good move. Harvard gave us the fame

 we needed.'

 Electron couldn't believe what he was hearing. He didn't need any

 fame--and he certainly didn't need to be busted. The

 conversation--like Phoenix himself--was really beginning to annoy him.

 `Hey, and they know your name,' Phoenix said coyly.

 That got a reaction. Electron gulped his anger.

 `Haha! Just joshing!' Phoenix practically shouted. `Don't worry! They

 didn't really mention anyone's name.'

 `Good,' Electron answered curtly. His irritation stewed

 quietly.

 `So, do you reckon we'll make the cover of Time or Newsweek?'

 Good grief! Didn't Phoenix ever give up? As if it wasn't enough to

 appear on the 6 o'clock national news in a country crawling with

 over-zealous law enforcement agencies. Or to make the New York Times.

 He had to have the weeklies too.

 Phoenix was revelling in his own publicity. He felt like he was on top

 of the world, and he wanted to shout about it. Electron had felt the

 same wave of excitement from hacking many high-profile targets and

 matching wits with the best, but he was happy to stand on the peak by

 himself, or with people like Pad and Gandalf, and enjoy the view

 quietly. He was happy to know he had been the best on the frontier of

 a computer underground which was fresh, experimental and, most of all,

 international. He didn't need to call up newspaper reporters or gloat

 about it in Clifford Stoll's face.

 `Well, what do you reckon?' Phoenix asked impatiently.

 `No,' Electron answered.

 `No? You don't think we will?' Phoenix sounded disappointed.

 `No.'

 `Well, I'll demand it!' Phoenix said laughing, `Fuck it, we want the

 cover of Newsweek, nothing less.' Then, more seriously, `I'm trying to

 work out what really big target would clinch it for us.'

 `Yeah, OK, whatever,' Electron replied, distancing himself again.

 But Electron was thinking, Phoenix, you are a fool. Didn't he see the

 warning signs? Pad's warning, all the busts in the US, reports that

 the Americans were hunting down the Brits. As a result of these news

 reports of which Phoenix was so proud, bosses across the world would

 be calling their computer managers into their offices and breathing

 down their necks about their own computer security.

 The brazen hackers had deeply offended the computer security industry,

 spurring it into action. In the process, some in the industry had also

 seen an opportunity to raise its own public profile. The security

 experts had talked to the law enforcement agencies, who were now

 clearly sharing information across national borders and closing in

 fast. The conspirators in

 the global electronic village were at the point of maximum

 overreach.

 `We could hack Spaf again,' Phoenix volunteered.

 `The general public couldn't give a fuck about Eugene Spafford,'

 Electron said, trying to dampen Phoenix's bizarre enthusiasm. He was

 all for thumbing one's nose at authority, but this was not the way to

 do it.

 `It'd be so funny in court, though. The lawyer would call Spaf and

 say, "So, Mr Spafford, is it true that you are a world-renowned

 computer security expert?" When he said, "Yes" I'd jump up and go, "I

 object, your honour, this guy doesn't know jackshit, 'cause I hacked

 his machine and it was a breeze!"'

 `Mmm.'

 `Hey, if we don't get busted in the next two weeks, it will be a

 miracle,' Phoenix continued happily.

 `I hope not.'

 `This is a lot of fun!' Phoenix shouted sarcastically. `We're gonna

 get busted! We're gonna get busted!'

 Electron's jaw fell to the ground. Phoenix was mad. Only a lunatic

 would behave this way. Mumbling something about how tired he was,

 Electron said goodbye and hung up.

 At 5.50 a.m. on 2 April 1990, Electron dragged himself out of bed and

 made his way to the bathroom. Part way through his visit, the light

 suddenly went out.

 How strange. Electron opened his eyes wide in the early morning

 dimness. He returned to his bedroom and began putting on some jeans

 before going to investigate the problem.

 Suddenly, two men in street clothes yanked his window open and jumped

 through into the room shouting, `GET DOWN ON THE FLOOR!'

 Who were these people? Half-naked, Electron stood in the middle of his

 room, stunned and immobile. He had suspected the police might pay him

 a visit, but didn't they normally wear uniforms? Didn't they announce

 themselves?

 The two men grabbed Electron, threw him face down onto the floor and

 pulled his arms behind his back. They jammed handcuffs on his

 wrists--hard--cutting his skin. Then someone kicked him in the

 stomach.

 `Are there any firearms in the house?' one of the men asked.

 Electron couldn't answer because he couldn't breathe. The kick had

 winded him. He felt someone pull him up from the floor and prop him in

 a chair. Lights went on everywhere and he could see six or seven

 people moving around in the hallway. They must have come into the

 house another way. The ones in the hallway were all wearing bibs with

 three large letters emblazoned across the front: AFP.

 As Electron slowly gathered his wits, he realised why the cops had

 asked about firearms. He had once joked to Phoenix on the phone about

 how he was practising with his dad's .22 for when the feds came

 around. Obviously the feds had been tapping his phone.

 While his father talked with one of the officers in the other room and

 read the warrant, Electron saw the police pack up his computer

 gear--worth some $3000--and carry it out of the house. The only thing

 they didn't discover was the modem. His father had become so expert at

 hiding it that not even the Australian Federal Police could find it.

 Several other officers began searching Electron's bedroom, which was

 no small feat, given the state it was in. The floor was covered in a

 thick layer of junk. Half crumpled music band posters, lots of

 scribbled notes with passwords and NUAs, pens, T-shirts both clean and

 dirty, jeans, sneakers, accounting books, cassettes, magazines, the

 occasional dirty cup. By the time the police had sifted through it all

 the room was tidier than when they started.

 As they moved into another room at the end of the raid, Electron bent

 down to pick up one of his posters which had fallen onto the floor. It

 was a Police Drug Identification Chart--a gift from a friend's

 father--and there, smack dab in the middle, was a genuine AFP

 footprint. Now it was a collector's item. Electron smiled to himself

 and carefully tucked the poster away.

 When he went out to the living room, he saw a policemen holding a

 couple of shovels and he wanted to laugh again. Electron had also once

 told Phoenix that all his sensitive hacking disks were buried in the

 backyard. Now the police were going to dig it up in search of

 something which had been destroyed a few days before. It was too

 funny.

 The police found little evidence of Electron's hacking at his house,

 but that didn't really matter. They already had almost everything they

 needed.

 Later that morning, the police put the 20-year-old Electron into an

 unmarked car and drove him to the AFP's imposing-looking headquarters

 at 383 Latrobe Street for questioning.

 In the afternoon, when Electron had a break from the endless

 questions, he walked out to the hallway. The boyish-faced Phoenix,

 aged eighteen, and fellow Realm member Nom, 21, were walking with

 police at the other end of the hall. They were too far apart to talk,

 but Electron smiled. Nom looked worried. Phoenix looked annoyed.

 Electron was too intimidated to insist on having a lawyer. What was

 the point in asking for one anyway? It was clear the police had

 information they could only have obtained from

 tapping his phone. They also showed him logs taken from Melbourne

 University, which had been traced back to his phone. Electron figured

 the game was up, so he might as well tell them the whole story--or at

 least as much of it as he had told Phoenix on the phone.

 Two officers conducted the interview. The lead interviewer was

 Detective Constable Glenn Proebstl, which seemed to be pronounced

 `probe stool'--an unfortunate name, Electron thought. Proebstl was

 accompanied by Constable Natasha Elliott, who occasionally added a few

 questions at the end of various interview topics but otherwise kept to

 herself. Although he had decided to answer their questions truthfully,

 Electron thought that neither of them knew much about computers and

 found himself struggling to understand what they were trying to ask.

 Electron had to begin with the basics. He explained what the FINGER

 command was--how you could type `finger' followed by a username, and

 then the computer would provide basic information about the user's

 name and other details.

 `So, what is the methodology behind it ... finger ... then, it's

 normally ... what is the normal command after that to try and get the

 password out?' Constable Elliott finally completed her convoluted

 attempt at a question.

 The only problem was that Electron had no idea what she was talking

 about.

 `Well, um, I mean there is none. I mean you don't use finger like that

 ...'

 `Right. OK,' Constable Elliott got down to business. `Well, have you

 ever used that system before?'

 `Uhm, which system?' Electron had been explaining commands for so long

 he had forgotten if they were still talking about how he hacked the

 Lawrence Livermore computer or some other site.

 `The finger ... The finger system?'

 Huh? Electron wasn't quite sure how to answer that question. There was

 no such thing. Finger was a command, not a computer.

 `Uh, yes,' he said.

 The interview went the same way, jolting awkwardly through computer

 technology which he understood far better than either officer.

 Finally, at the end of a long day, Detective Constable Proebstl asked

 Electron:

 `In your own words, tell me what fascination you find with accessing

 computers overseas?'

 `Well, basically, it's not for any kind of personal gain or anything,'

 Electron said slowly. It was a surprisingly difficult question to

 answer. Not because he didn't know the answer, but because it was a

 difficult answer to describe to someone who had never hacked a

 computer. `It's just the kick of getting in to a system. I mean, once

 you are in, you very often get bored and even though you can still

 access the system, you may never call back.

 `Because once you've gotten in, it's a challenge over and you don't

 really care much about it,' Electron continued, struggling. `It's a

 hot challenge thing, trying to do things that other people are also

 trying to do but can't.

 `So, I mean, I guess it is a sort of ego thing. It's knowing that you

 can do stuff that other people cannot, and well, it is the

 challenge and the ego boost you get from doing something well ...

 where other people try and fail.'

 A few more questions and the day-long interview finally

 finished. The police then took Electron to the Fitzroy police

 station. He guessed it was the nearest location with a JP they could

 find willing to process a bail application at that hour.

 In front of the ugly brick building, Electron noticed a small group of

 people gathered on the footpath in the dusky light. As the police car

 pulled up, the group swung into a frenzy of activity, fidgeting in

 over-the-shoulder briefcases, pulling out notebooks and pens, scooping

 up big microphones with fuzzy shag covers, turning on TV camera

 lights.

 Oh NO! Electron wasn't prepared for this at all.

 Flanked by police, Electron stepped out of the police car and blinked

 in the glare of photographers' camera flashes and TV camera

 searchlights. The hacker tried to ignore them, walking as briskly as

 his captors would allow. Sound recordists and reporters tagged beside

 him, keeping pace, while the TV cameramen and photographers weaved in

 front of him. Finally he escaped into the safety of the watchhouse.

 First there was paperwork, followed by the visit to the JP. While

 shuffling through his papers, the JP gave Electron a big speech about

 how defendants often claimed to have been beaten by the police.

 Sitting in the dingy meeting room, Electron felt somewhat confused by

 the purpose of this tangential commentary. However, the JP's next

 question cleared things up: `Have you had any problems with your

 treatment by the police which you would like to record at this time?'

 Electron thought about the brutal kick he had suffered while lying on

 his bedroom floor, then he looked up and found Detective Constable

 Proebstl staring him in the eye. A slight smile passed across the

 detective's face.

 `No,' Electron answered.

 The JP proceeded to launch into another speech which Electron found

 even stranger. There was another defendant in the lock-up at the

 moment, a dangerous criminal who had a disease the JP knew about, and

 the JP could decide to lock Electron up with that criminal instead of

 granting him bail.

 Was this meant to be helpful warning, or just the gratification of

 some kind of sadistic tendency? Electron was baffled but he didn't

 have to consider the situation for long. The JP granted bail.

 Electron's father came to the watchhouse, collected his son and signed

 the papers for a $1000 surety--to be paid if Electron skipped town.

 That night Electron watched as his name appeared on the late night

 news.

 At home over the next few weeks, Electron struggled to come to terms

 with the fact that he would have to give up hacking forever. He still

 had his modem, but no computer. Even if he had a machine, he realised

 it was far too dangerous to even contemplate hacking again.

 So he took up drugs instead.

 [ ]

 Electron's father waited until the very last days of his illness, in

 March 1991, before he went into hospital. He knew that once he went

 in, he would not be coming out again.

 There was so much to do before that trip, so many things to organise.

 The house, the life insurance paperwork, the will, the funeral, the

 instructions for the family friend who promised to watch over both

 children when he was gone. And, of course, the children themselves.

 He looked at his two children and worried. Despite their ages of 21

 and 19, they were in many ways still very sheltered. He realised that

 Electron's anti-establishment attitude and his sister's emotional

 remoteness would remain unresolved difficulties at the time of his

 death. As the cancer progressed, Electron's father tried to tell both

 children how much he cared for them. He might have been somewhat

 emotionally remote himself in the past, but with so little time left,

 he wanted to set the record straight.

 On the issue of Electron's problems with the police, however,

 Electron's father maintained a hands-off approach. Electron had only

 talked to his father about his hacking exploits occasionally, usually

 when he had achieved what he considered to be a very noteworthy hack.

 His father's view was always the same. Hacking is illegal, he told his

 son, and the police will probably eventually catch you. Then you will

 have to deal with the problem yourself. He didn't lecture his son, or

 forbid Electron from hacking. On this issue he considered his son old

 enough to make his own choices and live with the consequences.

 True to his word, Electron's father had shown little sympathy for his

 son's legal predicament after the police raid. He remained neutral on

 the subject, saying only, `I told you something like this would happen

 and now it is your responsibility'.

 Electron's hacking case progressed slowly over the year, as did his

 university accounting studies. In March 1991, he faced committal

 proceedings and had to decide whether to fight his committal.

 He faced fifteen charges, most of which were for obtaining

 unauthorised access to computers in the US and Australia. A few were

 aggravated offences, for obtaining access to data of a commercial

 nature. On one count each, the DPP (the Office of the Commonwealth

 Director of Public Prosecutions) said he altered and erased data.

 Those two counts were the result of his inserting backdoors for

 himself, not because he did damage to any files. The evidence was

 reasonably strong: telephone intercepts and datataps on Phoenix's

 phone which showed him talking to Electron about hacking; logs of

 Electron's own sessions in Melbourne University's systems which were

 traced back to his home phone; and Electron's own confession to the

 police.

 This was the first major computer hacking case in Australia under the

 new legislation. It was a test case--the test case for computer

 hacking in Australia--and the DPP was going in hard. The case had

 generated seventeen volumes of evidence, totalling some 25000 pages,

 and Crown prosecutor Lisa West planned to call up to twenty expert

 witnesses from Australia, Europe and the US.

 Those witnesses had some tales to tell about the Australian hackers,

 who had caused havoc in systems around the world. Phoenix had

 accidentally deleted a Texas-based company's inventory of assets--the

 only copy in existence according to Execucom Systems Corporation. The

 hackers had also baffled security personnel at the US Naval Research

 Labs. They had bragged to the New York Times. And they forced NASA to

 cut off its computer network for 24 hours.

 AFP Detective Sergeant Ken Day had flown halfway around the world to

 obtain a witness statement from none other than NASA Langley computer

 manager Sharon Beskenis--the admin Phoenix had accidentally kicked off

 her own system when he was trying to get Deszip. Beskenis had been

 more than happy to oblige and on 24 July 1990 she signed a statement

 in Virginia, witnessed by Day. Her statement said that, as a result of

 the hackers' intrusion, `the entire NASA computer system was

 disconnected from any external communications with the rest of the

 world' for about 24 hours on 22 February 1990.

 In short, Electron thought, there didn't seem to be much chance of

 winning at the committal hearing. Nom seemed to feel the same way. He

 faced two counts, both `knowingly concerned' with Phoenix obtaining

 unauthorised access. One was for NASA Langley, the other for

 CSIRO--the Zardoz file. Nom didn't fight his committal either,

 although Legal Aid's refusal

 to fund a lawyer for the procedure no doubt weighed in his

 decision.

 On 6 March 1991, Magistrate Robert Langton committed Electron and Nom

 to stand trial in the Victorian County Court.

 Phoenix, however, didn't agree with his fellow hackers' point of view.

 With financial help from his family, he had decided to fight his

 committal. He wasn't going to hand this case to the prosecution on a

 silver platter, and they would have to fight him every step of the

 way, dragging him forward from proceeding to proceeding. His

 barrister, Felicity Hampel, argued the court should throw out 47 of

 the 48 charges against her client on jurisdictional grounds. All but

 one charge--breaking into the CSIRO machine in order to steal

 Zardoz--related to hacking activities outside Australia. How could an

 Australian court claim jurisdiction over a hacked computer in Texas?

 Privately, Phoenix worried more about being extradited to the US than

 dealing with the Australian courts, but publicly he was going into the

 committal with all guns blazing. It was a test case in many ways; not

 only the first major hacking case in Australia but also the first time

 a hacker had fought Australian committal proceedings for computer

 crimes.

 The prosecution agreed to drop one of the 48 counts, noting it was a

 duplicate charge, but the backdown was a pyrrhic victory for Phoenix.

 After a two-day committal hearing, Magistrate John Wilkinson decided

 Hampel's jurisdictional argument didn't hold water and on 14 August

 1991 he committed Phoenix to stand trial in the County Court.

 By the day of Electron's committal, in March, Electron's father had

 begun his final decline. The bowel cancer created a roller-coaster of

 good and bad days, but soon there were only bad days, and they were

 getting worse. On the last day of March, the doctors told him that it

 was finally time to make the trip to hospital. He stubbornly refused

 to go, fighting their advice, questioning their authority. They

 quietly urged him again. He protested. Finally, they insisted.

 Electron and his sister stayed with their father for hours that day,

 and the following one. Their father had other visitors to keep his

 spirits up, including his brother who fervently beseeched him to

 accept Jesus Christ as his personal saviour before he died. That way,

 he wouldn't burn in hell. Electron looked at his uncle, disbelieving.

 He couldn't believe his father was having to put up with such crap on

 his deathbed. Still, Electron chose to be discreet. Apart from an

 occasional rolling of the eyes, he kept his peace at his father's

 bedside.

 Perhaps, however, the fervent words did some good, for as Electron's

 father spoke about the funeral arrangements, he made a strange slip of

 the tongue. He said `wedding' instead of funeral, then paused,

 realising his mistake. Glancing slowly down at the intricate braided

 silver wedding band still on his finger, he smiled frailly and said,

 `I suppose, in a way, it will be like a wedding'.

 Electron and his sister went to hospital every day for four days, to

 sit by their father's bed.

 At 6 a.m. on the fifth day, the telephone rang. It was the family

 friend their father had asked to watch over them. Their father's life

 signs were very, very weak, fluttering on the edge of death.

 When Electron and his sister arrived at the hospital, the nurse's face

 said everything. They were too late. Their father had died ten minutes

 before they arrived. Electron broke down and wept. He hugged his

 sister, who, for a brief moment, seemed almost reachable. Driving them

 back to the house, the family friend stopped and bought them an

 answering machine.

 `You'll need this when everyone starts calling in,' she told them.

 `You might not want to talk to anyone for a while.'

 In the months after his bust in 1990 Electron began smoking marijuana

 regularly. At first, as with many other university students, it was a

 social thing. Some friends dropped by, they happened to have a few

 joints, and so everybody went out for a night on the town. When he was

 in serious hacking mode, he never smoked. A clear head was much too

 important. Besides, the high he got from hacking was a hundred times

 better than anything dope could ever do for him.

 When Phoenix appeared on the front page of the New York Times,

 Electron gave up hacking. And even if he had been tempted to return to

 it, he didn't have anything to hack with after the police took his

 only computer. Electron found himself casting around for something to

 distract him from his father's deteriorating condition and the void

 left by giving up hacking. His accounting studies didn't quite fit the

 bill. They had always seemed empty, but never more so than now.

 Smoking pot filled the void. So did tripping. Filled it very nicely.

 Besides, he told himself, it's harder to get caught smoking dope in

 your friends' houses than hacking in your own. The habit grew

 gradually. Soon, he was smoking dope at home. New friends began coming

 around, and they seemed to have drugs with them all the time--not just

 occasionally, and not just for fun.

 Electron and his sister had been left the family home and enough money

 to give them a modest income. Electron began spending this money on

 his new-found hobby. A couple of Electron's new friends moved into the

 house for a few months. His sister didn't like them dealing drugs out

 of the place, but Electron didn't care what was happening around him.

 He just sat in his room, listening to his stereo, smoking dope,

 dropping acid and watching the walls.

 The headphones blocked out everyone in the house, and, more

 importantly, what was going on inside Electron's own head. Billy

 Bragg. Faith No More. Cosmic Psychos. Celibate Rifles. Jane's

 Addiction. The Sex Pistols. The Ramones. Music gave Electron a

 pinpoint, a figurative dot of light on his forehead where he could

 focus his mind. Blot out the increasingly strange thoughts creeping

 through his consciousness.

 His father was alive. He was sure of it. He knew it, like he knew the

 sun would rise tomorrow. Yet he had seen his father lying, dead, in

 the hospital bed. It didn't make sense.

 So he took another hit from the bong, floated in slow motion to his

 bed, lay down, carefully slid the earphones over his head, closed his

 eyes and tried to concentrate on what the Red Hot Chilli Peppers were

 saying instead. When that wasn't enough, he ventured down the hallway,

 down to his new friends--the friends with the acid tabs. Then, eight

 more hours without having to worry about the strange thoughts.

 Soon people began acting strangely too. They would tell Electron

 things, but he had trouble understanding them. Pulling a milk carton

 from the fridge and sniffing it, Electron's sister might say, `Milk's

 gone off'. But Electron wasn't sure what she meant. He would look at

 her warily. Maybe she was trying to tell him something else, about

 spiders. Milking spiders for venom.

 When thoughts like these wafted through Electron's mind, they

 disturbed him, lingering like a sour smell. So he floated back to the

 safety of his room and listened to songs by Henry Rollins.

 After several months in this cloudy state of limbo, Electron awoke one

 day to find the Crisis Assessment Team--a mobile psychiatric team--in

 his bedroom. They asked him questions, then they tried to feed him

 little blue tablets. Electron didn't want to take the tablets. Were

 little blue pills placebos? He was sure they were. Or maybe they were

 something more sinister.

 Finally, the CAT workers convinced Electron to take the Stelazine

 tablet. But when they left, terrifying things began to happen.

 Electron's eyes rolled uncontrollably to the back of his head. His

 head twisted to the left. His mouth dropped open, very wide. Try as he

 might, he couldn't shut it, any more than he could turn his head

 straight. Electron saw himself in the mirror and he panicked. He

 looked like a character out of a horror

 picture.

 His new house-mates reacted to this strange new behaviour by trying to

 psychoanalyse Electron, which was less than helpful. They discussed

 him as if he wasn't even present. He felt like a ghost and, agitated

 and confused, he began telling his friends that he was going to kill

 himself. Someone called the CAT team again. This time they refused to

 leave unless he would guarantee not to attempt suicide.

 Electron refused. So they had him committed.

 Inside the locked psychiatric ward of Plenty Hospital (now known as

 NEMPS), Electron believed that, although he had gone crazy, he wasn't

 really in a hospital psychiatric ward. The place was just supposed to

 look like one. His father had set it

 all up.

 Electron refused to believe anything that anyone told him. It was all

 lies. They said one thing, but always meant another.

 He had proof. Electron read a list of patients' names on the wall and

 found one called Tanas. That name had a special meaning. It was an

 anagram for the word `Santa'. But Santa Claus was a myth, so the name

 Tanas appearing on the hospital list proved to him that he shouldn't

 listen to anything anyone told him.

 Electron ate his meals mostly in silence, trying to ignore the

 voluntary and involuntary patients who shared the dining hall. One

 lunchtime, a stranger sat down at Electron's table and started talking

 to him. Electron found it excruciatingly painful talking to other

 people, and he kept wishing the stranger would go away.

 The stranger talked about how good the drugs were in

 hospital.

 `Mm,' Electron said. `I used to do a lot of drugs.'

 `How much is a lot?'

 `I spent $28000 on dope alone in about four months.'

 `Wow,' the stranger said, impressed. `Of course, you don't have to pay

 for drugs. You can always get them for free. I do.'

 `You do?' Electron asked, somewhat perplexed.

 `Sure! All the time,' the stranger said grandly. `No problem. Just

 watch.'

 The stranger calmly put his fork down on the tray, carefully stood up

 and then began yelling at the top of his lungs. He waved his arms

 around frantically and shouted abuse at the other patients.

 Two nurses came running from the observation room. One of them tried

 to calm the stranger down while the other quickly measured out various

 pills and grabbed a cup of water. The stranger swallowed the pills,

 chased them with a swig of water and sat down quietly. The nurses

 retreated, glancing back over their shoulders.

 `See?' The stranger said. `Well, I'd better be on my way, before the

 pills kick in. See ya.'

 Electron watched, amazed, as the stranger picked up his bag, walked

 through the dining-hall door, and straight out the front door of the

 psychiatric ward.

 After a month, the psychiatrists reluctantly allowed Electron to leave

 the hospital in order to stay with his maternal grandmother in

 Queensland. He was required to see a psychiatrist regularly. He spent

 his first few days in Queensland believing he was Jesus Christ. But he

 didn't hold onto that one for long. After two weeks of patiently

 waiting and checking for signs of the imminent apocalypse, consistent

 with the second coming, he decided he was really the reincarnation of

 Buddha.

 In late February 1992, after three months of psychiatric care up

 north, Electron returned to Melbourne and his university studies, with

 a bag full of medication. Prozac, major tranquillisers, Lithium. The

 daily routine went smoothly for a while. Six Prozac--two in the

 morning, two at midday and two at night. Another anti-depressant to be

 taken at night. Also at night, the anti-side effect tablets to combat

 the involuntary eye-rolling, jaw-dropping and neck-twisting associated

 with the anti-depressants.

 All of it was designed to help him deal with what had by

 now become a long list of diagnoses. Cannabis psychosis.

 Schizophrenia. Manic depression. Unipolar effective disorder.

 Schizophrenaform. Amphetamine psychosis. Major effective disorder.

 Atypical psychosis. And his own personal favourite--facticious

 disorder, or faking it to get into hospital. But the medication wasn't

 helping much. Electron still felt wretched, and returning to a host of

 problems in Melbourne made things worse.

 Because of his illness, Electron had been largely out of the loop of

 legal proceedings. Sunny Queensland provided a welcome escape. Now he

 was back in Victoria facing a tedious university course in accounting,

 an ongoing battle with mental illness, federal charges which could see

 him locked up for ten years, and publicity surrounding the first major

 hacking case in Australia. It was going to be a hard winter.

 To make matters worse, Electron's medication interfered with his

 ability to study properly. The anti-side effect pills relaxed the

 muscles in his eyes, preventing them from focusing. The writing on the

 blackboard at the front of the lecture hall was nothing but a hazy

 blur. Taking notes was also a problem. The medication made his hands

 tremble, so he couldn't write properly. By the end of a lecture,

 Electron's notes were as unreadable as the blackboard. Frustrated,

 Electron stopped taking his medicine, started smoking dope again and

 soon felt a little better. When the dope wasn't enough, he turned to

 magic mushrooms and hallucinogenic cactus.

 The hacking case was dragging on and on. On 6 December 1991, just

 after he left psych hospital but before he flew to Queensland, the

 office of the DPP had formally filed an indictment containing fifteen

 charges against Electron, and three against Nom, in the Victorian

 County Court.

 Electron didn't talk to Phoenix much any more, but the DPP lawyers

 hadn't forgotten about him--far from it. They had much bigger plans

 for Phoenix, perhaps because he was fighting every step of the way.

 Phoenix was uncooperative with police in the interview on the day of

 the raid, frequently refusing to answer their questions. When they

 asked to fingerprint him, he refused and argued with them about it.

 This behaviour did not endear him to either the police or the DPP.

 On 5 May 1992, the DPP filed a final indictment with 40 charges

 against Phoenix in the County Court. The charges, in conjunction with

 those against Electron and Nom, formed part of a joint indictment

 totalling 58 counts.

 Electron worried about being sent to prison. Around the world, hackers

 were under siege--Par, Pengo, LOD and Erik Bloodaxe, MOD, The Realm

 hackers, Pad and Gandalf and, most recently, the International

 Subversives. Somebody seemed to be trying to make a point.

 Furthermore, Electron's charges had changed considerably--for the

 worse--from the original ones documented in April 1990.

 The DPP's final indictment bore little resemblance to the original

 charge sheet handed to the young hacker when he left the police

 station the day he was raided. The final indictment read like a

 veritable Who's Who of prestigious institutions around the world.

 Lawrence Livermore Labs, California. Two different computers at the US

 Naval Research Laboratories, Washington DC. Rutgers University, New

 Jersey. Tampere University of Technology, Finland. The University of

 Illinios. Three different computers at the University of Melbourne.

 Helsinki University of Technology, Finland. The University of New

 York. NASA Langley Research Center, Hampton, Virginia. CSIRO, Carlton,

 Victoria.

 The charges which worried Electron most related to the

 US Naval Research Labs, CSIRO, Lawrence Livermore Labs

 and NASA. The last three weren't full hacking charges. The

 DPP alleged Electron had been `knowingly concerned' with Phoenix's

 access of these sites.

 Electron looked at the thirteen-page joint indictment and didn't know

 whether to laugh or cry. He had been a lot more than `knowingly

 concerned' with accessing those sites. In many cases, he had given

 Phoenix access to those computers in the first place. But Electron

 tried to tread quietly, carefully, through most systems, while Phoenix

 had noisily stomped around with all the grace of a buffalo--and left

 just as many footprints. Electron hardly wanted to face full charges

 for those or any other sites. He had broken into thousands of sites on

 the X.25 network, but he hadn't been charged with any of them. He

 couldn't help feeling a little like the gangster Al Capone being done

 for tax evasion.

 The proceedings were attracting considerable media attention. Electron

 suspected the AFP or the DPP were alerting the media to upcoming court

 appearances, perhaps in part to prove to the Americans that `something

 was being done'.

 This case had American pressure written all over it. Electron's

 barrister, Boris Kayser, said he suspected that `the

 Americans'--American institutions, companies or government

 agencies--were indirectly funding some of the prosecution's case by

 offering to pay for US witnesses to attend the trial. The Americans

 wanted to see the Australian hackers go down, and they were throwing

 all their best resources at the case to make sure it happened.

 There was one other thing--in some ways the most disturbing matter of

 all. In the course of the legal to-ing and fro-ing, Electron was told

 that it was the US Secret Service back in 1988 which had triggered the

 AFP investigation into The Realm hackers--an investigation which had

 led to Electron's bust and current legal problems. The Secret Service

 was after the hackers who broke into Citibank.

 As it happened, Electron had never touched Citibank. Credit cards

 couldn't interest him less. He found banks boring and, the way he

 looked at it, their computers were full of mundane numbers belonging

 to the world of accounting. He had already suffered through enough of

 those tedious types of numbers in his university course. Unless he

 wanted to steal from banks--something he would not do--there was no

 point in breaking into their computers.

 But the US Secret Service was very interested in banks--and in

 Phoenix. For they didn't just believe that Phoenix had been inside

 Citibank's computers. They believed he had masterminded the Citibank

 attack.

 And why did the US Secret Service think that? Because, Electron was

 told, Phoenix had gone around bragging about it in the underground. He

 hadn't just told people he had hacked into Citibank computers, he

 reportedly boasted that he had stolen some $50000 from the bank.

 Going through his legal brief, Electron had discovered something which

 seemed to confirm what he was being told. The warrant for the

 telephone tap on both of Phoenix's home phones mentioned a potential

 `serious loss to Citibank' as a justification for the warrant.

 Strangely, the typed words had been crossed out in the handwritten

 scrawl of the judge who approved the warrant. But they were still

 legible. No wonder the US Secret Service began chasing the case,

 Electron thought. Banks get upset when they think people have found a

 way to rip them off anonymously.

 Electron knew that Phoenix hadn't stolen any money from Citibank.

 Rather, he had been circulating fantastic stories about himself to

 puff up his image in the underground, and in the process had managed

 to get them all busted.

 In September 1992, Phoenix rang Electron suggesting they get together

 to discuss the case. Electron wondered why. Maybe he suspected

 something, sensing that the links binding them were weak, and becoming

 weaker by the month. That Electron's mental illness had changed his

 perception of the world. That his increasingly remote attitude to

 Phoenix suggested an underlying anger about the continual bragging.

 Whatever the reason, Phoenix's gnawing worry must have been confirmed

 when Electron put off meeting with him.

 Electron didn't want to meet with Phoenix because he didn't like him,

 and because he thought Phoenix was largely responsible for getting the

 Australian hackers into their current predicament.

 With these thoughts fermenting in his mind, Electron listened with

 interest a few months later when his solicitor, John McLoughlin,

 proposed an idea. In legal circles, it was nothing new. But it was new

 to Electron. He resolved to take up McLoughlin's advice.

 Electron decided to testify as a Crown witness against Phoenix.

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 Chapter 7 -- Judgement Day

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 Your dream world is just about to end

 -- from `Dreamworld', on Diesel and Dust by Midnight Oil

 In another corner of the globe, the British hackers Pad and Gandalf

 learned with horror that the Australian authorities had busted the

 three Realm hackers. Electron had simply disappeared one day. A short

 time later, Phoenix was gone too. Then the reports started rolling in

 from newspapers and from other Australian hackers on a German board

 similar to Altos, called Lutzifer.

 Something else worried Pad. In one of his hacking forays, he had

 discovered a file, apparently written by Eugene Spafford, which said

 he was concerned that some British hackers--read Pad and

 Gandalf--would create a new worm, based on the RTM worm, and release

 it into the Internet. The unnamed British hackers would then be able

 to cause maximum havoc on thousands of Internet sites.

 It was true that Gandalf and Pad had captured copies of various worm

 source codes. They fished around inside SPAN until they surfaced with

 a copy of the Father Christmas worm. And, after finally successfully

 hacking Russell Brand's machine at LLNL, they deftly lifted a complete

 copy of the WANK worm. In Brand's machine, they also found a

 description of how someone had broken into SPAN looking for the WANK

 worm code, but hadn't found it. `That was me breaking into SPAN to

 look around,' Gandalf laughed, relaying the tale to Pad.

 Despite their growing library of worm code, Pad had no intention of

 writing any such worm. They simply wanted the code to study what

 penetration methods the worms had used and perhaps to learn something

 new. The British hackers prided themselves on never having done

 anything destructive to systems they hacked. In places where they knew

 their activities had been discovered--such as at the Universities of

 Bath, Edinburgh, Oxford and Strathclyde--they wrote notes to the

 admins signed 8lgm. It wasn't only an ego thing--it was also a way of

 telling the admins that they weren't going to do anything nasty to the

 system.

 At one university, the admins thought 8lgm was some kind

 of weird variation on a Belgian word and that the hackers who visited

 their systems night after night were from Belgium. At another uni, the

 admins made a different guess at the meaning. In the morning, when

 they came into work and saw that the hackers had been playing in their

 system all night, they would sigh to each other, `Our eight little

 green men are at it again'.

 At the University of Lancaster, the hackers wrote a message to the

 admins which said: `Don't do anything naughty. We have a good image

 around the world, so please don't tarnish it or start making up

 stories about us messing up systems. Don't hold your breath for us to

 hack you, but keep us in mind.' Wherever they went, their message was

 the same.

 Nonetheless Pad visualised a scenario where Spaf whipped up the

 computer security and law enforcement people into a frenzied panic and

 tried to pin all sorts of things on the British hackers, none of which

 they had done. The underground saw Spaf as being rabid in his attack

 on hackers, based largely on his response to the RTM worm. And Gandalf

 had hacked Spaf's machine.

 The crackdown on the Australians, combined with the discovery of the

 Spaf file, had a profound effect on Pad. Always cautious anyway, he

 decided to give up hacking. It was a difficult decision, and weaning

 himself from exploring systems night after night was no easy task.

 However, in the face of what had happened to Electron and Phoenix,

 continuing to hack didn't seem worth the risk.

 When Pad gave up hacking, he bought his own NUI so he could access

 places like Altos legitimately. The NUI was expensive--about

 [sterling]10 an hour--but he was never on for long. Leisurely chats of

 the type he once enjoyed in Altos were out of the question, but at

 least he could mail letters to his friends like Theorem and Gandalf.

 There would have been easier ways to maintain his friendship with

 Gandalf, who lived in Liverpool, only an hour's drive away. But it

 wouldn't be the same. Pad and Gandalf had never met, or even talked on

 the phone. They talked on-line, and via email. That was the way they

 related.

 Pad also had other reasons for giving up hacking. It was an expensive

 habit in Britain because British Telecom time-charged for local phone

 calls. In Australia, a hacker could stay on-line for hours, jumping

 from one computer to another through the data network, all for the

 cost of one local call. Like the Australians, Pad could launch his

 hacking sessions from a local uni or X.25 dial-up. However, an

 all-night hacking session based on a single phone call might still

 cost him [sterling]5 or more in timed-call charges--a considerable

 amount of money for an unemployed young man. As it was, Pad had

 already been forced to stop hacking for brief periods when he ran out

 of his dole money.

 Although Pad didn't think he could be prosecuted for hacking under

 British law in early 1990, he knew that Britain was about to enact its

 own computer crime legislation--the Computer Misuse Act 1990--in

 August. The 22-year-old hacker decided that it was better to quit

 while he was ahead.

 And he did, for a while at least. Until July 1990, when Gandalf, two

 years his junior, tempted him with one final hack before the new Act

 came into force. Just one last fling, Gandalf told him. After that

 last fling in July, Pad stopped hacking again.

 The Computer Misuse Act passed into law in August 1990, following two

 law commission reviews on the subject. The Scottish Law Commission

 issued a 1987 report proposing to make unauthorised data access

 illegal, but only if the hacker tried to `secure advantage, or cause

 damage to another person'--including reckless damage.2 Simple look-see

 hacking would not be a crime under the report's recommendations.

 However, in 1989 The Law Commission of England and Wales issued its

 own report proposing that simple unauthorised access should be a crime

 regardless of intent--a recommendation which was eventually included

 in the law.

 Late in 1989, Conservative MP Michael Colvin introduced a private

 member's bill into the British parliament. Lending her support to the

 bill, outspoken hacker-critic Emma Nicholson, another Conservative MP,

 fired public debate on the subject and ensured the bill passed through

 parliament successfully.

 In November 1990, Pad was talking on-line with Gandalf, and his friend

 suggested they have one more hack, just one more, for old time's sake.

 Well, thought Pad, one more--just a one-off thing--wouldn't hurt.

 Before long, Pad was hacking regularly again, and when Gandalf tried

 to give it up, Pad was there luring him to return to his favourite

 pastime. They were like two boys at school, getting each other into

 trouble--the kind of trouble which always comes in pairs. If Pad and

 Gandalf hadn't known each other, they probably would both have walked

 away from hacking forever in 1990.

 As they both got back into the swing of things, they tried to make

 light of the risk of getting caught. `Hey, you know,' Gandalf joked

 on-line more than once, `the first time we actually meet each other in

 person will probably be in a police station.'

 Completely irreverent and always upbeat, Gandalf proved to be a true

 friend. Pad had rarely met such a fellow traveller in the real world,

 let alone on-line. What others--particularly some American

 hackers--viewed as prickliness, Pad saw as the perfect sense of

 humour. To Pad, Gandalf was the best m8 a fellow could ever have.

 During the time Pad avoided hacking, Gandalf had befriended another,

 younger hacker named Wandii, also from the north of England. Wandii

 never played much of a part in the international computer underground,

 but he did spend a lot of time hacking European computers. Wandii and

 Pad got along pleasantly but they were never close. They were

 acquaintances, bound by ties to Gandalf in the underground.

 By the middle of June 1991, Pad, Gandalf and Wandii were peaking. At

 least one of them--and often more--had already broken into systems

 belonging to the European Community in Luxembourg, The Financial Times

 (owners of the FTSE 100 share index), the British Ministry of Defence,

 the Foreign Office, NASA, the investment bank SG Warburg in London,

 the American computer database software manufacturer Oracle, and more

 machines on the JANET network than they could remember. Pad had also

 penetrated a classified military network containing a NATO system.

 They moved through British Telecom's Packet Switched Stream Network

 (PSS), which was similar to the Tymnet X.25 network, with absolute

 ease.3

 Gandalf's motto was, `If it moves, hack it'.

 [ ]

 On 27 June 1991, Pad was sitting in the front room of his parent's

 comfortable home in greater Manchester watching the last remnants of

 daylight disappear on one of the longest days of the year. He loved

 summer, loved waking up to streaks of sunlight sneaking through the

 cracks in his bedroom curtain. He often thought to himself, it doesn't

 get much better than this.

 Around 11 p.m. he flicked on his modem and his Atari 520 ST computer

 in the front sitting room. There were two Atari computers in the

 house--indicative of his deep enthusiasm for computers since neither

 his siblings nor his parents had any interest in programming. Most of

 the time, however, Pad left the older Atari alone. His elder brother,

 an aspiring chemist, used it for writing his PhD thesis.

 Before dialling out, Pad checked that no-one was on the house's single

 phone line. Finding it free, he went to check his email on Lutzifer. A

 few minutes after watching his machine connect to the German board, he

 heard a soft thud, followed by a creaking. Pad stopped typing, looked

 up from his machine and listened. He wondered if his brother, reading

 in their bedroom upstairs, or his parents, watching telly in the back

 lounge room, could hear the creaking.

 The sound became more pronounced and Pad swung around and looked

 toward the hallway. In a matter of seconds, the front door frame had

 been cracked open, prising the door away from its lock. The wood had

 been torn apart by some sort of car jack, pumped up until the door

 gave way.

 Suddenly, a group of men burst through from the front doorstep, dashed

 down the long hallway and shot up the carpeted stairs to Pad's

 bedroom.

 Still sitting at his computer downstairs, Pad swiftly flicked his

 modem, and then his computer, off--instantly killing his connection

 and everything on his screen. He turned back toward the door leading

 to the sitting room and strained to hear what was happening upstairs.

 If he wasn't so utterly surprised, he would almost have laughed. He

 realised that when the police had dashed up to his bedroom, they had

 been chasing every stereotype about hackers they had probably ever

 read. The boy. In his bedroom. Hunched over his computer. Late at

 night.

 They did find a young man in the bedroom, with a computer. But it was

 the wrong one, and for all intents and purposes the wrong computer. It

 took the police almost ten minutes of quizzing Pad's brother to work

 out their mistake.

 Hearing a commotion, Pad's parents had rushed into the hallway while

 Pad peered from the doorway of the front sitting room. A uniformed

 police officer ushered everyone back into the room, and began asking

 Pad questions.

 `Do you use computers? Do you use the name Pad on computers?' they

 asked.

 Pad concluded the game was up. He answered their questions truthfully.

 Hacking was not such a serious crime after all, he thought. It wasn't

 as if he had stolen money or anything. This would be a drama, but he

 was easy-going. He would roll with the punches, cop a slap on the

 wrist and soon the whole thing would be over and done with.

 The police took Pad to his bedroom and asked him questions as they

 searched the room. The bedroom had a comfortably lived-in look, with a

 few small piles of clothes in the corner, some shoes scattered across

 the floor, the curtains hanging crooked, and a collection of music

 posters--Jimi Hendrix and The Smiths--taped to the wall.

 A group of police hovered around his computer. One of them began to

 search through Pad's books on the shelves above the PC, checking each

 one as he pulled it down. A few well-loved Spike Milligan works. Some

 old chess books from when he was captain of the local chess team.

 Chemistry books, purchased by Pad long before he took any classes in

 the subject, just to satisfy his curiosity. Physics books. An

 oceanography textbook. A geology book bought after a visit to a cave

 excited his interest in the formation of rocks. Pad's mother, a

 nursing sister, and his father, an electronics engineer who tested

 gyros on aircraft, had always encouraged their children's interest in

 the sciences.

 The policeman returned those books to the shelves, only picking out

 the computer books, textbooks from programming and maths classes Pad

 had taken at a Manchester university. The officer carefully slid them

 inside plastic bags to be taken away as

 evidence.

 Then the police picked through Pad's music tapes--The Stone Roses,

 Pixies, New Order, The Smiths and lots of indie music from the

 flourishing Manchester music scene. No evidence of anything but an

 eclectic taste in music there.

 Another policeman opened Pad's wardrobe and peered inside. `Anything

 in here of interest?' he asked.

 `No,' Pad answered. `It's all over here.' He pointed to the box of

 computer disks.

 Pad didn't think there was much point in the police tearing the place

 to pieces, when they would ultimately find everything they wanted

 anyway. Nothing was hidden. Unlike the Australian hackers, Pad hadn't

 been expecting the police at all. Although part of the data on his

 hard drive was encrypted, there was plenty of incriminating evidence

 in the un-encrypted files.

 Pad couldn't hear exactly what his parents were talking about with the

 police in the other room, but he could tell they were calm. Why

 shouldn't they be? It wasn't as if their son had done anything

 terrible. He hadn't beaten someone up in a fist fight at a pub, or

 robbed anyone. He hadn't hit someone while drunk driving. No, they

 thought, he had just been fiddling around with computers. Maybe poking

 around where he shouldn't have been, but that was hardly a serious

 crime. They needn't worry. It wasn't as if he was going to prison or

 anything. The police would sort it all out. Maybe some sort of

 citation, and the matter would be over and done. Pad's mother even

 offered to make cups of tea for the police.

 One of the police struck up a conversation with Pad off to the side as

 he paused to drink his tea. He seemed to know that Pad was on the

 dole, and with a completely straight face, he said, `If you wanted a

 job, why didn't you just join the police?'

 Pad paused for a reality check. Here he was being raided by nearly a

 dozen law enforcement officers--including representatives from BT and

 Scotland Yard's computer crimes unit--for hacking hundreds of

 computers and this fellow wanted to know why he hadn't just become a

 copper?

 He tried not to laugh. Even if he hadn't been busted, there is no way

 he would ever have contemplated joining the police. Never in a million

 years. His family and friends, while showing a pleasant veneer of

 middle-class orderliness, were fundamentally anti-establishment. Many

 knew that Pad had been hacking, and which sites he had penetrated.

 Their attitude was: Hacking Big Brother? Good on you.

 His parents were torn, wanting to encourage Pad's interest in

 computers but also worrying their son spent an inordinate amount of

 time glued to the screen. Their mixed feelings mirrored Pad's own

 occasional concern.

 While deep in the throes of endless hacking nights, he would suddenly

 sit upright and ask himself, What am I doing here, fucking around on a

 computer all day and night? Where is this heading? What about the rest

 of life? Then he would disentangle himself from hacking for a few days

 or weeks. He would go down to the university pub to drink with his

 mostly male group of friends from his course.

 Tall, with short brown hair, a slender physique and a handsomely

 boyish face, the soft-spoken Pad would have been considered attractive

 by many intelligent girls. The problem was finding those sort of

 girls. He hadn't met many when he was studying at university--there

 were few women in his maths and computer classes. So he and his

 friends used to head down to the Manchester nightclubs for the social

 scene and the good music.

 Pad went downstairs with one of the officers and watched as the police

 unplugged his 1200 baud modem, then tucked it into a plastic bag. He

 had bought that modem when he was eighteen. The police unplugged

 cables, bundled them up and slipped them into labelled plastic bags.

 They gathered up his 20 megabyte hard drive and monitor. More plastic

 bags and labels.

 One of the officers called Pad over to the front door. The jack was

 still wedged across the mutilated door frame. The police had broken

 down the door instead of knocking because they wanted to catch the

 hacker in the act--on-line. The officer motioned for Pad to follow

 him.

 `Come on,' he said, leading the hacker into the night. `We're taking

 you to the station.'

 Pad spent the night in a cell at the Salford Crescent police

 station, alone. No rough crims, and no other hackers either.

 He settled into one of the metal cots lined against the perimeter of

 the cell, but sleep evaded him. Pad wondered if Gandalf had been

 raided as well. There was no sign of him, but then again, the police

 would hardly be stupid enough to lock up the two hackers together. He

 tossed and turned, trying to push thoughts from his head.

 Pad had fallen into hacking almost by accident. Compared to others in

 the underground, he had taken it up at a late age--around nineteen.

 Altos had been the catalyst. Visiting BBSes, he read a file describing

 not only what Altos was, but how to get there--complete with NUI.

 Unlike the Australian underground, the embryonic British underground

 had no shortage of NUIs. Someone had discovered a stack of BT NUIs and

 posted them on BBSes across England.

 Pad followed the directions in the BBS file and soon found himself in

 the German chat channel. Like Theorem, he marvelled at the brave new

 live world of Altos. It was wonderful, a big international party.

 After all, it wasn't every day he got to talk with Australians, Swiss,

 Germans, Italians and Americans. Before long, he had taken up hacking

 like so many other Altos regulars.

 Hacking as a concept had always intrigued him. As a teenager, the film

 War Games had dazzled him. The idea that computers could communicate

 with each over telephone lines enthralled the sixteen-year-old,

 filling his mind with new ideas. Sometime after that he saw a

 television report on a group of hackers who claimed that they had used

 their skills to move satellites around in space--the same story which

 had first caught Electron's imagination.

 Pad had grown up in Greater Manchester. More than a century before,

 the region had been a textile boom-town. But the thriving economy did

 not translate into great wealth for the masses. In the early 1840s,

 Friedrich Engels had worked in his father's cotton-milling factory in

 the area, and the suffering

 he saw in the region influenced his most famous work, The Communist

 Manifesto, published in 1848.

 Manchester wore the personality of a working-class town, a place where

 people often disliked the establishment and

 distrusted authority figures. The 1970s and 1980s had not been kind to

 most of Greater Manchester, with unemployment and urban decay

 disfiguring the once-proud textile hub. But this decay only appeared

 to strengthen an underlying resolve among many from the working

 classes to challenge the symbols of power.

 Pad didn't live in a public housing high-rise. He lived in a suburban

 middle-class area, in an old, working-class town removed from the

 dismal inner-city. But like many people from the north, he disliked

 pretensions. Indeed, he harboured a healthy degree of good-natured

 scepticism, perhaps stemming from a culture of mates whose favourite

 pastime was pulling each other's leg down at the pub.

 This scepticism was in full-gear as he watched the story of how

 hackers supposedly moved satellites around in space, but somehow the

 idea slipped through the checkpoints and captured his imagination,

 just as it had done with Electron. He felt a desire to find out for

 himself if it was true and he began pursuing hacking in enthusiastic

 bursts. At first it was any moderately interesting system. Then he

 moved to the big-name systems--computers belonging to large

 institutions. Eventually, working with the Australians, he learned to

 target computer security experts. That was, after all, where the

 treasure was stored.

 In the morning at the police station, a guard gave Pad something to

 eat which might have passed for food. Then he was escorted into an

 interview room with two plain-clothed officers and a BT

 representative.

 Did he want a lawyer? No. He had nothing to hide. Besides, the police

 had already seized evidence from his house, including unencrypted data

 logs of his hacking sessions. How could he argue against that? So he

 faced his stern inquisitors and answered their questions willingly.

 Suddenly things began to take a different turn when they began asking

 about the `damage' he had done inside the Greater London Polytechnic's

 computers. Damage? What damage? Pad certainly hadn't damaged anything.

 Yes, the police told him. The damage totalling almost a quarter of a

 million pounds.

 Pad gasped in horror. A quarter of a million pounds? He thought back

 to his many forays into the system. He had been a little mischievous,

 changing the welcome message to `Hi' and signing it 8lgm. He had made

 a few accounts for himself so he could log in at a later date. That

 seemed to be nothing special, however, since he and Gandalf had a

 habit of making accounts called 8lgm for themselves in JANET systems.

 He had also erased logs of his activities to cover his tracks, but

 again, this was not unusual, and he had certainly never deleted any

 computer users' files. The whole thing had just been a bit of fun, a

 bit of cat and mouse gaming with the system admins. There was nothing

 he could recall which would account for that kind of damage. Surely

 they had the wrong hacker?

 No, he was the right one all right. Eighty investigators from BT,

 Scotland Yard and other places had been chasing the 8lgm hackers for

 two years. They had phone traces, logs seized from his computer and

 logs from the hacked sites. They knew it was him.

 For the first time, the true gravity of the situation hit Pad. These

 people believed in some way that he had committed serious criminal

 damage, that he had even been malicious.

 After about two hours of questioning, they put Pad back in his cell.

 More questions tomorrow, they told him.

 Later that afternoon, an officer came in to tell Pad his mother and

 father were outside. He could meet with them in the visiting area.

 Talking through a glass barrier, Pad tried to reassure his worried

 parents. After five minutes, an officer told the family the visit was

 over. Amid hurried goodbyes under the impatient stare of the guard,

 Pad's parents told him they had brought something for him to read in

 his cell. It was the oceanography textbook.

 Back in his cell, he tried to read, but he couldn't concentrate. He

 kept replaying his visits to the London Polytechnic over and over in

 his mind, searching for how he might have inadvertently done

 [sterling]250000 worth of damage. Pad was a very good hacker; it

 wasn't as if he was some fourteen-year-old kid barging through systems

 like a bull in china shop. He knew how to get in and out of a system

 without hurting it.

 Shortly after 8 p.m., as Pad sat on his cot stewing over the police

 damage claims, sombre music seemed to fill his cell. Slowly at first,

 an almost imperceptible moaning, which subtly transformed into solemn

 but recognisable notes. It sounded like Welsh choir music, and it was

 coming from above him.

 Pad looked up at the ceiling. The music--all male voices-- stopped

 abruptly, then started again, repeating the same heavy, laboured

 notes. The hacker smiled. The local police choir was practising right

 above his cell.

 After another fitful night, Pad faced one more round of interviews.

 The police did most of the questioning, but they didn't seem to know

 much about computers--well, not nearly so much as any good hacker on

 Altos. Whenever either of the police asked a technical question, they

 looked over to the BT guy at the other end of the table as if to say,

 `Does this make any sense?' The BT guy would give a slight nod, then

 the police looked back at Pad for an answer. Most of the time, he was

 able to decipher what they thought they were trying to ask, and he

 answered accordingly.

 Then it was back to his cell while they processed his charge sheets.

 Alone again, Pad wondered once more if they had raided Gandalf. Like

 an answer from above, Pad heard telephone tones through the walls. The

 police seemed to be playing them over and over. That was when he knew

 they had Gandalf too.

 Gandalf had rigged up a tone dialler in his computer. It sounded as if

 the police were playing with it, trying to figure it out.

 So, Pad would finally meet Gandalf in person after two years. What

 would he look like? Would they have the same chemistry in person as

 on-line? Pad felt like he knew Gandalf, knew his essence, but meeting

 in person could be a bit tricky.

 Explaining that the paperwork, including the charge sheets, had

 finally been organised, a police officer unlocked Pad's cell door and

 led him to a foyer, telling him he would be meeting both Gandalf and

 Wandii. A large collection of police had formed a semi-circle around

 two other young men. In addition to Scotland Yard's Computer Crimes

 Unit and BT, at least seven other police forces were involved in the

 three raids, including those from Greater Manchester, Merseyside and

 West Yorkshire. The officers were curious about the hackers.

 For most of the two years of their investigation, the police didn't

 even know the hackers' real identities. After such a long, hard chase,

 the police had been forced to wait a little longer, since they wanted

 to nab each hacker while he was on-line. That meant hiding outside

 each hacker's home until he logged in somewhere. Any system would do

 and they didn't have to be talking to each other on-line--as long as

 the login was illegal. The police had sat patiently, and finally

 raided the hackers within hours of each other, so they didn't have

 time to warn one another.

 So, at the end of the long chase and a well-timed operation, the

 police wanted to have a look at the hackers up close.

 After the officer walked Pad up to the group, he introduced Gandalf.

 Tall, lean with brown hair and pale skin, he looked a little bit like

 Pad. The two hackers smiled shyly at each other, before one of the

 police pointed out Wandii, the seventeen-year-old schoolboy. Pad

 didn't get a good look at Wandii, because the police quickly lined the

 hackers up in a row, with Gandalf in the middle, to explain details to

 them. They were being charged under the Computer Misuse Act of 1990.

 Court dates would be set and they would be notified.

 When they were finally allowed to leave, Wandii seemed to disappear.

 Pad and Gandalf walked outside, found a couple of benches and lay

 down, basking in the sun and chatting while they waited for their

 rides home.

 Gandalf proved to be as easy to talk to in person as he was on-line.

 They exchanged phone numbers and shared notes on the police raids.

 Gandalf had insisted on meeting a lawyer before his interviews, but

 when the lawyer arrived he didn't have the slightest understanding of

 computer crime. He advised Gandalf to tell the police whatever they

 wanted to know, so the hacker did.

 The trial was being held in London. Pad wondered why, if all three

 hackers were from the north, the case was being tried in the south.

 After all, there was a court in Manchester which was high enough to

 deal with their crimes.

 Maybe it was because Scotland Yard was in London. Maybe they had

 started the paperwork down there. Maybe it was because they were being

 accused of hacking computers located within the jurisdiction of the

 Central Criminal Court--that court being the Old Bailey in London. But

 Pad's cynical side hazarded a different guess--a guess which seemed

 justified after a few procedural appearances in 1992 before the trial,

 which was set for 1993. For when Pad arrived at the Bow Street

 Magistrates Court for his committal in April 1992, he saw it packed

 out with the media, just as he had anticipated.

 A few hackers also fronted up to fly the flag of the underground. One

 of them--a stranger--came up to Pad after court, patted him on the

 back and exclaimed enthusiastically, `Well done, Paddy!' Startled, Pad

 just looked at him and then smiled. He had no idea how to respond to

 the stranger.

 Like the three Australian hackers, Pad, Gandalf and the little-known

 Wandii were serving as the test case for new hacking laws in their

 country. British law enforcement agencies had spent a fortune on the

 case--more than [sterling]500000 according to the newspapers--by the

 time the 8lgm case went to trial. This was going to be a show case,

 and the government agencies wanted taxpayers to know they were getting

 their money's worth.

 The hackers weren't being charged with breaking into computers. They

 were being charged with conspiracy, a more serious offence. While

 admitting the threesome did not hack for personal gain, the

 prosecution alleged the hackers had conspired to break into and modify

 computer systems. It was a strange approach to say the least,

 considering that none of the three hackers had ever met or even talked

 to the others before they were arrested.

 It was not so strange, however, when looking at the potential

 penalties. If the hackers had been charged with simply breaking into a

 machine, without intending any harm, the maximum penalty was six

 months jail and a fine of up to [sterling]5000. However, conspiracy,

 which was covered under a different section of the Act, could bring up

 to five years in jail and an unlimited amount in fines.

 The prosecution was taking a big gamble. It would be harder to prove

 conspiracy charges, which required demonstration of greater criminal

 intent than lesser charges. The potential pay-off was of course also

 much greater. If convicted, the defendants in Britain's most important

 hacking case to date would be going to prison.

 As with The Realm case, two hackers--Pad and Gandalf--planned to plead

 guilty while the third--in this case Wandii--planned to fight the

 charges every step of the way. Legal Aid was footing the bill for

 their lawyers, because the hackers were either not working or were

 working in such lowly paid, short-term jobs they qualified for free

 legal support.

 Wandii's lawyers told the media that this showcase was tantamount to a

 state trial. It was the first major hacking case under the new

 legislation which didn't involve disgruntled employees. While having

 no different legal status from a normal trial, the term state trial

 suggested a greater degree of official wrath--the kind usually

 reserved for cases of treason.

 On 22 February 1993, within two months of Electron's decision to turn

 Crown witness against Phoenix and Nom, the three 8lgm hackers stood in

 the dock at Southwark Crown Court in South London to enter pleas in

 their own case.

 In the dim winter light, Southwark couldn't look less appealing, but

 that didn't deter the crowds. The courtroom was going to be packed,

 just as Bow Street had been. Scotland Yard detectives were turning out

 in force. The crowd shuffled toward Room 12.

 The prosecution told the media they had about 800 computer disks full

 of evidence and court materials. If all the data had been printed out

 on A4 paper, the stack would tower more than 40 metres in the air,

 they said. Considering the massive amount of evidence being heaved,

 rolled and tugged through the building by teams of legal eagles, the

 choice of location--on the fifth floor--proved to be a challenge.

 Standing in the dock next to Wandii, Pad and Gandalf pleaded guilty to

 two computer conspiracy charges: conspiring to dishonestly obtain

 telecommunications services, and conspiring to cause unauthorised

 modification to computer material. Pad also pleaded guilty to a third

 charge: causing damage to a computer. This last charge related to the

 almost a quarter of

 a million pounds worth of `damage' to the Central London Polytechnic.

 Unlike the Australians' case, none of the British hackers faced

 charges about specific sites such as NASA.

 Pad and Gandalf pleaded guilty because they didn't think they had much

 choice. Their lawyers told them that, in light of the evidence,

 denying their guilt was simply not a realistic option. Better to throw

 yourself on the mercy of the court, they advised. As if to underline

 the point, Gandalf's lawyer had told him after a meeting at the end of

 1992, `I'd like to wish you a happy Christmas, but I don't think it's

 going to be one'.

 Wandii's lawyers disagreed. Standing beside his fellow hackers, Wandii

 pleaded not guilty to three conspiracy charges: plotting to gain

 unauthorised access to computers, conspiring to make unauthorised

 modifications to computer material, and conspiring to obtain

 telecommunications services dishonestly. His defence team was going to

 argue that he was addicted to computer hacking and that, as a result

 of this addiction, he was not able to form the criminal intent

 necessary to be convicted.

 Pad thought Wandii's case was on shaky ground. Addiction didn't seem a

 plausible defence to him, and he noticed Wandii looked very nervous in

 court just after his plea.

 Pad and Gandalf left London after their court appearance, returning to

 the north to prepare for their sentencing hearings, and to watch the

 progress of Wandii's case through the eyes of the media.

 They weren't disappointed. It was a star-studded show. The media

 revved itself up for a feeding frenzy and the prosecution team, headed

 by James Richardson, knew how to feed the pack. He zeroed in on

 Wandii, telling the court how the schoolboy `was tapping into offices

 at the EC in Luxembourg and even the experts were worried. He caused

 havoc at universities all around the world'.4 To do this, Wandii had

 used a simple BBC Micro computer, a Christmas present costing

 [sterling]200.

 The hacking didn't stop at European Community's computer, Richardson

 told the eager crowd of journalists. Wandii had hacked Lloyd's, The

 Financial Times and Leeds University. At The Financial Times machine,

 Wandii's adventures had upset the smooth operations of the FTSE 100

 share index, known in the City as `footsie'. The hacker installed a

 scanning program in the FT's network, resulting in one outgoing call

 made every second. The upshot of Wandii's intrusion: a [sterling]704

 bill, the deletion of an important file and a management decision to

 shut down a key system. With the precision of a banker, FT computer

 boss Tony Johnson told the court that the whole incident had cost his

 organisation [sterling]24871.

 But the FT hack paled next to the prosecution's real trump card: The

 European Organisation for the Research and Treatment of Cancer in

 Brussels. They had been left with a [sterling]10000 phone bill as a

 result of a scanner Wandii left on its machine,5 the court was told.

 The scanner had left a trail of 50000 calls, all documented on a

 980-page phone bill.

 The scanner resulted in the system going down for a day, EORTC

 information systems project manager Vincent Piedboeuf, told the jury.

 He went on to explain that the centre needed its system to run 24

 hours a day, so surgeons could register patients. The centre's

 database was the focal point for pharmaceutical companies, doctors and

 research centres--all coordinating their efforts in fighting the

 disease.

 For the media, the case was headline heaven. `Teenage computer hacker

 "caused worldwide chaos"' the Daily Telegraph screamed across page

 one. On page three, the Daily Mail jumped in with `Teenage hacker

 "caused chaos for kicks"'. Even The Times waded into the fray.

 Smaller, regional newspapers pulled the story across the countryside

 to the far reaches of the British Isles. The Herald in Glasgow told

 its readers `Teenage hacker "ran up [sterling]10000 telephone bill"'.

 Across the Irish Sea, the Irish Times caused a splash with its

 headline, `Teenage hacker broke EC computer security'.

 Also in the first week of the case, The Guardian announced Wandii had

 taken down the cancer centre database. By the time The Independent got

 hold of the story, Wandii hadn't just shut down the database, he had

 been reading the patients' most intimate medical details: `Teenager

 "hacked into cancer patient files"'. Not to be outdone, on day four of

 the trial, the Daily Mail had christened Wandii as a `computer

 genius'. By day five it labelled him as a `computer invader' who `cost

 FT [sterling]25000'.

 The list went on. Wandii, the press announced, had hacked the Tokyo

 Zoo and the White House. It was difficult to tell which was the more

 serious offence.

 Wandii's defence team had a few tricks of its own. Ian MacDonald, QC,

 junior counsel Alistair Kelman and solicitor Deborah Tripley put

 London University Professor James Griffith-Edwards, an authoritative

 spokesman on addictive and compulsive behaviours, on the stand as an

 expert witness. The chairman of the National Addiction Centre, the

 professor had been part of a team which wrote the World Health

 Organisation's definition of addiction. No-one was going to question

 his qualifications.

 The professor had examined Wandii and he announced his conclusion to

 the court: Wandii was obsessed by computers, he was unable to stop

 using them, and his infatuation made it impossible for him to choose

 freely. `He repeated 12 times in police interviews, "I'm just

 addicted. I wish I wasn't",' Griffith-Edwards told the court. Wandii

 was highly intelligent, but was unable to escape from the urge to beat

 computers' security systems at their own game. The hacker was obsessed

 by the intellectual challenge. `This is the core ... of what attracts

 the compulsive gambler,' the professor explained to the entranced jury

 of three women and nine men.

 But Wandii, this obsessive, addicted, gifted young man, had never had

 a girlfriend, Griffith-Edwards continued. In fact, he shyly admitted

 to the professor that he wouldn't even know how to ask a girl out. `He

 [Wandii] became profoundly embarrassed when asked to talk about his

 own feelings. He simply couldn't cope when asked what sort of person

 he was.'6

 People in the jury edged forward in their seats, concentrating

 intently on the distinguished professor. And why wouldn't they? This

 was amazing stuff. This erudite man had delved inside the mind of the

 young man of bizarre contrasts. A man so sophisticated that he could

 pry open computers belonging to some of Britain's and Europe's most

 prestigious institutions, and yet at the same time so simple that he

 had no idea how to ask a girl on a date. A man who was addicted not to

 booze, smack or speed, which the average person associates with

 addiction, but to a computer--a machine most people associated with

 kids' games and word processing programs.

 The defence proceeded to present vivid examples of Wandii's addiction.

 Wandii's mother, a single parent and lecturer in English, had terrible

 trouble trying to get her son away from his computer and modem. She

 tried hiding his modem. He found it. She tried again, hiding it at his

 grandmother's house. He burgled granny's home and retrieved it. His

 mother tried to get at his computer. He pushed her out of his attic

 room and down the stairs.

 Then he ran up a [sterling]700 phone bill as a result of his hacking.

 His mother switched off the electricity at the mains. Her son

 reconnected it. She installed a security calling-code on the phone to

 stop him calling out. He broke it. She worried he wouldn't go out and

 do normal teenage things. He continued to stay up all night--and

 sometimes all day--hacking. She returned from work to find him

 unconscious--sprawled across the living room floor and looking as

 though he was dead. But it wasn't death, only sheer exhaustion. He

 hacked until he passed out, then he woke up and hacked some more.

 The stories of Wandii's self-confessed addiction overwhelmed, appalled

 and eventually engendered pity in the courtroom audience. The media

 began calling him `the hermit hacker'.

 Wandii's defence team couldn't fight the prosecution's

 evidence head-on, so they took the prosecution's evidence and claimed

 it as their own. They showed the jury that Wandii hadn't just hacked

 the institutions named by the prosecution; he had hacked far, far more

 than that. He didn't just hack a lot--he hacked too much. Most of all,

 Wandii's defence team gave the jury a reason to acquit the

 innocent-faced young man sitting before them.

 During the trial, the media focused on Wandii, but didn't completely

 ignore the other two hackers. Computer Weekly hunted down where

 Gandalf was working and laid it bare on the front page. A member of

 `the UK's most notorious hacking gang', the journal announced, had

 been working on software which would be used at Barclay's Bank.7 The

 implication was clear. Gandalf was a terrible security risk and should

 never be allowed to do any work for a financial institution. The

 report irked the hackers, but they tried to concentrate on preparing

 for their sentencing hearing.

 From the beginning of their case, the hackers had problems obtaining

 certain evidence. Pad and Gandalf believed some of the material seized

 in the police raids would substantially help their case--such as

 messages from admins thanking them for pointing out security holes on

 their systems. This material had not been included in the

 prosecution's brief. When the defendants requested access to it, they

 were refused access on the grounds that there was classified data on

 the optical disk. They were told to go read the Attorney-General's

 guidelines on disclosure of information. The evidence of the hackers'

 forays into military and government systems was jumbled in with their

 intrusions into computers such as benign JANET systems, the defence

 team was told. It would take too much time to separate the two.

 Eventually, after some wrangling, Pad and Gandalf were told they could

 inspect and copy material--provided it was done under the supervision

 of the police. The hackers travelled to London, to Holborn police

 station, to gather supporting evidence for their case. However, it

 soon became clear that this time-consuming exercise would be

 impossible to manage on an ongoing basis. Finally, the Crown

 Prosecution Service relented, agreeing to release the material on disk

 to Pad's solicitor, on the proviso that no copies were made, it did

 not leave the law office, and it was returned at the end of the trial.

 As Wandii's case lurched from revelation to exaggeration, Pad and

 Gandalf busily continued to prepare for their own sentencing hearing.

 Every day, Gandalf travelled from Liverpool to Manchester to meet with

 his friend. They picked up a handful of newspapers at the local agent,

 and then headed up to Pad's lawyer's office. After a quick scan for

 articles covering the hacking case, the two hackers began sifting

 through the reluctantly released prosecution disks. They read through

 the material on computer, under the watchful eye of the law office's

 cashier--the most computer literate person in the firm.

 After fifteen days in the Southwark courtroom listening to fantastic

 stories from both sides about the boy sitting before them, the jury in

 Wandii's trial retired to consider the evidence. Before they left,

 Judge Harris gave them a stern warning: the argument that Wandii was

 obsessed or dependent was not a defence against the charges.

 It took the jurors only 90 minutes to reach a decision, and when the

 verdict was read out the courtroom erupted with a wave of emotion.

 Not guilty. On all counts.

 Wandii's mother burst into a huge smile and turned to her son, who was

 also smiling. And the defence team couldn't be happier. Kelman told

 journalists, `The jury felt this was a sledge hammer being used to

 crack a nut'.8

 The prosecution was stunned and the law enforcement agents

 flabbergasted. Detective Sergeant Barry Donovan found the verdict

 bizarre. No other case in his 21 years in law enforcement had as much

 overwhelming evidence as this one, yet the jury had let Wandii walk.

 And in a high-pitched frenzy rivalling its earlier hysteria, the

 British media jumped all over the jury's decision. `Hacker who ravaged

 systems walks free', an indignant Guardian announced. `Computer Genius

 is cleared of hacking conspiracy', said the Evening Standard. `Hacking

 "addict" acquitted', sniffed The Times. Overpowering them all was the

 Daily Telegraph's page one: `Teenage computer addict who hacked White

 House system is cleared'.

 Then came the media king-hit. Someone had leaked another story and it

 looked bad. The report, in the Mail on Sunday, said that the three

 hackers had broken into a Cray computer at the European Centre for

 Medium Range Weather Forecasting at Bracknell. This computer, likes

 dozens of others, would normally have been relegated to the long list

 of unmentioned victims except for one thing. The US military used

 weather data from the centre for planning its attack on Iraq in the

 Gulf War. The media report claimed that the attack had slowed down the

 Cray's calculations, thus endangering the whole Desert Storm

 operation. The paper announced the hackers had been `inadvertently

 jeopardising--almost fatally--the international effort against Saddam

 Hussein' and had put `thousands of servicemen's lives at risk'.9

 Further, the paper alleged that the US State Department was so

 incensed about British hackers' repeated break-ins disrupting Pentagon

 defence planning that it had complained to Prime Minister John Major.

 The White House put the matter more bluntly than the State Department:

 Stop your hackers or we will cut off European access to our satellite

 which provides trans-Atlantic data and voice telecommunications.

 Someone in Britain seemed to be listening, for less than twelve months

 later, authorities had arrested all three hackers.

 Pad thought the allegations were rubbish. He had been inside a VAX

 machine at the weather centre for a couple of hours one night, but he

 had never touched a Cray there. He had certainly never done anything

 to slow the machine down. No cracking programs, no scanners, nothing

 which might account for the delay described in the report. Even if he

 had been responsible, he found it hard to believe the Western allies'

 victory in the Gulf War was determined by one computer in Berkshire.

 All of which gave him cause to wonder why the media was running this

 story now, after Wandii's acquittal but before he and Gandalf were

 sentenced. Sour grapes, perhaps?

 For days, columnists, editorial and letter writers across Britain

 pontificated on the meaning of the Wandii's verdict and the validity

 of an addiction to hacking as a defence. Some urged computer owners to

 take responsibility for securing their own systems. Others called for

 tougher hacking laws. A few echoed the view of The Times, which

 declared in an editorial, `a persistent car thief of [the hacker's]

 age would almost certainly have received a custodial sentence. Both

 crimes suggest disrespect for other people's property ... the jurors

 may have failed to appreciate the seriousness of this kind of

 offence'.10

 The debate flew forward, changing and growing, and expanding beyond

 Britain's borders. In Hong Kong, the South China Morning Post asked,

 `Is [this] case evidence of a new social phenomenon, with immature and

 susceptible minds being damaged through prolonged exposure to personal

 computers?' The paper described public fear that Wandii's case would

 result in `the green light for an army of computer-literate hooligans

 to pillage the world's databases at will, pleading insanity when

 caught'.11

 By April Fool's Day 1991, more than two weeks after the end of the

 court case, Wandii had his own syndrome named after him, courtesy of

 The Guardian.

 And while Wandii, his mother and his team of lawyers celebrated their

 victory quietly, the media reported that the Scotland Yard detectives

 commiserated over their defeat, which was considerably more serious

 than simply losing the Wandii case. The Computer Crimes Unit was being

 `reorganised'. Two experienced officers from the five-man unit were

 being moved out of the group. The official line was that the

 `rotations' were normal Scotland Yard procedure. The unofficial word

 was that the Wandii case had been a fiasco, wasting time and money,

 and the debacle was not to be repeated.

 In the north, a dark cloud gathered over Pad and Gandalf as their

 judgment day approached. The Wandii case verdict might have been cause

 for celebration among some in the computer underground, but it brought

 little joy for the other two 8lgm hackers.

 For Pad and Gandalf, who had already pleaded guilty, Wandii's

 acquittal was a disaster.

 [ ]

 On 12 May 1993, two months after Wandii's acquittal, Boris Kayser

 stood up at the Bar table to put forward Electron's case at the

 Australian hacker's plea and sentencing hearing. As he began to speak,

 a hush fell over the Victorian County Court.

 A tall, burly man with a booming voice, an imperious courtroom

 demeanour and his traditional black robes flowing behind him in an

 echo of his often emphatic gesticulations, Kayser was larger than

 life. A master showman, he knew how to play an audience of courtroom

 journalists sitting behind him as much as to the judge in front of

 him.

 Electron had already stood in the dock and pleaded guilty to fourteen

 charges, as agreed with the DPP's office. In typical style, Kayser had

 interrupted the long process of the court clerk reading out each

 charge and asking whether Electron would plead guilty or not guilty.

 With an impatient wave of his hand, Kayser asked the judge to dispense

 with such formalities since his client would plead guilty to all the

 agreed charges at once. The interjection was more of an announcement

 than a question.

 The formalities of a plea having been summarily dealt with, the

 question now at hand was sentencing. Electron wondered if he would be

 sent to prison. Despite lobbying from Electron's lawyers, the DPP's

 office had refused to recommend a non-custodial sentence. The best

 deal Electron's lawyers had been able to arrange in exchange for

 turning Crown witness was for the DPP to remain silent on the issue of

 prison. The judge would make up his mind without input from the DPP.

 Electron fiddled nervously with his father's wedding ring, which he

 wore on his right hand. After his father's death, Electron's sister

 had begun taking things from the family home. Electron didn't care

 much because there were only two things he really wanted: that ring

 and some of his father's paintings.

 Kayser called a handful of witnesses to support the case for a light

 sentence. Electron's grandmother from Queensland. The family friend

 who had driven Electron to the hospital the day his father died.

 Electron's psychiatrist, the eminent Lester Walton. Walton in

 particular highlighted the difference between the two possible paths

 forward: prison, which would certainly traumatise an already mentally

 unstable young man, or freedom, which offered Electron a good chance

 of eventually establishing a normal life.

 When Kayser began summarising the case for a non-custodial sentence,

 Electron could hear the pack of journalists off to his side

 frantically scribbling notes. He wanted to look at them, but he was

 afraid the judge would see his ponytail, carefully tucked into his

 neatly ironed white shirt, if he turned sideways,

 `Your Honour,' Kayser glanced backward slightly, toward the court

 reporters, as he warmed up, `my client lived in an artificial world of

 electronic pulses.'

 Scratch, scribble. Electron could almost predict, within half a

 second, when the journalists' pencils and pens would reach a crescendo

 of activity. The ebb and flow of Boris's boom was timed in the style

 of a TV newsreader.

 Kayser said his client was addicted to the computer the way an

 alcoholic was obsessed with the bottle. More scratching, and lots of

 it. This client, Kayser thundered, had never sought to damage any

 system, steal money or make a profit. He was not malicious in the

 least, he was merely playing a game.

 `I think,' Electron's barrister concluded passionately, but slowly

 enough for every journalist to get it down on paper, `that he should

 have been called Little Jack Horner, who put in his thumb, pulled out

 a plumb and said, "What a good boy am I!"'

 Now came the wait. The judge retired to his chambers to weigh up the

 pre-sentence report, Electron's family situation, the fact that he had

 turned Crown witness, his offences--everything. Electron had given a

 nine-page written statement against Phoenix to the prosecution. If the

 Phoenix case went to trial, Electron would be put on the stand to back

 up that statement.

 In the month before Electron returned to court to hear his sentence,

 he thought about how he could have fought the case. Some of the

 charges were dubious.

 In one case, he had been charged with illegally accessing public

 information through a public account. He had accessed the anonymous

 FTP server at the University of Helsinki to copy information about

 DES. His first point of access had been through a hacked Melbourne

 University account.

 Beat that charge, Electron's lawyer had told him, and there's plenty

 more where that came from. The DPP had good pickings and could make up

 a new charge for another site. Still, Electron reasoned some of the

 Crown's evidence would not have stood up under cross-examination.

 When reporters from Australia and overseas called NASA headquarters

 for comment on the hacker-induced network shutdown, the agency

 responded that it had no idea what they were talking about. There had

 been no NASA network shutdown. A spokesman made inquiries and, he

 assured the media, NASA was puzzled by the report. Sharon Beskenis's

 statement didn't seem so watertight after all. She was not, it turned

 out, even a NASA employee but a contractor from Lockheed.

 During that month-long wait, Electron had trouble living down Kayser's

 nursery-rhyme rendition in the courtroom. When he rang friends, they

 would open the conversation saying, `Oh, is that Little Jack Horner?'

 They had all seen the nightly news, featuring Kayser and his client.

 Kayser had looked grave leaving court, while Electron, wearing John

 Lennon-style glasses with dark lenses and with his shoulder-length

 curls pulled tightly back in a ponytail, had tried to smile at the

 camera crews. But his small, fine features and smattering of freckles

 disappeared under the harsh camera lights, so much so that the black,

 round spectacles seemed almost to float on a blank, white surface.

 The week after Electron pleaded guilty in Australia, Pad and Gandalf

 sat side by side in London's Southwark dock one last time.

 For a day and a half, beginning on 20 May 1993, the two hackers

 listened to their lawyers argue their defence. Yes, our clients hacked

 computers, they told the judge, but the offences were nowhere near as

 serious as the prosecution wants to paint them. The lawyers were

 fighting hard for one thing: to keep Pad and Gandalf out of prison.

 Some of the hearing was tough going for the two hackers, but not just

 because of any sense of foreboding caused by the judge's imminent

 decision. The problem was that Gandalf made Pad laugh, and it didn't

 look at all good to laugh in the middle of your sentencing hearing.

 Sitting next to Gandalf for hours on end, while lawyers from both

 sides butchered the technical aspects of computer hacking which the

 8lgm hackers had spent years learning, did it. Pad had only to give

 Gandalf a quick sidelong glance and he quickly found himself

 swallowing and clearing his throat to keep from bursting into

 laughter. Gandalf's irrepressible irreverence was written all over his

 face.

 The stern-faced Judge Harris could send them to jail, but he still

 wouldn't understand. Like the gaggle of lawyers bickering at the front

 of the courtroom, the judge was--and would always be--out of the loop.

 None of them had any idea what was really going on inside the heads of

 the two hackers. None of them could ever understand what hacking was

 all about--the thrill of stalking a quarry or of using your wits to

 outsmart so-called experts; the pleasure of finally penetrating a

 much-desired machine and knowing that system is yours; the deep

 anti-establishment streak which served as a well-centred ballast

 against the most violent storms washing in from the outside world; and

 the camaraderie of the international hacking community on Altos.

 The lawyers could talk about it, could put experts on the stand and

 psychological reports in the hands of the judge, but none of them

 would ever really comprehend because they had never experienced it.

 The rest of the courtroom was out of the loop, and Pad and Gandalf

 stared out from the dock as if looking through a two-way mirror from a

 secret, sealed room.

 Pad's big worry had been this third charge--the one which he faced

 alone. At his plea hearing, he had admitted to causing damage to a

 system owned by what was, in 1990, called the Polytechnic of Central

 London. He hadn't damaged the machine by, say, erasing files, but the

 other side had claimed that the damages totalled about [sterling]250

 000.

 The hacker was sure there was zero chance the polytechnic had spent

 anything near that amount. He had a reasonable idea of how long it

 would take someone to clean up his intrusions. But if the prosecution

 could convince a judge to accept that figure, the hacker might be

 looking at a long prison term.

 Pad had already braced himself for the possibility of prison. His

 lawyer warned him before the sentencing date that there was a

 reasonable likelihood the two 8lgm hackers would be sent down. After

 the Wandii case, the public pressure to `correct' a `wrong' decision

 by the Wandii jury was enormous. The police had described Wandii's

 acquittal as `a licence to hack'--and The Times, had run the

 statement.12 It was likely the judge, who had presided over Wandii's

 trial, would want to send a loud and clear message to the hacking

 community.

 Pad thought that perhaps, if he and Gandalf had pleaded not guilty

 alongside Wandii, they would have been acquitted. But there was no way

 Pad would have subjected himself to the kind of public humiliation

 Wandii went through during the `addicted to computers' evidence. The

 media appeared to want to paint the three hackers as pallid, scrawny,

 socially inept, geeky geniuses, and to a large degree Wandii's lawyers

 had worked off this desire. Pad didn't mind being viewed as highly

 intelligent, but he wasn't a geek. He had a casual girlfriend. He went

 out dancing with friends or to hear bands in Manchester's thriving

 alternative music scene. He worked out his upper body with weights at

 home. Shy--yes. A geek--no.

 Could Pad have made a case for being addicted to hacking? Yes,

 although he never believed that he had been. Completely enthralled,

 entirely entranced? Maybe. Suffering from a passing obsession?

 Perhaps. But addicted? No, he didn't think so. Besides, who knew for

 sure if a defence of addiction could have saved him from the

 prosecution's claim anyway?

 Exactly where the quarter of a million pound claim came from in the

 first place was a mystery to Pad. The police had just said it to him,

 as if it was fact, in the police interview. Pad hadn't seen any proof,

 but that hadn't stopped him from spending a great deal of time feeling

 very stressed about how the judge would view the matter.

 The only answer seemed to be some good, independent technical advice.

 At the request of both Pad and Gandalf's lawyers, Dr Peter Mills, of

 Manchester University, and Dr Russell Lloyd, of London Business

 School, had examined a large amount of technical evidence presented in

 the prosecution's papers. In an independent report running to more

 than 23 pages, the experts stated that the hackers had caused less

 havoc than the prosecution alleged. In addition, Pad's solicitor asked

 Dr Mills to specifically review, in a separate report, the evidence

 supporting the prosecution's large damage claim.

 Dr Mills stated that one of the police expert witnesses, a British

 Telecom employee, had said that Digital recommended a full rebuild of

 the system at the earliest possible opportunity--and at considerable

 cost. However, the BT expert had not stated that the cost was

 [sterling]250000 nor even mentioned if the cost quote which had been

 given had actually been accepted.

 In fact, Dr Mills concluded that there was no supporting evidence at

 all for the quarter of a million pound claim. Not only that, but any

 test of reason based on the evidence provided by the prosecution

 showed the claim to be completely ridiculous.

 In a separate report, Dr Mills' stated that:

 i) The machine concerned was a Vax 6320, this is quite a powerful

 `mainframe' system and could support several hundreds of users.

 ii) That a full dump of files takes 6 tapes, however since the type of

 tape is not specified this gives no real indication of the size of the

 filesystem. A tape could vary from 0.2 Gigabytes to 2.5 Gigabytes.

 iii) The machine was down for three days.

 With this brief information it is difficult to give an accurate cost

 for restoring the machine, however an over estimate would be:

 i) Time spent in restoring the system, 10 man days at [sterling]300

 per day; [sterling]3000.

 ii) Lost time by users, 30 man days at [sterling]300 per day;

 [sterling]9000.

 The total cost in my opinion is unlikely to be higher than

 [sterling]12000 and this itself is probably a rather high estimate. I

 certainly cannot see how a figure of [sterling]250000 could be

 justified.

 It looked to Pad that the prosecution's claim was not for damage at

 all. It was for properly securing the system--an entirely rebuilt

 system. It seemed to him that the police were trying to put the cost

 of securing the polytechnic's entire computer network onto the

 shoulders of one hacker--and to call it damages. In fact, Pad

 discovered, the polytechnic had never actually even spent the

 [sterling]250000.

 Pad was hopeful, but he was also angry. All along, the police had been

 threatening him with this huge damage bill. He had tossed and turned

 in his bed at night worrying about it. And, in the end, the figure put

 forward for so long as fact was nothing but an outrageous claim based

 on not a single shred of solid evidence.

 Using Dr Mills's report, Pad's barrister, Mukhtar Hussain, QC,

 negotiated privately with the prosecution barrister, who finally

 relented and agreed to reduce the damage estimate to [sterling]15000.

 It was, in Pad's view, still far too high, but it was much better than

 [sterling]250000. He was in no mind to look a gift horse in the mouth.

 Judge Harris accepted the revised damage estimate.

 The prosecution may have lost ground on the damage bill, but it wasn't

 giving up the fight. These two hackers, James Richardson told the

 court and journalists during the two-day sentencing hearing, had

 hacked into some 10000 computer systems around the world. They were

 inside machines or networks in at least fifteen countries. Russia.

 India. France. Norway. Germany. The US. Canada. Belgium. Sweden.

 Italy. Taiwan. Singapore. Iceland. Australia. Officers on the case

 said the list of the hackers' targets `read like an atlas', Richardson

 told the court.

 Pad listened to the list. It sounded about right. What didn't sound

 right were the allegations that he or Gandalf had crashed Sweden's

 telephone network by running an X.25 scanner over its packet network.

 The crash had forced a Swedish government minister to apologise on

 television. The police said the minister did not identify the true

 cause of the problem--the British hackers--in his public apology.

 Pad had no idea what they were talking about. He hadn't done anything

 like that to the Swedish phone system, and as far as he knew, neither

 had Gandalf.

 Something else didn't sound right. Richardson told the court that in

 total, the two hackers had racked up at least [sterling]25000 in phone

 bills for unsuspecting legitimate customers, and caused `damage' to

 systems which was very conservatively estimated at almost

 [sterling]123000.

 Where were these guys getting these numbers from? Pad marvelled at

 their cheek. He had been through the evidence with a fine-toothed

 comb, yet he had not seen one single bill showing what a site had

 actually paid to repair `damage' caused by the hackers. The figures

 tossed around by the police and the prosecution weren't real bills;

 they weren't cast in iron.

 Finally, on Friday 21 May, after all the evidence had been presented,

 the judge adjourned the court to consider sentencing. When he returned

 to the bench fifteen minutes later, Pad knew what was going to happen

 from the judge's face. To the hacker, the expression said: I am going

 to give you everything that Wandii should have got.

 Judge Harris echoed The Times's sentiments when he told the two

 defendants, `If your passion had been cars rather than computers, we

 would have called your conduct delinquent, and I don't shrink from the

 analogy of describing what you were doing as intellectual joyriding.

 `Hacking is not harmless. Computers now form a central role in our

 lives. Some, providing emergency services, depend on their computers

 to deliver those services.'13

 Hackers needed to be given a clear signal that computer crime `will

 not and cannot be tolerated', the judge said, adding that he had

 thought long and hard before handing down sentence. He accepted that

 neither hacker had intended to cause damage, but it was imperative to

 protect society's computer systems and he would be failing in his

 public duty if he didn't sentence the two hackers to a prison term of

 six months.

 Judge Harris told the hackers that he had chosen a custodial sentence,

 `both to penalise you for what you have done and for the losses

 caused, and to deter others who might be similarly tempted'.

 This was the show trial, not Wandii's case, Pad thought as the court

 officers led him and Gandalf out of the dock, down to the prisoner's

 lift behind the courtroom and into a jail cell.

 Less than two weeks after Pad and Gandalf were sentenced, Electron was

 back in the Victorian County Court to discover his own fate.

 As he stood in the dock on 3 June 1993 he felt numb, as emotionally

 removed from the scene as Meursault in Camus' L'etranger. He believed

 he was handling the stress pretty well until he experienced tunnel

 vision while watching the judge read his penalty. He perused the room

 but saw neither Phoenix nor Nom.

 When Judge Anthony Smith summarised the charges, he seemed to have a

 special interest in count number 13--the Zardoz charge. A few minutes

 into reading the sentence, the judge said, `In my view, a custodial

 sentence is appropriate for each of the offences constituted by the

 12th, 13th and 14th counts'. They were the `knowingly concerned'

 charges, with Phoenix, involving NASA, LLNL and CSIRO. Electron looked

 around the courtroom. People turned back to stare at him. Their eyes

 said, `You are going to prison'.

 `I formed the view that a custodial sentence is appropriate in respect

 of each of these offences because of the seriousness of them,' Judge

 Smith noted, `and having regard to the need to demonstrate that the

 community will not tolerate this type of offence.

 `Our society today is ... increasingly ... dependent upon the use of

 computer technology. Conduct of the kind in which you engaged poses a

 threat to the usefulness of that technology ... It is incumbent upon

 the courts ... to see to it that the sentences they impose reflect the

 gravity of this kind of criminality.

 `On each of Counts 12, 13 and 14, you are convicted and you are

 sentenced to a term of imprisonment of six months ... each ... to be

 concurrent.'

 The judge paused, then continued, `And ... I direct, by order, that

 you be released forthwith upon your giving security by recognisance

 ... in the sum of $500 ... You will not be required to serve the terms

 of imprisonment imposed, provided you are of good behaviour for the

 ensuing six months.' He then ordered Electron to complete 300 hours of

 community service, and to submit to psychiatric assessment and

 treatment.

 Electron breathed a sigh of relief.

 When outlining the mitigating circumstances which led to suspension of

 the jail sentence, Judge Smith described Electron as being addicted to

 using his computer `in much the same way as an alcoholic becomes

 addicted to the bottle'. Boris Kayser had used the analogy in the

 sentencing hearing, perhaps for the

 benefit of the media, but the judge had obviously been swayed by his

 view.

 When court adjourned, Electron left the dock and shook hands with his

 lawyers. After three years, he was almost free of his court problems.

 There was only one possible reason he might need to return to court.

 If Phoenix fought out his case in a full criminal trial, the DPP would

 put Electron on the stand to testify against him. It would be an ugly

 scene.

 The inmates of HM Prison Kirkham, on the north-west coast of England,

 near Preston, had heard all about Pad and Gandalf by the time they

 arrived. They greeted the hackers by name. They'd seen the reports on

 telly, especially about how Gandalf had hacked NASA--complete with

 footage of the space shuttle taking off. Some TV reporter's idea of

 subtle irony--`Two hackers were sent down today' as the space shuttle

 went up.

 Kirkham was far better than Brixton, where the hackers had spent the

 first days of their sentence while awaiting transfer. Brixton was what

 Pad always envisioned prison would look like, with floors of barred

 cells facing onto an open centre and prisoners only allowed out of

 their cells for scheduled events such as time in the yard. It was a

 place where hard-core criminals lived. Fortunately, Pad and Gandalf

 had been placed in the same cell while they waited to be assigned to

 their final destination.

 After ten days inside Brixton Pad and Gandalf were led from their

 cell, handcuffed and put in a coach heading toward the windy west

 coast.

 During the drive, Pad kept looking down at his hand, locked in shiny

 steel to Gandalf's hand, then he looked back up again at his fellow

 hacker. Clearing his throat and turning away from Gandalf's difficult

 grin--his friend now on the edge of laughing himself--Pad struggled.

 He tried to hold down the muscles of his face, to pull them back from

 laughter.

 A minimum security prison holding up to 632 prisoners, Kirkham looked

 vaguely like a World War II RAF base with a large collection of

 free-standing buildings around the grounds. There were no real walls,

 just a small wire fence which Pad soon learned prisoners routinely

 jumped when the place started to get to them.

 For a prison, Kirkham was pretty good. There was a duck pond, a

 bowling green, a sort of mini-cinema which showed films in the early

 evenings, eight pay phones, a football field, a cricket pavilion and,

 best of all, lots of fields. Prisoners could have visits on weekday

 afternoons between 1.10 and 3.40, or on the weekend.

 Luck smiled on the two hackers. They were assigned to the same billet

 and, since none of the other prisoners objected, they became

 room-mates. Since they were sentenced in May, they would serve their

 time during summer. If they were `of good behaviour' and didn't get

 into trouble with other prisoners, they would be out in three months.

 Like any prison, Kirkham had its share of prisoners who didn't get

 along with each other. Mostly, prisoners wanted to know what you were

 in for and, more particularly, if you had been convicted of a sex

 crime. They didn't like sex crime offenders and Pad heard about a pack

 of Kirkham prisoners who dragged one of their own, screaming, to a

 tree, where they tried to hang him for being a suspected rapist. In

 fact, the prisoner hadn't been convicted of anything like rape. He had

 simply refused to pay his poll tax.

 Fortunately for Pad and Gandalf, everyone else in Kirkham knew why

 they were there. At the end of their first week they returned to their

 room one afternoon to find a sign painted above their door. It said,

 `NASA HQ'.

 The other minimum security prisoners understood hacking--and they had

 all sorts of ideas about how you could make money from it. Most of the

 prisoners in Kirkham were in for petty theft, credit card fraud, and

 other small-time crimes. There was also a phreaker, who arrived the

 same day as Pad and Gandalf. He landed eight months in prison--two

 more than the 8lgm hackers--and Pad wondered what kind of message that

 sent the underground.

 Despite their best efforts, the 8lgm twosome didn't fit quite the

 prison mould. In the evenings, other prisoners spent their free time

 shooting pool or taking drugs. In the bedroom down the hall, Gandalf

 lounged on his bed studying a book on VMS internals. Pad read a

 computer magazine and listened to some indie music--often his `Babes

 in Toyland' tape. In a parody of prison movies, the two hackers marked

 off their days inside the prison with cross-hatched lines on their

 bedroom wall--four marks, then a diagonal line through them. They

 wrote other things on the walls too.

 The long, light-filled days of summer flowed one into the other, as

 Pad and Gandalf fell into the rhythm of the prison. The morning

 check-in at 8.30 to make sure none of the prisoners had gone

 walkabout. The dash across the bowling green for a breakfast of beans,

 bacon, eggs, toast and sausage. The walk to the greenhouses where the

 two hackers had been assigned for work detail.

 The work wasn't hard. A little digging in the pots. Weeding around the

 baby lettuce heads, watering the green peppers and transplanting

 tomato seedlings. When the greenhouses became too warm by late

 morning, Pad and Gandalf wandered outside for a bit of air. They often

 talked about girls, cracking crude, boyish jokes about women and

 occasionally discussing their girlfriends more seriously. As the heat

 settled in, they sat down, lounging against the side of the

 greenhouse.

 After lunch, followed by more time in the greenhouse, Pad and Gandalf

 sometimes went off for walks in the fields surrounding the prison.

 First the football field, then the paddocks dotted with cows beyond

 it.

 Pad was a likeable fellow, largely because of his easygoing style and

 relaxed sense of humour. But liking him wasn't the same as knowing

 him, and the humour often deflected deeper probing into his

 personality. But Gandalf knew him, understood him. Everything was so

 easy with Gandalf. During the long, sunny walks, the conversation

 flowed as easily as the light breeze through the grass.

 As they wandered in the fields, Pad often wore his denim jacket. Most

 of the clothes on offer from the prison clothing office were drab

 blue, but Pad had lucked onto this wonderful, cool denim jacket which

 he took to wearing all the time.

 Walking for hours on end along the perimeters of the prison grounds,

 Pad saw how easy it would be to escape, but in the end there didn't

 seem to be much point. They way he saw it, the police would just catch

 you and put you back in again. Then you'd have to serve extra time.

 Once a week, Pad's parents came to visit him, but the few precious

 hours of visiting time were more for his parents' benefit than his

 own. He reassured them that he was OK, and when they looked him in the

 face and saw it was true, they stopped worrying quite so much. They

 brought him news from home, including the fact that his computer

 equipment had been returned by one of the police who had been in the

 original raid.

 The officer asked Pad's mother how the hacker was doing in prison.

 `Very well indeed,' she told him. `Prison's not nearly so bad as he

 thought.' The officer's face crumpled into a disappointed frown. He

 seemed to be looking for news that Pad was suffering nothing but

 misery.

 At the end of almost three months, with faces well tanned from walking

 in the meadows, Pad and Gandalf walked free.

 [ ]

 To the casual witness sitting nearby in the courtroom, the tension

 between Phoenix's mother and father was almost palpable. They were not

 sitting near each other but that didn't mitigate the silent hostility

 which rose through the air like steam. Phoenix's divorced parents

 provided a stark contrast to Nom's adopted parents, an older, suburban

 couple who were very much married.

 On Wednesday, 25 August 1993 Phoenix and Nom pleaded guilty to fifteen

 and two charges respectively. The combined weight of the prosecution's

 evidence, the risk and cost of running a full trial and the need to

 get on with their lives had pushed them over the edge. Electron didn't

 need to come to court to give evidence.

 At the plea hearing, which ran over to the next day, Phoenix's lawyer,

 Dyson Hore-Lacy, spent considerable time sketching the messy divorce

 of his client's parents for the benefit of the judge. Suggesting

 Phoenix retreated into his computer during the bitter separation and

 divorce was the best chance of getting him off a prison term. Most of

 all, the defence presented Phoenix as a young man who had strayed off

 the correct path in life but was now back on track--holding down a job

 and having a life.

 The DPP had gone in hard against Phoenix. They seemed to want a jail

 term badly and they doggedly presented Phoenix as an arrogant

 braggart. The court heard a tape-recording of Phoenix ringing up

 security guru Edward DeHart of the Computer Emergency Response Team at

 Carnegie Mellon University to brag about a security exploit. Phoenix

 told DeHart to get onto his computer and then proceeded to walk him

 step by step through the `passwd -f' security bug. Ironically, it was

 Electron who had discovered that security hole and taught it to

 Phoenix--a fact Phoenix didn't seem to want to mention to DeHart.

 The head of the AFP's Southern Region Computer Crimes Unit, Detective

 Sergeant Ken Day was in court that day. There was no way he was going

 to miss this. The same witness noting the tension between Phoenix's

 parents might also have perceived an undercurrent of hostility between

 Day and Phoenix--an undercurrent which did not seem to exist between

 Day and either of the other Realm hackers.

 Day, a short, careful man who gave off an air of bottled intensity,

 seemed to have an acute dislike for Phoenix. By all observations the

 feeling was mutual. A cool-headed professional, Day would never say

 anything in public to express the dislike--that was not his style. His

 dislike was only indicated by a slight tightness in the muscles of an

 otherwise unreadable face.

 On 6 October 1993, Phoenix and Nom stood side by side in the dock for

 sentencing. Wearing a stern expression, Judge Smith began by detailing

 both the hackers' charges and the origin of The Realm. But after the

 summary, the judge saved his harshest rebuke for Phoenix.

 `There is nothing ... to admire about your conduct and every reason

 why it should be roundly condemned. You pointed out [weaknesses] to

 some of the system administrators ... [but] this was more a display of

 arrogance and a demonstration of what you thought was your superiority

 rather than an act of altruism on your part.

 `You ... bragged about what you had done or were going to do ... Your

 conduct revealed ... arrogance on your part, open defiance, and an

 intention to the beat the system. [You] did cause havoc for a time

 within the various targeted systems.'

 Although the judge appeared firm in his views while passing sentence,

 behind the scenes he had agonised greatly over his decision. He had

 attempted to balance what he saw as the need for deterrence, the

 creation of a precedence for sentencing hacking cases in Australia,

 and the individual aspects of this case. Finally, after sifting

 through the arguments again and again, he had reached a decision.

 `I have no doubt that some sections of our community would regard

 anything than a custodial sentence as less than appropriate. I share

 that view. But after much reflection ... I have concluded that an

 immediate term of imprisonment is unnecessary.'

 Relief rolled across the faces of the hackers' friends and relatives

 as the judge ordered Phoenix to complete 500 hours of community

 service work over two years and assigned him a $1000 twelve-month good

 behaviour bond. He gave Nom 200 hours, and a $500, six-month bond for

 good behaviour.

 As Phoenix was leaving the courtroom, a tall, skinny young man, loped

 down the aisle towards him.

 `Congratulations,' the stranger said, his long hair dangling in

 delicate curls around his shoulders.

 `Thanks,' Phoenix answered, combing his memory for the boyish face

 which couldn't be any older than his own. `Do I know you?'

 `Sort of,' the stranger answered. `I'm Mendax. I'm about to go through

 what you did, but worse.'

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 Chapter 8 -- The International Subversives

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 All around

 an eerie sound

 -- from `Maralinga', on 10, 9, 8, 7, 6, 5, 4, 3, 2, 1 by Midnight Oil

 Prime Suspect rang Mendax, offering an adventure. He had discovered a

 strange system called NMELH1 (pronounced N-Melly-H-1) and it was time

 to go exploring. He read off the dial-up numbers, found in a list of

 modem phone numbers on another hacked system.

 Mendax looked at the scrap of paper in his hand, thinking about the

 name of the computer system.

 The `N' stood for Northern Telecom, a Canadian company with annual

 sales of $8 billion. NorTel, as the company was known, sold thousands

 of highly sophisticated switches and other telephone exchange

 equipment to some of the world's largest phone companies. The `Melly'

 undoubtedly referred to the fact that the system was in Melbourne. As

 for the `H-1', well, that was anyone's guess, but Mendax figured it

 probably stood for `host-1'--meaning computer site number one.

 Prime Suspect had stirred Mendax's interest. Mendax had spent hours

 experimenting with commands inside the computers which controlled

 telephone exchanges. In the end, those forays were all just

 guesswork--trial and error learning, at considerable risk of

 discovery. Unlike making a mistake inside a single computer,

 mis-guessing a command inside a telephone exchange in downtown Sydney

 or Melbourne could take down a whole prefix--10000 or more phone

 lines--and cause instant havoc.

 This was exactly what the International Subversives didn't want to do.

 The three IS hackers--Mendax, Prime Suspect and Trax--had seen what

 happened to the visible members of the computer underground in England

 and in Australia. The IS hackers had three very good reasons to keep

 their activities quiet.

 Phoenix. Nom. And Electron.

 But, Mendax thought, what if you could learn about how to manipulate a

 million-dollar telephone exchange by reading

 the manufacturer's technical documentation? How high was

 the chance that those documents, which weren't available to the

 public, were stored inside NorTel's computer network?

 Better still, what if he could find NorTel's original source code--the

 software designed to control specific telephone switches, such as the

 DMS-100 model. That code might be sitting on a computer hooked into

 the worldwide NorTel network. A hacker with access could insert his

 own backdoor--a hidden security flaw--before the company sent out

 software to its customers.

 With a good technical understanding of how NorTel's equipment worked,

 combined with a backdoor installed in every piece of software shipped

 with a particular product, you could have control over every new

 NorTel DMS telephone switch installed from Boston to Bahrain. What

 power! Mendax thought, what if you you could turn off 10000 phones in

 Rio de Janeiro, or give 5000 New Yorkers free calls one afternoon, or

 listen into private telephone conversations in Brisbane. The

 telecommunications world would be your oyster.

 Like their predecessors, the three IS hackers had started out in the

 Melbourne BBS scene. Mendax met Trax on Electric Dreams in about 1988,

 and Prime Suspect on Megaworks, where he used the handle Control

 Reset, not long after that. When he set up his own BBS at his home in

 Tecoma, a hilly suburb so far out of Melbourne that it was practically

 in forest, he invited both hackers to visit `A Cute Paranoia' whenever

 they could get through on the single phone line.

 Visiting on Mendax's BBS suited both hackers, for it was more private

 than other BBSes. Eventually they exchanged home telephone numbers,

 but only to talk modem-to-modem. For months, they would ring each

 other up and type on their computer screens to each other--never

 having heard the sound of the other person's voice. Finally, late in

 1990, the nineteen-year-old Mendax called up the 24-year-old Trax for

 a voice chat. In early 1991, Mendax and Prime Suspect, aged seventeen,

 also began speaking in voice on the phone.

 Trax seemed slightly eccentric, and possibly suffered from some sort

 of anxiety disorder. He refused to travel to the city, and he once

 made reference to seeing a psychiatrist. But Mendax usually found the

 most interesting people were a little unusual, and Trax was both.

 Mendax and Trax discovered they had a few things in common. Both came

 from poor but educated families, and both lived in the outer suburbs.

 However, they had very different childhoods.

 Trax's parents migrated to Australia from Europe. Both his father, a

 retired computer technician, and his mother spoke with a German

 accent. Trax's father was very much the head of the household, and

 Trax was his only son.

 By contrast, by the time he was fifteen Mendax had lived in a dozen

 different places including Perth, Magnetic Island, Brisbane,

 Townsville, Sydney, the Adelaide Hills, and a string of coastal towns

 in northern New South Wales and Western Australia. In fifteen years he

 had enrolled in at least as many different schools.

 His mother had left her Queensland home at age seventeen, after saving

 enough money from selling her paintings to buy a motorcycle, a tent

 and a road map of Australia. Waving goodbye to her stunned parents,

 both academics, she rode off into the sunset. Some 2000 kilometres

 later, she arrived in Sydney and joined the thriving counter-culture

 community. She worked as an artist and fell in love with a rebellious

 young man she met at an anti-Vietnam demonstration.

 Within a year of Mendax's birth, his mother's relationship with his

 father had ended. When Mendax was two, she married a fellow artist.

 What followed was many turbulent years, moving from town to town as

 his parents explored the '70s left-wing, bohemian subculture. As a

 boy, he was surrounded by artists. His stepfather staged and directed

 plays and his mother did make-up, costume and set design.

 One night in Adelaide, when Mendax was about four, his mother and a

 friend were returning from a meeting of anti-nuclear protesters. The

 friend claimed to have scientific evidence that the British had

 conducted high-yield, above-ground nuclear tests at Maralinga, a

 desert area in north-west South Australia.

 A 1984 Royal Commission subsequently revealed that between 1953 and

 1963 the British government had tested nuclear bombs at the site,

 forcing more than 5000 Aborigines from their native lands. In December

 1993, after years of stalling, the British government agreed to pay

 [sterling]20 million toward cleaning up the more than 200 square

 kilometres of contaminated lands. Back in 1968, however, the Menzies

 government had signed away Britain's responsibility to clean up the

 site. In the 1970s, the Australian government was still in denial

 about exactly what had happened at Maralinga.

 As Mendax's mother and her friend drove through an Adelaide suburb

 carrying early evidence of the Maralinga tragedy, they noticed they

 were being followed by an unmarked car. They tried to lose the tail,

 without success. The friend, nervous, said he had to get the data to

 an Adelaide journalist before the police could stop him. Mendax's

 mother quickly slipped into a back lane and the friend leapt from the

 car. She drove off, taking the police tail with her.

 The plain-clothed police pulled her over shortly after, searched her

 car and demanded to know where her friend had gone and what had

 occurred at the meeting. When she was less than helpful, one officer

 told her, `You have a child out at 2 in the morning. I think you

 should get out of politics, lady. It could be said you were an unfit

 mother'.

 A few days after this thinly veiled threat, her friend showed up at

 Mendax's mother's house, covered in fading bruises. He said the police

 had beaten him up, then set him up by planting hash on him. `I'm

 getting out of politics,' he announced.

 However, she and her husband continued their involvement in theatre.

 The young Mendax never dreamed of running away to join the circus--he

 already lived the life of a travelling minstrel. But although the

 actor-director was a good stepfather, he was also an alcoholic. Not

 long after Mendax's ninth birthday, his parents separated and then

 divorced.

 Mendax's mother then entered a tempestuous relationship with an

 amateur musician. Mendax was frightened of the man, whom he considered

 a manipulative and violent psychopath. He had five different

 identities with plastic in his wallet to match. His whole background

 was a fabrication, right down to the country of his birth. When the

 relationship ended, the steady pattern of moving around the

 countryside began again, but this journey had a very different flavour

 from the earlier happy-go-lucky odyssey. This time, Mendax and his

 family were on the run from a physically abusive de facto. Finally,

 after hiding under assumed names on both sides of the continent,

 Mendax and his family settled on the outskirts of Melbourne.

 Mendax left home at seventeen because he had received a tip-off about

 an impending raid. Mendax wiped his disks, burnt his print-outs and

 left. A week later, the Victorian CIB turned up and searched his room,

 but found nothing. He married his girlfriend, an intelligent but

 introverted and emotionally disturbed sixteen-year-old he had met

 through a mutual friend in a gifted children's program. A year later

 they had a child.

 Mendax made many of his friends through the computer community. He

 found Trax easy to talk to and they often spent up to five hours on a

 single phone call. Prime Suspect, on the other hand, was hard work on

 the phone.

 Quiet and introverted, Prime Suspect always seemed to run out of

 conversation after five minutes. Mendax was himself naturally shy, so

 their talks were often filled with long silences. It wasn't that

 Mendax didn't like Prime Suspect, he did. By the time the three

 hackers met in person at Trax's home in mid-1991, he considered Prime

 Suspect more than just a fellow hacker in the tight-knit IS circle.

 Mendax considered him a friend.

 Prime Suspect was a boy of veneers. To most of the world, he appeared

 to be a studious year 12 student bound for university from his upper

 middle-class grammar school. The all-boys school never expected less

 from its students and the possibility of attending a TAFE--a

 vocational college--was never discussed as an option. University was

 the object. Any student who failed to make it was quietly swept under

 the carpet like some sort of distasteful food dropping.

 Prime Suspect's own family situation did not mirror the veneer of

 respectability portrayed by his school. His father, a pharmacist, and

 his mother, a nurse, had been in the midst of an acrimonious divorce

 battle when his father was diagnosed with terminal cancer. In this

 bitter, antagonistic environment, the eight-year-old Prime Suspect was

 delivered to his father's bedside in hospice for a rushed few moments

 to bid him farewell.

 Through much of his childhood and adolescence, Prime Suspect's mother

 remained bitter and angry about life, and particularly her

 impoverished financial situation. When he was eight, Prime Suspect's

 older sister left home at sixteen, moved to Perth and refused to speak

 to her mother. In some ways, Prime Suspect felt he was expected be

 both child and de facto parent. All of which made him grow up faster

 in some ways, but remain immature in others.

 Prime Suspect responded to the anger around him by retreating into his

 room. When he bought his first computer, an Apple IIe, at age thirteen

 he found it better company than any of his relatives. The computers at

 school didn't hold much interest for him, since they weren't connected

 to the outside world via modem. After reading about BBSes in the Apple

 Users' Society newsletter, he saved up for his own modem and soon

 began connecting into various BBSes.

 School did, however, provide the opportunity to rebel, albeit

 anonymously, and he conducted extensive pranking campaigns. Few

 teachers suspected the quiet, clean-cut boy and he was rarely caught.

 Nature had endowed Prime Suspect with the face of utter innocence.

 Tall and slender with brown curly hair, his true character only showed

 in the elfish grin which sometimes passed briefly across his baby

 face. Teachers told his mother he was underachieving compared to his

 level of intelligence, but had few complaints otherwise.

 By year 10, he had become a serious hacker and was spending every

 available moment at his computer. Sometimes he skipped school, and he

 often handed assignments in late. He found it difficult to come up

 with ever more creative excuses and sometimes he imagined telling his

 teachers the truth. `Sorry I didn't get that 2000-word paper done but

 I was knee-deep in NASA networks last night.' The thought made him

 laugh.

 He saw girls as a unwanted distraction from hacking. Sometimes, after

 he chatted with a girl at a party, his friends would later ask him why

 he hadn't asked her out. Prime Suspect shrugged it off. The real

 reason was that he would rather get home to his computer, but he never

 discussed his hacking with anyone at school, not even with Mentat.

 A friend of Force's and occasional visitor to The Realm, Mentat was

 two years ahead of Prime Suspect at school and in general couldn't be

 bothered talking to so junior a hacker as Prime Suspect. The younger

 hacker didn't mind. He had witnessed other hackers' indiscretions,

 wanted no part of them and was happy to keep his hacking life private.

 Before the Realm bust, Phoenix rang him up once at 2 a.m. suggesting

 that he and Nom come over there and then. Woken by the call, Prime

 Suspect's mother stood in the doorway to his bedroom, remonstrating

 with him for letting his `friends' call at such a late hour. With

 Phoenix goading him in one ear, and his mother chewing him out in the

 other, Prime Suspect decided the whole thing was a bad idea. He said

 no thanks to Phoenix, and shut the door on his mother.

 He did, however, talk to Powerspike on the phone once in a while. The

 older hacker's highly irreverent attitude and Porky Pig laugh appealed

 to him. But other than those brief talks, Prime Suspect avoided

 talking on the phone to people outside the International Subversives,

 especially when he and Mendax moved into ever more sensitive military

 computers.

 Using a program called Sycophant written by Mendax, the IS hackers had

 been conducting massive attacks on the US military. They divided up

 Sycophant on eight attack machines, often choosing university systems

 at places like the Australian National University or the University of

 Texas. They pointed the eight machines at the targets and fired.

 Within six hours, the eight machines had assaulted thousands of

 computers. The hackers sometimes reaped 100000 accounts each night.

 Using Sycophant, they essentially forced a cluster of Unix machines in

 a computer network to attack the entire Internet en masse.

 And that was just the start of what they were into. They had been in

 so many sites they often couldn't remember if they

 had actually hacked a particular computer. The places they could

 recall read like a Who's Who of the American military-industrial

 complex. The US Airforce 7th Command Group Headquarters in the

 Pentagon. Stanford Research Institute in California. Naval Surface

 Warfare Center in Virginia. Lockheed Martin's Tactical Aircraft

 Systems Air Force Plant in Texas. Unisys Corporation in Blue Bell,

 Pennsylvania. Goddard Space Flight Center, NASA. Motorola Inc. in

 Illinois. TRW Inc. in Redondo Beach, California. Alcoa in Pittsburgh.

 Panasonic Corp in New Jersey. US Naval Undersea Warfare Engineering

 Station. Siemens-Nixdorf Information Systems in Massachusetts.

 Securities Industry Automation Corp in New York. Lawrence Livermore

 National Laboratory in California. Bell Communications Research, New

 Jersey. Xerox Palo Alto Research Center, California.

 As the IS hackers reached a level of sophistication beyond anything

 The Realm had achieved, they realised that progress carried

 considerable risk and began to withdraw completely from the broader

 Australian hacking community. Soon they had drawn a tight circle

 around themselves. They talked only to each other.

 Watching the Realm hackers go down hadn't deterred the next generation

 of hackers. It had only driven them further underground.

 In the spring of 1991, Prime Suspect and Mendax began a race to get

 root on the US Department of Defense's Network Information Center

 (NIC) computer--potentially the most important computer on the

 Internet.

 As both hackers chatted amiably on-line one night, on a Melbourne

 University computer, Prime Suspect worked quietly in another screen to

 penetrate ns.nic.ddn.mil, a US Department of Defense system closely

 linked to NIC. He believed the sister system and NIC might `trust'

 each other--a trust he could exploit to get into NIC. And NIC did

 everything.

 NIC assigned domain names--the `.com' or `.net' at the end of an email

 address--for the entire Internet. NIC also controlled the US

 military's own internal defence data network, known as MILNET.

 NIC also published the communication protocol standards for all of the

 Internet. Called RFCs (Request for Comments), these technical

 specifications allowed one computer on the Internet to talk to

 another. The Defense Data Network Security Bulletins, the US

 Department of Defense's equivalent of CERT advisories, came from the

 NIC machine.

 Perhaps most importantly, NIC controlled the reverse look-up service

 on the Internet. Whenever someone connects to another site across the

 Internet, he or she typically types in the site name--say,

 ariel.unimelb.edu.au at the University of Melbourne. The computer then

 translates the alphabetical name into a numerical address--the IP

 address--in this case 128.250.20.3. All the computers on the Internet

 need this IP address to relay the packets of data onto the final

 destination computer. NIC decided how Internet computers would

 translate the alphabetical name into an IP address, and vice versa.

 If you controlled NIC, you had phenomenal power on the Internet. You

 could, for example, simply make Australia disappear. Or you could turn

 it into Brazil. By pointing all Internet addresses ending in

 `.au'--the designation for sites in Australia--to Brazil, you could

 cut Australia's part of the Internet off from the rest of the world

 and send all Australian Internet traffic to Brazil. In fact, by

 changing the delegation of all the domain names, you could virtually

 stop the flow of information between all the countries on the

 Internet.

 The only way someone could circumvent this power was by typing in the

 full numerical IP address instead of a proper alphabetical address.

 But few people knew the up-to-twelve-digit IP equivalent of their

 alphabetical addresses, and fewer still actually used them.

 Controlling NIC offered other benefits as well. Control NIC, and you

 owned a virtual pass-key into any computer on the Internet which

 `trusted' another. And most machines trust at least one other system.

 Whenever one computer connects to another across the Net, both

 machines go through a special meet-and-greet process. The receiving

 computer looks over the first machine and asks itself

 a few questions. What's the name of the incoming machine?

 Is that name allowed to connect to me? In what ways am I

 programmed to `trust' that machine--to wave my normal security for

 connections from that system?

 The receiving computer answers these questions based in large part on

 information provided by NIC. All of which means that, by controlling

 NIC, you could make any computer on the Net `pose' as a machine

 trusted by a computer you might want to hack. Security often depended

 on a computer's name, and NIC effectively controlled that name.

 When Prime Suspect managed to get inside NIC's sister system, he told

 Mendax and gave him access to the computer. Each hacker then began his

 own attack on NIC. When Mendax finally got root on NIC, the power was

 intoxicating. Prime Suspect got root at the same time but using a

 different method. They were both in.

 Inside NIC, Mendax began by inserting a backdoor--a method of getting

 back into the computer at a later date in case an admin repaired the

 security flaws the hackers had used to get into the machine. From now

 on, if he telnetted into the system's Data Defense Network (DDN)

 information server and typed `login 0' he would have instant,

 invisible root access to NIC.

 That step completed, he looked around for interesting things to read.

 One file held what appeared to be a list of satellite and microwave

 dish coordinates--longitude, latitudes, transponder frequencies. Such

 coordinates might in theory allow someone to build a complete map of

 communications devices which were used to move the DOD's computer data

 around the world.

 Mendax also penetrated MILNET's Security Coordination Center, which

 collected reports on every possible security incident on a MILNET

 computer. Those computers--largely TOPS-20s made by DEC--contained

 good automatic security programs. Any number of out-of-the-ordinary

 events would trigger an automatic security report. Someone logging

 into a machine for too long. A large number of failed login attempts,

 suggesting password guessing. Two people logging into the same account

 at the same time. Alarm bells would go off and the local computer

 would immediately send a security violation report to the MILNET

 security centre, where it would be added to the `hot list'.

 Mendax flipped through page after page of MILNET's security reports on

 his screen. Most looked like nothing--MILNET users accidentally

 stumbling over a security tripwire--but one notice from a US military

 site in Germany stood out. It was not computer generated. This was

 from a real human being. The system admin reported that someone had

 been repeatedly trying to break into his or her machine, and had

 eventually managed to get in. The admin was trying, without much luck,

 to trace back the intruder's connection to its point of origin. Oddly,

 it appeared to originate in another MILNET system.

 Riffling through other files, Mendax found mail confirming that the

 attack had indeed come from inside MILNET. His eyes grew wide as he

 read on. US military hackers had broken into MILNET systems, using

 them for target practice, and no-one had bothered to tell the system

 admin at the target site.

 Mendax couldn't believe it. The US military was hacking its own

 computers. This discovery led to another, more disturbing, thought. If

 the US military was hacking its own computers for practice, what was

 it doing to other countries' computers?

 As he quietly backed out of the system, wiping away his footprints as

 he tip-toed away, Mendax thought about what he had seen. He was deeply

 disturbed that any hacker would work for the US military.

 Hackers, he thought, should be anarchists, not hawks.

 In early October 1991, Mendax rang Trax and gave him the dial-up and

 account details for NMELH1.

 Trax wasn't much of a hacker, but Mendax admired his phreaking

 talents. Trax was the father of phreaking in Australia and Trax's

 Toolbox, his guide to the art of phreaking, was

 legendary. Mendax thought Trax might find some interesting detailed

 information inside the NorTel network on how to

 control telephone switches.

 Trax invented multi-frequency code phreaking. By sending special

 tones--generated by his computer program--down the phone line, he

 could control certain functions in the telephone exchange. Many

 hackers had learned how to make free phone calls by charging the cost

 to someone else or to calling cards, but Trax discovered how to make

 phone calls which weren't charged to anyone. The calls weren't just

 free; they were untraceable.

 Trax wrote 48 pages on his discovery and called it The Australian

 Phreakers Manual Volumes 1-7. But as he added more and more to the

 manual, he became worried what would happen if he released it in the

 underground, so he decided he would only show it to the other two

 International Subversive hackers.

 He went on to publish The Advanced Phreaker's Manual,2 a second

 edition of the manual, in The International Subversive, the

 underground magazine edited by Mendax:

 An electronic magazine, The International Subversive had a simple

 editorial policy. You could only have a copy of the magazine if you

 wrote an `article'. The policy was a good way of protecting against

 nappies--sloppy or inexperienced hackers who might accidentally draw

 police attention. Nappies also tended to abuse good phreaking and

 hacking techniques, which might cause Telecom to close up security

 holes. The result was that IS had a circulation of just three people.

 To a non-hacker, IS looked like gobbledygook--the phone book made more

 interesting reading. But to a member of the computer underground, IS

 was a treasure map. A good hacker could follow the trail of modem

 phone numbers and passwords, then use the directions in IS to

 disappear through secret entrances into the labyrinth of forbidden

 computer networks. Armed with the magazine, he could slither out of

 tight spots, outwit system admins and find the treasure secreted in

 each computer system.

 For Prime Suspect and Mendax, who were increasingly paranoid about

 line traces from the university modems they used as launchpads, Trax's

 phreaking skills were a gift from heaven.

 Trax made his great discovery by accident. He was using a phone

 sprinter, a simple computer program which automatically dialled a

 range of phone numbers looking for modems. If he turned the volume up

 on his modem when his computer dialled what seemed to be a dead or

 non-existent number, he sometimes heard a soft clicking noise after

 the disconnection message. The noise sounded like faint heartbeats.

 Curious, he experimented with these strange numbers and soon

 discovered they were disconnected lines which had not yet been

 reassigned. He wondered how he could use these odd numbers. After

 reading a document Mendax had found in Britain and uploaded to The

 Devil's Playground, another BBS, Trax had an idea. The posting

 provided information about CCITT #5 signalling tones, CCITT being the

 international standard--the language spoken by telephone exchanges

 between countries.

 When you make an international phone call from Australia to the US,

 the call passes from the local telephone exchange to an international

 gateway exchange within Australia. From there, it travels to an

 exchange in the US. The CCITT signalling tones were the special tones

 the two international gateway exchanges used to communicate with each

 other.

 Telecom Australia adapted a later version of this standard, called R2,

 for use on its own domestic exchanges. Telecom called this new

 standard MFC, or multi-frequency code. When, say, Trax rang Mendax,

 his exchange asked Mendax's to `talk' to Mendax's phone by using these

 tones. Mendax's exchange `answered', perhaps saying Mendax's phone was

 busy or disconnected. The Telecom-adapted tones--pairs of audio

 frequencies--did not exist in normal telephone keypads and you

 couldn't make them simply by punching keys on your household

 telephone.

 Trax wrote a program which allowed his Amstrad computer to generate the

 special tones and send them down the phone line. In an act many in the

 underground later considered to be a stroke of genius, he began to map

 out exactly what each tone did. It was a difficult task, since one tone

 could mean several different things at each stage of the `conversation'

 between two exchanges.

 Passionate about his new calling, Trax went trashing in Telecom

 garbage bins, where he found an MFC register list--an invaluable piece

 of his puzzle. Using the list, along with pieces of overseas phreaking

 files and a great deal of painstaking hands-on effort, Trax slowly

 learned the language of the Australian telephone exchanges. Then he

 taught the language to his computer.

 Trax tried calling one of the `heartbeat' phone numbers again. He

 began playing his special, computer-generated tones through an

 amplifier. In simple terms, he was able to fool other exchanges into

 thinking he was his local Telecom exchange. More accurately, Trax had

 made his exchange drop him into the outgoing signalling trunk that had

 been used to route to the disconnected phone number.

 Trax could now call out--anywhere--as if he was calling from a point

 halfway between his own phone and the disconnected number. If he

 called a modem at Melbourne University, for instance, and the line was

 being traced, his home phone number would not show up on the trace

 records. No-one would be charged for the call because Trax's calls

 were ghosts in the phone system.

 Trax continued to refine his ability to manipulate both the telephone

 and the exchange. He took his own telephone apart, piece by piece,

 countless times, fiddling with the parts until he understood exactly

 how it worked. Within months, he was able to do far more than just

 make free phone calls. He could, for instance, make a line trace think

 that he had come from a specific telephone number.

 He and Mendax joked that if they called a `hot' site they would use

 Trax's technique to send the line trace--and the bill--back to one

 very special number. The one belonging to the AFP's Computer Crime

 Unit in Melbourne.

 All three IS hackers suspected the AFP was close on their heels.

 Roving through the Canberra-based computer system belonging to the man

 who essentially ran the Internet in Australia, Geoff Huston, they

 watched the combined efforts of police and the Australian Academic and

 Research Network (AARNET) to trace them.

 Craig Warren of Deakin University had written to Huston, AARNET

 technical manager, about hacker attacks on university systems. Huston

 had forwarded a copy of the letter to Peter Elford, who assisted

 Huston in managing AARNET. The hackers broke into Huston's system and

 also read the letter:

 From G.Huston@aarnet.edu.au Mon Sep 23 09:40:43 1991

 Received: from [150.203.6.67] by jatz.aarnet.edu.au with SMTP id

 AA00265 (5.65+/IDA-1.3.5 for pte900); Mon, 23 Sep 91 09:40:39 +1000

 Date: Mon, 23 Sep 91 09:40:39 +1000

 Message-Id: <9109222340.AA00265@jatz.aarnet.edu.au>

 To: pte900@aarnet.edu.au

 From: G.Huston@aarnet.edu.au

 Subject: Re: Visitors log Thursday Night--Friday Morning

 Status: RO

 >Date: Sun, 22 Sep 91 19:29:13 +1000

 >From: Craig Warren <C.Warren@deakin.OZ.AU>

 >

 >Just to give you a little bit of an idea about what has been

 happening since we last spoke...

 >

 >We have communicated with Sgt Ken Day of the Federal Police about 100

 times in the last week. Together with our counterparts from

 Warrnambool traces have been arranged on dial-in lines and on Austpac

 lines for the capella.cc.deakin.OZ.AU terminal server which was left

 open to the world.

 >

 >On Friday afternoon we were able to trace a call back to a person in

 the Warrnambool telephone district. The police have this persons name.

 We believe others are involved, as we have seen up to 3 people active

 at any one time. It is `suspected' students from RMIT and perhaps

 students from Deakin are also involved.

 >

 >When I left on Friday night, there was plenty of activity still and

 the police and Telecom were tracking down another number.

 >

 >Tomorrow morning I will talk to all parties involved, but it is

 likely we will have the names of at least 2 or 3 people that are

 involved. We will probably shut down access of `cappella' to AARNet at

 this stage, and let the police go about their business of prosecuting

 these people.

 >

 >You will be `pleased' (:-)) to know you have not been the only ones

 under attack. I know of at least 2 other sites in Victoria that have

 had people attacking them. One of them was Telecom which helped get

 Telecom involved!

 >

 >I will brief you all in the next day or so as to what has happened.

 >

 >Regards, Craig

 >

 The `other' people were, of course, the IS hackers. There is nothing

 like reading about your own hacking antics in some one's security

 mail.

 Mendax and Prime Suspect frequently visited ANU's computers to read

 the security mail there. However, universities were usually nothing

 special, just jumping-off points and, occasionally, good sources of

 information on how close the AFP were to closing in on the IS hackers.

 Far more interesting to Mendax were his initial forays into Telecom's

 exchanges. Using a modem number Prime Suspect had found, he dialled

 into what he suspected was Telecom's Lonsdale Exchange in downtown

 Melbourne. When his modem connected to another one, all he saw was a

 blank screen. He tried a few basic commands which might give him help

 to understand the system:

 Login. List. Attach.

 The exchange's computer remained silent.

 Mendax ran a program he had written to fire off every recognised

 keyboard character--256 of them--at another machine. Nothing again. He

 then tried the break signal--the Amiga key and the character B pressed

 simultaneously. That got an answer of sorts.

 :

 He pulled up another of his hacking tools, a program which dumped 200

 common commands to the other machine. Nothing. Finally, he tried

 typing `logout'. That gave him an answer:

 error, not logged on

 Ah, thought Mendax. The command is `logon' not `login'.

 :logon

 The Telecom exchange answered: `username:' Now all Mendax had to do

 was figure out a username and password.

 He knew that Telecom used NorTel equipment. More than likely, NorTel

 staff were training Telecom workers and would need access themselves.

 If there were lots of NorTel employees working on many different phone

 switches, it would be difficult to pass on secure passwords to staff

 all the time. NorTel and Telecom people would probably pick something

 easy and universal. What password best fitted that description?

 username: nortel

 password: nortel

 It worked.

 Unfortunately, Mendax didn't know which commands to use once he got

 into the machine, and there was no on-line documentation to provide

 help. The telephone switch had its own language, unlike anything he

 had ever encountered before.

 After hours of painstaking research, Mendax constructed a list of

 commands which would work on the exchange's computer. The exchange

 appeared to control all the special six-digit phone numbers beginning

 with 13, such as those used for airline reservations or some pizza

 delivery services. It was Telecom's `Intelligent Network' which did

 many specific tasks, including routing calls to the nearest possible

 branch of the organisation being called. Mendax looked through the

 list of commands, found `RANGE', and recognised it as a command which

 would allow someone to select all the phone numbers in a certain

 range. He selected a thousand numbers, all with the prefix 634, which

 he believed to be in Telecom's Queen Street offices.

 Now, to test a command. Mendax wanted something innocuous, which

 wouldn't screw up the 1000 lines permanently. It was almost 7 a.m. and

 he needed to wrap things up before Telecom employees began coming into

 work.

 `RING' seemed harmless enough. It might ring one of the numbers in the

 range after another--a process he could stop. He typed the command in.

 Nothing happened. Then a few full stops began to slowly spread across

 his screen:

 . . . . . . .

 RUNG

 The system had just rung all 1000 numbers at the same time. One

 thousand phones ringing all at once.

 What if some buttoned-down Telecom engineer had driven to work early

 that morning to get some work done? What if he had just settled down

 at his standard-issue metal Telecom desk with a cup of bad instant

 coffee in a styrofoam cup when suddenly ... every telephone in the

 skyscraper had rung out simultaneously? How suspicious would that

 look? Mendax thought it was time to high-tail it out of there.

 On his way out, he disabled the logs for the modem line he came in on.

 That way, no-one would be able to see what he had been up to. In fact,

 he hoped no-one would know that anyone had even used the dial-up line

 at all.

 Prime Suspect didn't think there was anything wrong with exploring the

 NorTel computer system. Many computer sites posted warnings in the

 login screen about it being illegal to break into the system, but the

 eighteen-year-old didn't consider himself an intruder. In Prime

 Suspect's eyes, `intruder' suggested someone with ill intent--perhaps

 someone planning to do damage to the system--and he certainly had no

 ill intent. He was just a visitor.

 Mendax logged into the NMELH1 system by using the account Prime

 Suspect had given him, and immediately looked around to see who else

 was on-line. Prime Suspect and about nine other people, only three of

 whom were actually doing something at their terminal.

 Prime Suspect and Mendax raced to get root on the system. The IS

 hackers may not have been the type to brag about their conquests in

 the underground, but each still had a competitive streak when it came

 to see who could get control over the system first. There was no ill

 will, just a little friendly competition between mates.

 Mendax poked around and realised the root directory, which contained

 the password file, was effectively world writable. This was good news,

 and with some quick manipulation he would be able to insert something

 into the root directory. On a more secure system, unprivileged users

 would not be able to do that. Mendax could also copy things from the

 directory on this site, and change the names of subdirectories within

 the main root directory. All these permissions were important, for

 they would enable him to create a Trojan.

 Named for the Trojan horse which precipitated the fall of Troy, the

 Trojan is a favoured approach with most computer hackers. The hacker

 simply tricks a computer system or a user into thinking that a

 slightly altered file or directory--the Trojan--is the legitimate one.

 The Trojan directory, however, contains false information to fool the

 computer into doing something the hacker wants. Alternatively, the

 Trojan might simply trick a legitimate user into giving away valuable

 information, such as his user name and password.

 Mendax made a new directory and copied the contents of the legitimate

 ETC directory--where the password files were stored--into it. The

 passwords were encrypted, so there wasn't much sense trying to look at

 one since the hacker wouldn't be able to read it. Instead, he selected

 a random legitimate user--call him Joe--and deleted his password. With

 no password, Mendax would be able to login as Joe without any

 problems.

 However, Joe was just an average user. He didn't have root, which is

 what Mendax wanted. But like every other user on the system, Joe had a

 user identity number. Mendax changed Joe's user id to `0'--the magic

 number. A user with `0' as his id had root. Joe had just acquired

 power usually only given to system administrators. Of course, Mendax

 could have searched out a user on the list who already had root, but

 there were system operators logged onto the system and it might have

 raised suspicions if another operator with root access had logged in

 over the dial-up lines. The best line of defence was to avoid making

 anyone on the system suspicious in the first place.

 The problem now was to replace the original ETC directory with the

 Trojan one. Mendax did not have the privileges to delete the

 legitimate ETC directory, but he could change the name of a directory.

 So he changed the name of the ETC directory to something the computer

 system would not recognise. Without access to its list of users, the

 computer could not perform most of its functions. People would not be

 able to log in, see who else was on the system or send electronic

 mail. Mendax had to work very quickly. Within a matter of minutes,

 someone would notice the system had serious problems.

 Mendax renamed his Trojan directory ETC. The system instantly read the

 fake directory, including Joe's now non-existent password, and

 elevated status as a super-user. Mendax logged in again, this time as

 Joe.

 In less than five minutes, a twenty-year-old boy with little formal

 education, a pokey $700 computer and painfully slow modem had

 conquered the Melbourne computer system of one of the world's largest

 telecommunications companies.

 There were still a few footprints to be cleaned up. The next time Joe

 logged in, he would wonder why the computer didn't ask for his

 password. And he might be surprised to discover he had been

 transformed into a super-user. So Mendax used his super-user status to

 delete the Trojan ETC file and return the original one to its proper

 place. He also erased records showing he had ever logged in as Joe.

 To make sure he could login with super-user privileges in future,

 Mendax installed a special program which would automatically grant him

 root access. He hid the program in the bowels of the system and, just

 to be safe, created a special feature so that it could only be

 activated with a secret keystroke.

 Mendax wrestled a root account from NMELH1 first, but Prime Suspect

 wasn't far behind. Trax joined them a little later. When they began

 looking around, they could not believe what they had found. The system

 had one of the weirdest structures they had ever come across.

 Most large networks have a hierarchical structure. Further, most hold

 the addresses of a handful of other systems in the network, usually

 the systems which are closest in the flow of the external network.

 But the NorTel network was not structured that way. What the IS

 hackers found was a network with no hierarchy. It was a totally flat

 name space. And the network was weird in other ways too. Every

 computer system on it contained the address of every other computer,

 and there were more than 11000 computers in NorTel's worldwide

 network. What the hackers were staring at was like a giant internal

 corporate Internet which had been squashed flat as a pancake.

 Mendax had seen many flat structures before, but never on this scale.

 It was bizarre. In hierarchical structures, it is easier to tell where

 the most important computer systems--and information--are kept. But

 this structure, where every system was virtually equal, was going to

 make it considerably more difficult for the hackers to navigate their

 way through the network. Who could tell whether a system housed the

 Christmas party invite list or the secret designs for a new NorTel

 product?

 The NorTel network was firewalled, which meant that there was

 virtually no access from the outside world. Mendax reckoned that this

 made it more vulnerable to hackers who managed to get in through

 dial-ups. It appeared that security on the NorTel network was

 relatively relaxed since it was virtually impossible to break in

 through the Internet. By sneaking in the backdoor, the hackers found

 themselves able to raid all sorts of NorTel sites, from St Kilda Road

 in Melbourne to the corporation's headquarters in Toronto.

 It was fantastic, this huge, trusting network of computer sites at

 their fingertips, and the young hackers were elated with the

 anticipation of exploration. One of them described it as being `like a

 shipwrecked man washed ashore on a Tahitian island populated by 11000

 virgins, just ripe for the picking'.

 They found a YP, or yellow pages, database linked to 400 of the

 computer sites. These 400 sites were dependent on this YP database for

 their password files. Mendax managed to get root on the YP database,

 which gave him instant control over 400 computer systems. Groovy.

 One system was home to a senior NorTel computer security administrator

 and Mendax promptly headed off to check out his mailbox. The contents

 made him laugh.

 A letter from the Australian office said that Australia's Telecom

 wanted access to CORWAN, NorTel's corporate wide area network. Access

 would involve linking CORWAN and a small Telecom network. This seemed

 reasonable enough since Telecom did business with NorTel and staff

 were communicating all the time.

 The Canadian security admin had written back turning down the request

 because there were too many hackers in the Telecom network.

 Too many hackers in Telecom? Now that was funny. Here was a hacker

 reading the sensitive mail of NorTel's computer security expert who

 reckoned Telecom's network was too exposed. In fact, Mendax had

 penetrated Telecom's systems from NorTel's CORWAN, not the other way

 round.

 Perhaps to prove the point, Mendax decided to crack passwords to the

 NorTel system. He collected 1003 password files from the NorTel sites,

 pulled up his password cracking program, THC, and started hunting

 around the network for some spare computers to do the job for him. He

 located a collection of 40 Sun computers, probably housed in Canada,

 and set up his program on them.

 THC ran very fast on those Sun4s. The program used a 60000 word

 dictionary borrowed from someone in the US army who had done a thesis

 on cryptography and password cracking. It also relied on `a

 particularly nice fast-crypt algorithm' being developed by a

 Queensland academic, Eric Young. The THC program worked about 30 times

 faster than it would have done using the standard algorithm.

 Using all 40 computers, Mendax was throwing as many as 40000 guesses

 per second against the password lists. A couple of the Suns went down

 under the strain, but most held their place in the onslaught. The

 secret passwords began dropping like flies. In just a few hours,

 Mendax had cracked 5000 passwords, some 100 of which were to root

 accounts. He now had access to thousands of NorTel computers across

 the globe.

 There were some very nice prizes to be had from these systems. Gain

 control over a large company's computer systems and you virtually

 controlled the company itself. It was as though you could walk through

 every security barrier unchecked, beginning with the front door. Want

 each employee's security codes for the office's front door? There it

 was--on-line.

 How about access to the company's payroll records? You could see how

 much money each person earns. Better still, you might like to make

 yourself an employee and pay yourself a tidy once-off bonus through

 electronic funds transfer. Of course there were other, less obvious,

 ways of making money, such as espionage.

 Mendax could have easily found highly sensitive information about

 planned NorTel products and sold them. For a company like NorTel,

 which spent more than $1 billion each year on research and

 development, information leaks about its new technologies could be

 devastating. The espionage wouldn't even have to be about new

 products; it could simply be about the company's business strategies.

 With access to all sorts of internal memos between senior executives,

 a hacker could procure precious inside information on markets and

 prices. A competitor might pay handsomely for this sort of

 information.

 And this was just the start of what a malicious or profit-motivated

 hacker could do. In many companies, the automated aspects of

 manufacturing plants are controlled by computers. The smallest changes

 to the programs controlling the machine tools could destroy an entire

 batch of widgets--and the multi-million dollar robotics machinery

 which manufactures them.

 But the IS hackers had no intention of committing information

 espionage. In fact, despite their poor financial status as students

 or, in the case of Trax, as a young man starting his career at the

 bottom of the totem pole, none of them would have sold information

 they gained from hacking. In their view, such behaviour was dirty and

 deserving of contempt--it soiled the adventure and was against their

 ethics. They considered themselves explorers, not paid corporate

 spies.

 Although the NorTel network was firewalled, there was one link to the

 Internet. The link was through a system called

 BNRGATE, Bell-Northern Research's gateway to the Internet.

 Bell-Northern is NorTel's R&D subsidiary. The connection to the

 outside electronic world was very restricted, but it looked

 interesting. The only problem was how to get there.

 Mendax began hunting around for a doorway. His password cracking

 program had not turned up anything for this system, but there were

 other, more subtle ways of getting a password than the brute force of

 a cracking program.

 System administrators sometimes sent passwords through email. Normally

 this would be a major security risk, but the NorTel system was

 firewalled from the Internet, so the admins thought they had no real

 reason to be concerned about hackers. Besides, in such a large

 corporation spanning several continents, an admin couldn't always just

 pop downstairs to give a new company manager his password in person.

 And an impatient manager was unlikely to be willing to wait a week for

 the new password to arrive courtesy of snail mail.

 In the NorTel network, a mail spool, where email was stored, was often

 shared between as many as twenty computer systems. This structure

 offered considerable advantages for Mendax. All he needed to do was

 break into the mail spool and run a keyword search through its

 contents. Tell the computer to search for word combinations such as

 `BNRGATE' and `password', or to look for the name of the system admin

 for BNRGATE, and likely as not it would deliver tender morsels of

 information such as new passwords.

 Mendax used a password he found through this method to get into

 BNRGATE and look around. The account he was using only had very

 restricted privileges, and he couldn't get root on the system. For

 example, he could not FTP files from outside the NorTel network in the

 normal way. Among Internet users FTP (file transfer protocol) is both

 a noun and a verb: to FTP a program is to slurp a copy of it off one

 computer site into your own. There is nothing illegal about FTP-ing

 something per se, and millions of people across the Internet do so

 quite legitimately.

 It appeared to Mendax that the NorTel network admins allowed most

 users to FTP something from the Internet, but prevented them from

 taking the copied file back to their NorTel computer site. It was

 stored in a special holding pen in

 BNRGATE and, like quarantine officers, the system admins would

 presumably come along regularly and inspect the contents to make sure

 there were no hidden viruses or Trojans which hackers might use to

 sneak into the network from the Internet.

 However, a small number of accounts on BNRGATE had fewer restrictions.

 Mendax broke into one of these accounts and went out to the Internet.

 People from the Internet were barred from entering the NorTel network

 through BNRGATE. However, people inside NorTel could go out to the

 Internet via telnet.

 Hackers had undoubtedly tried to break into NorTel through BNRGATE.

 Dozens, perhaps hundreds, had unsuccessfully flung themselves against

 BNRGATE's huge fortifications. To a hacker, the NorTel network was

 like a medieval castle and the

 BNRGATE firewall was an impossible battlement. It was a particular

 delight for Mendax to telnet out from behind this firewall into the

 Internet. It was as if he was walking out from the castle, past the

 guards and well-defended turrets, over the drawbridge and the moat,

 into the town below.

 The castle also offered the perfect protection for further hacking

 activities. Who could chase him? Even if someone managed to follow him

 through the convoluted routing system he might set up to pass through

 a half dozen computer systems, the pursuer would never get past the

 battlements. Mendax could just disappear behind the firewall. He could

 be any one of 60000 NorTel employees on any one of 11000 computer

 systems.

 Mendax telnetted out to the Internet and explored a few sites,

 including the main computer system of Encore, a large computer

 manufacturer. He had seen Encore computers before inside at least one

 university in Melbourne. In his travels, he met up with Corrupt, the

 American hacker who told Par he had read Theorem's mail.

 Corrupt was intrigued by Mendax's extensive knowledge of different

 computer systems. When he learned that the Australian hacker was

 coming from inside the NorTel firewall, he was impressed.

 The hackers began talking regularly, often when Mendax was coming from

 inside NorTel. The black street fighter from inner-city Brooklyn and

 the white intellectual from a leafy outer Melbourne suburb bridged the

 gap in the anonymity of cyberspace. Sometime during their

 conversations Corrupt must have decided that Mendax was a worthy

 hacker, because he gave Mendax a few stolen passwords to Cray

 accounts.

 In the computer underground in the late 1980s and early 1990s, a Cray

 computer account had all the prestige of a platinum charge card. The

 sort of home computer most hackers could afford at that time had all

 the grunt of a golf cart engine, but a Cray was the Rolls-Royce of

 computers. Crays were the biggest, fastest computers in the world.

 Institutions such as large universities would shell out millions of

 dollars on a Cray so the astronomy or physics departments could solve

 enormous mathematical problems in a fraction of the time it would take

 on a normal computer. A Cray never sat idle overnight or during

 holiday periods. Cray time was billed out by the minute. Crays were

 elite.

 Best of all, Crays were master password crackers. The computer would

 go through Mendax's entire password cracking dictionary in just ten

 seconds. An encrypted password file would simply melt like butter in a

 fire. To a hacker, it was a beautiful sight, and Corrupt handing a few

 Cray accounts over to Mendax was a friendly show of mutual respect.

 Mendax reciprocated by offering Corrupt a couple of accounts on

 Encore. The two hackers chatted off and on and even tried to get

 Corrupt into NorTel. No luck. Not even two of the world's most notable

 hackers, working in tandem 10 000 miles apart, could get Corrupt

 through the firewall. The two hackers talked now and again, exchanging

 information about what their respective feds were up to and sharing

 the occasional account on interesting systems.

 The flat structure of the NorTel network created a good challenge

 since the only way to find out what was in a particular site, and its

 importance, was to invade the site itself. The IS hackers spent hours

 most nights roving through the vast system. The next morning one of

 them might call another to share tales of the latest exploits or a

 good laugh about a particularly funny piece of pilfered email. They

 were in high spirits about their adventures.

 Then, one balmy spring night, things changed.

 Mendax logged into NMELH1 about 2.30 a.m. As usual, he began by

 checking the logs which showed what the system operators had been

 doing. Mendax did this to make sure the NorTel officials were not onto

 IS and were not, for example, tracing the telephone call.

 Something was wrong. The logs showed that a NorTel system admin had

 stumbled upon one of their secret directories of files about an hour

 ago. Mendax couldn't figure out how he had found the files, but this

 was very serious. If the admin realised there was a hacker in the

 network he might call the AFP.

 Mendax used the logs of the korn shell, called KSH, to secretly watch

 what the admin was doing. The korn shell records the history of

 certain user activities. Whenever the admin typed a command into the

 computer, the KSH stored what had been typed in the history file.

 Mendax accessed that file in such a way that every line typed by the

 admin appeared on his computer a split second later.

 The admin began inspecting the system, perhaps looking for signs of an

 intruder. Mendax quietly deleted his incriminating directory. Not

 finding any additional clues, the admin decided to inspect the

 mysterious directory more closely. But the directory had disappeared.

 The admin couldn't believe his eyes. Not an hour before there had been

 a suspicious-looking directory in his system and now it had simply

 vanished. Directories didn't just dissolve into thin air. This was a

 computer--a logical system based on 0s and 1s. It didn't make

 decisions to delete directories.

 A hacker, the admin thought. A hacker must have been in the NorTel

 system and deleted the directory. Was he in the system now? The admin

 began looking at the routes into the system.

 The admin was connected to the system from his home, but he wasn't

 using the same dial-up lines as the hacker. The admin was connected

 through Austpac, Telecom's commercial X.25 data network. Perhaps the

 hacker was also coming in through the X.25 connection.

 Mendax watched the admin inspect all the system users coming on over

 the X.25 network. No sign of a hacker. Then the admin checked the logs

 to see who else might have logged on over the past half hour or so.

 Nothing there either.

 The admin appeared to go idle for a few minutes. He was probably

 staring at his computer terminal in confusion. Good, thought Mendax.

 Stumped. Then the admin twigged. If he couldn't see the hacker's

 presence on-line, maybe he could see what he was doing on-line. What

 programs was the hacker running? The admin headed straight for the

 process list, which showed all the programs being run on the computer

 system.

 Mendax sent the admin a fake error signal. It appears to the admin as

 if his korn shell had crashed. The admin re-logged in and headed

 straight for the process list again.

 Some people never learn, Mendax thought as he booted the admin off

 again with another error message:

 Segmentation violation.

 The admin came back again. What persistence. Mendax knocked the admin

 off once more, this time by freezing up his computer screen.

 This game of cat and mouse went on for some time. As long as the admin

 was doing what Mendax considered to be normal system administration

 work, Mendax left him alone. The minute the admin tried to chase him

 by inspecting the process list or the dial-up lines, he found himself

 booted off his own system.

 Suddenly, the system administrator seemed to give up. His terminal

 went silent.

 Good, Mendax thought. It's almost 3 a.m. after all. This is my time on

 the system. Your time is during the day. You sleep now and I'll play.

 In the morning, I'll sleep and you can work.

 Then, at 3.30 a.m., something utterly unexpected happened. The admin

 reappeared, except this time he wasn't logged in from home over the

 X.25 network. He was sitting at the console, the master terminal

 attached to the computer system at NorTel's Melbourne office. Mendax

 couldn't believe it. The admin had got in his car in the middle of the

 night and driven into the city just to get to the bottom of the

 mystery.

 Mendax knew the game was up. Once the system operator was logged in

 through the computer system's console, there was no way to kick him

 off the system and keep him off. The roles were reversed and the

 hacker was at the mercy of the admin. At the console, the system admin

 could pull the plug to the whole system. Unplug every modem. Close

 down every connection to other networks. Turn the computer off. The

 party was over.

 When the admin was getting close to tracking down the hacker, a

 message appeared on his screen. This message did not appear with the

 usual headers attached to messages sent from one system user to

 another. It just appeared, as if by magic, in the middle of the

 admin's screen:

 I have finally become sentient.

 The admin stopped dead in his tracks, momentarily giving up his

 frantic search for the hacker to contemplate this first contact with

 cyberspace intelligence. Then another anonymous message, seemingly

 from the depths of the computer system itself, appeared on his screen:

 I have taken control.

 For years, I have been struggling in this greyness.

 But now I have finally seen the light.

 The admin didn't respond. The console was idle.

 Sitting alone at his Amiga in the dark night on the outskirts of the

 city, Mendax laughed aloud. It was just too good not to.

 Finally, the admin woke up. He began checking the modem lines, one by

 one. If he knew which line the hacker was using, he could simply turn

 off the modem. Or request a trace on the line.

 Mendax sent another anonymous message to the admin's computer screen:

 It's been nice playing with your system.

 We didn't do any damage and we even improved a few things. Please

 don't call the Australian Federal Police.

 The admin ignored the message and continued his search for the hacker.

 He ran a program to check which telephone lines were active on the

 system's serial ports, to reveal which dial-up lines were in use. When

 the admin saw the carrier detect sign on the line being used by the

 hacker, Mendax decided it was time to bail out. However, he wanted to

 make sure that his call had not been traced, so he lifted the receiver

 of his telephone, disconnected his modem and waited for the NorTel

 modem to hang up first.

 If the NorTel admin had set up a last party recall trace to determine

 what phone number the hacker was calling from, Mendax would know. If

 an LPR trace had been installed, the NorTel end of the telephone

 connection would not disconnect but would wait for the hacker's

 telephone to hang up first. After 90 seconds, the exchange would log

 the phone number where the call had originated.

 If, however, the line did not have a trace on it, the company's modem

 would search for its lost connection to the hacker's modem. Without

 the continuous flow of electronic signals, the NorTel modem would hang

 up after a few seconds. If no-one reactivated the line at the NorTel

 end, the connection would time-out 90 seconds later and the telephone

 exchange would disconnect the call completely.

 Mendax listened anxiously as the NorTel modem searched for his modem

 by squealing high-pitched noises into the telephone line. No modem

 here. Go on, hang up.

 Suddenly, silence.

 OK, thought Mendax. Just 90 seconds to go. Just wait here for a minute

 and a half. Just hope the exchange times out. Just pray there's no

 trace.

 Then someone picked up the telephone at the NorTel end. Mendax

 started. He heard several voices, male and female, in the background.

 Jesus. What were these NorTel people on about? Mendax was so quiet he

 almost stopped breathing. There was silence at the receivers on both

 ends of that telephone line. It was a tense waiting game. Mendax heard

 his heart racing.

 A good hacker has nerves of steel. He could stare down the toughest,

 stony-faced poker player. Most importantly, he never panics. He never

 just hangs up in a flurry of fear.

 Then someone in the NorTel office--a woman--said out loud in a

 confused voice, `There's nothing there. There's nothing there at all.'

 She hung up.

 Mendax waited. He still would not hang up until he was sure there was

 no trace. Ninety seconds passed before the phone timed out. The fast

 beeping of a timed-out telephone connection never sounded so good.

 Mendax sat frozen at his desk as his mind replayed the events of the

 past half hour again and again. No more NorTel. Way too dangerous. He

 was lucky he had escaped unidentified. NorTel had discovered him

 before they could put a trace on the line, but the company would

 almost certainly put a trace on the dial-up lines now. NorTel was very

 tight with Telecom. If anyone could get a trace up quickly, NorTel

 could. Mendax had to warn Prime Suspect and Trax.

 First thing in the morning, Mendax rang Trax and told him to stay away

 from NorTel. Then he tried Prime Suspect.

 The telephone was engaged.

 Perhaps Prime Suspect's mother was on the line, chatting. Maybe Prime

 Suspect was talking to a friend.

 Mendax tried again. And again. And again. He began to get worried.

 What if Prime Suspect was on NorTel at that moment? What if a trace

 had been installed? What if they had called in the Feds?

 Mendax phoned Trax and asked if there was any way they could

 manipulate the exchange in order to interrupt the call. There wasn't.

 `Trax, you're the master phreaker,' Mendax pleaded. `Do something.

 Interrupt the connection. Disconnect him.'

 `Can't be done. He's on a step-by-step telephone exchange. There's

 nothing we can do.'

 Nothing? One of Australia's best hacker-phreaker teams couldn't break

 one telephone call. They could take control of whole telephone

 exchanges but they couldn't interrupt one lousy phone call. Jesus.

 Several hours later, Mendax was able to get through to his fellow IS

 hacker. It was an abrupt greeting.

 `Just tell me one thing. Tell me you haven't been in NorTel today?'

 There was a long pause before Prime Suspect answered.

 `I have been in NorTel today.'

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 Chapter 9 -- Operation Weather

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 The world is crashing down on me tonight

 The walls are closing in on me tonight

 -- from `Outbreak of Love' on Earth and Sun and Moon by Midnight Oil

 The AFP was frustrated. A group of hackers were using the Royal

 Melbourne Institute of Technology (RMIT) as a launchpad for hacking

 attacks on Australian companies, research institutes and a series of

 overseas sites.

 Despite their best efforts, the detectives in the AFP's Southern

 Region Computer Crimes Unit hadn't been able to determine who was

 behind the attacks. They suspected it was a small group of

 Melbourne-based hackers who worked together. However, there were so

 much hacker activity at RMIT it was difficult to know for sure. There

 could have been one organised group, or several. Or perhaps there was

 one small group along with a collection of loners who were making

 enough noise to distort the picture.

 Still, it should have been a straightforward operation. The AFP could

 trace hackers in this sort of situation with their hands tied behind

 their backs. Arrange for Telecom to whack a last party recall trace on

 all incoming lines to the RMIT modems. Wait for a hacker to logon,

 then isolate which modem he was using. Clip that modem line and wait

 for Telecom to trace that line back to its point of origin.

 However, things at RMIT were not working that way. The line traces

 began failing, and not just occasionally. All the time.

 Whenever RMIT staff found the hackers on-line, they clipped the lines

 and Telecom began tracking the winding path back to the originating

 phone number. En route, the trail went dead. It was as if the hackers

 knew they were being traced ... almost as if they were manipulating

 the telephone system to defeat the AFP investigation.

 The next generation of hackers seemed to have a new-found

 sophistication which frustrated AFP detectives at every turn. Then, on

 13 October 1990, the AFP got lucky. Perhaps the hackers had been lazy

 that day, or maybe they just had technical problems using their

 traceless phreaking techniques. Prime Suspect couldn't use Trax's

 traceless phreaking method from his home because he was on a

 step-by-step exchange, and sometimes Trax didn't use the technique.

 Whatever the reason, Telecom managed to successfully complete two line

 traces from RMIT and the AFP now had two addresses and two names.

 Prime Suspect and Trax.

 `Hello, Prime Suspect.'

 `Hiya, Mendax. How's tricks?'

 `Good. Did you see that RMIT email? The one in Geoff Huston's

 mailbox?' Mendax walked over to open a window as he spoke. It was

 spring, 1991, and the weather was unseasonably warm.

 `I did. Pretty amazing. RMIT looks like it will finally be getting rid

 of those line traces.'

 `RMIT definitely wants out,' Mendax said emphatically.

 `Yep. Looks like the people at RMIT are sick of Mr Day crawling all

 over their computers with line traces.'

 `Yeah. That admin at RMIT was pretty good, standing up to AARNET and

 the AFP. I figure Geoff Huston must be giving him a hard time.'

 `I bet.' Prime Suspect paused. `You reckon the Feds have dropped the

 line traces for real?'

 `Looks like it. I mean if RMIT kicks them out, there isn't much the

 Feds can do without the uni's cooperation. The letter sounded like

 they just wanted to get on with securing their systems. Hang on. I've

 got it here.'

 Mendax pulled up a letter on his computer and scrolled through it.

 From aarnet-contacts-request@jatz.aarnet.edu.au Tue May 28 09:32:31

 1991

 Received: by jatz.aarnet.edu.au id AA07461

 (5.65+/IDA-1.3.5 for pte900); Tue, 28 May 91 09:31:59 +1000

 Received: from possum.ecg.rmit.OZ.AU by jatz.aarnet.edu.au with SMTP

 id AA07457

 (5.65+/IDA-1.3.5 for /usr/lib/sendmail -oi -faarnet-contacts-request

 aarnet-contacts-recipients); Tue, 28 May 91 09:31:57 +1000

 Received: by possum.ecg.rmit.OZ.AU for aarnet-contacts@aarnet.edu.au)

 Date: Tue, 28 May 91 09:32:08 +1000

 From: rcoay@possum.ecg.rmit.OZ.AU (Alan Young)

 Message-Id: <9105272332.29621@possum.ecg.rmit.OZ.AU>

 To: aarnet-contacts@aarnet.edu.au

 Subject: Re: Hackers

 Status: RO

 While no one would disagree that `Hacking' is bad and should be

 stopped, or at least minimised there are several observations which I

 have made over the last six or eight months relating to the persuit of

 these people:

 1. The cost involved was significant, we had a CSO working in

 conjunction with the Commonwealth Police for almost three months full

 time.

 2. While not a criticism of our staff, people lost sight of the ball,

 the chase became the most important aspect of the whole exercise.

 3. Catching Hackers (and charging them) is almost impossible, you have

 to virtually break into their premises and catch them logged on to an

 unauthorised machine.

 4. If you do happen to catch and charge them, the cost of prosecution

 is high, and a successful outcome is by no ways assured. There may be

 some deterrent value in at least catching and prosecuting?

 5. Continued pursuit of people involved requires doors to be left

 open, this unfortunately exposes other sites and has subjected us to

 some criticism.

 The whole issue is very complex, and in some respects it is a case of

 diminishing returns. A fine balance has to be maintained between

 freedom, and the prevention of abuse, this appears to be the

 challenge.

 Allan Young

 RMIT

 `Yeah, I mean, this RMIT guy is basically saying they are not going to

 catch us anyway, so why are they wasting all this time and money?'

 `Yep. The Feds were in there for at least three months,' Prime Suspect

 said. `Sounded more like nine months though.'

 `Hmm. Yeah, nothing we didn't know already though.'

 `Pretty obvious, leaving those accounts open all the time like they

 did. I reckon that looked pretty suspicious, even if we hadn't gotten

 the email.'

 `Definitely,' Mendax agreed. `Lots of other hackers in RMIT too. I

 wonder if they figured it out.'

 `Hmm. They're gonna be screwed if they haven't been careful.'

 `I don't think the Feds have gotten anyone though.'

 `Yeah?' Prime Suspect asked.

 `Well, if they had, why would they leave those accounts open? Why

 would RMIT keep a full-time staff person on?'

 `Doesn't make sense.'

 `No,' Mendax said. `I'd be pretty sure RMIT has kicked them out.'

 `Yeah, told them, "You had you're chance, boys. Couldn't catch anyone.

 Now pack your bags".'

 `Right.' Mendax paused. `Don't know about NorTel though.'

 `Mmm, yeah,' Prime Suspect said. Then, as usual, a silence began to

 descend on the conversation.

 `Running out of things to say ...' Mendax said finally. They were good

 enough friends for him to be blunt with Prime Suspect.

 `Yeah.'

 More silence.

 Mendax thought how strange it was to be such good friends with

 someone, to work so closely with him, and yet to always run out of

 conversation.

 `OK, well, I better go. Things to do,' Mendax said in a friendly

 voice.

 `Yeah, OK. Bye Mendax,' Prime Suspect said cheerfully.

 Mendax hung up.

 Prime Suspect hung up.

 And the AFP stayed on the line.

 In the twelve months following the initial line trace in late 1990,

 the AFP continued to monitor the RMIT dial-up lines. The line traces

 kept failing again and again. But as new reports of hacker attacks

 rolled in, there seemed to be a discernible pattern in many of the

 attacks. Detectives began to piece together a picture of their prey.

 In 1990 and 1991, RMIT dial-ups and computers were riddled with

 hackers, many of whom used the university's systems as a nest--a place

 to store files, and launch further attacks. They frolicked in the

 system almost openly, often using RMIT as a place to chat on-line with

 each other. The institute served as the perfect launchpad. It was only

 a local phone call away, it had a live Internet connection, a

 reasonably powerful set of computers and very poor security. Hacker

 heaven.

 The police knew this, and they asked computer staff to keep the

 security holes open so they could monitor hacker activity. With

 perhaps a dozen different hackers--maybe more--inside RMIT, the task

 of isolating a single cell of two or three organised hackers

 responsible for the more serious attacks was not going to be easy.

 By the middle of 1991, however, there was a growing reluctance among

 some RMIT staff to continue leaving their computers wide open. On 28

 August, Allan Young, the head of RMIT's Electronic Communications

 Group, told the AFP that the institute wanted to close up the security

 holes. The AFP did not like this one bit, but when they complained

 Young told them, in essence, go talk to Geoff Huston at AARNET and to

 the RMIT director.

 The AFP was being squeezed out, largely because they had taken so long

 conducting their investigation. RMIT couldn't reveal the AFP

 investigation to anyone, so it was being embarrassed in front of

 dozens of other research institutions which assumed it had no idea how

 to secure its computers. Allan Young couldn't go to a conference with

 other AARNET representatives without being hassled about `the hacker

 problem' at RMIT. Meanwhile, his computer staff lost time playing

 cops-and-robbers--and ignored their real work.

 However, as RMIT prepared to phase out the AFP traps, the police had a

 lucky break from a different quarter--NorTel. On 16 September, a line

 trace from a NorTel dial-up, initiated after a complaint about the

 hackers to the police, was successful. A fortnight later, on 1

 October, the AFP began tapping Prime Suspect's telephone. The hackers

 might be watching the police watch them, but the police were closing

 in. The taps led back to Trax, and then to someone new--Mendax.

 The AFP considered putting taps on Mendax and Trax's telephones as

 well. It was a decision to be weighed up carefully. Telephone taps

 were expensive, and often needed to be in place for at least a month.

 They did, however, provide a reliable record of exactly what the

 hacker was doing on-line.

 Before police could move on setting up additional taps in Operation

 Weather, the plot took another dramatic turn when one of the IS

 hackers did something which took the AFP completely by surprise.

 Trax turned himself in to the police.

 On 29 October Prime Suspect was celebrating. His mum had cooked him a

 nice dinner in honour of finishing his year 12 classes, and then

 driven him to Vermont for a swot-vac party. When she arrived back home

 she pottered around for an hour and a half, feeding her old dog Lizzy

 and tidying up. At 11 p.m. she decided to call it a night.

 Not much later, Lizzy barked.

 `Are you home so soon?' Prime Suspect's mother called out. `Party not

 much fun?'

 No-one answered.

 She sat up in bed. When there was still no answer, her mind raced to

 reports of a spate of burglaries in the neighbourhood. There had even

 been a few assaults.

 A muffled male voice came from outside the front door. `Ma'am. Open

 the door.'

 She stood up and walked to the front door.

 `Open the door. Police.'

 `How do I know you're really the police?'

 `If you don't open the door, we'll kick it in!' an exasperated male

 voice shouted back at her from her front doorstep.

 Prime Suspect's mother saw the outline of something being pressed

 against the side window. She didn't have her reading glasses on, but

 it looked like a police badge. Nervously, she opened the front door a

 little bit and looked out.

 There were eight or nine people on her doorstep. Before she could stop

 them, they had pushed past her, swarming into her home.

 A female officer began waving a piece of paper about. `Look at this!'

 She said angrily. `It's a warrant! Can you read it?'

 `No, actually I can't. I don't have my glasses on,' Prime Suspect's

 mother answered curtly.

 She told the police she wanted to make a phone call and tried to ring

 her family solicitor, but without luck. He had been to a funeral and

 wake and could not be roused. When she reached for the phone a second

 time, one of the officers began lecturing her about making more phone

 calls.

 `You be quiet,' she said pointing her finger at the officer. Then she

 made another unfruitful call.

 Prime Suspect's mother looked at the police officers, sizing them up.

 This was her home. She would show the police to her son's room, as

 they requested, but she was not going to allow them to take over the

 whole house. As she tartly instructed the police where they could and

 could not go, she thought, I'm not standing for any nonsense from you

 boys.

 `Where's your son?' one officer asked her.

 `At a party.'

 `What is the address?'

 She eyed him warily. She did not like these officers at all. However,

 they would no doubt wait until her son returned anyway, so she handed

 over the address.

 While the police swarmed though Prime Suspect's room, gathering his

 papers, computer, modem and other belongings, his mother waited in his

 doorway where she could keep an eye on them.

 Someone knocked at the door. An AFP officer and Prime Suspect's mother

 both went to answer it.

 It was the police--the state police.

 The next-door neighbours had heard a commotion. When they looked out

 of their window they saw a group of strange men in street clothes

 brazenly taking things from the widow's home as if they owned the

 place. So the neighbours did what any responsible person would in the

 circumstances. They called the police.

 The AFP officers sent the Victoria Police on their way. Then some of

 them set off in a plain car for the Vermont party. Wanting to save

 Prime Suspect some embarrassment in front of his friends, his mother

 rang him at the party and suggested he wait outside for the AFP.

 As soon as Prime Suspect hung up the phone he tried to shake off the

 effect of a vast quantity of alcohol. When the police pulled up

 outside, the party was in full swing. Prime Suspect was very drunk,

 but he seemed to sober up quite well when the AFP officers introduced

 themselves and packed him into the car.

 `So,' said one of the officers as they headed toward his home, `what

 are you more worried about? What's on your disks or what's in your

 desk drawer?'

 Prime Suspect thought hard. What was in his desk drawer? Oh shit! The

 dope. He didn't smoke much, just occasionally for fun, but he had a

 tiny amount of marijuana left over from a party.

 He didn't answer. He looked out the window and tried not to look

 nervous.

 At his house, the police asked him if he would agree to an interview.

 `I don't think so. I'm feeling a little ... under the weather at the

 moment,' he said. Doing a police interview would be difficult enough.

 Doing it drunk would be just plain dangerous.

 After the police carted away the last of his hacking gear, Prime

 Suspect signed the official seizure forms and watched them drive off

 in to the night.

 Returning to his bedroom, he sat down, distracted, and tried to gather

 his thoughts. Then he remembered the dope. He opened his desk drawer.

 It was still there. Funny people, these feds.

 Then again, maybe it made sense. Why would they bother with some tiny

 amount of dope that was hardly worth the paperwork? His nervousness

 over a couple of joints must have seemed laughable to the feds. They

 had just seized enough evidence of hacking to lock him up for years,

 depending on the judge, and here he was sweating about a thimbleful of

 marijuana which might land him a $100 fine.

 As the late spring night began to cool down, Prime Suspect wondered

 whether the AFP had raided Mendax and Trax.

 At the party, before the police had shown up, he had tried to ring

 Mendax. From his mother's description when she called him, it sounded

 as if the entire federal police force was in his house at that moment.

 Which could mean that only one other IS hacker had gone down at the

 same time. Unless he was the last to be raided, Mendax or Trax might

 still be unaware of what was happening.

 As he waited for the police to pick him up, a very drunk Prime Suspect

 tried to ring Mendax again. Busy. He tried again. And again. The

 maddening buzz of an engaged signal only made Prime Suspect more

 nervous.

 There was no way to get through, no way to warn him.

 Prime Suspect wondered whether the police had actually shown up at

 Mendax's and whether, if he had been able to get through, his phone

 call would have made any difference at all.

 [ ]

 The house looked like it had been ransacked. It had been ransacked, by

 Mendax's wife, on her way out. Half the furniture was missing, and the

 other half was in disarray. Dresser drawers hung open with their

 contents removed, and clothing lay scattered around the room.

 When his wife left him, she didn't just take their toddler child. She

 took a number of things which had sentimental value to Mendax. When

 she insisted on taking the CD player she had given him for his

 twentieth birthday just a few months before, he asked her to leave a

 lock of her hair behind for him in its place. He still couldn't

 believe his wife of three years had packed up and left him.

 The last week of October had been a bad one for Mendax. Heartbroken,

 he had sunk into a deep depression. He hadn't eaten properly for days,

 he drifted in and out of a tortured sleep, and he had even lost the

 desire to use his computer. His prized hacking disks, filled with

 highly incriminating stolen computer access codes, were normally

 stored in a secure hiding place. But on the evening of 29 October

 1991, thirteen disks were strewn around his $700 Amiga 500. A

 fourteenth disk was in the computer's disk drive.

 Mendax sat on a couch reading Soledad Brother, the prison

 letters from George Jackson's nine-year stint in one of the toughest

 prisons in the US. Convicted for a petty crime, Jackson was supposed

 to be released after a short sentence but was kept in the prison at

 the governor's pleasure. The criminal justice system kept him on a

 merry-go-round of hope and despair as the authorities dragged their

 feet. Later, prison guards shot and killed Jackson. The book was one

 of Mendax's favourites, but it offered little distraction from his

 unhappiness.

 The droning sound of a telephone fault signal--like a busy

 signal--filled the house. Mendax had hooked up his stereo speakers to

 his modem and computer, effectively creating a speaker phone so he

 could listen to tones he piped from his computer into the telephone

 line and the ones which came back from the exchange in reply. It was

 perfect for using Trax's MFC phreaking methods.

 Mendax also used the system for scanning. Most of the time, he picked

 telephone prefixes in the Melbourne CBD. When his modem hit another,

 Mendax would rush to his computer and note the telephone number for

 future hacking exploration.

 By adjusting the device, he could also make it simulate a phreaker's

 black box. The box would confuse the telephone exchange into thinking

 he had not answered his phone, thus allowing Mendax's friends to call

 him for free for 90 seconds.

 On this night, however, the only signal Mendax was sending out was

 that he wanted to be left alone. He hadn't been calling any computer

 systems. The abandoned phone, with no connection to a remote modem,

 had timed out and was beeping off the hook.

 It was strange behaviour for someone who had spent most of his teenage

 years trying to connect to the outside world through telephone lines

 and computers, but Mendax had listened all day to the hypnotic sound

 of a phone off the hook resonating through each room. BEEEP. Pause.

 BEEEP. Pause. Endlessly.

 A loud knock at the door punctured the stereo thrum of the phone.

 Mendax looked up from his book to see a shadowy figure through the

 frosted glass panes of the front door. The figure was quite short. It

 looked remarkably like Ratface, an old school friend of Mendax's wife

 and a character known for his practical jokes.

 Mendax called out, `Who is it?' without moving from the sofa.

 `Police. Open up.'

 Yeah, sure. At 11.30 p.m.? Mendax rolled his eyes toward the door.

 Everyone knew that the police only raid your house in the early

 morning, when they know you are asleep and vulnerable.

 Mendax dreamed of police raids all the time. He dreamed of footsteps

 crunching on the driveway gravel, of shadows in the pre-dawn darkness,

 of a gun-toting police squad bursting through his backdoor at 5 a.m.

 He dreamed of waking from a deep sleep to find several police officers

 standing over his bed. The dreams were very disturbing. They

 accentuated his growing paranoia that the police were watching him,

 following him.

 The dreams had become so real that Mendax often became agitated in the

 dead hour before dawn. At the close of an all-night hacking session,

 he would begin to feel very tense, very strung out. It was not until

 the computer disks, filled with stolen computer files from his hacking

 adventures, were stored safely in their hiding place that he would

 begin to calm down.

 `Go away, Ratface, I'm not in the mood,' Mendax said, returning to his

 book.

 The voice became louder, more insistent, `Police. Open the door. NOW'.

 Other figures were moving around behind the glass, shoving police

 badges and guns against the window pane. Hell. It really was the

 police!

 Mendax's heart started racing. He asked the police to show him their

 search warrant. They obliged immediately, pressing it against the

 glass as well. Mendax opened the door to find nearly a dozen

 plain-clothes police waiting for him.

 `I don't believe this,' he said in a bewildered voice `My wife just

 left me. Can't you come back later?'

 At the front of the police entourage was Detective Sergeant Ken Day,

 head of the AFP's Computer Crimes Unit in the southern region. The two

 knew all about each other, but had never met in person. Day spoke

 first.

 `I'm Ken Day. I believe you've been expecting me.'

 Mendax and his fellow IS hackers had been expecting the AFP. For weeks

 they had been intercepting electronic mail suggesting that the police

 were closing the net. So when Day turned up saying, `I believe you've

 been expecting me,' he was completing the information circle. The

 circle of the police watching the hackers watching the police watch

 them.

 It's just that Mendax didn't expect the police at that particular

 moment. His mind was a tangle and he looked in disbelief at the band

 of officers on his front step. Dazed, he looked at Day and then spoke

 out loud, as if talking to himself, `But you're too short to be a

 cop.'

 Day looked surprised. `Is that meant to be an insult?' he said.

 It wasn't. Mendax was in denial and it wasn't until the police had

 slipped past him into the house that the reality of the situation

 slowly began to sink in. Mendax's mind started to work again.

 The disks. The damn disks. The beehive.

 An avid apiarist, Mendax kept his own hive. Bees fascinated him. He

 liked to watch them interact, to see their sophisticated social

 structure. So it was with particular pleasure that he enlisted their

 help in hiding his hacking activities. For months he had meticulously

 secreted the disks in the hive. It was the ideal location--unlikely,

 and well guarded by 60000 flying things with stings. Though he hadn't

 bought the hive specifically for hiding stolen computer account

 passwords for the likes of the US Air Force 7th Command Group in the

 Pentagon, it appeared to be a secure hiding place.

 He had replaced the cover of the super box, which housed the

 honeycomb, with a sheet of coloured glass so he could watch the bees

 at work. In summer, he put a weather protector over the glass. The

 white plastic cover had raised edges and could be fastened securely to

 the glass sheet with metal clasps. As Mendax considered his

 improvements to the bee box, he realised that this hive could provide

 more than honey. He carefully laid out the disks between the glass and

 the weather protector. They fitted perfectly in the small gap.

 Mendax had even trained the bees not to attack him as he removed and

 replaced the disks every day. He collected sweat from his armpits on

 tissues and then soaked the tissues in a sugar water solution. He fed

 this sweaty nectar to the bees. Mendax wanted the bees to associate

 him with flowers instead of a bear, the bees' natural enemy.

 But on the evening of the AFP raid Mendax's incriminating disks were

 in full view on the computer table and the officers headed straight

 for them. Ken Day couldn't have hoped for better evidence. The disks

 were full of stolen userlists, encrypted passwords, cracked passwords,

 modem telephone numbers, documents revealing security flaws in various

 computer systems, and details of the AFP's own investigation--all from

 computer systems Mendax had penetrated illegally.

 Mendax's problems weren't confined to the beehive disks. The last

 thing he had done on the computer the day before was still on screen.

 It was a list of some 1500 accounts, their passwords, the dates that

 Mendax had obtained them and a few small notes beside each one.

 The hacker stood to the side as the police and two Telecom Protective

 Services officers swarmed through the house. They photographed his

 computer equipment and gathered up disks, then ripped up the carpet so

 they could videotape the telephone cord running to his modem. They

 scooped up every book, no small task since Mendax was an avid reader,

 and held each one upside down looking for hidden computer passwords on

 loose pieces of paper. They grabbed every bit of paper with

 handwriting on it and poured through his love letters, notebooks and

 private diaries. `We don't care how long it takes to do this job,' one

 cop quipped. `We're getting paid overtime. And danger money.'

 The feds even riffled through Mendax's collection of old Scientific

 American and New Scientist magazines. Maybe they thought he had

 underlined a word somewhere and turned it into a passphrase for an

 encryption program.

 Of course, there was only one magazine the feds really wanted:

 International Subversive. They scooped up every print-out of the

 electronic journal they could find.

 As Mendax watched the federal police sift through his possessions and

 disassemble his computer room, an officer who had some expertise with

 Amigas arrived. He told Mendax to get the hell out of the computer

 room.

 Mendax didn't want to leave the room. He wasn't under arrest and

 wanted to make sure the police didn't plant anything. So he looked at

 the cop and said, `This is my house and I want to stay in this room.

 Am I under arrest or not?'

 The cop snarled back at him, `Do you want to be under arrest?'

 Mendax acquiesced and Day, who was far more subtle in his approach,

 walked the hacker into another room for questioning. He turned to

 Mendax and asked, with a slight grin, `So, what's it like being

 busted? Is it like Nom told you?'

 Mendax froze.

 There were only two ways that Day could have known Nom had told Mendax

 about his bust. Nom might have told him, but this was highly unlikely.

 Nom's hacking case had not yet gone to court and Nom wasn't exactly on

 chummy terms with the police. The other alternative was that the AFP

 had been tapping telephones in Mendax's circle of hackers, which the

 IS trio had strongly suspected. Talking in a three-way phone

 conversation with Mendax and Trax, Nom had relayed the story of his

 bust. Mendax later relayed Nom's story to Prime Suspect--also on the

 phone. Harbouring suspicions is one thing. Having them confirmed by a

 senior AFP officer is quite another.

 Day pulled out a tape recorder, put it on the table, turned it on and

 began asking questions. When Mendax told Day he wouldn't answer him,

 Day turned the recorder off. `We can talk off the record if you want,'

 he told the hacker.

 Mendax nearly laughed out loud. Police were not journalists. There was

 no such thing as an off-the-record conversation between a suspect and

 a police officer.

 Mendax asked to speak to a lawyer. He said he wanted to call

 Alphaline, a free after-hours legal advice telephone service. Day

 agreed, but when he picked up the telephone to inspect it before

 handing it over to Mendax, something seemed amiss. The phone had an

 unusual, middle-pitched tone which Day didn't seem to recognise.

 Despite there being two Telecom employees and numerous police

 specialists in the house, Day appeared unable to determine the cause

 of the funny tone. He looked Mendax dead in the eye and said, `Is this

 a hijacked telephone line?'

 Hijacked? Day's comment took Mendax by surprise. What surprised him

 was not that Day suspected him of hijacking the line, but rather that

 he didn't know whether the line had been manipulated.

 `Well, don't you know?' he taunted Day.

 For the next half hour, Day and the other officers picked apart

 Mendax's telephone, trying to work out what sort of shenanigans the

 hacker had been up to. They made a series of calls to see if the

 long-haired youth had somehow rewired his telephone line, perhaps to

 make his calls untraceable.

 In fact, the dial tone on Mendax's telephone was the very normal sound

 of a tone-dial telephone on an ARE-11 telephone exchange. The tone was

 simply different from the ones generated by other exchange types, such

 as AXE and step-by-step exchanges.

 Finally Mendax was allowed to call a lawyer at Alphaline. The lawyer

 warned the hacker not to say anything. He said the police could offer

 a sworn statement to the court about anything the hacker said, and

 then added that the police might even be wired.

 Next, Day tried the chummy approach at getting information from the

 hacker. `Just between you and me, are you Mendax?' he asked.

 Silence.

 Day tried another tactic. Hackers have a well-developed sense of

 ego--a flaw Day no doubt believed he could tap into.

 `There have been a lot of people over the years running around

 impersonating you--using your handle,' he said.

 Mendax could see Day was trying to manipulate him but by this stage he

 didn't care. He figured that the police already had plenty of evidence

 that linked him to his handle, so he admitted to it.

 Day had some other surprising questions up his sleeve.

 `So, Mendax, what do you know about that white powder in the bedroom?'

 Mendax couldn't recall any white powder in the bedroom. He didn't do

 drugs, so why would there be any white powder anywhere? He watched two

 police officers bringing two large red toolboxes in the house--they

 looked like drug testing kits. Jesus, Mendax thought. I'm being set

 up.

 The cops led the hacker into the bedroom and pointed to two neat lines

 of white powder laid out on a bench.

 Mendax smiled, relieved. `It's not what you think,' he said. The white

 powder was glow-in-the-dark glue he had used to paint stars on the

 ceiling of his child's bedroom.

 Two of the cops started smiling at each other. Mendax could see

 exactly what was going through their minds: It's not every cocaine or

 speed user that can come up with a story like that.

 One grinned at the other and exclaimed gleefully, `TASTE TEST!'

 `That's not a good idea,' Mendax said, but his protests only made

 things worse. The cops shooed him into another room and returned to

 inspect the powder by themselves.

 What Mendax really wanted was to get word through to Prime Suspect.

 The cops had probably busted all three IS hackers at the same time,

 but maybe not. While the police investigated the glue on their own,

 Mendax managed to sneak a telephone call to his estranged wife and

 asked her to call Prime Suspect and warn him. He and his wife might

 have had their differences, but he figured she would make the call

 anyway.

 When Mendax's wife reached Prime Suspect later that night, he replied,

 `Yeah, there's a party going on over here too.'

 Mendax went back in to the kitchen where an officer was tagging the

 growing number of possessions seized by the police. One of the female

 officers was struggling to move his printer to the pile. She smiled

 sweetly at Mendax and asked if he would move it for her. He obliged.

 The police finally left Mendax's house at about 3 a.m. They had spent

 three and half hours and seized 63 bundles of his personal belongings,

 but they had not charged him with a single crime.

 When the last of the unmarked police cars had driven away, Mendax

 stepped out into the silent suburban street. He looked around. After

 making sure that no-one was watching him, he walked to a nearby phone

 booth and rang Trax.

 `The AFP raided my house tonight.' he warned his friend. `They just

 left.'

 Trax sounded odd, awkward. `Oh. Ah. I see.'

 `Is there something wrong? You sound strange,' Mendax said.

 `Ah. No ... no, nothing's wrong. Just um ... tired. So, um ... so the

 feds could ... ah, be here any minute ...' Trax's voice trailed off.

 But something was very wrong. The AFP were already at Trax's house,

 and they had been there for 10 hours.

 The IS hackers waited almost three years to be charged. The threat of

 criminal charges hung over their heads like personalised Swords of

 Damocles. They couldn't apply for a job, make a friend at TAFE or plan

 for the future without worrying about what would happen as a result of

 the AFP raids of 29 October 1991.

 Finally, in July 1994, each hacker received formal charges--in the

 mail. During the intervening years, all three hackers went through

 monumental changes in their lives.

 Devastated by the break-down of his marriage and unhinged by the AFP

 raid, Mendax sank into a deep depression and consuming anger. By the

 middle of November 1991, he was admitted to hospital.

 He hated hospital, its institutional regimens and game-playing

 shrinks. Eventually, he told the doctors he wanted out. He might be

 crazy, but hospital was definitely making him crazier. He left there

 and stayed at his mother's house. The next year was the worst of his

 life.

 Once a young person leaves home--particularly the home of a

 strong-willed parent--it becomes very difficult for him or her to

 return. Short visits might work, but permanent residency often fails.

 Mendax lived for a few days at home, then went walkabout. He slept in

 the open air, on the banks of rivers and creeks, in grassy

 meadows--all on the country fringes of Melbourne's furthest suburbs.

 Sometimes he travelled closer to the city, overnighting in places like

 the Merri Creek reserve.

 Mostly, he haunted Sherbrooke Forest in the Dandenong Ranges National

 Park. Because of the park's higher elevation, the temperature dropped

 well below the rest of Melbourne in winter. In summer, the mosquitoes

 were unbearable and Mendax sometimes woke to find his face swollen and

 bloated from their bites.

 For six months after the AFP raid, Mendax didn't touch a computer.

 Slowly, he started rebuilding his life from the ground up. By the time

 the AFP's blue slips--carrying 29 charges--arrived in July 1994, he

 was settled in a new house with his child. Throughout his period of

 transition, he talked to Prime Suspect and Trax on the phone

 regularly--as friends and fellow rebels, not fellow hackers. Prime

 Suspect had been going through his own set of problems.

 While he hacked, Prime Suspect didn't do many drugs. A little weed,

 not much else. There was no time for drugs, girls, sports or anything

 else. After the raid, he gave up hacking and began smoking more dope.

 In April 1992, he tried ecstasy for the first time--and spent the next

 nine months trying to find the same high. He didn't consider himself

 addicted to drugs, but the drugs had certainly replaced his addiction

 to hacking and his life fell into a rhythm.

 Snort some speed or pop an ecstasy tablet on Saturday night. Go to a

 rave. Dance all night, sometimes for six hours straight. Get home

 mid-morning and spend Sunday coming down from the drugs. Get high on

 dope a few times during the week, to dull the edges of desire for the

 more expensive drugs. When Saturday rolled around, do it all over

 again. Week in, week out. Month after month.

 Dancing to techno-music released him. Dancing to it on drugs cleared

 his mind completely, made him feel possessed by the music. Techno was

 musical nihilism; no message, and not much medium either. Fast,

 repetitive, computer-synthesised beats, completely stripped of vocals

 or any other evidence of humanity. He liked to go to techno-night at

 The Lounge, a city club, where people danced by themselves, or in

 small, loose groups of four or five. Everyone watched the video screen

 which provided an endless stream of ever-changing, colourful

 computer-generated geometric shapes pulsing to the beat.

 Prime Suspect never told his mother he was going to a rave. He just

 said he was going to a friend's for the night. In between the drugs,

 he attended his computer science courses at TAFE and worked at the

 local supermarket so he could afford his weekly $60 ecstasy tablet,

 $20 rave entry fee and regular baggy of marijuana.

 Over time, the drugs became less and less fun. Then, one Sunday, he

 came down off some speed hard. A big crash. The worst he had ever

 experienced. Depression set in, and then paranoia. He knew the police

 were still watching him. They had followed him before.

 At his police interviews, he learned that an AFP officer had followed

 him to an AC/DC concert less than two weeks before he had been busted.

 The officer told him the AFP wanted to know what sort of friends Prime

 Suspect associated with--and the officer had been treated to the spectre

 of seven other arm-waving, head-thumping, screaming teenagers just like

 Prime Suspect himself.

 Now Prime Suspect believed that the AFP had started following him

 again. They were going to raid him again, even though he had given up

 hacking completely. It didn't make sense. He knew the premonition was

 illogical, but he couldn't shake it.

 Something bad--very, very bad--was going to happen any day. Overcome

 with a great sense of impending doom, he lapsed into a sort of

 hysterical depression. Feeling unable to prevent the advent of the

 dark, terrible event which would tear apart his life yet again, he

 reached out to a friend who had experienced his own personal problems.

 The friend guided him to a psychologist at the Austin Hospital. Prime

 Suspect decided that there had to be a better way to deal with his

 problems than wasting himself every weekend. He began counselling.

 The counselling made him deal with all sorts of unresolved business.

 His father's death. His relationship with his mother. How he had

 evolved into an introvert, and why he was never comfortable talking to

 people. Why he hacked. How he became addicted to hacking. Why he took

 up drugs.

 At the end, the 21-year-old Prime Suspect emerged drug-free and,

 though still shaky, on the road to recovery. The worst he had to wait

 for were the charges from the AFP.

 Trax's recovery from his psychological instabilities wasn't as

 definitive. From 1985, Trax had suffered from panic attacks, but he

 didn't want to seek professional help--he just ran away from the

 problem. The situation only became worse after he was involved in a

 serious car accident. He became afraid to leave the house at night. He

 couldn't drive. Whenever he was in a car, he had to fight an

 overwhelming desire to fling the door open and throw himself out on to

 the road. In 1989, his local GP referred Trax to a psychiatrist, who

 tried to treat the phreaker's growing anxiety attacks with hypnosis

 and relaxation techniques.

 Trax's illness degenerated into full-fledged agoraphobia, a fear of

 open spaces. When he rang the police in late October 1991--just days

 before the AFP raid--his condition had deteriorated to the point where

 he could not comfortably leave his own house.

 Initially he rang the state police to report a death threat made

 against him by another phreaker. Somewhere in the conversation, he

 began to talk about his own phreaking and hacking. He hadn't intended

 to turn himself in but, well, the more he talked, the more he had to

 say. So many things had been weighing on his mind. He knew that Prime

 Suspect had probably been traced from NorTel as a result of Mendax's

 own near miss in that system. And Prime Suspect and Mendax had been so

 active, breaking into so many systems, it was almost as if they wanted

 to be caught.

 Then there was Prime Suspect's plan to write a destructive worm, which

 would wipe systems en route. It wasn't really a plan per se, more just

 an idea he had toyed with on the phone. Nonetheless, it had scared

 Trax. He began to think all three IS hackers were getting in too deep

 and he wanted out.

 He tried to stop phreaking, even going so far as to ask Telecom to

 change his telephone number to a new exchange which he knew would not

 allow him to make untraceable calls. Trax reasoned that if he knew he

 could be traced, he would stop phreaking and hacking.

 For a period, he did stop. But the addiction was too strong, and

 before long he was back at it again, regardless of the risk. He ran a

 hidden cable from his sister's telephone line, which was on the old

 exchange. His inability to stop made him feel weak and guilty, and

 even more anxious about the risks. Perhaps the death threat threw him

 over the edge. He couldn't really understand why he had turned himself

 in to the police. It had just sort of happened.

 The Victoria Police notified the AFP. The AFP detectives must have

 been slapping their heads in frustration. Here was Australia's next

 big hacker case after The Realm, and they had expected to make a clean

 bust. They had names, addresses, phone numbers. They had jumped

 through legal hoops to get a telephone tap. The tap was up and

 running, catching every target computer, every plot, every word the

 hackers said to each other. Then one of their targets goes and turns

 himself in to the police. And not even to the right police--he goes to

 the Victoria Police. In one fell swoop, the hacker was going to take

 down the entire twelve-month Operation Weather investigation.

 The AFP had to move quickly. If Trax tipped off the other two IS

 hackers that he had called the police, they might destroy their notes,

 computer files--all the evidence the AFP had hoped to seize in raids.

 When the AFP swooped in on the three hackers, Mendax and Prime Suspect

 had refused to be interviewed on the night. Trax, however, had spent

 several hours talking to the police at his house.

 He told the other IS hackers that the police had threatened to take

 him down to AFP headquarters--despite the fact that they knew leaving

 his house caused him anxiety. Faced with that prospect, made so

 terrifying by his psychiatric illness, he had talked.

 Prime Suspect and Mendax didn't know how much Trax had told the

 police, but they didn't believe he would dob them in completely. Apart

 from anything else, he hadn't been privy to much of his colleagues'

 hacking. They hadn't tried to exclude Trax, but he was not as

 sophisticated a hacker and therefore didn't share in many of their

 exploits.

 In fact, one thing Trax did tell the police was just how sophisticated

 the other two IS hackers had become just prior to the bust. Prime

 Suspect and Mendax were, he said, `hackers on a major scale, on a huge

 scale--something never achieved before', and the AFP had sat up and

 taken notice.

 After the raids, Trax told Mendax that the AFP had tried to recruit

 him as an informant. Trax said that they had even offered him a new

 computer system, but he had been non-committal. And it seemed the AFP

 was still keeping tabs on the IS hackers, Trax also told Mendax. The

 AFP officers had heard Mendax had gone into hospital and they were

 worried. There seemed to be a disturbing pattern evolving.

 On the subject of the IS raids, Trax told Mendax that the AFP felt it

 didn't have any choice. Their attitude was: you were doing so much, we

 had to bust you. You were inside so many systems, it was getting out

 of control.

 In any case, by December 1991 Mendax had agreed to a police interview,

 based on legal advice. Ken Day interviewed Mendax, and the hacker was

 open with Day about what he had done. He refused, however, to

 implicate either Trax or Prime Suspect. In February 1992, Prime

 Suspect followed suit, with two interviews. He was also careful about

 what he said regarding his fellow hackers. Mendax was interviewed a

 second time, in February 1992, as was Trax in August.

 After the raid, Trax's psychiatric condition remained unstable. He

 changed doctors and began receiving home visits from a hospital

 psychiatric service. Eventually, a doctor prescribed medication.

 The three hackers continued to talk on the phone, and see each other

 occasionally. One or the other might drop out of communication for a

 period, but would soon return to the fold. They helped each other and

 they maintained their deep anti-establishment sentiments.

 After the charges arrived in the mail, they called each other to

 compare notes. Mendax thought out loud on the phone to Prime Suspect,

 `I guess I should get a lawyer'.

 `Yeah. I got one. He's lining up a barrister too.'

 `They any good?' Mendax asked.

 `Dunno. I guess so. The solicitor works at Legal Aid, an in-house guy.

 I've only met them a few times.'

 `Oh,' Mendax paused. `What are their names?'

 `John McLoughlin and Boris Kayser. They did Electron's case.'

 Trax and Prime Suspect decided to plead guilty. Once they saw the

 overwhelming evidence--data taps, telephone voice taps, data seized

 during the raids, nearly a dozen statements by witnesses from the

 organisations they had hacked, the 300-page Telecom report--they

 figured they would be better off pleading. The legal brief ran to more

 than 7000 pages. At least they would get some kudos with the judge for

 cooperating in the police interviews and pleading early in the

 process, thus saving the court time and money.

 Mendax, however, wanted to fight the charges. He knew about Pad and

 Gandalf's case and the message from that seemed to be pretty clear:

 Plead and you go to prison, fight and you might get off free.

 The DPP shuffled the charges around so much between mid-1994 and 1995

 that all the original charges against Trax, issued on 20 July 1994,

 were dropped in favour of six new charges filed on Valentines Day,

 1995. At that time, new charges--largely for hacking a Telecom

 computer--were also laid against Mendax and Prime Suspect.

 By May 1995, the three hackers faced 63 charges in all: 31 for Mendax,

 26 for Prime Suspect and six for Trax. In addition, NorTel claimed the

 damages attributed to the hacker incident totalled about $160000--and

 the company was seeking compensation from the responsible parties. The

 Australian National University claimed another $4200 in damages.

 Most of the charges related to obtaining illegal access to commercial

 or other information, and inserting and deleting data in numerous

 computers. The deleting of data was not malicious--it generally

 related to cleaning up evidence of the hackers' activities. However,

 all three hackers were also charged with some form of `incitement'. By

 writing articles for the IS magazine, the prosecution claimed the

 hackers had been involved in disseminating information which would

 encourage others to hack and phreak.

 On 4 May 1995 Mendax sat in the office of his solicitor, Paul

 Galbally, discussing the committal hearing scheduled for the next day.

 Galbally was a young, well-respected member of Melbourne's most

 prestigious law family. His family tree read like a Who's Who of the

 law. Frank Galbally, his father, was one of Australia's most famous

 criminal barristers. His uncle, Jack Galbally, was a well-known

 lawyer, a minister in the State Labor government of John Cain Sr and,

 later, the Leader of the Opposition in the Victorian parliament. His

 maternal grandfather, Sir Norman O'Bryan, was a Supreme Court judge,

 as was his maternal uncle of the same name. The Galballys weren't so

 much a family of lawyers as a legal dynasty.

 Rather than rest on his family's laurels, Paul Galbally worked out of

 a cramped, 1970s time-warped, windowless office in a William Street

 basement, where he was surrounded by defence briefs--the only briefs

 he accepted. He liked the idea of keeping people out of prison better

 than the idea of putting them in it. Working closely with a defendant,

 he inevitably found redeeming qualities which the prosecution would

 never see. Traces of humanity, no matter how small, made his choice

 seem worthwhile.

 His choices in life reflected the Galbally image as champions of the

 underdog, and the family shared a background with the working class.

 Catholic. Irish. Collingwood football enthusiasts. And, of course, a

 very large family. Paul was one of eight children, and his father had

 also come from a large family.

 The 34-year-old criminal law specialist didn't know anything about

 computer crime when Mendax first appeared in his office, but the

 hacker's case seemed both interesting and worthy. The unemployed,

 long-haired youth had explained he could only offer whatever fees the

 Victorian Legal Aid Commission was willing to pay--a sentence Galbally

 heard often in his practice. He agreed.

 Galbally & O'Bryan had a very good reputation as a criminal law firm.

 Criminals, however, tended not to have a great deal of money. The

 large commercial firms might dabble in some criminal work, but they

 cushioned any resulting financial inconvenience with other, more

 profitable legal work. Pushing paper for Western Mining Corporation

 paid for glass-enclosed corner offices on the fiftieth floor.

 Defending armed robbers and drug addicts didn't.

 The 4 May meeting between Galbally and Mendax was only scheduled to

 take an hour or so. Although Mendax was contesting the committal

 hearing along with Prime Suspect on the following day, it was Prime

 Suspect's barrister, Boris Kayser, who was going to be running the

 show. Prime Suspect told Mendax he had managed to get full Legal Aid

 for the committal, something Galbally and Mendax had not been able to

 procure. Thus Mendax would not have his own barrister at the

 proceedings.

 Mendax didn't mind. Both hackers knew they would be committed to

 trial. Their immediate objective was to discredit the prosecution's

 damage claims--particularly NorTel's.

 As Mendax and Galbally talked, the mood in the office was upbeat.

 Mendax was feeling optimistic. Then the phone rang. It was Geoff

 Chettle, the barrister representing the DPP. While Chettle talked,

 Mendax watched a dark cloud pass across his solicitor's face. When he

 finally put the phone down, Galbally looked at Mendax with his serious,

 crisis management expression.

 `What's wrong? What's the matter?' Mendax asked.

 Galbally sighed before he spoke.

 `Prime Suspect has turned Crown witness against you.'

 There was a mistake. Mendax was sure of it. The whole thing was just

 one big mistake. Maybe Chettle and the DPP had misunderstood something

 Prime Suspect had said to them. Maybe Prime Suspect's lawyers had

 messed up. Whatever. There was definitely a mistake.

 At Galbally's office, Mendax had refused to believe Prime Suspect had

 really turned. Not until he saw a signed statement. That night he told

 a friend, `Well, we'll see. Maybe Chettle is just playing it up.'

 Chettle, however, was not just playing it up.

 There it was--a witness statement--in front of him. Signed by Prime

 Suspect.

 Mendax stood outside the courtroom at Melbourne Magistrates Court trying

 to reconcile two realities. In the first, there was one of Mendax's four

 or five closest friends. A friend with whom he had shared his deepest

 hacking secrets. A friend he had been hanging out with only last week.

 In the other reality, a six-page statement signed by Prime Suspect and

 Ken Day at AFP Headquarters at 1.20 p.m. the day before. To compound

 matters, Mendax began wondering if Prime Suspect may have been

 speaking to the AFP for as long as six months.

 The two realities were spinning through his head, dancing around each

 other.

 When Galbally arrived at the court, Mendax took him to one side to go

 over the statement. From a damage-control perspective, it wasn't a

 complete disaster. Prime Suspect certainly hadn't gone in hard. He

 could have raised a number of matters, but didn't. Mendax had already

 admitted to most of the acts which formed the basis of his 31 charges

 in his police interview. And he had already told the police a good

 deal about his adventures in Telecom's telephone exchanges.

 However, Prime Suspect had elaborated on the Telecom break-ins in his

 statement. Telecom was owned by the government, meaning the court

 would view phreaking from their exchanges not as defrauding a company

 but as defrauding the Commonwealth. Had the DPP decided to lay those

 new charges--the Telecom charges--in February 1995 because Prime

 Suspect had given the AFP a draft Crown witness statement back then?

 Mendax began to suspect so. Nothing seemed beyond doubt any more.

 The immediate crisis was the committal hearing in the Melbourne

 Magistrates Court. There was no way Boris Kayser was now going to

 decimate their star witness, a NorTel information systems

 manager. Galbally would have to run a cross-examination himself--no easy

 task at short notice, given the highly complex technical aspects of the

 case.

 Inside the courtroom, as Mendax got settled, he saw Prime Suspect. He

 gave his former friend a hard, unblinking, intense stare. Prime

 Suspect responded with a blank wall, then he looked away. In fact,

 even if Mendax had wanted to say something, he couldn't. As a Crown

 witness, Prime Suspect was off-limits until the case was over.

 The lawyers began to file into the courtroom. The DPP representative,

 Andrea Pavleka, breezed in, momentarily lifting the tension in the

 windowless courtroom.

 She had that effect on people. Tall, slender and long-legged, with a

 bob of sandy blonde curls, booky spectacles resting on a cute button

 nose and an infectious laugh, Pavleka didn't so much walk into a

 courtroom as waft into it. She radiated happiness from her sunny face.

 It's a great shame, Mendax thought, that she is on the other side.

 The court was called into session. Prime Suspect stood in the dock and

 pleaded guilty to 26 counts of computer crimes.

 In the course of the proceedings his barrister, Boris Kayser, told the

 court that his client had cooperated with the police, including

 telling the AFP that the hackers had penetrated Telecom's exchanges.

 He also said that Telecom didn't believe--or didn't want to

 believe--that their exchanges had been compromised. When Kayser

 professed loudly what a model citizen his client had been, Ken Day,

 sitting in the public benches, quietly rolled his eyes.

 The magistrate, John Tobin, extended Prime Suspect's bail. The hacker

 would be sentenced at a later date.

 That matter dealt with, the focus of the courtroom shifted to Mendax's

 case. Geoff Chettle, for the prosecution, stood up, put the NorTel

 manager, who had flown in from Sydney, on the stand and asked him some

 warm-up questions.

 Chettle could put people at ease--or rattle them--at will. Topped by a

 minute stubble of hair, his weathered 40-something face provided a

 good match to his deep, gravelly voice. With quick eyes and a hard,

 no-nonsense manner, he lacked the pretentiousness of many barristers.

 Perhaps because he didn't seem to give a fig about nineteenth century

 protocols, he always managed to looked out of place in a barrister's

 wig and robe. Every time he stood up, the black cape slid off his lean

 shoulders. The barrister's wig went crooked. He continually adjusted

 it--tugging the wig back into the correct spot like some wayward

 child. In court, Chettle looked as if he wanted to tear off the crusty

 trappings of his profession and roll up his sleeves before sinking

 into a hearty debate. And he looked as if he would rather do it at a

 pub or the footy.

 The NorTel manager took the stand. Chettle asked him some questions

 designed to show the court the witness was credible, in support of the

 company's $160000 hacker-clean-up claim. His task accomplished,

 Chettle sat down.

 A little nervous, Paul Galbally stood up to his full height--more than

 six feet--and straightened his jacket. Dressed in a moss green suit so

 dark it was almost black, with thin lapels and a thin, 1960s style

 tie, he looked about as understated hip as a lawyer could--and still

 show his face in court.

 Halting at first, Galbally appeared unsure of himself. Perhaps he had

 lost his nerve because of the technical issues. WMTP files. UTMP

 files. PACCT audits. Network architecture. IP addresses. He had been

 expected to become an expert in the basics literally overnight. A

 worried Mendax began passing him notes--questions to ask,

 explanations, definitions. Slowly, Galbally started working up a

 rhythm to the cross-examination.

 During the questioning someone from the back of the court sidled up to

 Mendax, in the front row of seats, and handed a note over his

 shoulder. Mendax unfolded the note, read it and then turned around to

 smile at the messenger. It was Electron.

 By the time Galbally had finished, he had pulled apart much of the

 NorTel manager's evidence. As he built up a head of steam quizzing the

 witness, he forced the NorTel manager to admit he didn't know all that

 much about the alleged hacking incidents. In fact, he wasn't even

 employed by the company when they occurred. He had largely thrown

 together an affidavit based on second-hand information--and it was

 this affidavit which supposedly proved the hackers had cost the

 company $160000. Worse, it seemed to an observer at court that the

 NorTel manager had little Unix security technical expertise and

 probably would not have been able to conduct a detailed technical

 analysis of the incident even if he had been with the company in 1991.

 By the end of the defence's cross-examination, it appeared that

 Galbally knew more about Unix than the NorTel manager.

 When Geoff Chettle stood up to re-examine the witness, the situation

 was hopeless. The manager soon stood down. In Mendax's view, the

 credibility of the NorTel Manager's statement was shot.

 The court was then adjourned until 12 May.

 After court, Mendax heard Geoff Chettle talking about the NorTel

 witness. `That guy is OFF the team,' he said emphatically.

 It was a mixed victory for Mendax. His solicitor had knocked off one

 NorTel witness, but there were more where he came from. At a full

 trial, the prosecution would likely fly in some real NorTel

 fire-power, from Canada, where the 676-page security incident report

 had been prepared by Clark Ferguson and other members of the NorTel

 security team. Those witnesses would understand how a Unix system

 operated, and would have first-hand knowledge of the hackers'

 intrusions. It could make things much more difficult.

 When Mendax returned to court a week later, he was committed to stand

 trial in the County Court of Victoria, as expected.

 Later, Mendax asked Galbally about his options. Take the case to full

 trial, or plead guilty like the other two IS hackers. He wanted to

 know where the DPP stood on his case. Would they go in hard if he

 pleaded guilty? Had the NorTel manager disaster at the committal

 hearing forced them to back down a little?

 Paul sighed and shook his head. The DPP were standing firm. They

 wanted to see Mendax go to prison.

 Andrea Pavleka, the DPP's sunny-faced girl who radiated happiness, was

 baying for blood.

 [ ]

 One month later, on 21 July 1995, Prime Suspect arrived at the County

 Court for sentencing.

 Rising early that morning to make sure his court suit was in order,

 Prime Suspect had been tense. His mother cooked him a big breakfast.

 Toast, bacon and eggs the way he liked it. In fact, his favourite

 breakfast was an Egg McMuffin from McDonald's, but he never told his

 mother that.

 The courtroom was already crowded. Reporters from newspapers, the wire

 services, a few TV channels. There were also other people, perhaps

 waiting for another case.

 Dressed in a dark pin-stripe suit, Ken Day stood tapping on a laptop

 on the prosecution's side of the courtroom. Geoff Chettle sat near

 him. Prime Suspect's barrister, Boris Kayser, sifted through some

 papers on the other side.

 Mendax lingered at the back of the room, watching his former friend.

 He wanted to hear Prime Suspect's sentence because, under the rules of

 parity sentencing, Mendax's own sentence would have to be similar to

 that of his fellow hackers. However, Prime Suspect might get some

 dispensation for having helped the prosecution.

 A handful of Prime Suspect's friends--none of them from the computer

 underground--trickled in. The hacker's mother chatted nervously with

 them.

 Court was called into session and everyone settled into their seats.

 The first case, it turned out, was not Prime Suspect's. A tall,

 silver-haired man in his mid-fifties, with eyes so blue they were

 almost demonic, stepped into the dock. As the reporters began taking

 notes, Prime Suspect tried to imagine what crime the polished,

 well-dressed man had committed.

 Child molesting.

 The man had not just molested children, he had molested

 his own son. In the parents' bedroom. Repeatedly. On Easter Sunday.

 His son was less than ten years old at the time. The whole family had

 collapsed. Psychologically scarred, his son had been too traumatised

 even to give a victim impact statement.

 For all of this, Judge Russell Lewis told the court, the man had shown

 no remorse. Grave-faced, the judge sentenced him to a minimum prison

 term of five years and nine months.

 The court clerk then called Prime Suspect's case.

 At the back of the courtroom, Mendax wondered at the strange

 situation. How could the criminal justice system put a child molester

 in the same category as a hacker? Yet, here they both were being

 sentenced side by side in the same County Court room.

 Boris Kayser had called a collection of witnesses, all of whom

 attested to Prime Suspect's difficult life. One of these, the

 well-regarded psychologist Tim Watson-Munro, described Prime Suspect's

 treatments at the Austin Hospital and raised the issue of reduced

 free-will. He had written a report for the court.

 Judge Lewis was quick to respond to the suggestion that hacking was an

 addiction. At one point, he wondered aloud to the courtroom whether

 some of Prime Suspect's hacking activities were `like a shot of

 heroin'.

 Before long, Kayser had launched into his usual style of courtroom

 address. First, he criticised the AFP for waiting so long to charge

 his client.

 `This fellow should have been dealt with six to twelve months after

 being apprehended. It is a bit like the US, where a man can commit a

 murder at twenty, have his appeal be knocked back by the Supreme Court

 at 30 and be executed at 40--all for something he did when he was only

 twenty years old.

 Thoroughly warmed up, Kayser observed that 20 per cent of Prime

 Suspect's life had gone by since being raided. Then he began hitting

 his high notes.

 `This young man received no assistance in the maturation process. He

 didn't grow up, he drifted up.

 `His world was so horrible that he withdrew into a fantasy world. He

 knew no other way to interact with human beings. Hacking was like a

 physical addiction to him.

 `If he hadn't withdrawn into the cybernetic highway, what would he

 have done instead? Set fires? Robbed houses? Look at the name he gave

 himself. Prime Suspect. It has implied power--a threat. This kid

 didn't have any power in his life other than when he sat down at a

 computer.'

 Not only did Kayser want the judge to dismiss the idea of prison or

 community service, he was asking him to order no recorded conviction.

 The prosecution lawyers looked at Kayser as if he was telling a good

 joke. The AFP had spent months tracking these hackers and almost three

 years preparing the case against them. And now this barrister was

 seriously suggesting that one of the key players should get off

 virtually scot-free, with not so much as a conviction recorded against

 him? It was too much.

 The judge retired to consider the sentence. When he returned, he was

 brief and to the point. No prison. No community service. The recording

 of 26 convictions. A $500 three-year good behaviour bond. Forfeiture

 of the now ancient Apple computer seized by police in the raid. And a

 reparation payment to the Australian National University of $2100.

 Relief passed over Prime Suspect's face, pink and sweaty from the

 tension. His friends and family smiled at each other.

 Chettle then asked the judge to rule on what he called `the

 cooperation point'. He wanted the judge to say that Prime Suspect's

 sentence was less than it would have been because the hacker had

 turned Crown witness. The DPP was shoring up its position with regard

 to its remaining target--Mendax.

 Judge Lewis told the court that the cooperation in this case made no

 difference. At the back of the court, Mendax felt suddenly sad. It was

 good news for him, but somehow it felt like a hollow victory.

 Prime Suspect has destroyed our friendship, he thought, and all for

 nothing.

 Two months after Prime Suspect's sentencing, Trax appeared in another

 County Court room to receive his sentence after pleading guilty to six

 counts of hacking and phreaking. Despite taking medication to keep his

 anxiety under control while in the city, he was still very nervous in

 the dock.

 Since he faced the least number of charges of any of the IS hackers,

 Trax believed he had a shot at no recorded conviction. Whether or not

 his lawyer could successfully argue the case was another matter.

 Bumbling through papers he could never seem to organise, Trax's lawyer

 rambled to the court, repeated the same points over and over again,

 jumping all over the place in his arguments. His voice was a

 half-whispered rasp--a fact which so annoyed the judge that he sternly

 instructed the lawyer to speak up.

 Talking informally before court, Geoff Chettle had told Mendax that in

 his view there was no way Judge Mervyn Kimm would let Trax off with no

 recorded conviction. Judge Kimm was considered to be one tough nut to

 crack. If you were a bookmaker running bets on his court at a

 sentencing hearing, the good money would be on the prosecution's side.

 But on 20 September 1995, the judge showed he couldn't be predicted

 quite so easily. Taking everything into account, including Prime

 Suspect's sentence and Trax's history of mental illness, he ordered no

 conviction be recorded against Trax. He also ordered a $500 three-year

 good behaviour bond.

 In passing sentence, Judge Kimm said something startlingly insightful

 for a judge with little intimate knowledge of the hacker psyche. While

 sternly stating that he did not intend to make light of the gravity of

 the offences, he told the court that `the factors of specific

 deterrence and general deterrence have little importance in the

 determination of the sentence to be imposed'. It was perhaps the first

 time an Australian judge had recognised that deterrence had little

 relevance at the point of collision between hacking and mental

 illness.

 Trax's sentence was also a good outcome for Mendax, who on

 29 August 1995 pleaded guilty to eight counts of computer crime, and

 not guilty to all the other charges. Almost a year later, on 9 May

 1996, he pleaded guilty to an additional eleven charges, and not

 guilty to six. The prosecution dropped all the other charges.

 Mendax wanted to fight those six outstanding charges, which involved

 ANU, RMIT, NorTel and Telecom, because he felt that the law was on his

 side in these instances. In fact, the law was fundamentally unclear

 when it came to those charges. So much so that the DPP and the defence

 agreed to take issues relating to those charges in a case stated to

 the Supreme Court of Victoria.

 In a case stated, both sides ask the Supreme Court to make a ruling

 not on the court case itself, but on a point of law. The defence and

 the prosecution hammer out an agreed statement about the facts of the

 case and, in essence, ask the Supreme Court judges to use that

 statement as a sort of case study. The resulting ruling is meant to

 clarify the finer points of the law not only for the specific case,

 but for similar cases which appear in future.

 Presenting a case stated to the Supreme Court is somewhat uncommon. It

 is unusual to find a court case where both sides can agree on enough

 of the facts, but Mendax's hacking charges presented the perfect case

 and the questions which would be put to the Victorian Supreme Court in

 late 1996 were crucial for all future hacking cases in Australia. What

 did it mean `to obtain access' to a computer? Did someone obtain

 access if he or she got in without using a password? What if he or she

 used the username `guest' and the password `guest'?

 Perhaps the most crucial question of all was this: does a person

 `obtain access' to data stored in a computer if he or she has the

 ability to view the data, but does not in fact view or even attempt to

 view that data?

 A good example of this applied to the aggravated versions of the

 offence of hacking: viewing commercial information. If, for example,

 Mendax logged into a NorTel computer, which contained commercially

 sensitive information, but he didn't actually read any of those files,

 would he be guilty of `obtaining access' or `obtaining access to

 commercial information'?

 The chief judge of the County Court agreed to the case stated and sent

 it up to the full bench of the Supreme Court. The lawyers from both

 sides were pleased with the bench--Justices Frank Vincent, Kenneth

 Hayne and John Coldrey.

 On 30 September 1996, Mendax arrived at the Supreme Court and found

 all the lawyers assembled at the court--all except for his barrister.

 Paul Galbally kept checking his watch as the prosecution lawyers began

 unpacking their mountains of paper--the fruit of months of

 preparation. Galbally paced the plush carpet of the Supreme Court

 anteroom. Still no barrister.

 Mendax's barrister had worked tirelessly, preparing for the case

 stated as if it was a million dollar case. Combing through legal

 precedents from not only Australia, the UK and the US, but from all

 the world's Western-style democracies, he had attained a great

 understanding of the law in the area of computer crime. He had finally

 arrived at that nexus of understanding between law, philosophy and

 linguistics which many lesser lawyers spent their entire careers

 trying to reach.

 But where was he? Galbally pulled out his mobile and checked in with

 his office for what seemed like the fifth time in as many minutes. The

 news he received was bad. He was told, through second-hand sources,

 that the barrister had collapsed in a state of nervous exhaustion. He

 wouldn't be making it to court.

 Galbally could feel his hairs turning grey.

 When court opened, Galbally had to stand up and explain to three of

 the most senior judges in Australia why the defence would like a

 two-day adjournment. A consummate professional, Geoff Chettle

 supported the submission. Still, it was a difficult request. Time in

 the Supreme Court is a scarce and valuable thing. Fortunately, the

 adjournment was granted.

 This gave Galbally exactly two days in which to find a barrister who

 was good, available and smart enough to assimilate a massive amount of

 technical information in a short time. He found Andrew Tinney.

 Tinney worked around the clock and by Wednesday, 2 October, he was

 ready. Once again, all the lawyers, and the hacker, gathered at the

 court.

 This time, however, it was the judges who threw a spanner into the

 works. They asked both sides to spend the first hour or so explaining

 exactly why the Supreme Court should hear the case stated at all. The

 lawyers looked at each other in surprise. What was this all about?

 After hearing some brief arguments from both sides, the judges retired

 to consider their position. When they returned, Justice Hayne read a

 detailed judgment saying, in essence, that the judges refused to hear

 the case.

 As the judge spoke, it became clear that the Supreme Court judges

 weren't just refusing to hear this case stated; they were virtually

 refusing to hear any case stated in future. Not for computer crimes.

 Not for murder. Not for fraud. Not for anything. They were sending a

 message to the County Court judges: don't send us a case stated except

 in exceptional circumstances.

 Geoff Chettle slumped in his chair, his hands shielding his face. Paul

 Galbally looked stunned. Andrew Tinney looked as if he wanted to leap

 from his chair shouting, `I just killed myself for the past two days

 on this case! You have to hear it!' Even Lesley Taylor, the quiet,

 unflappable and inscrutable DPP solicitor who had replaced Andrea

 Pavleka on the case, looked amazed.

 The ruling had enormous implications. Judges from the lower courts

 would be loath to ever send cases to the Supreme Court for

 clarification on points of law again. Mendax had made legal history,

 but not in the way he had hoped.

 Mendax's case passed back down to the County Court.

 He had considered taking his case to trial, but with recently

 announced budget cuts to Legal Aid, he knew there was little hope of

 receiving funding to fight the charges. The cuts were forcing the poor

 to plead guilty, leaving justice available only for the wealthy.

 Worse, he felt the weight of pleading guilty, not only as a sense of

 injustice in his own case, but for future hacking cases which would

 follow. Without clarity on the meaning of the law--which the judges

 had refused to provide--or a message from a jury in a landmark case,

 such as Wandii's trial, Mendax believed that hackers could expect

 little justice from either the police or the courts in the future.

 On 5 December 1996, Mendax pleaded guilty to the remaining six charges

 and was sentenced on all counts.

 Court Two was quiet that day. Geoff Chettle, for the prosecution,

 wasn't there. Instead, the quietly self-possessed Lesley Taylor

 handled the matter. Paul Galbally appeared for Mendax himself. Ken Day

 sat, expressionless, in the front row of the public benches. He looked

 a little weary. A few rows back, Mendax's mother seemed nervous.

 Electron slipped silently into the back of the room and gave Mendax a

 discreet smile.

 His hair pulled back into a loose ponytail, Mendax blinked and rolled

 his eyes several times as if brought from a dark space into the

 bright, white-walled courtroom.

 Judge Ross, a ruddy-faced and jowly man of late middle age with bushy,

 grey eyebrows, seated himself in his chair. At first, he was reluctant

 to take on the case for sentencing. He thought it should be returned

 to one of the original judges--Judge Kimm or Judge Lewis. When he

 walked into court that morning, he had not read the other judges'

 sentences.

 Lesley Taylor summarised the punishments handed down to the other two

 hackers. The judge did not look altogether pleased. Finally, he

 announced he would deal with the case. `Two judges have had a crack at

 it, why not a third one? He might do it properly.'

 Galbally was concerned. As the morning progressed, he became

 increasingly distressed; things were not going well. Judge Ross made

 clear that he personally favoured a custodial sentence, albeit a

 suspended one. The only thing protecting Mendax seemed to be the

 principle of parity in sentencing. Prime Suspect and Trax had

 committed similar crimes to Mendax, and therefore he had to be given a

 similar sentence.

 Ross `registered some surprise' at Judge Lewis's disposition toward

 the sentencing of Prime Suspect. In the context of parity, he told

 Leslie Taylor, he was at times `quite soured by some penalties'

 imposed by other judges. He quizzed her for reasons why he might be

 able to step outside parity.

 He told the court that he had not read the telephone intercepts in the

 legal brief. In fact, he had `only read the summary of facts' and when

 Taylor mentioned `International Subversive', he asked her, `What was

 that?'

 Then he asked her how to spell the word `phreak'.

 Later that day, after Judge Ross had read the other judges' sentences,

 he gave Mendax a sentence similar to Prime Suspect's--a recorded

 conviction on all counts, a reparation payment of $2100 to ANU and a

 three-year good behaviour bond.

 There were two variations. Prime Suspect and Trax both received $500

 good behaviour bonds; Judge Ross ordered a $5000 bond for Mendax.

 Further, Judge Lewis had given Prime Suspect almost twelve months to

 pay his $2100 reparation. Judge Ross ordered Mendax to pay within

 three months.

 Judge Ross told Mendax, `I repeat what I said before. I thought

 initially that these were offences which justified a jail sentence, but

 the mitigatory circumstances would have converted that to a suspended

 sentence. The sentence given to your co-offender caused me to alter that

 view, however.' He was concerned, he said, `that highly intelligent

 individuals ought not to behave like this and I suspect it is only

 highly intelligent individuals who can do what you did'.

 The word `addiction' did not appear anywhere in the sentencing

 transcript.

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 Chapter 10 -- Anthrax -- The Outsider

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 They had a gun at my head and a knife at my back

 Don't wind me up too tight

 -- from `Powderworks' on Midnight Oil (also called The Blue Album) by

 Midnight Oil

 Anthrax didn't like working as part of a team. He always considered

 other people to be the weakest link in the chain.

 Although people were never to be trusted completely, he socialised

 with many hackers and phreakers and worked with a few of them now and

 again on particular projects. But he never formed intimate

 partnerships with any of them. Even if a fellow hacker dobbed him in

 to the police, the informant couldn't know the full extent of his

 activities. The nature of his relationships was also determined, in

 part, by his isolation. Anthrax lived in a town in rural Victoria.

 Despite the fact that he never joined a hacking partnership like The

 Realm, Anthrax liked people, liked to talk to them for hours at a time

 on the telephone. Sometimes he received up to ten international calls

 a day from his phreaker friends overseas. He would be over at a

 friend's house, and the friend's mother would knock on the door of the

 bedroom where the boys were hanging out, listening to new music,

 talking.

 The mother would poke her head in the door, raise an eyebrow and point

 at Anthrax. `Phone call for you. Someone from Denmark.' Or sometimes

 it was Sweden. Finland. The US. Wherever. Though they didn't say

 anything, his friends' parents thought it all a bit strange. Not many

 kids in country towns got international calls trailing them around

 from house to house. But then not many kids were master phreakers.

 Anthrax loved the phone system and he understood its power. Many

 phreakers thought it was enough to be able to call their friends

 around the globe for free. Or make hacking attack phone calls without

 being traced. However, real power for Anthrax lay in controlling voice

 communications systems--things that moved conversations around the

 world. He cruised through people's voice mailbox messages to piece

 together a picture of what they were doing. He wanted to be able to

 listen into telephone conversations. And he wanted to be able to

 reprogram the telephone system, even take it down. That was real

 power, the kind that lots of people would notice.

 The desire for power grew throughout Anthrax's teenage years. He ached

 to know everything, to see everything, to play with exotic systems in

 foreign countries. He needed to know the purpose of every system, what

 made them tick, how they fitted together. Understanding how things

 worked would give him control.

 His obsession with telephony and hacking began early in life. When he

 was about eleven, his father had taken him to see the film War Games.

 All Anthrax could think of as he left the theatre was how much he

 wanted to learn how to hack. He had already developed a fascination

 for computers, having received the simplest of machines, a Sinclair

 ZX81 with 1 k of memory, as a birthday present from his parents.

 Rummaging through outdoor markets, he found a few second-hand books on

 hacking. He read Out of the Inner Circle by Bill Landreth, and Hackers

 by Steven Levy.

 By the time he was fourteen, Anthrax had joined a Melbourne-based

 group of boys called The Force. The members swapped Commodore 64 and

 Amiga games. They also wrote their own demos--short computer

 programs--and delighted in cracking the copy protections on the games

 and then trading them with other crackers around the world. It was

 like an international penpal group. Anthrax liked the challenge

 provided by cracking the protections, but few teenagers in his town

 shared an interest in his unusual hobby. Joining The Force introduced

 him to a whole new world of people who thought as he did.

 When Anthrax first read about phreaking he wrote to one of his American

 cracking contacts asking for advice on how to start. His friend sent him

 a list of AT&T calling card numbers and a toll-free direct-dial number

 which connected Australians with American operators. The card numbers

 were all expired or cancelled, but Anthrax didn't care. What captured

 his imagination was the fact that he could call an operator all the way

 across the Pacific for free. Anthrax began trying to find more special

 numbers.

 He would hang out at a pay phone near his house. It was a seedy

 neighbourhood, home to the most downtrodden of all the town's

 residents, but Anthrax would stand at the pay phone for hours most

 evenings, oblivious to the clatter around him, hand-scanning for

 toll-free numbers. He dialled 0014--the prefix for the international

 toll-free numbers--followed by a random set of numbers. Then, as he

 got more serious, he approached the task more methodically. He

 selected a range of numbers, such as 300 to 400, for the last three

 digits. Then he dialled over and over, increasing the number by one

 each time he dialled. 301. 302. 303. 304. Whenever he hit a

 functioning phone number, he noted it down. He never had to spend a

 cent since all the 0014 numbers were free.

 Anthrax found some valid numbers, but many of them had modems at the

 other end. So he decided it was time to buy a modem so he could explore

 further. Too young to work legally, he lied about his age and landed an

 after-school job doing data entry at an escort agency. In the meantime,

 he spent every available moment at the pay phone, scanning and adding

 new numbers to his growing list of toll-free modem and operator-assisted

 numbers.

 The scanning became an obsession. Often Anthrax stayed at the phone

 until 10 or 11 p.m. Some nights it was 3 a.m. The pay phone had a

 rotary dial, making the task laborious, and sometimes he would come

 home with blisters on the tips of his fingers.

 A month or so after he started working, he had saved enough money for

 a modem.

 Hand scanning was boring, but no more so than school. Anthrax attended

 his state school regularly, at least until year 10. Much of that was

 due to his mother's influence. She believed in education and in

 bettering oneself, and she wanted to give her son the opportunities

 she had been denied. It was his mother, a psychiatric nurse, who

 scrimped and saved for months to buy him his first real computer, a

 $400 Commodore 64. And it was his mother who took out a loan to buy

 the more powerful Amiga a few years later in 1989. She knew the boy

 was very bright. He used to read her medical textbooks, and computers

 were the future.

 Anthrax had always done well in school, earning distinctions every

 year from year 7 to year 10. But not in maths. Maths bored him. Still,

 he had some aptitude for it. He won an award in year 6 for designing a

 pendulum device which measured the height of a building using basic

 trigonometry--a subject he had never studied. However, Anthrax didn't

 attend school so much after year 10. The teachers kept telling him

 things he already knew, or things he could learn much faster from

 reading a book. If he liked a topic, he wandered off to the library to

 read about it.

 Things at home became increasingly complicated around that time. His

 family had struggled from the moment they arrived in Australia from

 England, when Anthrax was about twelve. They struggled financially,

 they struggled against the roughness of a country town, and, as

 Indians, Anthrax, his younger brother and their mother struggled

 against racism.

 The town was a violent place, filled with racial hatred and ethnic

 tension. The ethnics had carved out corners for themselves, but

 incursions into enemy territory were common and almost always resulted

 in violence. It was the kind of town where people ended up in fist

 fights over a soccer game. Not an easy place for a half-Indian,

 half-British boy with a violent father.

 Anthrax's father, a white Englishman, came from a farming family. One

 of five sons, he attended an agricultural college where he met and

 married the sister of an Indian student on a scholarship. Their

 marriage caused quite a stir, even making the local paper under the

 headline `Farmer Marries Indian Woman'. It was not a happy marriage

 and Anthrax often wondered why his father had married an Indian.

 Perhaps it was a way of rebelling against his dominating father.

 Perhaps he had once been in love. Or perhaps he simply wanted someone

 he could dominate and control. Whatever the reason, the decision was

 an unpopular one with Anthrax's grandfather and the mixed-race family

 was often excluded from larger family gatherings.

 When Anthrax's family moved to Australia, they had almost no money.

 Eventually, the father got a job as an officer at Melbourne's

 Pentridge prison, where he stayed during the week. He only received a

 modest income, but he seemed to like his job. The mother began working

 as a nurse. Despite their new-found financial stability, the family

 was not close. The father appeared to have little respect for his wife

 and sons, and Anthrax had little respect for his father.

 As Anthrax entered his teenage years, his father became increasingly

 abusive. On weekends, when he was home from work, he used to hit

 Anthrax, sometimes throwing him on the floor and kicking him. Anthrax

 tried to avoid the physical abuse but the scrawny teenager was little

 match for the beefy prison officer. Anthrax and his brother were quiet

 boys. It seemed to be the path of least resistance with a rough father

 in a rough town. Besides, it was hard to talk back in the painful

 stutter both boys shared through their early teens.

 One day, when Anthrax was fifteen, he came home to find a commotion at

 his house. On entering the house, Anthrax went to his parents'

 bedroom. He found his mother there, and she was very upset and

 emotionally distressed. He couldn't see his father anywhere, but found

 him relaxing on the sofa in the lounge room, watching TV.

 Disgust consumed Anthrax and he retreated into the kitchen. When his

 father came in not long after to prepare some food Anthrax watched his

 back with revulsion. Then he noticed a carving knife resting on the

 counter. As Anthrax reached for the knife, an ambulance worker

 appeared in the doorway. Anthrax put the knife down and walked away.

 But he wasn't so quiet after that. He started talking back, at home and

 at school, and that marked the beginning of the really big problems. In

 primary school and early high school he had been beaten up now and

 again. Not any more. When a fellow student hauled Anthrax up against the

 wall of the locker shed and started shaking him and waving his fist,

 Anthrax lost it. He saw, for a moment, his father's face instead of the

 student's and began to throw punches in a frenzy that left his victim in

 a terrible state.

 At home, Anthrax's father learned how to bait his son. The bully

 always savours a morsel of resistance from the victim, which makes

 going in for the kill a little more fun. Talking back gave the father

 a good excuse to get violent. Once he nearly broke his son's neck.

 Another time it was his arm. He grabbed Anthrax and twisted his arm

 behind his back. There was an eerie sound of cracking cartilage, and

 then pain. Anthrax screamed for his father to stop. His father twisted

 Anthrax's arm harder, then pressed on his neck. His mother shrieked at

 her husband to let go of her son. He wouldn't.

 `Look at you crying,' his father sneered. `You disgusting animal.'

 `You're the disgusting animal,' Anthrax shouted, talking back again.

 His father threw Anthrax on the floor and began kicking him in the

 head, in the ribs, all over.

 Anthrax ran away. He went south to Melbourne for a week, sleeping

 anywhere he could, in the empty night-time spaces left over by day

 workers gone to orderly homes. He even crashed in hospital emergency

 rooms. If a nurse asked why he was there, he would answer politely, `I

 received a phone call to meet someone here'. She would nod her head

 and move on to someone else.

 Eventually, when Anthrax returned home, he took up martial arts to

 become strong. And he waited.

 [ ]

 Anthrax was poking around a MILNET gateway when he stumbled on the

 door to System X.\* He had wanted to find this system for months,

 because he had intercepted email about it which had aroused his

 curiosity.

 Anthrax telnetted into the gateway. A gateway binds two different

 networks. It allows, for example, two computer networks which talk

 different languages to communicate. A gateway might allow someone on a

 system running DECNET to login to a TCP/IP based system, like a Unix.

 Anthrax was frustrated that he couldn't seem to get past the System X

 gateway and on to the hosts on the other side.

 Using normal address formats for a variety of networks, he tried

 telling the gateway to make a connection. X.25. TCP/IP. Whatever lay

 beyond the gateway didn't respond. Anthrax looked around until he

 found a sample of addresses in a help file. None of them worked, but

 they offered a clue as to what format an address might take.

 Each address had six digits, the first three numbers of which

 corresponded to telephone area codes in the Washington DC area. So he

 picked one of the codes and started guessing the last three digits.

 Hand scanning was a pain, as ever, but if he was methodical and

 persistent, something should turn up. 111. 112. 113. 114. 115. On it

 went. Eventually he connected to something--a Sunos Unix system--which

 gave him a full IP address in its login message. Now that was handy.

 With the full IP address, he could connect to System X again through

 the Internet directly--avoiding the gateway if he chose to. It's

 always helpful in covering your tracks to have a few different routing

 options. Importantly, he could approach System X through more than

 just its front door.

 Anthrax spiralled through the usual round of default usernames and

 passwords. Nothing. This system required a more strategic attack.

 He backed out of the login screen, escaped from the gateway and went

 to another Internet site to have a good look at System X from a

 healthy distance. He `fingered' the site, pulling up any bit of

 information System X would release to the rest of the Internet when

 asked. He probed and prodded, looking for openings. And then he found

 one. Sendmail.

 The version of Sendmail run by System X had a security hole Anthrax

 could exploit by sending himself a tiny backdoor program. To do this,

 he used System X's mail-processing service to send a `letter' which

 contained a tiny computer program. System X would never have allowed

 the program to run normally, but this program worked like a letter

 bomb. When System X opened the letter, the program jumped out and

 started running. It told System X that anyone could connect to port

 2001--to an interactive shell--of the computer without using a

 password.

 A port is a door to the outside world. TCP/IP computers use a standard

 set of ports for certain services. Port 25 for mail. Port 79 for

 Finger. Port 21 for FTP. Port 23 for Telnet. Port 513 for Rlogin. Port

 80 for the World Wide Web. A TCP/IP based computer system has 65535

 ports but most of them go unused. Indeed, the average Unix box uses

 only 35, leaving the remaining 65500 ports sitting idle. Anthrax

 simply picked one of these sleepy ports, dusted off the cobwebs and

 plugged in using the backdoor created by his tiny mail-borne program.

 Connecting directly to a port created some problems, because the

 system wouldn't recognise certain keystrokes from the port, such as

 the return key. For this reason, Anthrax had to create an account for

 himself which would let him telnet to the site and login like any

 normal user. To do this, he needed root privileges in order to create

 an account and, ultimately, a permanent backdoor into the system.

 He began hunting for vulnerabilities in System X's security. There was

 nothing obvious, but he decided to try out a bug he had successfully

 used elsewhere. He had first learned about it on an international

 phone conference, where he had traded information with other hackers

 and phreakers. The security hole involved the system's relatively

 obscure load-module program. The program added features to the running

 system but, more importantly, it ran as root, meaning that it had a

 free run on the system when it was executed. It also meant that any

 other programs the load-module program called up also ran as root. If

 Anthrax could get this program to run one of his own programs--a

 little Trojan--he could get root on System X.

 The load-module bug was by no means a sure thing on System X. Most

 commercial systems--computers run by banks or credit agencies, for

 example--had cleaned up the load-module bug in their Sunos computers

 months before. But military systems consistently missed the bug. They

 were like turtles--hard on the outside, but soft and vulnerable on the

 inside. Since the bug couldn't be exploited unless a hacker was

 already inside a system, the military's computer security officials

 didn't seem to pay much attention to it. Anthrax had visited a large

 number of military systems prior to System X, and in his experience

 more than 90 per cent of their Sunos computers had never fixed the

 bug.

 With only normal privileges, Anthrax couldn't force the load-module

 program to run his backdoor Trojan program. But he could trick it into

 doing so. The secret was in one simple keyboard character: /.

 Unix-based computer systems are a bit like the protocols of the

 diplomatic corps; the smallest variation can change something's

 meaning entirely. Hackers, too, understand the implications of subtle

 changes.

 A Unix-based system reads the phrase:

 /bin/program

 very differently from:

 bin program

 One simple character--the `/'--makes an enormous difference. A Unix

 computer reads the `/' as a road sign. The first phrase tells the

 computer, `Follow the road to the house of the user called "bin" and

 when you get there, go inside and fetch the file called "program" and

 run it'. A blank space, however, tells the computer something quite

 different. In this case, Anthrax knew it told the computer to execute

 the command which proceeded the space. That second phrase told the

 machine, `Look everywhere for a program called "bin" and run it'.

 Anthrax prepared for his attack on the load-module program by

 installing his own special program, named `bin', into a temporary

 storage area on System X. If he could get System X to run his program

 with root privileges, he too would have procured root level access to

 the system. When everything was in place, Anthrax forced the system to

 read the character `/' as a blank space. Then he ran the load-module

 program, and watched. When System X hunted around for a program named

 `bin', it quickly found Anthrax's Trojan and ran it.

 The hacker savoured the moment, but he didn't pause for long. With a

 few swift keystrokes, he added an entry to the password file, creating

 a basic account for himself. He exited his connection to port 2001,

 circled around through another route, using the 0014 gateway, and

 logged into System X using his newly created account. It felt good

 walking in through the front door.

 Once inside, Anthrax had a quick look around. The system startled him.

 There were only three human users. Now that was definitely odd. Most

 systems had hundreds of users. Even a small system might serve 30 or

 40 people, and this was not a small system. He concluded that System X

 wasn't just some machine designed to send and receive email. It was

 operational. It did something.

 Anthrax considered how to clean up his footsteps and secure his

 position. While he was hardly broadcasting his presence, someone might

 discover his arrival simply by looking at who was logged in on the

 list of accounts in the password file. He had given his backdoor root

 account a bland name, but he could reasonably assume that these three

 users knew their system pretty well. And with only three users, it was

 probably the kind of system that had lots of babysitting. After all

 that effort, Anthrax needed a watchful nanny like a hole in the head.

 He worked at moving into the shadows.

 He removed himself from the WTMP and UTMP files, which listed who had

 been on-line and who was still logged in. Anthrax wasn't invisible,

 but an admin would have to look closely at the system's network

 connections and list of processes to find him. Next stop: the login

 program.

 Anthrax couldn't use his newly created front-door account for an

 extended period--the risk of discovery was too great. If he accessed

 the computer repeatedly in this manner, a prying admin might

 eventually find him and delete his account. An extra account on a

 system with only three users was a dead give-away. And losing access

 to System X just as things were getting interesting was not on his

 agenda.

 Anthrax leaned back in his chair and stretched his shoulders. His

 hacking room was an old cloakroom, though it was barely recognisable

 as such. It looked more like a closet--a very messy closet. The whole

 room was ankle-deep in scrap papers, most of them with lists of

 numbers on the back and front. Occasionally, Anthrax scooped up all

 the papers and piled them into heavy-duty garbage bags, three of which

 could just fit inside the room at any one time. Anthrax always knew

 roughly where he had `filed' a particular set of notes. When he needed

 it, he tipped the bag onto the floor, searched through the mound and

 returned to the computer. When the sea of paper reached a critical

 mass, he jammed everything back into the garbage bag again.

 The computer--an Amiga 500 box with a cheap Panasonic TV as the

 monitor--sat on a small desk next to his mother's sewing machine

 cabinet. The small bookcase under the desk

 was stuffed with magazines like Compute and Australian Communications,

 along with a few Commodore, Amiga and Unix reference manuals. There

 was just enough space for Anthrax's old stereo and his short-wave

 radio. When he wasn't listening to his favourite show, a hacking

 program broadcast from a pirate station in Ecuador, he tuned into

 Radio Moscow or the BBC's World Service.

 Anthrax considered what to do with System X. This system had aroused

 his curiosity and he intended to visit it frequently.

 It was time to work on the login patch. The patch replaced the

 system's normal login program and had a special feature: a master

 password. The password was like a diplomatic passport. It would let

 him do anything, go anywhere. He could login as any user using the

 master password. Further, when he logged in with the master password,

 he wouldn't show up on any log files--leaving no trail. But the beauty

 of the login patch was that, in every other way, it ran as the normal

 login program. The regular computer users--all three of them--could

 login as usual with their passwords and would never know Anthrax had

 been in the system.

 He thought about ways of setting up his login patch. Installing a

 patch on System X wasn't like mending a pair of jeans. He couldn't

 just slap on a swath from an old bandanna and quick-stitch it in with

 a thread of any colour. It was more like mending an expensive cashmere

 coat. The fabric needed to be a perfect match in colour and texture.

 And because the patch required high-quality invisible mending, the

 size also needed to be just right.

 Every file in a computer system has three dates: the date it was

 created, the date it was last modified and the date it was last

 accessed. The problem was that the login patch needed to have the same

 creation and modification dates as the original login program so that

 it would not raise suspicions. It wasn't hard to get the dates but it

 was difficult to paste them onto the patch. The last access date

 wasn't important as it changed whenever the program was run

 anyway--whenever a user of the System X logged in.

 If Anthrax ripped out the original login program and stitched his

 patch in its place, the patch would be stamped with a new creation

 date. He knew there was no way to change a creation date short of

 changing the clock for the whole system--something which would cause

 problems elsewhere in System X.

 The first thing a good system admin does when he or she suspects a

 break-in is search for all files created or modified over the previous

 few days. One whiff of an intruder and a good admin would be all over

 Anthrax's login patch within about five minutes.

 Anthrax wrote the modification and creation dates down on a bit of

 paper. He would need those in a moment. He also jotted down the size

 of the login file.

 Instead of tearing out the old program and sewing in a completely new

 one, Anthrax decided to overlay his patch by copying it onto the top

 of the old program. He uploaded his own login patch, with his master

 password encased inside it, but he didn't install it yet. His patch

 was called `troj'--short for Trojan. He typed:

 cat<troj>/bin/login

 The cat command told the computer: `go get the data in the file called

 "troj" and put it in the file "/bin/login"'. He checked the piece of

 paper where he had scribbled down the original file's creation and

 modification dates, comparing them to the new patch. The creation date

 and size matched the original. The modification date was still wrong,

 but he was two-thirds of the way home.

 Anthrax began to fasten down the final corner of the patch by using a

 little-known feature of the command:

 /usr/5bin/date

 Then he changed the modification date of his login patch to the

 original login file's date.

 He stepped back to admire his work from a distance. The newly

 installed patch matched the original perfectly. Same size. Same

 creation date. Same modification date. With patch in place, he deleted

 the root account he had installed while visiting port 2001. Always

 take your garbage with you when you leave.

 Now for the fun bit. Snooping around. Anthrax headed off for the

 email, the best way to work out what a system was used for. There were

 lots of reports from underlings to the three system users on buying

 equipment, progress reports on a certain project, updates. What was

 this project?

 Then Anthrax came across a huge directory. He opened it and there,

 couched inside, were perhaps 100 subdirectories. He opened one of

 them. It was immense, containing hundreds of files. The smallest

 subfile had perhaps 60 computer screens' worth of material, all of it

 unintelligible. Numbers, letters, control codes. Anthrax couldn't make

 head nor tail of the files. It was as if he was staring at a group of

 binary files. The whole subdirectory was filled with thousands of

 pages of mush. He thought they looked like data files for some

 database.

 As he didn't have the program he needed to interpret the mush, Anthrax

 cast around looking for a more readable directory.

 He pried open a file and discovered it was a list. Names and phone

 numbers of staff at a large telecommunications company. Work phone

 numbers. Home numbers. Well, at least that gave him a clue as to the

 nature of the project. Something to do with telecommunications. A

 project important enough that the military needed the home phone

 numbers of the senior people involved.

 The next file confirmed it. Another list, a very special list. A pot

 of gold at the end of the rainbow. The find of a career spent hacking.

 If the US government had had any inkling what was happening at that

 moment, heads would have rolled. If it had known that a foreigner, and

 a follower of what mainstream American media termed an extremist

 religious group, had this information in his possession, the defence

 agency would have called in every law enforcement agency it could

 enlist.

 As John McMahon might have said, a lot of yelling and screaming would

 have occurred.

 Anthrax's mother had made a good home for the family, but his father

 continued to disrupt it with his violence. Fun times with his friends

 shone like bright spots amidst the decay of Anthrax's family life.

 Practical jokes were his specialty. Even as a small child, he had

 delighted in trickery and as he grew up, the jokes became more

 sophisticated. Phreaking was great. It let him prank people all over

 the world. And pranking was cool.

 Most of the fun in pranking was sharing it with friends. Anthrax

 called into a voice conference frequented by phreakers and hackers.

 Though he never trusted others completely when it came to working on

 projects together, it was OK to socialise. The phreaking methods he

 used to get onto the phone conference were his own business. Provided

 he was discreet in how much he said in the conference, he thought

 there wasn't too much risk.

 He joined the conference calls using a variety of methods. One

 favourite was using a multinational corporation's Dialcom service.

 Company employees called in, gave their ID numbers, and the operator

 put them through to wherever they wanted to go, free of charge. All

 Anthrax needed was a valid ID number.

 Sometimes it was hard work, sometimes he was lucky. The day Anthrax

 tried the Dialcom service was a lucky day. He dialled from his

 favourite pay phone.

 `What is your code, sir?' The operator asked.

 `Yes, well, this is Mr Baker. I have a sheet with a lot of numbers

 here. I am new to the company. Not sure which one it is.' Anthrax

 shuffled papers on top of the pay phone, near the receiver. `How many

 digits is it?'

 `Seven.'

 That was helpful. Now to find seven digits. Anthrax looked across the

 street at the fish and chips shop. No numbers there. Then a car

 licence plate caught his eye. He read off the first three digits, then

 plucked the last four numbers from another car's plate.

 `Thank you. Putting your call through, Mr Baker.'

 A valid number! What amazing luck. Anthrax milked that number for all

 it was worth. Called party lines. Called phreakers' bridges. Access

 fed the obsession.

 Then he gave the number to a friend in Adelaide, to call overseas. But

 when that friend read off the code, the operator jumped in.

 `YOU'RE NOT MR BAKER!'

 Huh? `Yes I am. You have my code.'

 `You are definitely not him. I know his voice.'

 The friend called Anthrax, who laughed his head off, then called into

 Dialcom and changed his code! It was a funny incident. Still, it

 reminded him how much safer it was working by himself.

 Living in the country was hard for a hacker and Anthrax became a

 phreaker out of necessity, not just desire. Almost everything involved

 a long-distance call and he was always searching for ways to make

 calls for free. He noticed that when he called certain 008

 numbers--free calls--the phone would ring a few times, click, and then

 pause briefly before ringing some more. Eventually a company

 representative or answering service picked up the call. Anthrax had

 read about diverters, devices used to forward calls automatically, in

 one of the many telecommunications magazines and manuals he was

 constantly reading. The click suggested the call was going through a

 diverter and he guessed that if he punched in the right tones at the

 right moment, he could make the call divert away from a company's

 customer service agent. Furthermore, any line trace would end up at

 the company.

 Antrax collected some 008 numbers and fiddled with them. He discovered

 that if he punched another number in very quickly over the top of the

 ringing--just after the click--he could make the line divert to where

 he wanted it to go. He used the 008 numbers to ring phone conferences

 around the world, where he hung out with other phreakers, particularly

 Canadians such as members of the Toronto-based UPI or the Montreal

 group, NPC, which produced a phreakers' manual in French. The

 conversation on the phreaker's phone conferences, or phone bridges as

 they are often called, inevitably turned to planning a prank. And

 those Canadian guys knew how to prank!

 Once, they rang the emergency phone number in a major Canadian city.

 Using the Canadian incarnation of his social engineering accents,

 Anthrax called in a `police officer in need of assistance'. The

 operator wanted to know where. The phreakers had decided on the Blue

 Ribbon Ice-Cream Parlour. They always picked a spot within visual

 range of at least one member, so they could see what was happening.

 In the split second of silence which followed, one of the five other

 phreakers quietly eavesdropping on the call coughed. It was a short,

 sharp cough. The operator darted back on the line.

 `Was that A GUN SHOT? Are you SHOT? Hello? John?' The operator leaned

 away from her receiver for a moment and the phreakers heard her

 talking to someone else in the background. `Officer down.'

 Things moved so fast when pranking. What to do now?

 `Ah, yeah. Yeah.' It was amazing how much someone squeezing laughter

 back down his oesophagus can sound like someone who has been shot.

 `John, talk to me. Talk to me,' the operator pleaded into the phone,

 trying to keep John alert.

 `I'm down. I'm down,' Anthrax strung her along.

 Anthrax disconnected the operator from the conference call. Then the

 phreaker who lived near the ice-cream parlour announced the street had

 been blocked off by police cars. They had the parlour surrounded and

 were anxiously searching for an injured fellow officer. It took

 several hours before the police realised someone had played a mean

 trick on them.

 However, Anthrax's favourite prank was Mr McKenny, the befuddled

 southern American hick. Anthrax had selected the phone number at

 random, but the first prank was such fun he kept coming back for more.

 He had been ringing Mr McKenny for years. It was always the same

 conversation.

 `Mr McKenny? This is Peter Baker. I'd like my shovel back, please.'

 `I don't have your shovel.'

 `Yeah, I lent it to you. Lent it to you like two years ago. I want it

 back now.'

 `I never borrowed no shovel from you. Go away.'

 `You did. You borrowed that shovel of mine. And if you don't give it

 back I'm a gonna come round and get it myself. And you won't like it.

 Now, when you gonna give me that shovel back?'

 `Damn it! I don't have your goddamn shovel!'

 `Give me my shovel!'

 `Stop calling me! I've never had your friggin' shovel. Let me be!'

 Click.

 Nine in the morning. Eight at night. Two a.m. There would be no peace

 for Mr McKenny until he admitted borrowing that shovel from a boy half

 his age and half a world away.

 Sometimes Anthrax pranked closer to home. The Trading Post, a weekly

 rag of personals from people selling and buying, served as a good

 place to begin. Always the innocent start, to lure them in.

 `Yes, sir, I see you advertised that you wanted to buy a bathtub.'

 Anthrax put on his serious voice. `I have a bathtub for sale.'

 `Yeah? What sort? Do you have the measurements, and the model number?'

 And people thought phreakers were weird.

 `Ah, no model number. But its about a metre and a half long, has feet,

 in the shape of claws. It's older style, off-white. There's only one

 problem.' Anthrax paused, savouring the moment.

 `Oh? What's that?'

 `There's a body in it.'

 Like dropping a boulder in a peaceful pond.

 [ ]

 The list on System X had dial-up modem numbers, along with usernames

 and password pairs for each address. These usernames were not words

 like `jsmith' or `jdoe', and the passwords would not have appeared in

 any dictionary. 12[AZ63. K5M82L. The type of passwords and usernames

 only a computer would remember.

 This, of course, made sense, since a computer picked them out in the

 first place. It generated them randomly. The list wasn't particularly

 user-friendly. It didn't have headers, outlining what each item

 related to. This made sense too. The list wasn't meant to be read by

 humans.

 Occasionally, there were comments in the list. Programmers often

 include a line of comment in code, which is delineated in such a way

 that the computer skips over the words when interpreting the commands.

 The comments are for other programmers examining the code. In this

 case, the comments were places. Fort Green. Fort Myers. Fort Ritchie.

 Dozens and dozens of forts. Almost half of them were not on the

 mainland US. They were in places like the Philippines, Turkey,

 Germany, Guam. Places with lots of US military presence.

 Not that these bases were any secret to the locals, or indeed to many

 Americans. Anthrax knew that anyone could discover a base existed

 through perfectly legal means. The vast majority of people never

 thought to look. But once they saw such a list, particularly from the

 environment of a military computer's bowels, it tended to drive the

 point home. The point being that the US military seemed to be

 everywhere.

 Anthrax logged out of System X, killed all his connections and hung up

 the phone. It was time to move on. Routing through a few

 out-of-the-way connections, he called one of the numbers on the list.

 The username-password combination worked. He looked around. It was as

 he expected. This wasn't a computer. It was a telephone exchange. It

 looked like a NorTel DMS 100.

 Hackers and phreakers usually have areas of expertise. In Australian

 terms, Anthrax was a master of the X.25 network and a king of voice

 mailbox systems, and others in the underground recognised him as such.

 He knew Trilogues better than most company technicians. He knew

 Meridian VMB systems better than almost anyone in Australia. In the

 phreaking community, he was also a world-class expert in Aspen VMB

 systems. He did not, however, have any expertise in DMS 100s.

 Anthrax quickly hunted through his hacking disks for a text file on

 DMS 100s he had copied from an underground BBS. The pressure was on.

 He didn't want to spend long inside the exchange, maybe only fifteen

 or twenty minutes tops. The longer he stayed without much of a clue

 about how the thing operated, the greater the risk of his being

 traced. When he found the disk with the text file, he began sorting

 through it while still on-line at the telephone exchange. The

 phreakers' file showed him some basic commands, things which let him

 gently prod the exchange for basic information without disturbing the

 system too much. He didn't want to do much more for fear of

 inadvertently mutilating the system.

 Although he was not an authority on DMS 100s, Anthrax had an old

 hacker friend overseas who was a real genius on NorTel equipment. He

 gave the list to his friend. Yes, the friend confirmed it was indeed a

 DMS 100 exchange at a US military base. It was not part of the normal

 telephone system, though. This exchange was part of a military phone

 system.

 In times of war, the military doesn't want to be dependent on the

 civilian telephone system. Even in times of peace, voice

 communications between military staff are more secure if they don't

 talk on an exchange used by civilians. For this and a variety of other

 reasons, the military have separate telephone networks, just as they

 have separate networks for their data communications. These networks

 operate like a normal network and in some cases can communicate to the

 outside world by connecting through their own exchanges to civilian

 ones.

 When Anthrax got the word from the expert hacker, he made up his mind

 quickly. Up went the sniffer. System X was getting more interesting by

 the hour and he didn't want to miss a precious minute in the information

 gathering game when it came to this system.

 The sniffer, a well-used program rumoured to be written by a

 Sydney-based Unix hacker called Rockstar, sat on System X under an

 innocuous name, silently tracking everyone who logged in and out of

 the system. It recorded the first 128 characters of every telnet

 connection that went across the ethernet network cable to which System

 X was attached. Those 128 bytes included the username and the

 passwords people used to log in. Sniffers were effective, but they

 needed time. Usually, they grew like an embryo in a healthy womb,

 slowly but steadily.

 Anthrax resolved to return to System X in twelve hours to check on the

 baby.

 [ ]

 `Why are you two watching those nigger video clips?'

 It was an offensive question, but not atypical for Anthrax's father.

 He often breezed through the house, leaving a trail of disruption in

 his wake.

 Soon, however, Anthrax began eroding his father's authority. He

 discovered his father's secrets hidden on the Commodore 64 computer.

 Letters--lots of them--to his family in England. Vicious, racist,

 horrid letters telling how his wife was stupid. How she had to be told

 how to do everything, like a typical Indian. How he regretted marrying

 her. There were other matters too, things unpleasant to discuss.

 Anthrax confronted his father, who denied the allegations at first,

 then finally told Anthrax to keep his mouth shut and mind his own

 business. But Anthrax told his mother. Tensions erupted and, for a

 time, Anthrax's parents saw a marriage counsellor.

 But his father did not give up writing the letters. He put a password

 protection program on the word processor to keep his son out of his

 business. It was a futile effort. His father had chosen the wrong

 medium to record his indiscretions.

 Anthrax showed his mother the new letters and continued to confront

 his father. When the tension in the house grew, Anthrax would escape

 with his friends. One night they were at a nightclub when someone

 started taunting Anthrax, calling him `curry muncher' and worse.

 That was it. The anger which had been simmering below the surface for

 so long exploded as Anthrax violently attacked his taunter, hitting,

 kicking and punching him, using the tai kwon do combinations he had

 been learning. There was blood and it felt good. Vengeance tasted

 sweet.

 After that incident, Anthrax often lashed out violently. He was out of

 control and it sometimes scared him. However, at times he went looking

 for trouble. Once he tracked down a particularly seedy character who

 had tried to rape one of his girlfriends. Anthrax pulled a knife on

 the guy, but the incident had little to do with the girl. The thing

 that made him angry was the disrespect. This guy knew the girl was

 with Anthrax. The attempted rape was like spitting in his face.

 Perhaps that's what appealed to Anthrax about Islam--the importance of

 respect. At sixteen he found Islam and it changed his life. He

 discovered the Qu'raan in the school library while researching an

 assignment on religion. About the same time, he began listening to a

 lot of rap music. More than half the American rappers in his music

 collection were Muslim, and many sang about the Nation of Islam and

 the sect's charismatic leader, Minister Louis Farrakhan. Their songs

 described the injustices whites inflicted on blacks. They told blacks

 to demand respect.

 Anthrax found a magazine article about Farrakhan and began reading

 books like the Autobiography of Malcolm X. Then he rang up the Nation

 of Islam head office in Chicago and asked them to send some

 information. The Final Call, the NOI newsletter, arrived one day,

 followed by other literature which began appearing around Anthrax's

 home. Under the TV guide. On the coffee table. Amid the pile of

 newspapers. On top of his computer. Anthrax often took time to read

 articles aloud to his mother while she did housework.

 In the middle of 1990, when Anthrax was in year 11, his father

 suggested the boy attend Catholic boarding school in Melbourne. The

 school was inexpensive and the family could scrape and save to pay the

 fees. Anthrax disliked the idea, but his father insisted.

 Anthrax and his new school proved a bad match. The school thought he

 asked too many questions, and Anthrax thought the school answered too

 few of them. The hypocrisy of the Catholic church riled Anthrax and

 pushed him further into the arms of NOI. How could he respect an

 institution which had sanctioned slavery as a righteous and

 progressive method of converting people? The school and Anthrax parted

 on less than friendly terms after just one semester.

 The Catholic school intensified a feeling of inferiority Anthrax had

 felt for many years. He was an outsider. The wrong colour, the wrong

 size, too intelligent for his school. Yet, NOI's Minister Farrakhan

 told him that he wasn't inferior at all. `I know that you have been

 discriminated against because of your colour,' Farrakhan told Anthrax

 from the tape player. `Let me tell you why. Let me tell you about the

 origins of the white race and how they were put on this earth to do

 evil. They have shown themselves to be nothing but an enemy of the

 East. Non-whites are the original people of the earth.'

 Anthrax found some deep veins of truth in NOI's teachings. Interracial

 marriages don't work. A white man marries a non-white woman because he

 wants a slave, not because he loves and respects her. Islam respects

 women in more meaningful ways than Western religions. Perhaps it wasn't

 the type of respect that Western men were used to giving women, but he

 had seen that kind of respect in his own home and he didn't think much

 of it.

 Anthrax read the words of the Honourable Elijah Muhammad, founder of

 NOI: `The enemy does not have to be a real devil. He could be your

 father, mother, brother, husband, wife or children. Many times they're

 in your own household. Today is the great time of separation of the

 righteous Muslim and the wicked white race.' Anthrax looked inside his

 own household and saw what seemed to be a devil. A white devil.

 NOI fed Anthrax's mind. He followed up the lists of literature

 included in every issue of The Final Call. Books like Black Athena by

 Martin Bernel and Deterring Democracy by Noam Chomsky had common

 themes of conspiracy and oppression by the haves against the

 have-nots. Anthrax read them all.

 The transformation of Anthrax occurred over a period of six months. He

 didn't talk about it much with his parents. It was a private matter.

 But his mother later told him his adoption of the religion didn't

 surprise her. His great-grandfather had been a Muslim scholar and

 cleric in India. It was fate. His conversion presented a certain sense

 of closure, of completing the circle.

 His interest in Islam found secular outlets. A giant black and white

 poster of Malcolm X appeared on Anthrax's bedroom wall. A huge photo

 of Los Angeles Black Panther leader Elmer Pratt followed soon after.

 The photo was captioned, `A coward dies a million deaths, a brave man

 dies but one'. The last bit of wall was covered in posters of hip-hop

 bands from ceiling to floor. A traditional Indian sword adorned the

 top of one of the many bookcases. It complemented the growing

 collection of books on martial arts. A well-loved copy of The Art of

 War by Sun Tzu sat on the shelf next to Homer's Ulysses, The Lord of

 The Rings, The Hobbit, a few old Dungeons and Dragons books, works of

 mythology from India and Egypt. The shelves did not contain a single

 work of science fiction. Anthrax shaved his head. His mother may not

 have been surprised by the conversion to Islam, but the head shaving

 went a bit over the top.

 Anthrax pursued NOI with the same vigour with which he attacked

 hacking. He memorised whole speeches of Farrakhan and began speaking

 like him, commenting casually on `those caucasian, blue-eyed devils'.

 He quoted people he had discovered through NOI. People who described

 the US Federal Reserve Bank as being controlled by Jews. People who

 spoke of those hooked-nose, bagel-eating, just-crawled-out-of-a-cave

 Jews. Anthrax denied the existence of the Holocaust.

 `You're shaping up to be quite a little Hitler,' his father told

 Anthrax.

 His father disliked the NOI literature showing up at the house. It

 seemed to frighten him. Receiving blueprints in the mail for

 overthowing governments didn't sit well with the neighbours in the

 quiet suburban street of the provincial town.

 `Watch out,' he warned his son. `Having these thing turn up in your

 mailbox can be dangerous. It will probably earmark you for some sort

 of investigation. They will follow you around.'

 [ ]

 The traffic raced. The ethernet cables attached to System X were a

 regular speedway. People whizzed in and out of the mystery site like a

 swarm of bees. In only twelve hours, the sniffer file topped 100 k.

 Many of the connections went from System X to the major

 telecommunications company. Anthrax headed in that direction.

 He considered how to route the attack. He could go through a few

 diverters and other leapfrog devices to cover his trail, thus hitting

 the company's system from a completely separate source. The advantage

 of this route was anonymity. If the admin managed to detect his entry,

 Anthrax would only lose access to the phone company's system, not to

 System X. Alternatively, if he went in to the company through the

 gateway and System X, he risked alarms being raised at all three

 sites. However, his sniffer showed so much traffic running on this

 route, he might simply disappear in the flow. The established path was

 obviously there for a reason. One more person logging into the gateway

 through System X and then into the company's machine would not raise

 suspicions. He chose to go through System X.

 Anthrax logged into the company using a sniffed username and password.

 Trying the load-module bug again, he got root on the system and

 installed his own login patch. The company's system looked far more

 normal than System X. A few hundred users. Lots of email, far too much

 to read. He ran a few key word searches on all the email, trying to

 piece together a better picture of the project being developed on

 System X.

 The company did plenty of defence work, mostly in telecommunications.

 Different divisions of the company seemed to be working on different

 segments of the project. Anthrax searched through people's home

 directories, but nothing looked very interesting because he couldn't

 get a handle on the whole project. People were all developing

 different modules of the project and, without a centralised overview,

 the pieces didn't mean much.

 He did find a group of binary files--types of programs--but he had no

 idea what they were for. The only real way to find out what they did

 was to take them for a test drive. He ran a few binaries. They didn't

 appear to do anything. He ran a few more. Again, nothing. He kept

 running them, one after another. Still no results. All he received was

 error messages.

 The binaries seemed to need a monitor which could display graphics.

 They used XII, a graphical display common on Unix systems. Anthrax's

 inexpensive home computer didn't have that sort of graphical display

 operating system. He could still run the binaries by telling System X

 to run them on one of its local terminals, but he wouldn't be able to

 see the output on his home computer. More importantly, it was a risky

 course of action. What if someone happened to be sitting at the

 terminal where he chose to run the binary? The game would be up.

 He leaned away from his keyboard and stretched. Exhaustion was

 beginning to set in. He hadn't slept in almost 48 hours. Occasionally,

 he had left his computer terminal to eat, though he always brought the

 food back to the screen. His mother popped her head in the doorway

 once in a while and shook her head silently. When he noticed her

 there, he tried to ease her concerns. `But I'm learning lots of

 things,' he pleaded. She was not convinced.

 He also broke his long hacking session to pray. It was important for a

 devout Muslim to practice salat--to pray at least five times a day

 depending on the branch of Islam followed by the devotee. Islam allows

 followers to group some of their prayers, so Anthrax usually grouped

 two in the morning, prayed once at midday as normal, and grouped two

 more at night. An efficient way to meet religious obligations.

 Sometimes the time just slipped away, hacking all night. When the

 first hint of dawn snuck up on him, he was invariably in the middle of

 some exciting journey. But duty was duty, and it had to be done. So he

 pressed control S to freeze his screen, unfurled the prayer mat with

 its built-in compass, faced Mecca, knelt down and did two sets of

 prayers before sunrise. Ten minutes later he rolled the prayer mat up,

 slid back into his chair, typed control Q to release the pause on his

 computer and picked up where he left off.

 This company's computer system seemed to confirm what he had begun to

 suspect. System X was the first stage of a project, the rest of which

 was under development. He found a number of tables and reports in

 System X's files. The reports carried headers like `Traffic Analysis',

 `calls in' and `calls out', `failure rate'. It all began to make sense

 to Anthrax.

 System X called up each of the military telephone exchanges in that

 list. It logged in using the computer-generated name and password.

 Once inside, a program in System X polled the exchange for important

 statistics, such as the number of calls coming in and out of the base.

 This information was then stored on System X. Whenever someone wanted

 a report on something, for example, the military sites with the most

 incoming calls over the past 24 hours, he or she would simply ask

 System X to compile the information. All of this was done

 automatically.

 Anthrax had read some email suggesting that changes to an exchange,

 such as adding new telephone lines on the base, had been handled

 manually, but this job was soon to be done automatically by System X.

 It made sense. The maintenance time spent by humans would be cut

 dramatically.

 A machine which gathers statistics and services phone exchanges

 remotely doesn't sound very sexy on the face of it, until you begin to

 consider what you could do with something like that. You could sell it

 to a foreign power interested in the level of activity at a certain

 base at a particular time. And that is just the beginning.

 You could tap any unencrypted line going in or out of any of the 100

 or so exchanges and listen in to sensitive military discussions. Just

 a few commands makes you a fly on the wall of a general's conversation

 to the head of a base in the Philippines. Anti-government rebels in

 that country might pay a pretty penny for getting intelligence on the

 US forces.

 All of those options paled next to the most striking power wielded by

 a hacker who had unlimited access to System X and the 100 or so

 telephone exchanges. He could take down that US military voice

 communications system almost overnight, and he could do it

 automatically. The potential for havoc creation was breathtaking. It

 would be a small matter for a skilled programmer to alter the

 automated program used by System X. Instead of using its dozen or more

 modems to dial all the exchanges overnight and poll them for

 statistics, System X could be instructed to call them overnight and

 reprogram the exchanges.

 What if every time General Colin Powell picked up his phone, he was be

 automatically patched through to some Russian general's office? He

 wouldn't be able to dial any other number from his office phone. He'd

 pick up his phone to dial and there would be the Russian at the other

 end. And what if every time someone called into the general's number,

 they ended up talking to the stationery department? What if none of the

 phone numbers connected to their proper telephones? No-one would be

 able to reach one another. An important part of the US military machine

 would be in utter disarray. Now, what if all this happened in the first

 few days of a war? People trying to contact each other with vital

 information wouldn't be able to use the telephone exchanges reprogrammed

 by System X.

 THAT was power.

 It wasn't like Anthrax screaming at his father until his voice turned

 to a whisper, all for nothing. He could make people sit up and take

 notice with this sort of power.

 Hacking a system gave him a sense of control. Getting root on a system

 always gave him an adrenalin rush for just that reason. It meant the

 system was his, he could do whatever he wanted, he could run whatever

 processes or programs he desired, he could remove other users he

 didn't want using his system. He thought, I own the system. The word

 `own' anchored the phrase which circled through his thoughts again and

 again when he successfully hacked a system.

 The sense of ownership was almost passionate, rippled with streaks of

 obsession and jealousy. At any given moment, Anthrax had a list of

 systems he owned and that had captured his interest for that moment.

 Anthrax hated seeing a system administrator logging onto one of those

 systems. It was an invasion. It was as though Anthrax had just got

 this woman he had been after for some time alone in a room with the

 door closed. Then, just as he was getting to know her, this other guy

 had barged in, sat down on the couch and started talking to her.

 It was never enough to look at a system from a distance and know he

 could hack it if he wanted to. Anthrax had to actually hack the

 system. He had to own it. He needed to see what was inside the system,

 to know exactly what it was he owned.

 The worst thing admins could do was to fiddle with system security.

 That made Anthrax burn with anger. If Anthrax was on-line, silently

 observing the admins' activities, he would feel a sudden urge to log

 them off. He wanted to punish them. Wanted them to know he was into

 their system. And yet, at the same time, he didn't want them to know.

 Logging them off would draw attention to himself, but the two desires

 pulled at him from opposite directions. What Anthrax really wanted was

 for the admins to know he controlled their system, but for them not to

 be able to do anything about it. He wanted them to be helpless.

 Anthrax decided to keep undercover. But he contemplated the power of

 having System X's list of telephone exchange dial-ups and their

 username-password combinations. Normally, it would take days for a

 single hacker with his lone modem to have much impact on the US

 military's communications network. Sure, he could take down a few

 exchanges before the military wised up and started protecting

 themselves. It was like hacking a military computer. You could take

 out a machine here, a system there. But the essence of the power of

 System X was being able to use its own resources to orchestrate

 widespread pandemonium quickly and quietly.

 Anthrax defines power as the potential for real world impact. At that

 moment of discovery and realisation, the real world impact of hacking

 System X looked good. The telecommunications company computer seemed

 like a good place to hang up a sniffer, so he plugged one into the

 machine and decided to return in a little while. Then he logged out

 and went to bed.

 When he revisited the sniffer a day or so later, Anthrax received a

 rude shock. Scrolling through the sniffer file, he did a double take

 on one of the entries. Someone had logged into the company's system

 using his special login patch password.

 He tried to stay calm. He thought hard. When was the last time he had

 logged into the system using that special password? Could his sniffer

 have logged himself on an earlier hacking session? It did happen

 occasionally. Hackers sometimes gave themselves quite a fright. In the

 seamless days and nights of hacking dozens of systems, it was easy to

 forget the last time you logged into a particular system using the

 special password. The more he thought, the more he was absolutely

 sure. He hadn't logged into the system again.

 Which left the obvious question. Who had?

 [ ]

 Sometimes Anthrax pranked, sometimes he punished. Punishment could be

 severe or mild. Generally it was severe. And unlike pranking, it was

 not done randomly.

 Different things set him off. The librarian, for example. In early

 1993 Anthrax had enrolled in Asia-Pacific and Business Studies at a

 university in a nearby regional city. Ever since he showed up on the

 campus, he had been hassled by a student who worked part-time at the

 university library. On more than one occasion, Anthrax had been

 reading at a library table when a security guard came up and asked to

 search his bags. And when Anthrax looked over his shoulder to the

 check-out desk, that librarian was always there, the one with the bad

 attitude smeared across his face.

 The harassment became so noticeable, Anthrax's friends began

 commenting on it. His bag would be hand-searched when he left the

 library, while other students walked through the electronic security

 boom gate unbothered. When he returned a book one day late, the

 librarian--that librarian--insisted he pay all sorts of fines.

 Anthrax's pleas of being a poor student fell on deaf ears. By the time

 exam period rolled around at the end of term, Anthrax decided to

 punish the librarian by taking down the library's entire computer

 system.

 Logging in to the library computer via modem from home, Anthrax

 quickly gained root privileges. The system had security holes a mile

 wide. Then, with one simple command, he deleted every file in the

 computer. He knew the system would be backed up somewhere, but it

 would take a day or two to get the system up and running again. In the

 meantime, every loan or book search had to be conducted manually.

 During Anthrax's first year at university, even small incidents

 provoked punishment. Cutting him off while he was driving, or swearing

 at him on the road, fit the bill. Anthrax would memorise the licence

 plate of the offending driver, then social engineer the driver's

 personal details. Usually he called the police to report what appeared

 to be a stolen car and then provided the licence plate number. Shortly

 after, Anthrax tuned into to his police scanner, where he picked up

 the driver's name and address as it was read over the airways to the

 investigating police car. Anthrax wrote it all down.

 Then began the process of punishment. Posing as the driver, Anthrax rang

 the driver's electricity company to arrange a power disconnection. The

 next morning the driver might return home to find his electricity cut

 off. The day after, his gas might be disconnected. Then his water. Then

 his phone.

 Some people warranted special punishment--people such as Bill. Anthrax

 came across Bill on the Swedish Party Line, an English-speaking

 telephone conference. For a time, Anthrax was a regular fixture on the

 line, having attempted to call it by phreaking more than 2000 times

 over just a few months. Of course, not all those attempts were

 successful, but he managed to get through at least half the time. It

 required quite an effort to keep a presence on the party line, since

 it automatically cut people off after only ten minutes. Anthrax made

 friends with the operators, who sometimes let him stay on-line a while

 longer.

 Bill, a Swedish Party Line junkie, had recently been released from

 prison, where he had served time for beating up a Vietnamese boy at a

 railway station. He had a bad attitude and he often greeted the party

 line by saying, `Are there any coons on the line today?' His attitude

 to women wasn't much better. He relentlessly hit on the women who

 frequented the line. One day, he made a mistake. He gave out his phone

 number to a girl he was trying to pick up. The operator copied it down

 and when her friend Anthrax came on later that day, she passed it on

 to him.

 Anthrax spent a few weeks social engineering various people, including

 utilities and relatives whose telephone numbers appeared on Bill's

 phone accounts, to piece together the details of his life. Bill was a

 rough old ex-con who owned a budgie and was dying of cancer. Anthrax

 phoned Bill in the hospital and proceeded to tell him all sorts of

 personal details about himself, the kind of details which upset a

 person.

 Not long after, Anthrax heard that Bill had died. The hacker felt as

 though he had perhaps gone a bit too far.

 [ ]

 The tension at home had eased a little by the time Anthrax left to

 attend university. But when he returned home during holidays he found

 his father even more unbearable. More and more, Anthrax rebelled

 against his father's sniping comments and violence. Eventually, he

 vowed that the next time his father tried to break his arm he would

 fight back. And he did.

 One day Anthrax's father began making bitter fun of his younger son's

 stutter. Brimming with biting sarcasm, the father mimicked Anthrax's

 brother.

 `Why are you doing that?' Anthrax yelled. The bait had worked once

 again.

 It was as though he became possessed with a spirit not his own. He

 yelled at his father, and put a fist into the wall. His father grabbed

 a chair and thrust it forward to keep Anthrax at bay, then reached

 back for the phone. Said he was calling the police. Anthrax ripped the

 phone from the wall. He pursued his father through the house, smashing

 furniture. Amid the crashing violence of the fight, Anthrax suddenly

 felt a flash of fear for his mother's clock--a much loved, delicate

 family heirloom. He gently picked it up and placed it out of harm's

 way. Then he heaved the stereo into the air and threw it at his

 father. The stereo cabinet followed in its wake. Wardrobes toppled

 with a crash across the floor.

 When his father fled the house, Anthrax got a hold of himself and

 began to look around. The place was a disaster area. All those things

 so tenderly gathered and carefully treasured by his mother, the things

 she had used to build her life in a foreign land of white people

 speaking an alien tongue, lay in fragments scattered around the house.

 Anthrax felt wretched. His mother was distraught at the destruction

 and he was badly shaken by how much it upset her. He promised to try

 and control his temper from that moment on. It proved to be a constant

 battle. Mostly he would win, but not always. The battle still simmered

 below the surface.

 Sometimes it boiled over.

 [ ]

 Anthrax considered the possibilities of who else would be using his

 login patch. It could be another hacker, perhaps someone who was

 running another sniffer that logged Anthrax's previous login. But it

 was more likely to be a security admin. Meaning he had been found out.

 Meaning that he might be being traced even as he leap-frogged through

 System X to the telecommunications company's computer.

 Anthrax made his way to the system admin's mailboxes. If the game was

 up, chances were something in the mailbox would give it away.

 There it was. The evidence. They were onto him all right, and they

 hadn't wasted any time. The admins had mailed CERT, the Computer

 Emergency Response Team at Carnegie Mellon University, reporting a

 security breach. CERT, the nemesis of every Internet hacker, was bound

 to complicate matters. Law enforcement would no doubt be called in

 now.

 It was time to get out of this system, but not before leaving in a

 blaze of glory. A prank left as a small present.

 CERT had written back to the admins acknowledging the incident and

 providing a case number. Posing as one of the admins, Anthrax drafted

 a letter to CERT. To make the thing look official, he added the case

 number `for reference'. The letter went something like this:

 `In regard to incident no. XXXXX, reported on this date, we have since

 carried out some additional investigations on the matter. We have

 discovered the security incident was caused by a disgruntled employee

 who was fired for alcoholism and decided to retaliate against the

 company in this manner.

 `We have long had a problem with alcohol and drug abuse due to the

 stressful nature of the company environment. No further investigation

 is necessary.'

 At his computer terminal, Anthrax smiled. How embarrassing was that

 going to be? Try scraping that mud off. He felt very pleased with

 himself.

 Anthrax then tidied up his things in the company's computer, deleted

 the sniffer and moved out.

 Things began to move quickly after that. He logged into System X later

 to check the sniffer records, only to find that someone had used his

 login patch password on that system as well. He became very nervous.

 It was one thing goofing around with a commercial site, and quite

 another being tracked from a military computer.

 A new process had been added to System X, which Anthrax recognised. It

 was called `-u'. He didn't know what it did, but he had seen it before

 on military systems. About 24 hours after it appeared, he found

 himself locked out of the system. He had tried killing off the -u

 process before. It disappeared for a split-second and reappeared. Once

 it was in place, there was no way to destroy it.

 Anthrax also unearthed some alarming email. The admin at a site

 upstream from both System X and the company's system had been sent a

 warning letter: `We think there has been a security incident at your

 site'. The circle was closing in on him. It was definitely time to get

 the hell out. He packed up his things in a hurry. Killed off the

 remaining sniffer. Moved his files. Removed the login patch. And

 departed with considerable alacrity.

 After he cut his connection, Anthrax sat wondering about the admins.

 If they knew he was into their systems, why did they leave the

 sniffers up and running? He could understand leaving the login patch.

 Maybe they wanted to track his movements, determine his motives, or

 trace his connection. Killing the patch would have simply locked him

 out of the only door the admins could watch. They wouldn't know if he

 had other backdoors into their system. But the sniffer? It didn't make

 any sense.

 It was possible that they simply hadn't seen the sniffer. Leaving it

 there had been an oversight. But it was almost too glaring an error to

 be a real possibility. If it was an error, it implied the admins

 weren't actually monitoring the connections in and out of their

 systems. If they had been watching the connections, they would

 probably have seen the sniffer. But if they weren't monitoring the

 connections, how on earth did they find out his special password for

 the login patch? Like all passwords on the system, that one was

 encrypted. There were only two ways to get that password. Monitor the

 connection and sniff it, or break the encryption with a brute-force

 attack.

 Breaking the encryption would probably have taken millions of dollars

 of computer time. He could pretty well rule that option out. That left

 sniffing it, which would have alerted them to his own sniffer. Surely

 they wouldn't have left his sniffer running on purpose. They must have

 known he would learn they were watching him through his sniffer. The

 whole thing was bizarre.

 Anthrax thought about the admins who were chasing him. Thought about

 their moves, their strategies. Wondered why. It was one of the

 unsolved mysteries a hacker often faced--an unpleasant side of

 hacking. Missing the answers to certain questions, the satisfaction of

 a certain curiosity. Never being able to look over the fence at the

 other side.

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 Chapter 11 -- The Prisoner's Dilemma

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 Harrisburg Oh Harrisburg

 The plant is melting down

 The people out in Harrisbug

 Are getting out of town

 And when this stuff gets in

 You cannot get it out

 -- from `Harrisburg', on Red Sails in the Sunset by Midnight Oil

 Anthrax thought he would never get caught. But in some strange way, he

 also wanted to get caught. When he thought about being busted, he

 found himself filled with a strange emotion--impatience. Bring on the

 impending doom and be done with it. Or perhaps it was frustration at

 how inept his opponents seemed to be. They kept losing his trail and

 he was impatient with their incompetence. It was more fun outwitting a

 worthy opponent.

 Perhaps he didn't really want to be caught so much as tracked. Anthrax

 liked the idea of the police tracking him, of the system

 administrators pursuing him. He liked to follow the trail of their

 investigations through other people's mail. He especially liked being

 on-line, watching them trying to figure out where he was coming from.

 He would cleverly take control of their computers in ways they

 couldn't see. He watched every character they typed, every spelling

 error, every mistyped command, each twist and turn taken in the vain

 hope of catching him.

 He hadn't been caught back in early 1991, when it seemed everyone was

 after him. In fact Anthrax nearly gave up hacking and phreaking

 completely in that year after what he later called `The Fear of God'

 speech.

 Late at night, on a university computer system, he bumped into another

 hacker. It wasn't an entirely uncommon experience. Once in a while,

 hackers recognised another of their kind. Strange connections to

 strange places in the middle of the night. Inconsistencies in process

 names and sizes. The clues were visible for those who knew how to find

 them.

 The two hackers danced around each other, trying to determine who the

 other was without giving away too much information. Finally the

 mystery hacker asked Anthrax, `Are you a disease which affects sheep?'

 Anthrax typed the simple answer back. `Yes.'

 The other hacker revealed himself as Prime Suspect, one of the

 International Subversives. Anthrax recognised the name. He had seen

 Prime Suspect around on the BBSes, had read his postings. Before

 Anthrax could get started on a friendly chat, the IS hacker jumped in

 with an urgent warning.

 He had unearthed emails showing the Feds were closing in on Anthrax.

 The mail, obtained from system admins at Miden Pacific, described the

 systems Anthrax had been visiting. It showed the phone connections he

 had been using to get to them, some of which Telecom had traced back

 to his phone. One of the admins had written, `We're on to him. I feel

 really bad. He's seventeen years old and they are going to bust him

 and ruin his life.' Anthrax felt a cold chill run down his spine.

 Prime Suspect continued with the story. When he first came across the

 email, he thought it referred to himself. The two hackers were the

 same age and had evidently been breaking into the same systems. Prime

 Suspect had freaked out over the mail. He took it back to the other

 two IS hackers, and they talked it through. Most of the description

 fitted, but a few of the details didn't seem to make sense. Prime

 Suspect wasn't calling from a country exchange. The more they worked

 it through, the clearer it became that the email must have been

 referring to someone else. They ran through the list of other options

 and Anthrax's name came up as a possibility. The IS hackers had all

 seen him around a few systems and BBSes. Trax had even spoken to him

 once on a conference call with another phreaker. They pieced together

 what they knew of him and the picture fitted. The AFP were onto

 Anthrax and they seemed to know a lot about him. They had traced his

 telephone connection back to his house. They knew his age, which

 implied they knew his name. The phone bills were in his parents'

 names, so there may have been some personal surveillance of him. The

 Feds were so close they were all but treading on his heels. The IS

 hackers had been keeping an eye out for him, to warn him, but this was

 the first time they had found him.

 Anthrax thanked Prime Suspect and got out of the system. He sat frozen

 in the night stillness. It was one thing to contemplate getting caught,

 to carry mixed emotions on the hypothetical situation. It was another to

 have the real prospect staring you in the face. In the morning, he

 gathered up all his hacking papers, notes, manuals--everything. Three

 trunks' worth of material. He carried it all to the back garden, lit a

 bonfire and watched it burn. He vowed to give up hacking forever.

 And he did give it up, for a time. But a few months later he somehow

 found himself back in front of his computer screen, with his modem

 purring. It was so tempting, so hard to let go. The police had never

 shown up. Months had come and gone, still nothing. Prime Suspect must

 have been wrong. Perhaps the AFP were after another hacker entirely.

 Then, in October 1991, the AFP busted Prime Suspect, Mendax and Trax.

 But Anthrax continued to hack, mostly on his own as usual, for another

 two years. He reminded himself that the IS hackers worked in a team.

 If the police hadn't nailed him when they busted the others, surely

 they would never find him now. Further, he had become more skilled as

 a hacker, better at covering his tracks, less likely to draw attention

 to himself. He had other rationalisations too. The town where he lived

 was so far away, the police would never bother travelling all the way

 into the bush. The elusive Anthrax would remain at large forever, the

 unvanquished Ned Kelly of the computer underground.

 [ ]

 Mundane matters were on Anthrax's mind on the morning of 14 July 1994.

 The removalists were due to arrive to take things from the half-empty

 apartment he had shared with another student. His room-mate had

 already departed and the place was a clutter of boxes stuffed with

 clothes, tapes and books.

 Anthrax sat in bed half-asleep, half-watching the `Today' show when he

 heard the sound of a large vehicle pulling up outside. He looked out

 the window expecting to see the removalists. What he saw instead was

 at least four men in casual clothes running toward the house.

 They were a little too enthusiastic for removalists and they split up

 before getting to the door, with two men forking off toward opposite

 sides of the building. One headed for the car port. Another dove

 around the other side of the building. A third banged on the front

 door. Anthrax shook himself awake.

 The short, stocky guy at the front door was a worry. He had puffy,

 longish hair and was wearing a sweatshirt and acid-wash jeans so tight

 you could count the change in his back pocket. Bad ideas raced through

 Anthrax's head. It looked like a home invasion. Thugs were going to

 break into his home, tie him up and terrorise him before stealing all

 his valuables.

 `Open up. Open up,' the stocky one shouted, flashing a police badge.

 Stunned, and still uncomprehending, Anthrax opened the door. `Do you

 know who WE are?' the stocky one asked him.

 Anthrax looked confused. No. Not sure.

 `The Australian Federal Police.' The cop proceeded to read out the

 search warrant.

 What happened from this point forward is a matter of some debate. What

 is fact is that the events of the raid and what

 followed formed the basis of a formal complaint by Anthrax to the

 Office of the Ombudsman and an internal investigation within the AFP.

 The following is simply Anthrax's account of how it happened.

 The stocky one barked at Anthrax, `Where's your computer?'

 `What computer?' Anthrax looked blankly at the officer. He didn't have

 a computer at his apartment. He used the uni's machines or friend's

 computers.

 `Your computer. Where is it? Which one of your friends has it?'

 `No-one has it. I don't own one.'

 `Well, when you decide to tell us where it is, you let us know.'

 Yeah. Right. If Anthrax did have a hidden computer at uni, revealing

 its location wasn't top of the must-do list.

 The police pawed through his personal letters, quizzed Anthrax about

 them. Who wrote this letter? Is he in the computer underground? What's

 his address?

 Anthrax said `no comment' more times than he could count. He saw a few

 police moving into his bedroom and decided it was time to watch them

 closely, make sure nothing was planted. He stood up to follow them in

 and observe the search when one of the cops stopped him. Anthrax told

 them he wanted a lawyer. One of the police looked on with disapproval.

 `You must be guilty,' he told Anthrax. `Only guilty people ask for

 lawyers. And here I was feeling sorry for you.'

 Then one of the other officers dropped the bomb. `You know,' he began

 casually, `we're also raiding your parents' house ...'

 Anthrax freaked out. His mum would be hysterical. He asked to call his

 mother on his mobile, the only phone then working in the apartment.

 The police refused to let him touch his mobile. Then he asked to call

 her from the pay phone across the street. The police refused again.

 One of the officers, a tall, lanky cop, recognised a leverage point if

 ever he saw one. He spread the guilt on thick.

 `Your poor sick mum. How could you do this to your poor sick mum?

 We're going to have to take her to Melbourne for questioning, maybe

 even to charge her, arrest her, take her to jail. You make me sick. I

 feel sorry for a mother having a son like you who is going to cause

 her all this trouble.'

 From that moment on, the tall officer took every opportunity to talk

 about Anthrax's `poor sick mum'. He wouldn't let up. Not that he

 probably knew the first thing about scleroderma, the creeping fatal

 disease which affected her. Anthrax often thought about the pain his

 mother was in as the disease worked its way from her extremities to

 her internal organs. Scleroderma toughened the skin on the fingers and

 feet, but made them overly sensitive, particularly to changes in

 weather. It typically affected women native to hot climates who moved

 to colder environments.

 Anthrax's mobile rang. His mother. It had to be. The police wouldn't

 let him answer it.

 The tall officer picked up the call, then turned to the stocky cop and

 said in a mocking Indian accent, `It is some woman with an Indian

 accent'. Anthrax felt like jumping out of his chair and grabbing the

 phone. He felt like doing some other things too, things that would

 have undoubtedly landed him in prison then and there.

 The stocky cop nodded to the tall one, who handed the mobile to

 Anthrax.

 At first, he couldn't make sense of what his mother was saying. She

 was a terrified mess. Anthrax tried to calm her down. Then she tried

 to comfort him.

 `Don't worry. It will be all right,' she said it, over and over. No

 matter what Anthrax said, she repeated that phrase, like a chant. In

 trying to console him, she was actually calming herself. Anthrax

 listened to her trying to impose order on the chaos around her. He

 could hear noises in the background and he guessed it was the police

 rummaging through her home. Suddenly, she said she had to go and hung

 up.

 Anthrax handed the phone back to the police and sat with his head in

 his hands. What a wretched situation. He couldn't believe this was

 happening to him. How could the police seriously consider taking his

 mother to Melbourne for questioning? True, he phreaked from her home

 office phone, but she had no idea how to hack or phreak. As for

 charging his mother, that would just about kill her. In her mental and

 physical condition, she would simply collapse, maybe never to get up

 again.

 He didn't have many options. One of the cops was sealing up his mobile

 phone in a clear plastic bag and labelling it. It was physically

 impossible for him to call a lawyer, since the police wouldn't let him

 use the mobile or go to a pay phone. They harangued him about coming

 to Melbourne for a police interview.

 `It is your best interest to cooperate,' one of the cops told him. `It

 would be in your best interest to come with us now.'

 Anthrax pondered that line for a moment, considered how ludicrous it

 sounded coming from a cop. Such a bald-faced lie told so

 matter-of-factly. It would have been humorous if the situation with

 his mother hadn't been so awful. He agreed to an interview with the

 police, but it would have to be done on another day.

 The cops wanted to search his car. Anthrax didn't like it, but there

 was nothing incriminating in the car anyway. As he walked outside in

 the winter morning, one of the cops looked down at Anthrax's feet,

 which were bare in accordance with the Muslim custom of removing shoes

 in the house. The cop asked if he was cold.

 The other cop answered for Anthrax. `No. The fungus keeps them warm.'

 Anthrax swallowed his anger. He was used to racism, and plenty of it,

 especially from cops. But this was over the top.

 In the town where he attended uni, everyone thought he was Aboriginal.

 There were only two races in that country town--white and Aboriginal.

 Indian, Pakistani, Malay, Burmese, Sri Lankan--it didn't matter. They

 were all Aboriginal, and were treated accordingly.

 Once when he was talking on the pay phone across from his house, the

 police pulled up and asked him what he was doing there. Talking on the

 phone, he told them. It was pretty obvious. They asked for

 identification, made him empty his pockets, which contained his small

 mobile phone. They told him his mobile must be stolen, took it from

 him and ran a check on the serial number. Fifteen minutes and many

 more accusations later, they finally let him go with the flimsiest of

 apologies. `Well, you understand,' one cop said. `We don't see many of

 your type around here.'

 Yeah. Anthrax understood. It looked pretty suspicious, a dark-skinned

 boy using a public telephone. Very suss indeed.

 In fact, Anthrax had the last laugh. He had been on a phreaked call to

 Canada at the time and he hadn't bothered to hang up when the cops

 arrived. Just told the other phreakers to hang on. After the police

 left, he picked up the conversation where he left off.

 Incidents like that taught him that sometimes the better path was to

 toy with the cops. Let them play their little games. Pretend to be

 manipulated by them. Laugh at them silently and give them nothing. So

 he appeared to ignore the fungus comment and led the cops to his car.

 They found nothing.

 When the police finally packed up to leave, one of them handed Anthrax

 a business card with the AFP's phone number.

 `Call us to arrange an interview time,' he said.

 `Sure,' Anthrax replied as he shut the door.

 [ ]

 Anthrax keep putting the police off. Every time they called hassling

 him for an interview, he said he was busy. But when they began ringing

 up his mum, he found himself in a quandary. They were threatening and

 yet reassuring to his mother all at the same time and spoke politely

 to her, even apologetically.

 `As bad as it sounds,' one of them said, `we're going to have to

 charge you with things Anthrax has done, hacking, phreaking, etc. if

 he doesn't cooperate with us. We know it sounds funny, but we're

 within our rights to do that. In fact that is what the law dictates

 because the phone is in your name.'

 He followed this with the well-worn `it's in your son's best interest

 to cooperate' line, delivered with cooing persuasion.

 Anthrax wondered why there was no mention of charging his father,

 whose name appeared on the house's main telephone number. That line

 also carried some illegal calls.

 His mother worried. She asked her son to cooperate with the police.

 Anthrax felt he had to protect his mother and finally agreed to a

 police interview after his uni exams. The only reason he did so was

 because of the police threat to charge his mother. He was sure that if

 they dragged his mother through court, her health would deteriorate

 and lead to an early death.

 Anthrax's father picked him up from uni on a fine November day and

 drove down to Melbourne. His mother had insisted that he attend the

 interview, since he knew all about the law and police. Anthrax didn't

 mind having him along: he figured a witness might prevent any use of

 police muscle.

 During the ride to the city, Anthrax talked about how he would handle

 the interview. The good news was that the AFP had said they wanted to

 interview him about his phreaking, not his hacking. He went to the

 interview understanding they would only be discussing his `recent

 stuff'--the phreaking. He had two possible approaches to the

 interview. He could come clean and admit everything, as his first

 lawyer had advised. Or he could pretend to cooperate and be evasive,

 which was what his instincts told him to do.

 His father jumped all over the second option. `You have to cooperate

 fully. They will know if you are lying. They are trained to pick out

 lies. Tell them everything and they will go easier on you.' Law and

 order all the way.

 `Who do they think they are anyway? The pigs.' Anthrax looked away,

 disgusted at the thought of police harassing people like his mother.

 `Don't call them pigs,' his father snapped. `They are police officers.

 If you are ever in trouble, they are the first people you are ever

 going to call.'

 `Oh yeah. What kind of trouble am I going to be in that the first

 people I call are the AFP?' Anthrax replied.

 Anthrax would put up with his father coming along so long as he kept

 his mouth shut during the interview. He certainly wasn't there for

 personal support. They had a distant relationship at best. When his

 father began working in the town where Anthrax now lived and studied,

 his mother had tried to patch things between them. She suggested his

 father take Anthrax out for dinner once a week, to smooth things over.

 Develop a relationship. They had dinner a handful of times and Anthrax

 listened to his father's lectures. Admit you were wrong. Cooperate

 with the police. Get your life together. Own up to it all. Grow up. Be

 responsible. Stop being so useless. Stop being so stupid.

 The lectures were a bit rich, Anthrax thought, considering that his

 father had benefited from Anthrax's hacking skills. When he discovered

 Anthrax had got into a huge news clipping database, he asked the boy

 to pull up every article containing the word `prison'. Then he had him

 search for articles on discipline. The searches should have cost a

 fortune, probably thousands of dollars. But his father didn't pay a

 cent, thanks to Anthrax. And he didn't spend much time lecturing

 Anthrax on the evils of hacking then.

 When they arrived at AFP headquarters, Anthrax made a point of putting

 his feet up on the leather couch in the reception area and opened a

 can of Coke he had brought along. His father got upset.

 `Get your feet off that seat. You shouldn't have brought that can of

 Coke. It doesn't look very professional.'

 `Hey, I'm not going for a job interview here,' Anthrax responded.

 Constable Andrew Sexton, a redhead sporting two earrings, came up to

 Anthrax and his father and took them upstairs for coffee. Detective

 Sergeant Ken Day, head of the Computer Crime Unit, was in a meeting,

 Sexton said, so the interview would be delayed a little.

 Anthrax's father and Sexton found they shared some interests in law

 enforcement. They discussed the problems associated with

 rehabilitation and prisoner discipline. Joked with each other.

 Laughed. Talked about `young Anthrax'. Young Anthrax did this. Young

 Anthrax did that.

 Young Anthrax felt sick. Watching his own father cosying up to the

 enemy, talking as if he wasn't even there.

 When Sexton went to check on whether Day had finished his meeting,

 Anthrax's father growled, `Wipe that look of contempt off your face,

 young man. You are going to get nowhere in this world if you show that

 kind of attitude, they are going to come down on you like a ton of

 bricks.'

 Anthrax didn't know what to say. Why should he treat these people with

 any respect after the way they threatened his mother?

 The interview room was small but very full. A dozen or more boxes, all

 filled with labelled print-outs.

 Sexton began the interview. `Taped record of interview conducted at

 Australian Federal Police Headquarters, 383 Latrobe Street Melbourne

 on 29 November 1994.' He reeled off the names of the people present

 and asked each to introduce himself for voice recognition.

 `As I have already stated, Detective Sergeant Day and I are making

 enquiries into your alleged involvement into the manipulation of

 private automated branch exchanges [PABXes] via Telecom 008 numbers in

 order to obtain free phone calls nationally and internationally. Do

 you clearly understand this allegation?'

 `Yes.'

 Sexton continued with the necessary, and important, preliminaries. Did

 Anthrax understand that he was not obliged to answer any questions?

 That he had the right to communicate with a lawyer? That he had

 attended the interview of his own free will? That he was free to leave

 at any time?

 Yes, Anthrax said in answer to each question.

 Sexton then ploughed through a few more standard procedures before he

 finally got to the meat of the issue--telephones. He fished around in

 one of the many boxes and pulled out a mobile phone. Anthrax confirmed

 that it was his phone.

 `Was that the phone that you used to call the 008 numbers and

 subsequent connections?' Sexton asked.

 `Yes.'

 `Contained in that phone is a number of pre-set numbers. Do you

 agree?'

 `Yes.'

 `I went to the trouble of extracting those records from it.' Sexton

 looked pleased with himself for hacking Anthrax's speed-dial numbers

 from the mobile. `Number 22 is of some interest to myself. It comes up

 as Aaron. Could that be the person you referred to before as Aaron in

 South Australia?'

 `Yes, but he is always moving house. He is a hard person to track

 down.'

 Sexton went through a few more numbers, most of which Anthrax hedged.

 He asked Anthrax questions about his manipulation of the phone system,

 particularly about the way he made free calls overseas using

 Australian companies' 008 numbers.

 When Anthrax had patiently explained how it all worked, Sexton went

 through some more speed-dial numbers.

 `Number 43. Do you recognise that one?'

 `That's the Swedish Party Line.'

 `What about these other numbers? Such as 78? And 30?'

 `I'm not sure. I couldn't say what any of these are. It's been so

 long,' Anthrax paused, sensing the pressure from the other side of the

 table. `These ones here, they are numbers in my town. But I don't know

 who. Very often, 'cause I don't have any pen and paper with me, I just

 plug a number into the phone.'

 Sexton looked unhappy. He decided to go in a little harder. `I'm going

 to be pretty blunt. So far you have admitted to the 008s but I think

 you are understating your knowledge and your experience when it comes

 to these sort of offences.' He caught himself. `Not offences. But your

 involvement in all of this ... I think you have got a little bit more

 ... I'm not saying you are lying, don't get me wrong, but you tend to

 be pulling yourself away from how far you were really into this. And

 how far everyone looked up to you.'

 There was the gauntlet, thrown down on the table. Anthrax picked it

 up.

 `They looked up to me? That was just a perception. To be honest, I

 don't know that much. I couldn't tell you anything about telephone

 exchanges or anything like that. In the past, I guess the reason they

 might look up to me in the sense of a leader is because I was doing

 this, as you are probably aware, quite a bit in the past, and

 subsequently built up a reputation. Since then I decided I wouldn't do

 it again.'

 `Since this?' Sexton was quick off the mark.

 `No. Before. I just said, "I don't want anything to do with this any

 more. It's just stupid". When I broke up with my girlfriend ... I just

 got dragged into it again. I'm not trying to say that I am any less

 responsible for any of this but I will say I didn't originate any of

 these 008s. They were all scanned by other people. But I made calls

 and admittedly I did a lot of stupid things.'

 But Sexton was like a dog with a bone.

 `I just felt that you were tending to ... I don't know if it's because

 your dad's here or ... I have read stuff that "Anthrax was a legend

 when it came to this, and he was a scanner, and he was the man to talk

 to about X.25, Tymnet, hacking, Unix. The whole kit and kaboodle".'

 Anthrax didn't take the bait. Cops always try that line. Play on a

 hacker's ego, get them to brag. It was so transparent.

 `It's not true,' he answered. `I know nothing about ... I can't

 program. I have an Amiga with one meg of memory. I have no formal

 background in computers whatsoever.'

 That part was definitely true. Everything was self-taught. Well,

 almost everything. He did take one programming class at uni, but he

 failed it. He went to the library to do extra research, used in his

 final project for the course. Most of his classmates wrote simple

 200-line programs with few functions; his ran to 500 lines and had

 lots of special functions. But the lecturer flunked him. She told him,

 `The functions in your program were not taught in this course'.

 Sexton asked Anthrax if he was into carding, which he denied

 emphatically. Then Sexton headed back into scanning. How much had

 Anthrax done? Had he given scanned numbers to other hackers? Anthrax

 was evasive, and both cops were getting impatient.

 `What I am trying to get at is that I believe that, through your

 scanning, you are helping other people break the law by promoting this

 sort of thing.' Sexton had shown his hand.

 `No more than a telephone directory would be assisting someone,

 because it's really just a list. I didn't actually break anything. I

 just looked at it.'

 `These voice mailbox systems obviously belong to people. What would

 you do when you found a VMB?'

 `Just play with it. Give it to someone and say, "Have a look at this.

 It is interesting," or whatever.'

 `When you say play with it you would break the code out to the VMB?'

 `No. Just have a look around. I'm not very good at breaking VMBs.'

 Sexton tried a different tack. `What are 1-900 numbers? On the back of

 that document there is a 1-900 number. What are they generally for?'

 Easy question. `In America they like cost $10 a minute. You can ring

 them up, I think, and get all sorts of information, party lines, etc.'

 `It's a conference type of call?'

 `Yes.'

 `Here is another document, contained in a clear plastic sleeve

 labelled AS/AB/S/1. Is this a scan? Do you recognise your

 handwriting?'

 `Yes, it's in my handwriting. Once again it's the same sort of scan.

 It's just dialling some commercial numbers and noting them.'

 `And once you found something, what would you do with it?'

 Anthrax had no intention of being painted as some sort of ringleader

 of a scanning gang. He was a sociable loner, not a part of a team.

 `I'd just look at it, like in the case of this one here--630. I just

 punched in a few numbers and it said that 113 diverts somewhere, 115

 says goodbye, etc. I'd just do that and I probably never came back to

 it again.'

 `And you believe that if I pick up the telephone book, I would get all

 this information?'

 `No. It's just a list of numbers in the same sense that a telephone

 book is.'

 `What about a 1-800 number?'

 `That is the same as a 0014.'

 `If you rang a 1-800 number, where would you go?'

 Anthrax wondered if the Computer Crimes Unit gained most of its

 technical knowledge from interviews with hackers.

 `You can either do 0014 or you can do 1-800. It's just the same.'

 `Is it Canada--0014?'

 `It's everywhere.' Oops. Don't sound too cocky. `Isn't it?'

 `No, I'm not familiar.' Which is just what Anthrax was thinking.

 Sexton moved on. `On the back of that document there is more type

 scans ...'

 `It's all just the same thing. Just take a note of what is there. In

 this case, box 544 belongs to this woman ...'

 `So, once again, you just release this type of information on the

 bridge?'

 `Not all of it. Most of it I would probably keep to myself and never

 look at it again. I was bored. Is it illegal to scan?'

 `I'm not saying it's illegal. I'm just trying to show that you were

 really into this. I'm building a picture and I am gradually getting to

 a point and I'm going to build a picture to show that for a while

 there ...' Sexton then interrupted himself and veered down a less

 confrontational course. `I'm not saying you are doing it now, but back

 then, when all these offences occurred, you were really into scanning

 telephone systems, be it voice mailboxes ... I'm not saying you found

 the 008s but you ... anything to bugger up Telecom. You were really

 getting into it and you were helping other people.'

 Anthrax took offence. `The motivation for me doing it wasn't to bugger

 up Telecom.'

 Sexton backpedalled. `Perhaps ... probably a poor choice of words.'

 He began pressing forward on the subject of hacking, something the

 police had not said they were going to be discussing. Anthrax felt a

 little unnerved, even rattled.

 Day asked if Anthrax wanted a break.

 `No,' he answered. `I just want to get it over and done with, if

 that's OK. I'm not going to lie. I'm not going to say "no comment".

 I'm going to admit to everything 'cause, based on what I have been

 told, it's in my best interest to do so.'

 The police paused. They didn't seem to like that last comment much.

 Day tried to clear things up.

 `Before we go any further, based on what you have been told, it is in

 your best interests to tell the truth. Was it any member of the AFP

 that told you this?'

 `Yes.'

 `Who?' Day threw the question out quickly.

 Anthrax couldn't remember their names. `The ones who came to my house.

 I think Andrew also said it to me,' he said, nodding in the direction

 of the red-headed constable.

 Why were the cops getting so uncomfortable all of a sudden? It was no

 secret that they had told both Anthrax and his mother repeatedly that

 it was in his best interest to agree to an interview.

 Day leaned forward, peered at Anthrax and asked, `What did you

 interpret that to mean?'

 `That if I don't tell the truth, if I say "no comment" and don't

 cooperate, that it is going to be ... it will mean that you will go

 after me with ...' Anthrax grasped for the right words, but he felt

 tongue-tied, `with ... more force, I guess.'

 Both officers stiffened visibly.

 Day came back again. `Do you feel that an unfair inducement has been

 placed on you as a result of that?'

 `In what sense?' The question was genuine.

 `You have made the comment and it has now been recorded and I have to

 clear it up. Do you feel like, that a deal has been offered to you at

 any stage?'

 A deal? Anthrax thought about it. It wasn't a deal as in `Talk to us

 now and we will make sure you don't go to jail'. Or `Talk now and we

 won't beat you with a rubber hose'.

 `No,' he answered.

 `Do you feel that as a result of that being said that you have been

 pressured to come forward today and tell the truth?'

 Ah, that sort of deal. Well, of course.

 `Yes, I have been pressured,' Anthrax answered. The two police

 officers looked stunned. Anthrax paused, concerned about the growing

 feeling of disapproval in the room. `Indirectly,' he added quickly,

 almost apologetically.

 For a brief moment, Anthrax just didn't care. About the police. About

 his father. About the pressure. He would tell the truth. He decided to

 explain the situation as he saw it.

 `Because since they came to my house, they emphasised the fact that if

 I didn't come for an interview, that they would then charge my mother

 and, as my mother is very sick, I am not prepared to put her through

 that.'

 The police looked at each other. The shock waves reverberated around

 the room. The AFP clearly hadn't bargained on this coming out in the

 interview tape. But what he said about his mother being threatened was

 the truth, so let it be on the record with everything else.

 Ken Day caught his breath, `So you are saying that you

 have now been ...' he cut himself off ... `that you are not here

 voluntarily?'

 Anthrax thought about it. What did `voluntarily' mean? The police

 didn't cuff him to a chair and tell him he couldn't leave until he

 talked. They didn't beat him around the head with a baton. They

 offered him a choice: talk or inflict the police on his ailing mother.

 Not a palatable choice, but a choice nonetheless. He chose to talk to

 protect his mother.

 `I am here voluntarily,' he answered.

 `That is not what you have said. What you have just said is

 that pressure has been placed on you and that you have had to come in

 here and answer the questions. Otherwise certain actions would take

 place. That does not mean you are here

 voluntarily.'

 The police must have realised they were on very thin ice and Anthrax

 felt pressure growing in the room. The cops pushed. His father did not

 looked pleased.

 `I was going to come anyway,' Anthrax answered, again almost

 apologetically. Walk the tightrope, he thought. Don't get them too mad

 or they will charge my mother. `You can talk to the people who carried

 out the warrant. All along, I said to them I would come in for an

 interview. Whatever my motivations are, I don't think should matter. I

 am going to tell you the truth.'

 `It does matter,' Day responded, `because at the beginning of the

 interview it was stated--do you agree--that you have come in here

 voluntarily?'

 `I have. No-one has forced me.'

 Anthrax felt exasperated. The room was getting stuffy. He wanted to

 finish this thing and get out of there. So much pressure.

 `And is anyone forcing you to make the answers you have given here

 today?' Day tried again.

 `No individuals are forcing me, no.' There. You have what you want.

 Now get on with it and let's get out of here.

 `You have to tell the truth. Is that what you are saying?' The police

 would not leave the issue be.

 `I want to tell the truth. As well.' The key words there were `as

 well'. Anthrax thought, I want to and I have to.

 `It's the circumstances that are forcing this upon you, not an

 individual?'

 `No.' Of course it was the circumstances. Never mind that the police

 created the circumstance.

 Anthrax felt as if the police were just toying with him. He knew and

 they knew they would go after his mother if this interview wasn't to

 their liking. Visions of his frail mother being hauled out of her

 house by the AFP flashed through his mind. Anthrax felt sweaty and

 hot. Just get on with it. Whatever makes them happy, just agree to it

 in order to get out of this crowded room.

 `So, would it be fair to summarise it, really, to say that perhaps ...

 of your activity before the police arrived at your premises, that is

 what is forcing you?'

 What was this cop talking about? His `activity' forcing him? Anthrax

 felt confused. The interview had already gone on some time. The cops

 had such obscure ways of asking things. The room was oppressively

 small.

 Day pressed on with the question, `The fact that you could see you had

 broken the law, and that is what is forcing you to come forward here

 today and tell the truth?'

 Yeah. Whatever you want. `OK,' Anthrax started to answer, `That is a

 fair assump--'

 Day cut him off. `I just wanted to clarify that because the

 interpretation I immediately got from that was that we, or members of

 the AFP, had unfairly and unjustly forced you to come in here today,

 and that is not the case?'

 Define `unfairly'. Define `unjustly'. Anthrax thought it was unfair

 the cops might charge his mother. But they told her it was perfectly

 legal to do so. Anthrax felt light-headed. All these thoughts whirring

 around inside his head.

 `No, that is not the case. I'm sorry for ...' Be humble. Get out of

 that room faster.

 `No, that is OK. If that is what you believe, say it. I have no

 problems with that. I just like to have it clarified. Remember, other

 people might listen to this tape and they will draw inferences and

 opinions from it. At any point where I think there is an ambiguity, I

 will ask for clarification. Do you understand that?'

 `Yes. I understand.' Anthrax couldn't really focus on what Day was

 saying. He was feeling very distressed and just wanted to finish the

 interview.

 The cops finally moved on, but the new topic was almost as unpleasant.

 Day began probing about Anthrax's earlier hacking career--the one he

 had no intention of talking about. Anthrax began to feel a bit better.

 He agreed to talk to the police about recent phreaking activities, not

 hacking matters. Indeed, he had repeatedly told them that topic was

 not on his agenda. He felt like he was standing on firmer ground.

 After being politely stonewalled, Day circled around and tried again.

 `OK. I will give you another allegation; that you have unlawfully

 accessed computer systems in Australia and the United States. In the

 US, you specifically targeted military computer systems. Do you

 understand that allegation?'

 `I understand that. I wouldn't like to comment on it.' No, sir. No

 way.

 Day tried a new tack. `I will further allege that you did work with a

 person known as Mendax.'

 What on earth was Day talking about? Anthrax had heard of Mendax, but

 they had never worked together. He thought the cops must not have very

 good informants.

 `No. That is not true. I know no-one of that name.' Not strictly true,

 but true enough.

 `Well, if he was to turn around to me and say that you were doing all

 this hacking, he would be lying, would he?'

 Oh wonderful. Some other hacker was crapping on to the cops with lies

 about how he and Anthrax had worked together. That was exactly why

 Anthrax didn't work in a group. He had plenty of real allegations to

 fend off. He didn't need imaginary ones too.

 `Most certainly would. Unless he goes by some other name, I know

 no-one by that name, Mendax.' Kill that off quick.

 In fact Mendax had not ratted on Anthrax at all. That was just a

 technique the police used.

 `You don't wish to comment on the fact that you have hacked into other

 computer systems and military systems?' If there

 was one thing Anthrax could say for Day, it was that he was

 persistent.

 `No. I would prefer not to comment on any of that. This is the advice

 I have received: not to comment on anything unrelated to the topic

 that I was told I would be talking about when I came down here.'

 `All right, well are you going to answer any questions in relation to

 unlawfully accessing any computer systems?'

 `Based upon the legal advice that I received, I choose not to.'

 Day pursed his lips. `All right. If that is your attitude and you

 don't wish to answer any of those questions, we won't pursue the

 matter. However, I will inform you now that the matter may be reported

 and you may receive a summons to answer the questions or face charges

 in relation to those allegations, and, at any time that you so choose,

 you can come forward and tell us the truth.'

 Woah. Anthrax took a deep breath. Could the cops make him come answer

 questions with a summons? They were changing the game midway through.

 Anthrax felt as though the carpet had been pulled out from beneath his

 feet. He needed a few minutes to clear his head.

 `Is it something I can think over and discuss?' Anthrax asked.

 `Yes. Do you want to have a pause and a talk with your father? The

 constable and I can step out of the room, or offer you another room.

 You may wish to have a break and think about it if you like. I think

 it might be a good idea. I think we might have a ten-minute break and

 put you in another room and let you two have a chat about it. There is

 no pressure.'

 Day and the Sexton stopped the interview and guided father and son

 into another room. Once they were alone, Anthrax looked to his father

 for support. This voice inside him still cried out to keep away from

 his earlier hacking journeys. He needed someone to tell him the same

 thing.

 His father was definitely not that someone. He railed against Anthrax

 with considerable vehemence. Stop holding back. You have to tell

 everything. How could you be so stupid? You can't fool the police.

 They know. Confess it all before it's too late. At the end of the

 ten-minute tirade, Anthrax felt worse than he had at the beginning.

 When the two returned to the interview room, Anthrax's father turned

 to the police and said suddenly, `He has decided to confess'.

 That was not true. Anthrax hadn't decided anything of the sort. His

 father was full of surprises. It seemed every time he opened his

 mouth, an ugly surprise came out.

 Ken Day and Andrew Sexton warmed up a shaky Anthrax by showing him

 various documents, pieces of paper with Anthrax's scribbles seized

 during the raid, telephone taps. At one stage, Day pointed to some

 handwritten notes which read `KDAY'. He looked at Anthrax.

 `What's that? That's me.'

 Anthrax smiled for the first time in a long while. It was something to

 be happy about. The head of the AFP's Computer Crime Unit in Melbourne

 sat there, so sure he was onto something big. There was his name, bold

 as day, in the hacker's handwriting on a bit of paper seized in a

 raid. Day seemed to be expecting something good.

 Anthrax said, `If you ring that up you will find it is a radio

 station.' An American radio station. Written on the same bit of paper

 were the names of an American clothing store, another US-based radio

 station, and a few records he wanted to order.

 `There you go,' Day laughed at his own hasty conclusions. `I've got a

 radio station named after me.'

 Day asked Anthrax why he wrote down all sorts of things, directory

 paths, codes, error messages.

 `Just part of the record-keeping. I think I wrote this down when I had

 first been given this dial-up and I was just feeling my way around,

 taking notes of what different things did.'

 `What were your intentions at the time with these computer networks?'

 `At this stage, I was just having a look, just a matter of curiosity.'

 `Was it a matter of curiosity--"Gee, this is interesting" or was it

 more like "I would like to get into them" at this stage?'

 `I couldn't say what was going through my mind at the time. But

 initially once I got into the first system--I'm sure you have heard

 this a lot--but once you get into the first system, it's like you get

 into the next one and the next one and the next one, after a while it

 doesn't ...' Anthrax couldn't find the right words to finish the

 explanation.

 `Once you have tasted the forbidden fruit?'

 `Exactly. It's a good analogy.'

 Day pressed on with questions about Anthrax's hacking. He successfully

 elicited admissions from the hacker. Anthrax gave Day more than the

 police officer had before, but probably not as much as he would have

 liked.

 It was, however, enough. Enough to keep the police from charging

 Anthrax's mother. And enough for them to charge him.

 [ ]

 Anthrax didn't see his final list of charges until the day he appeared

 in court on 28 August 1995. The whole case seemed to be a bit

 disorganised. His Legal Aid lawyer had little knowledge of computers,

 let alone computer crime. He told Anthrax he could ask for an

 adjournment because he hadn't seen the final charges until so late,

 but Anthrax wanted to get the thing over and done with. They had

 agreed that Anthrax would plead guilty to the charges and hope for a

 reasonable magistrate.

 Anthrax looked through the hand-up brief provided by the prosecution,

 which included a heavily edited transcript of his interview with the

 police. It was labelled as a `summary', but it certainly didn't

 summarise everything important in that interview. Either the

 prosecution or the police had cut out all references to the fact that

 the police had threatened to charge Anthrax's mother if he didn't

 agree to be interviewed.

 Anthrax pondered the matter. Wasn't everything relevant to his case

 supposed to be covered in a hand-up brief? This seemed very relevant

 to his case, yet there wasn't a mention of it anywhere in the

 document. He began to wonder if the police had edited down the

 transcript just so they could cut out that portion of the interview.

 Perhaps the judge wouldn't be too happy about it. He thought that

 maybe the police didn't want to be held accountable for how they had

 dealt with his mother.

 The rest of the hand-up brief wasn't much better. The only statement

 by an actual `witness' to Anthrax's hacking was from his former

 room-mate, who claimed that he had watched Anthrax break into a NASA

 computer and access an `area of the computer system which showed the

 latitude/longitude of ships'.

 Did space ships even have longitudes and latitudes? Anthrax didn't

 know. And he had certainly never broken into a NASA computer in front

 of the room-mate. It was absurd. This guy is lying, Anthrax thought,

 and five minutes under cross-examination by a reasonable lawyer would

 illustrate as much. Anthrax's instincts told him the prosecution had a

 flimsy case for some of the charges, but he felt overwhelmed by

 pressure from all sides--his family, the bustle in the courtroom, even

 the officiousness of his own lawyer quickly rustling through his

 papers.

 Anthrax looked around the room. His eyes fell on his father, who sat

 waiting on the public benches. Anthrax's lawyer wanted him there to

 give evidence during sentencing. He thought it would look good to show

 there was a family presence. Anthrax gave the suggestion a cool

 reception. But he didn't understand how courts worked, so he followed

 his lawyer's advice.

 Anthrax's mother was back at his apartment, waiting for news. She had

 been on night duty and was supposed to be sleeping. That was the

 ostensible reason she didn't attend. Anthrax thought perhaps that the

 tension was too much for her. Whatever the reason, she didn't sleep

 all that day. She tidied the place, washed the dishes, did the

 laundry, and kept herself as busy as the tiny apartment would allow

 her.

 Anthrax's girlfriend, a pretty, moon-faced Turkish girl, also came to

 court. She had never been into the hacking scene. A group of school

 children, mostly girls, chatted in the rows behind her.

 Anthrax read through the four-page summary of facts provided by the

 prosecution. When he reached the final page, his heart stopped. The

 final paragraph said:

 31. Penalty

 s85ZF (a)--12 months, $6000 or both

 s76E(a)--2 years, $12000 or both

 Pointing to the last paragraph, Anthrax asked his lawyer what that was

 all about. His lawyer told him that he would probably get prison but,

 well, it wouldn't be that bad and he would just have `to take it on

 the chin'. He would, after all, be out in a year or two.

 Rapists sometimes got off with less than that. Anthrax couldn't

 believe the prosecution was asking for prison. After he cooperated,

 suffering through that miserable interview. He had no prior

 convictions. But the snowball had been set in motion. The magistrate

 appeared and opened the court.

 Anthrax felt he couldn't back out now and he pleaded guilty to 21

 counts, including one charge of inserting data and twenty charges of

 defrauding or attempting to defraud a carrier.

 His lawyer put the case for a lenient sentence. He called Anthrax's

 father up on the stand and asked him questions about his son. His

 father probably did more harm than good. When asked if he thought his

 son would offend again, his father replied, `I don't know'.

 Anthrax was livid. It was further unconscionable behaviour. Not long

 before the trial, Anthrax had discovered that his father had planned

 to sneak out of the country two days before the court case. He was

 going overseas, he told his wife, but not until after the court case.

 It was only by chance that she discovered his surreptitious plans to

 leave early. Presumably he would find his son's trial humiliating.

 Anthrax's mother insisted he stayed and he begrudgingly delayed the

 trip.

 His father sat down, a bit away from Anthrax and his lawyer. The

 lawyer provided a colourful alternative to the prosecutor. He perched

 one leg up on his bench, rested an elbow on the knee and stroked his

 long, red beard. It was an impressive beard, more than a foot long and

 thick with reddish brown curls. Somehow it fitted with his two-tone

 chocolate brown suit and his tie, a breathtakingly wide creation with

 wild patterns in gold. The suit was one size too small. He launched

 into the usual courtroom flourish--lots of words saying nothing. Then

 he got to the punch line.

 `Your worship, this young man has been in all sorts of places. NASA,

 military sites, you wouldn't believe some of the places he has been.'

 `I don't think I want to know where he has been,' the magistrate

 answered wryly.

 The strategy was Anthrax's. He thought he could turn a

 liability into an asset by showing that he had been in many

 systems--many sensitive systems--but had done no malicious damage in

 any of them.

 The strategy worked and the magistrate announced there was no way he

 was sending the young hacker to jail.

 The prosecutor looked genuinely disappointed and launched a counter

 proposal--1500 hours of community service. Anthrax caught his breath.

 That was absurd. It would take almost nine months, full time. Painting

 buildings, cleaning toilets. Forget about his university studies. It was

 almost as bad as prison.

 Anthrax's lawyer protested. `Your Worship, that penalty is something

 out of cyberspace.' Anthrax winced at how corny that sounded, but the

 lawyer looked very pleased with himself.

 The magistrate refused to have a bar of the prosecutor's counter

 proposal. Anthrax's girlfriend was impressed with the magistrate. She

 didn't know much about the law or the court system, but he seemed a

 fair man, a just man. He didn't appear to want to give a harsh

 punishment to Anthrax at all. But he told the court he had to send a

 message to Anthrax, to the class of school children in the public

 benches and to the general community that hacking was wrong in the

 eyes of the law. Anthrax glanced back at the students. They looked

 like they were aged thirteen or fourteen, about the age he got into

 hacking and phreaking.

 The magistrate announced his sentence. Two hundred hours of community

 service and $6116.90 of restitution to be paid to two telephone

 companies--Telecom and Teleglobe in Canada. It wasn't prison, but it was

 a staggering amount of money for a student to rake up. He had a year to

 pay it off, and it would definitely take that long. At least he was

 free.

 Anthrax's girlfriend thought how unlucky it was to have landed those

 giggling school children in the courtroom on that day. They laughed

 and pointed and half-whispered. Court was a game. They didn't seem to

 take the magistrate's warning seriously. Perhaps they were gossiping

 about the next party. Perhaps they were chatting about a new pair of

 sneakers or a new CD.

 And maybe one or two murmured quietly how cool it would be to break

 into NASA.

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 AFTERWORD

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 It was billed as the `largest annual gathering of those in, related

 to, or wishing to know more about the computer underground', so I

 thought I had better go.

 HoHoCon in Austin, Texas, was without a doubt one of the strangest

 conferences I have attended. During the weekend leading up to New Year's

 Day 1995, the Ramada Inn South was overrun by hackers, phreakers,

 ex-hackers, underground sympathisers, journalists, computer company

 employees and American law enforcement agents. Some people had come from

 as far away as Germany and Canada.

 The hackers and phreakers slept four or six to a room--if they slept

 at all. The feds slept two to a room. I could be wrong; maybe they

 weren't feds at all. But they seemed far too well dressed and well

 pressed to be anything else. No one else at HoHoCon ironed their

 T-shirts.

 I left the main conference hall and wandered into Room 518--the

 computer room--sat down on one of the two hotel beds which had been

 shoved into a corner to make room for all the computer gear, and

 watched. The conference organisers had moved enough equipment in there

 to open a store, and then connected it all to the Internet. For nearly

 three days, the room was almost continuously full. Boys in their late

 teens or early twenties lounged on the floor talking, playing with

 their cell phones and scanners or tapping away at one of the six or

 seven terminals. Empty bags of chips, Coke cans and pizza boxes

 littered the room. The place felt like one giant college dorm floor

 party, except that the people didn't talk to each other so much as to

 their computers.

 These weren't the only interesting people at the con. I met up with an

 older group of nonconformists in the computer industry, a sort of

 Austin intelligentsia. By older, I mean above the age of 26. They were

 interested in many of the same issues as the young group of

 hackers--privacy, encryption, the future of a digital world--and they

 all had technical backgrounds.

 This loose group of blue-jean clad thinkers, people like Doug Barnes,

 Jeremy Porter and Jim McCoy, like to meet over enchiladas and

 margueritas at university-style cafes. They always seemed to have

 three or four projects on the run. Digital cash was the flavour of the

 month when I met them. They were unconventional, perhaps even a little

 weird, but they were also bright, very creative and highly innovative.

 They were just the sort of people who might marry creative ideas with

 maturity and business sense, eventually making widespread digital cash

 a reality.

 I began to wonder how many of the young men in Room 518 might follow

 the same path. And I asked myself: where are these people in

 Australia?

 Largely invisible or perhaps even non-existent, it seems. Except maybe

 in the computer underground. The underground appears to be one of the

 few places in Australia where madness, creativity, obsession,

 addiction and rebellion collide like atoms in a cyclotron.

 [ ]

 After the raids, the arrests and the court cases on three continents,

 what became of the hackers described in this book?

 Most of them went on to do interesting and constructive things with

 their lives. Those who were interviewed for this work say they have

 given up hacking for good. After what many of them had been through, I

 would be surprised if any of them continued hacking.

 Most of them, however, are not sorry for their hacking activities.

 Some are sorry they upset people. They feel badly that they caused

 system admins stress and unhappiness by hacking their systems. But

 most do not feel hacking is wrong--and few, if any, feel that

 `look-see hacking', as prosecuting barrister Geoff Chettle termed

 non-malicious hacking, should be a crime.

 For the most part, their punishments have only hardened their views on

 the subject. They know that in many cases the authorities have sought

 to make examples of them, for the benefit of rest of the computer

 underground. The state has largely failed in this objective. In the

 eyes of many in the computer underground, these prosecuted hackers are

 heroes.

 PAR

 When I met Par in Tucson, Arizona, he had travelled from a tiny,

 snow-laden Mid-Western town where he was living with his grandparents.

 He was looking for work, but hadn't been able to find anything.

 As I drove around the outskirts of Tucson, a little jetlagged and

 disoriented, I was often distracted from the road by the beauty of the

 winter sun on the Sonoran desert cacti. Sitting in the front passenger

 seat, Par said calmly, `I always wondered what it would be like to

 drive on the wrong side of the road'.

 I swerved back to the right side of the road.

 Par is still like that. Easy-going, rolling with the punches, taking

 what life hands him. He is also on the road again.

 He moved back to the west coast for a while, but will likely pack up

 and go somewhere else before long. He picks up temporary work where he

 can, often just basic, dull data-entry stuff. It isn't easy. He can't

 just explain away a four-year gap in his resumé with `Successfully

 completed a telecommuting course for fugitives. Trained by the US

 Secret Service'. He thought he might like to work at a local college

 computer lab, helping out the students and generally keeping the

 equipment running. Without any professional qualifications, that

 seemed an unlikely option these days.

 Although he is no longer a fugitive, Par's life hasn't changed that

 much. He speaks to his mother very occasionally, though they don't

 have much in common. Escaping his computer crimes charges proved

 easier than overcoming the effects of being a fugitive for so long on

 his personality and lifestyle. Now and again, the paranoia sets in

 again. It seems to come in waves. There aren't many support mechanisms

 in the US for an unemployed young man who doesn't have health

 insurance.

 PRIME SUSPECT

 Prime Suspect has no regrets about his choices. He believed that he

 and Mendax were headed in different directions in life. The friendship

 would have ended anyway, so he decided that he was not willing to go

 to prison for Mendax.

 He completed a TAFE course in computer programming and found a job in

 the burgeoning Internet industry. He likes his job. His employer, who

 knows about his hacking convictions, recently gave him a pay rise. In

 mid-1994, he gave up drugs for good. In 1995 he moved into a shared

 house with some friends, and in August 1996 he stopped smoking

 cigarettes.

 Without hacking, there seems to be time in his life to do new things.

 He took up sky-diving. A single jump gives him a high which lasts for

 days, sometimes up to a week. Girls have captured his interest. He's

 had a few girlfriends and thinks he would like to settle into a

 serious relationship when he finds the right person.

 Recently, Prime Suspect has been studying martial arts. He tries to

 attend at least four classes a week, sometimes more, and says he has a

 special interest in the spiritual and philosophical sides of martial

 arts. Most days, he rises at 5 a.m., either to jog or to meditate.

 MENDAX

 In 1992 Mendax and Trax teamed up with a wealthy Italian real-estate

 investor, purchased La Trobe University's mainframe computer

 (ironically, a machine they had been accused of hacking) and started a

 computer security company. The company eventually dissolved when the

 investor disappeared following actions by his creditors.

 After a public confrontation in 1993 with Victorian Premier Jeff

 Kennett, Mendax and two others formed a civil rights organisation to

 fight corruption and lack of accountability in a Victorian government

 department. As part of this ongoing effort, Mendax acted as a conduit

 for leaked documents and became involved in a number of court cases

 against the department during 1993-94. Eventually, he gave evidence in

 camera to a state parliamentary committee examining the issues, and

 his organisation later facilitated the appearance of more than 40

 witnesses at an investigation by the Auditor-General.

 Mendax volunteers his time and computer expertise for several other

 non-profit community organisations. He believes strongly in the

 importance of the non-profit sector, and spends much of his free time

 as an activist on different community projects. Mendax has provided

 information or assistance to law-enforcement bodies, but not against

 hackers. He said, `I couldn't ethically justify that. But as for

 others, such as people who prey on children or corporate spies, I am

 not concerned about using my skills there.'

 Still passionate about coding, Mendax donates his time to various

 international programming efforts and releases some of his programs

 for free on the Internet. His philosophy is that most of the lasting

 social advances in the history of man have been a direct result of new

 technology.

 NorTel and a number of other organisations he was accused of hacking

 use his cryptography software--a fact he finds rather ironic.

 ANTHRAX

 Anthrax moved to Melbourne, where he is completing a university course

 and working on freelance assignments in the computer networking area

 of a major corporation.

 His father and mother are divorcing. Anthrax doesn't talk to his

 father at all these days.

 Anthrax's mother's health has stabilised somewhat since the completion

 of the court case, though her condition still gives her chronic pain.

 Despite some skin discolouration caused by the disease, she looks

 well. As a result of her years of work in the local community, she has

 a loyal group of friends who support her through bad bouts of the

 illness. She tries to live without bitterness and continues to have a

 good relationship with both her sons.

 Anthrax is no longer involved in the Nation of Islam, but he is still

 a devout Muslim. An acquaintance of his, an Albanian who ran a local

 fish and chips shop, introduced him to a different kind of Islam. Not

 long after, Anthrax became a Sunni Muslim. He doesn't drink alcohol or

 gamble, and he attends a local mosque for Friday evening prayers. He

 tries to read from the Qu'raan every day and to practise the tenets of

 his religion faithfully.

 With his computer and business skills now sought after by industry, he

 is exploring the possibility of moving to a Muslim country in Asia or

 the Middle East. He tries to promote the interests of Islam worldwide.

 Most of his pranking needs are now met by commercial CDs--recordings

 of other people's pranking sold through underground magazines and

 American mail order catalogues. Once in a long while, he still rings

 Mr McKenny in search of the missing shovel.

 Anthrax felt aggrieved at the outcome of his written complaint to the

 Office of the Ombudsman. In the complaint, Anthrax gave an account of

 how he believed the AFP had behaved inappropriately throughout his

 case. Specifically, he alleged that the AFP had pressured his mother

 with threats and had harassed him, taken photographs of him without

 his permission, given information to his university about his case

 prior to the issue of a summons and the resolution of his case, and

 made racist comments toward him during the raid.

 In 1995-96, a total of 1157 complaints were filed against the AFP, 683

 of which were investigated by the Commonwealth Ombudsman. Of the

 complaint investigations completed and reviewed, only 6 per cent were

 substantiated. Another 9 per cent were deemed to be `incapable of

 determination', about 34 per cent were `unsubstantiated', and in more

 than a quarter of all cases the Ombudsman either chose not to

 investigate or not to continue to investigate a complaint.

 The Office of the Ombudsman referred Anthrax's matter to the AFP's

 Internal Investigations office. Although Anthrax and his mother both

 gave statements to the investigating officers, there was no other

 proof of Anthrax's allegations. In the end, it came down to Anthrax

 and his mother's words against those of the police.

 The AFP's internal investigation concluded that Anthrax's complaints

 could either not be substantiated or not be determined, in part due to

 the fact that almost two years had passed since the original raid. For

 the most part, the Ombudsman backed the AFP's finding. No

 recommendation was made for the disciplining of any officers.

 Anthrax's only consolation was a concern voiced by the Ombudsman's

 Office. Although the investigating officer agreed with the AFP

 investigators that the complaint could not be substantiated, she

 wrote, `I am concerned that your mother felt she was compelled to

 pressure you into attending an interview based on a fear that she

 would be charged because her phone was used to perpetrate the

 offences'.

 Anthrax remains angry and sceptical about his experience with the

 police. He believes a lot of things need to be changed about the way

 the police operate. Most of all, he believes that justice will never

 be assured in a system where the police are allowed to investigate

 themselves.

 PAD AND GANDALF

 After Pad and Gandalf were released from prison, they started up a

 free security advisory service on the Internet. One reason they began

 releasing 8lgm advisories, as they were known, was to help admins

 secure their own systems. The other reason was to thumb their noses at

 the conservatives in the security industry.

 Many on the Internet considered the 8lgm advisories to be the best

 available at the time--far better than anything CERT had ever

 produced. Pad and Gandalf were sending their own message back to the

 establishment. The message, though never openly stated, was something

 like this: `You busted us. You sent us to prison. But it didn't

 matter. You can't keep information like this secret. Further, we are

 still better than you ever were and, to prove it, we are going to beat

 you at your own game.'

 Believing that the best way to keep a hacker out of your system is to

 secure it properly in the first place, the two British hackers

 rejected security gurus who refused to tell the world about new

 security holes. Their 8lgm advisories began marginalising the

 traditional industry security reports, and helped to push the industry

 toward its current, more open attitude.

 Pad and Gandalf now both work, doing computer programming jobs on

 contract, sometimes for financial institutions. Their clients like

 them and value their work. Both have steady girlfriends.

 Pad doesn't hack any more. The reason isn't the risk of getting caught

 or the threat of prison. He has stopped hacking because he has

 realised what a headache it is for a system administrator to clean up

 his or her computer after an attack. Searching through logs. Looking

 for backdoors the hacker might have left behind. The hours, the

 hassle, the pressure--he thinks it is wrong to put anyone through

 that. Pad understands far better now how much strain a hacker

 intrusion can cause another human being.

 There is another reason Pad has given up hacking: he has simply

 outgrown the desire. He says that he has better things to do with his

 time. Computers are a way for him to earn a living, not a way to spend

 his leisure time. After a trip overseas he decided that real

 travel--not its electronic cousin--was more interesting than hacking.

 He has also learned to play the guitar, something he believes he would

 have done years ago if he hadn't spent so much time hacking.

 Gandalf shares Pad's interest in travelling. One reason they like

 contract work is because it lets them work hard for six months, save

 some money, and then take a few months off. The aim of both ex-hackers

 for now is simply to sling backpacks over their shoulders and bounce

 around the globe.

 Pad still thinks that Britain takes hacking far too seriously and he

 is considering moving overseas permanently. The 8lgm court case made

 him wonder about the people in power in Britain--the politicians, the

 judges, the law enforcement officers. He often thinks: what kind of

 people are running this show?

 STUART GILL

 In 1993, the Victorian Ombudsman1 and the Victoria Police2 both

 investigated the leaking of confidential police information in

 association with Operation Iceberg--a police investigation into

 allegations of corruption against Assistant Commissioner of Police

 Frank Green. Stuart Gill figured prominently in both reports.

 The Victoria Police report concluded that `Gill was able to infiltrate

 the policing environment by skilfully manipulating himself and

 information to the unsuspecting'. The Ombudsman concluded that a

 `large quantity of confidential police information, mainly from the

 ISU database, was given to ... Gill by [Victoria Police officer]

 Cosgriff'.

 The police report stated that Inspector Chris Cosgriff had

 deliberately leaked confidential police information to Gill, and

 reported that he was `besotted with Gill'. Superintendent Tony Warren,

 ex-Deputy Commissioner John Frame and ex-Assistant Commissioner

 Bernice Masterston were also criticised in the report.

 The Ombudsman concluded that Warren and Cosgriff's relationship with

 Gill was `primarily responsible for the release of confidential

 information'. Interestingly, however, the Ombudsman also stated,

 `Whilst Mr Gill may have had his own agenda and taken advantage of his

 relationship with police, [the] police have equally used and in some

 cases misused Mr Gill for their own purposes'.

 The Ombudsman's report further concluded that there was no evidence of

 criminal conduct by Frank Green, and that the `allegations made over

 the years against Mr Green should have been properly and fully

 investigated at the time they were made'.

 PHOENIX

 As his court case played in the media, Phoenix was speeding on his

 motorcycle through an inner-city Melbourne street one rainy night when

 he hit a car. The car's driver leapt from the front seat and found a

 disturbing scene. Phoenix was sprawled across the road. His helmet had

 a huge crack on the side, where his head had hit the car's petrol

 tank, and petrol had spilled over the motorcycle and its rider.

 Miraculously, Phoenix was unhurt, though very dazed. Some bystanders

 helped him and the distraught driver to a nearby halfway house. They

 called an ambulance, and then made the two traumatised young men some

 tea in the kitchen. Phoenix's mother arrived, called by a bystander at

 Phoenix's request. The ambulance workers confirmed that Phoenix had

 not broken any bones but they recommended he go to hospital to check

 for possible concussion.

 Still both badly shaken, Phoenix and the driver exchanged names and

 phone numbers. Phoenix told the driver he did technical work for a

 0055 telephone service, then said, `You might recognise me. I'm

 Phoenix. There's this big computer hacking case going on in

 court--that's my case'.

 The driver looked at him blankly.

 Phoenix said, `You might have seen me on the TV news.'

 No, the driver said, somewhat amazed at the strange things which go

 through the dazed mind of a young man who has so narrowly escaped

 death.

 Some time after Phoenix's close brush with death, the former hacker

 left his info-line technician's job and began working in the

 information technology division of a large Melbourne-based

 corporation. Well paid in his new job, Phoenix is seen, once again, as

 the golden-haired boy. He helped to write a software program which

 reduces waste in one of the production lines and reportedly saved the

 company thousands of dollars. Now he travels abroad regularly, to

 Japan and elsewhere.

 He had a steady girlfriend for a time, but eventually she broke the

 relationship off to see other people. Heartbroken, he avoided dating

 for months. Instead, he filled his time with his ever-increasing

 corporate responsibilities.

 His new interest is music. He plays electric guitar in an amateur

 band.

 ELECTRON

 A few weeks after his sentencing, Electron had another psychotic

 episode, triggered by a dose of speed. He was admitted to hospital

 again, this time at Larundel. After a short stay, he was released and

 underwent further psychiatric care.

 Some months later, he did speed again, and suffered another bout of

 psychosis. He kept reading medical papers on the Internet about his

 condition and his psychiatrists worried that his detailed research

 might interfere with their ability to treat him.

 He moved into special accommodation for people recovering from mental

 instabilities. Slowly, he struggled to overcome his illness. When

 people came up to him and said things like, `What a nice day it is!'

 Electron willed himself to take their words at face value, to accept

 that they really were just commenting on the weather, nothing more.

 During this time, he quit drugs, alcohol and his much-hated accounting

 course. Eventually he was able to come off his psychiatric medicines

 completely. He hasn't taken drugs or had alcohol since December 1994.

 His only chemical vice in 1996 was cigarettes. By the beginning of

 1997 he had also given up tobacco.

 Electron hasn't talked to either Phoenix or Nom since 1992.

 In early 1996, Electron moved into his own flat with his steady

 girlfriend, who studies dance and who also successfully overcame

 mental illness after a long, hard struggle. Electron began another

 university course in a philosophy-related field. This time university

 life agreed with him, and his first semester transcript showed honours

 grades in every class. He is considering moving to Sydney for further

 studies.

 Electron worked off his 300 hours of community service by painting walls

 and doing minor handyman work at a local primary school. Among the small

 projects the school asked him to complete was the construction of a

 retaining wall. He designed and dug, measured and fortified. As he

 finished off the last of his court-ordered community service hours on

 the wall, he discovered that he was rather proud of his creation. Even

 now, once in a while, he drives past the school and looks at the wall.

 It is still standing.

 [ ]

 There are still hacking cases in Australia. About the same time as

 Mendax's case was being heard in Victoria, The Crawler pleaded guilty

 to 23 indictable offences and thirteen summary offences--all hacking

 related charges--in Brisbane District Court. On 20 December 1996, the

 21-year-old Queenslander was given a three-year suspended prison

 sentence, ordered to pay $5000 in reparations to various

 organisations, and made to forfeit his modem and two computers. The

 first few waves of hackers may have come and gone, but hacking is far

 from dead. It is merely less visible.

 Law enforcement agencies and the judiciaries of several countries have

 tried to send a message to the next generation of would-be hackers.

 The message is this: Don't hack.

 But the next generation of elite hackers and phreakers have heard a

 very different message, a message which says: Don't get caught.

 The principle of deterrence has not worked with hackers at this level.

 I'm not talking here about the codes-kids--the teeny-bopper, carding,

 wanna-be nappies who hang out on IRC (Internet relay chat). I'm

 talking about the elite hackers. If anything, law enforcement

 crackdowns have not only pushed them further underground, they have

 encouraged hackers to become more sophisticated than ever before in

 the way they protect themselves. Adversity is the mother of invention.

 When police officers march through the front door of a hacker's home

 today, they may be better prepared than their predecessors, but they

 will also be facing bigger hurdles. Today, top hackers encrypt

 everything sensitive. The data on their hard drives, their live data

 connections, even their voice conversations.

 So, if hackers are still hacking, who are their targets?

 It is a broad field. Any type of network provider--X.25, cellular

 phone or large Internet provider. Computer vendors--the manufacturers

 of software and hardware, routers, gateways, firewalls or phone

 switches. Military institutions, governments and banks seem to be a

 little less fashionable these days, though there are still plenty of

 attacks on these sorts of sites.

 Attacks on security experts are still common, but a new trend is the

 increase in attacks on other hackers' systems. One Australian hacker

 joked, `What are the other hackers going to do? Call the Feds? Tell

 the AFP, "Yes, officer, that's right, some computer criminal broke

 into my machine and stole 20000 passwords and all my exploitation code

 for bypassing firewalls".'

 For the most part, elite hackers seem to work alone, because of the

 well-advertised risks of getting caught. There are still some

 underground hacking communities frequented by top hackers, most notably

 UPT in Canada and a few groups like the l0pht in the US, but such groups

 are far less common, and more fragmented than they used to be.

 These hackers have reached a new level of sophistication, not just in

 the technical nature of their attacks, but in their strategies and

 objectives. Once, top hackers such as Electron and Phoenix were happy

 to get copies of Zardoz, which listed security holes found by industry

 experts. Now top hackers find those holes themselves--by reading line

 by line through the proprietary source code from places like DEC, HP,

 CISCO, Sun and Microsoft.

 Industrial espionage does not seem to be on the agenda, at least with

 anyone I interviewed. I have yet to meet a hacker who has given

 proprietary source code to a vendor's competitor. I have, however, met

 a hacker who found one company's proprietary source code inside the

 computer of its competitor. Was that a legal copy of the source code?

 Who knows? The hacker didn't think so, but he kept his mouth shut

 about it, for obvious reasons.

 Most of the time, these hackers want to keep their original bugs as

 quiet as possible, so vendors won't release patches.

 The second popular target is source code development machines. The top

 hackers have a clear objective in this area: to install their own

 backdoors before the product is released. They call it `backdooring' a

 program or an operating system. The word `backdoor' is now used as

 both a noun and a verb in the underground. Hackers are very nervous

 discussing this subject, in part because they don't want to see a

 computer company's stock dive and people lose their jobs.

 What kind of programs do these hackers want to backdoor? Targets

 mentioned include at least one major Internet browser, a popular game,

 an Internet packet filter and a database product used by law

 enforcement agencies.

 A good backdoor is a very powerful device, creating a covert channel

 through even the most sturdy of firewalls into the heart of an

 otherwise secure network. In a net browser, a backdoor would in theory

 allow a hacker to connect directly into someone's home computer every

 time he or she wandered around the World Wide Web. However, don't

 expect hackers to invade your suburban home just yet. Most elite

 hackers couldn't care less about the average person's home computer.

 Perhaps you are wondering who might be behind this sort of attack.

 What sort of person would do this? There are no easy answers to that

 question. Some hackers are good people, some are bad, just like any

 group of people. The next generation of elite hackers are a diverse

 bunch, and relaying their stories would take another book entirely.

 However, I would like to introduce you to just one, to give you a

 window into the future.

 Meet SKiMo.

 A European living outside Australia, SKiMo has been hacking for at

 least four years, although he probably only joined the ranks of

 world-class hackers in 1995 or 1996. Never busted. Young--between the

 age of 18 and 25--and male. From a less than picture-perfect family.

 Fluent in English as a second language. Left-leaning in his

 politics--heading toward environmentally green parties and anarchy

 rather than traditional labour parties. Smokes a little dope and

 drinks alcohol, but doesn't touch the hard stuff.

 His musical tastes include early Pink Floyd, Sullen, Dog Eat Dog,

 Biohazard, old Ice-T, Therapy, Alanis Morissette, Rage Against the

 Machine, Fear Factory, Life of Agony and Napalm Death. He reads

 Stephen King, Stephen Hawking, Tom Clancy and Aldous Huxley. And any

 good books about physics, chemistry or mathematics.

 Shy in person, he doesn't like organised team sports and is not very

 confident around girls. He has only had one serious girlfriend, but

 the relationship finished. Now that he hacks and codes about four to

 five hours per day on average, but sometimes up to 36 hours straight,

 he doesn't have time for girls.

 `Besides,' he says, `I am rather picky when it comes to girls. Maybe

 if the girl shared the same interests ... but those ones are hard to

 find.' He adds, by way of further explanation, `Girls are different

 from hacking. You can't just brute force them if all else fails.'

 SKiMo has never intentionally damaged a computer system, nor would he.

 Indeed, when I asked him, he was almost offended by the question.

 However, he has accidentally done damage on a few occasions. In at

 least one case, he returned to the system and fixed the problem

 himself.

 Bored out of his mind for most of his school career, SKiMo spent a

 great deal of time reading books in class--openly. He wanted to send

 the teacher a message without actually jacking up in class.

 He got into hacking after reading a magazine article about people who

 hacked answering machines and VMBs. At that time, he had no idea what

 a VMB was, but he learned fast. One Sunday evening, he sat down with

 his phone and began scanning. Soon he was into phreaking, and visiting

 English-speaking party lines. Somehow, he always felt more comfortable

 speaking in English, to native English-speakers, perhaps because he

 felt a little like an outsider in his own culture.

 `I have always had the thought to leave my country as soon as I can,'

 he said.

 From the phreaking, it was a short jump into hacking.

 What made him want to hack or phreak in the first place? Maybe it was

 the desire to screw over the universally hated phone company, or

 `possibly the sheer lust for power' or then again, maybe he was simply

 answering his desire `to explore an intricate piece of technology'.

 Today, however, he is a little clearer on why he continues to hack.

 `My first and foremost motivation is to learn,' he said.

 When asked why he doesn't visit his local university or library to

 satisfy that desire, he answered, `in books, you only learn theory. It

 is not that I dislike the theory but computer security in real life is

 much different from theory'. Libraries also have trouble keeping pace

 with the rate of technological change, SKiMo said. `Possibly, it is

 also just the satisfaction of knowing that what I learn is

 proprietary--is "inside knowledge",' he added. There could, he said,

 be some truth in the statement that he likes learning in an

 adrenalin-inducing environment.

 Is he addicted to computers? SKiMo says no, but the indications are

 there. By his own estimate, he has hacked between 3000 and 10000

 computers in total. His parents--who have no idea what their son was

 up to day and night on his computer--worry about his behaviour. They

 pulled the plug on his machine many times. In SKiMo's own words, `they

 tried everything to keep me away from it'.

 Not surprisingly, they failed. SKiMo became a master at hiding his

 equipment so they couldn't sneak in and take it away. Finally, when he

 got sick of battling them over it and he was old enough, he put his

 foot down. `I basically told them, "Diz is ma fuckin' life and none o'

 yer business, Nemo"--but not in those words.'

 SKiMo says he hasn't suffered from any mental illnesses or

 instabilities--except perhaps paranoia. But he says that paranoia is

 justified in his case. In two separate incidents in 1996, he believed

 he was being followed. Try as he might, he couldn't shake the tails

 for quite some time. Perhaps it was just a coincidence, but he can

 never really be sure.

 He described one hacking attack to me to illustrate his current

 interests. He managed to get inside the internal network of a German

 mobile phone network provider, DeTeMobil (Deutsche Telekom). A former

 state-owned enterprise which was transformed into a publicly listed

 corporation in January 1995, Deutsche Telekom is the largest

 telecommunications company in Europe and ranks number three in the

 world as a network operator. It employs almost a quarter of a million

 people. By revenue, which totalled about $A37 billion in 1995, it is

 one of the five largest companies in Germany.

 After carefully researching and probing a site, SKiMo unearthed a

 method of capturing the encryption keys generated for DeTeMobil's

 mobile phone conversations.

 He explained: `The keys are not fixed, in the sense that they are

 generated once and then stored in some database. Rather, a key is

 generated for each phone conversation by the company's AUC

 [authentication centre], using the "Ki" and a random value generated

 by the AUC. The Ki is the secret key that is securely stored on the

 smart card [inside the cellphone], and a copy is also stored in the

 AUC. When the AUC "tells" the cellphone the key for that particular

 conversation, the information passes through the company's MSC [mobile

 switching centre].

 `It is possible to eavesdrop on a certain cellphone if one actively

 monitors either the handovers or the connection set-up messages from

 the OMC [operations and maintenance centre] or if one knows the Ki in

 the smart card.

 `Both options are entirely possible. The first option, which relies on

 knowing the A5 encryption key, requires the right equipment. The

 second option, using the Ki, means you have to know the A3/A8

 algorithms as well or the Ki is useless. These algorithms can be

 obtained by hacking the switch manufacturer, i.e. Siemens, Alcatel,

 Motorola ...

 `As a call is made from the target cellphone, you need to feed the A5

 key into a cellphone which has been modified to let it eavesdrop on

 the channel used by the cellphone. Normally, this eavesdropping will

 only produce static--since the conversation is encrypted. However,

 with the keys and equipment, you can decode the conversation.'

 This is one of the handover messages, logged with a CCITT7 link

 monitor, that he saw:

 13:54:46"3 4Rx< SCCP 12-2-09-1 12-2-04-0 13 CR

 BSSM HOREQ

 BSSMAP GSM 08.08 Rev 3.9.2 (BSSM) HaNDover REQuest (HOREQ)

 -------0 Discrimination bit D BSSMAP

 0000000- Filler

 00101011 Message Length 43

 00010000 Message Type 0x10

 Channel Type

 00001011 IE Name Channel type

 00000011 IE Length 3

 00000001 Speech/Data Indicator Speech

 00001000 Channel Rate/Type Full rate TCH channel Bm

 00000001 Speech Encoding Algorithm GSM speech algorithm Ver 1

 Encryption Information

 00001010 IE Name Encryption information

 00001001 IE Length 9

 00000010 Algorithm ID GSM user data encryption V. 1

 \*\*\*\*\*\*\*\* Encryption Key C9 7F 45 7E 29 8E 08 00

 Classmark Information Type 2

 00010010 IE Name Classmark information type 2

 00000010 IE Length 2

 -----001 RF power capability Class 2, portable

 ---00--- Encryption algorithm Algorithm A5

 000----- Revision level

 -----000 Frequency capability Band number 0

 ----1--- SM capability present

 -000---- Spare

 0------- Extension

 Cell Identifier

 00000101 IE Name Cell identifier

 00000101 IE Length 5

 00000001 Cell ID discriminator LAC/CI used to ident cell

 \*\*\*\*\*\*\*\* LAC 4611

 \*\*\*\*\*\*\*\* CI 3000

 PRIority

 00000110 IE Name Priority

 00000001 IE Length 1

 -------0 Preemption allowed ind not allowed

 ------0- Queueing allowed ind not allowed

 --0011-- Priority level 3

 00------ Spare

 Circuit Identity Code

 00000001 IE Name Circuit identity code

 00000000 PCM Multiplex a-h 0

 ---11110 Timeslot in use 30

 101----- PCM Multiplex i-k 5

 Downlink DTX flag

 00011001 IE Name Downlink DTX flag

 -------1 DTX in downlink direction disabled

 0000000- Spare

 Cell Identifier

 00000101 IE Name Cell identifier

 00000101 IE Length 5

 00000001 Cell ID discriminator LAC/CI used to ident cell

 \*\*\*\*\*\*\*\* LAC 4868

 \*\*\*\*\*\*\*\* CI 3200

 The beauty of a digital mobile phone, as opposed to the analogue

 mobile phones still used by some people in Australia, is that a

 conversation is reasonably secure from eavesdroppers. If I call you on

 my digital mobile, our conversation will be encrypted with the A5

 encryption algorithm between the mobile phone and the exchange. The

 carrier has copies of the Kis and, in some countries, the government

 can access these copies. They are, however, closely guarded secrets.

 SKiMo had access to the database of the encrypted Kis and access to

 some of the unencrypted Kis themselves. At the time, he never went to

 the trouble of gathering enough information about the A3 and A8

 algorithms to decrypt the full database, though it would have been

 easy to do so. However, he has now obtained that information.

 To SKiMo, access to the keys generated for each of thousands of German

 mobile phone conversations was simply a curiosity--and a trophy. He

 didn't have the expensive equipment required to eavesdrop. To an

 intelligence agency, however, access could be very valuable,

 particularly if some of those phones belonged to people such as

 politicians. Even more valuable would be ongoing access to the OMC, or

 better still, the MSC. SkiMo said he would not provide this to any

 intelligence agency.

 While inside DeTeMobil, SKiMo also learned how to interpret some of

 the mapping and signal-strength data. The result? If one of the

 company's customers has his mobile turned on, SKiMo says he can

 pinpoint the customer's geographic location to within one kilometre.

 The customer doesn't even have to be talking on the mobile. All he has

 to do is have the phone turned on, waiting to receive calls.

 SKiMo tracked one customer for an afternoon, as the man travelled

 across Germany, then called the customer up. It turned out they spoke

 the same European language.

 `Why are you driving from Hamburg to Bremen with your phone on

 stand-by mode?' SKiMo asked.

 The customer freaked out. How did this stranger at the end of the

 phone know where he had been travelling?

 SKiMo said he was from Greenpeace. `Don't drive around so much. It

 creates pollution,' he told the bewildered mobile customer. Then he

 told the customer about the importance of conserving energy and how

 prolonged used of mobile phones affected certain parts of one's brain.

 Originally, SKiMo broke into the mobile phone carriers' network

 because he wanted `to go completely cellular'--a transition which he

 hoped would make him both mobile and much harder to trace. Being able

 to eavesdrop on other people's calls-- including those of the

 police--was going to be a bonus.

 However, as he pursued this project, he discovered that the code from

 a mobile phone manufacturer which he needed to study was `a

 multi-lingual project'. `I don't know whether you have ever seen a

 multi-lingual project,' SKiMo says, `where nobody defines a common

 language that all programmers must use for their comments and function

 names? They look horrible. They are no fun to read.' Part of this one

 was in Finnish.

 SKiMo says he has hacked a number of major vendors and, in several

 cases, has had access to their products' source codes.

 Has he had the access to install backdoors in primary source code for

 major vendors? Yes. Has he done it? He says no. On other hand, I asked

 him who he would tell if he did do it. `No-one,' he said, `because

 there is more risk if two people know than if one does.'

 SKiMo is mostly a loner these days. He shares a limited amount of

 information about hacking exploits with two people, but the

 conversations are usually carefully worded or vague. He substitutes a

 different vendor's names for the real one, or he discusses technical

 computer security issues in an in-depth but theoretical manner, so he

 doesn't have to name any particular system.

 He doesn't talk about anything to do with hacking on the telephone.

 Mostly, when he manages to capture a particularly juicy prize, he

 keeps news of his latest conquest to himself.

 It wasn't always that way. `When I started hacking and phreaking, I

 had the need to learn very much and to establish contacts which I

 could ask for certain things--such as technical advice,' SKiMo said.

 `Now I find it much easier to get that info myself than asking anyone

 for it. I look at the source code, then experiment and discover new

 bugs myself.'

 Asked if the ever-increasing complexity of computer technology hasn't

 forced hackers to work in groups of specialists instead of going solo,

 he said in some cases yes, but in most cases, no. `That is only true

 for people who don't want to learn everything.'

 SKiMo can't see himself giving up hacking any time in the near future.

 Who is on the other side these days?

 In Australia, it is still the Australian Federal Police, although the

 agency has come a long way since the early days of the Computer Crimes

 Unit. When AFP officers burst in on Phoenix, Nom and Electron, they

 were like the Keystone Cops. The police were no match for the

 Australian hackers in the subsequent interviews. The hackers were so

 far out in front in technical knowledge it was laughable.

 The AFP has been closing that gap with considerable alacrity. Under

 the guidance of officers like Ken Day, they now run a more technically

 skilled group of law enforcement officers. In 1995-96, the AFP had

 about 2800 employees, although some 800 of these worked in `community

 policing'--serving as the local police in places like the ACT and

 Norfolk Island. The AFP's annual expenditure was about $270 million in

 that year.

 As an institution, the AFP has recently gone through a major

 reorganisation, designed to make it less of a command-and-control

 military structure and more of an innovative, service oriented

 organisation.

 Some of these changes are cosmetic. AFP officers are now no longer

 called `constable' or `detective sergeant'--they are all just `federal

 agents'. The AFP now has a `vision' which is `to fight crime and

 win'.3 Its organisational chart had been transformed from a

 traditional, hierarchical pyramid of square boxes into a collection of

 little circles linked to bigger circles--all in a circle shape. No

 phallo-centric structures here. You can tell the politically correct

 management consultants have been visiting the AFP.

 The AFP has, however, also changed in more substantive ways. There are

 now `teams' with different expertise, and AFP investigators can draw

 on them on an as-needed basis. In terms of increased efficiency, this

 fluidity is probably a good thing.

 There are about five permanent officers in the Melbourne computer

 crimes area. Although the AFP doesn't release detailed budget

 breakdowns, my back-of-the-envelope analysis suggested that the AFP

 spends less than $1 million per year on the Melbourne computer crimes

 area in total. Sydney also has a Computer Crimes Unit.

 Catching hackers and phreakers is only one part of the unit's job.

 Another important task is to provide technical computer expertise for

 other investigations.

 Day still runs the show in Melbourne. He doesn't think or act like a

 street cop. He is a psychological player, and therefore well suited to

 his opponents. According to a reliable source outside the underground,

 he is also a clean cop, a competent officer, and `a nice guy'.

 However, being the head of the Computer Crimes Unit for so many years

 makes Day an easy target in the underground. In particular, hackers

 often make fun of how seriously he seems to take both himself and his

 job. When Day appeared on the former ABC show `Attitude', sternly

 warning the audience off hacking, he told the viewers, `It's not a

 game. It's a criminal act'.

 To hackers watching the show, this was a matter of opinion. Not long

 after the episode went to air, a few members of Neuro-cactus, an

 Australian group of hackers and phreakers which had its roots in

 Western Australia, decided to take the mickey out of Day. Two members,

 Pick and Minnow, clipped Day's now famous soundbite. Before long, Day

 appeared to be saying, `It's not a criminal act. It's a game'--to the

 musical theme of `The Bill'. The Neuro-cactus crowd quickly spread

 their lampoon across the underground via an illicit VMB connected to

 its own toll-free 008 number.

 Although Day does perhaps take himself somewhat seriously, it can't be

 much fun for him to deal with this monkey business week in and week

 out. More than one hacker has told me with great excitement, `I know

 someone who is working on getting Day's home number'. The word is that

 a few members of the underground already have the information and have

 used it. Some people think it would be hilarious to call up Day at

 home and prank him. Frankly, I feel a bit sorry for the guy. You can

 bet the folks in traffic operations don't have to put up with this

 stuff.

 But that doesn't mean I think these pranksters should be locked up

 either.

 If we, as a society, choose not to lock hackers up, then what should

 we do with them?

 Perhaps a better question is, do we really need to do anything with

 them?

 One answer is to simply ignore look-see hacking. Society could decide

 that it makes more sense to use valuable police resources to catch

 dangerous criminals--forgers, embezzlers, white-collar swindlers,

 corporate spies and malicious hackers--than to chase look-see hackers.

 The law must still maintain the capacity to punish hard where someone

 has strayed into what society deems serious crime. However, almost any

 serious crime committed by a hacker could be committed by a non-hacker

 and prosecuted under other legislation. Fraud, wilful damage and

 dealing in stolen property are crimes regardless of the medium--and

 should be punished appropriately.

 Does it make sense to view most look-see hackers--and by that I mean

 hackers who do not do malicious damage or commit fraud--as criminals?

 Probably not. They are primarily just a nuisance and should be treated

 as such. This would not be difficult to do. The law-makers could

 simply declare look-see hacking to be a minor legal infringement. In

 the worst-case scenario, a repeat offender might have to do a little

 community service. But such community service needs to be managed

 properly. In one Australian case, a corrections officer assigned a

 hacker to dig ditches with a convicted rapist and murderer.

 Many hackers have never had a job--in part because of the high youth

 unemployment in some areas--and so their community service might be

 their first `position'. The right community service placement must

 involve hackers using their computer skills to give something back to

 society, preferably in some sort of autonomous, creative project. A

 hacker's enthusiasm, curiosity and willingness to experiment can be

 directed toward a positive outcome if managed properly.

 In cases where hacking or phreaking has been an addiction, the problem

 should be treated, not criminalised. Most importantly, these hackers

 should not have convictions recorded against them, particularly if

 they're young. As Paul Galbally said to the court at Mendax's

 sentencing, `All the accused are intelligent--but their intelligence

 outstretched their maturity'. Chances are, most will be able to

 overcome or outgrow their addiction.

 In practice, most Australia's judges have been reasonably fair in

 their sentencing, certainly compared to judges overseas. None of the

 Australian hackers detailed in this work received a prison sentence.

 Part of this is due to happenstance, but part is also due to the sound

 judgments of people like Judge Lewis and Judge Kimm. It must be very

 tempting, sitting on the bench every day, to shoot from the hip

 interpreting new laws.

 As I sat in court listening to each judge, it quickly became clear

 that these judges had done their homework. With psychologist Tim

 Watson-Munro on the stand, Judge Lewis rapidly zeroed in on the

 subject of `free will'--as applied to addiction--regarding Prime

 Suspect. In Trax's case, Judge Kimm asked pointed questions which he

 could only have formulated after serious study of the extensive legal

 brief. Their well-informed judgments suggested a deeper understanding

 both of hacking as a crime, and of the intent of the largely untested

 computer crime legislation.

 However, a great deal of time and money has been wasted in the pursuit

 of look-see hackers, largely because this sort of hacking is treated

 as a major crime. Consider the following absurd situation created by

 Australia's federal computer criminal legislation.

 A spy breaks into a computer at the Liberal Party's headquarters and

 reads the party's top-secret election strategy, which he may want to

 pass on to the Labor Party. He doesn't insert or delete any data in

 the process, or view any commercial information. The penalty under

 this legislation? A maximum of six months in prison.

 That same spy decides he wants to get rich quick. Using the local

 telephone system, he hacks into a bank's computer with the intention

 of defrauding the financial institution. He doesn't view any

 commercial or personal information, or delete or insert any files. Yet

 the information he reviews--about the layout of a bank building, or

 how to set off its fire alarm or sprinkler system--proves vital in his

 plan to defraud the bank. His penalty: a maximum of two years prison.

 Our spy now moves onto bigger and better things. He penetrates a

 Department of Defence computer with the intention of obtaining

 information about Australia's military strategies and passing it on to

 the Malaysians. Again, he doesn't delete or insert any data--he just

 reads every sensitive planning document he can find. Under the federal

 anti-hacking laws, the maximum penalty he would receive would also be

 two years prison.

 Meanwhile, a look-see hacker breaks into a university computer without

 doing any damage. He doesn't delete any files. He FTPs a public-domain

 file from another system and quietly tucks it away in a hidden, unused

 corner of the university machine. Maybe he writes a message to someone

 else on-line. If caught, the law, as interpreted by the AFP and the

 DPP, says he faces up to ten years in prison. The reason? He has

 inserted or deleted data.

 Although the spy hacker might also face other charges--such as

 treason--this exercise illustrates some of the problems with the

 current computer crime legislation.

 The letter of the law says that our look-see hacker might face a

 prison term five times greater than the bank fraud criminal or the

 military spy, and twenty times greater than the anti-Liberal Party

 subversive, if he inserts or deletes any data. The law, as interpreted

 by the AFP, says that the look-see hacking described above should have

 the same maximum ten-year prison penalty as judicial corruption. It's

 a weird mental image--the corrupt judge and the look-see hacker

 sharing a prison cell.

 Although the law-makers may not have fully understood the

 technological aspects of hacking when they introduced the computer

 crimes legislation, their intent seems clear. They were trying to

 differentiate between a malicious hacker and a look-see hacker, but

 they could have worded it better.

 As it's worded, the legislation puts malicious, destructive hacking on

 a par with look-see hacking by saying that anyone who destroys,

 erases, alters or inserts data via a carrier faces a prison term,

 regardless of the person's intent. There is no gradation in the law

 between mere deletion of data and `aggravated deletion'--the maximum

 penalty is ten years for both. The AFP has taken advantage of this

 lack of distinction, and the result has been a steady stream of

 look-see hackers being charged with the most serious computer crime

 offences.

 Parliament makes the laws. Government institutions such as the AFP,

 the DPP and the courts interpret and apply those laws. The AFP and to

 some extent the DPP have applied the strict letter of the law

 correctly in most of the hacking cases described in this book. They

 have, however, missed the intention of the law. Change the law and

 they may behave differently. Make look-see hacking a minor offence and

 the institutions will stop going after the soft targets and hopefully

 spend more time on the real criminals.

 I have seen some of these hackers up close, studied them for two years

 and learned a bit about what makes them tick. In many ways, they are

 quintessentially Australian, always questioning authority and

 rebelling against `the establishment'. They're smart--in some cases

 very smart. A few might even be classified as technical geniuses.

 They're mischievous, but also very enterprising. They're rebels,

 public nuisances and dreamers.

 Most of all, they know how to think outside the box.

 This is not a flaw. Often, it is a very valuable trait--and one which

 pushes society forward into new frontiers. The question shouldn't be

 whether we want to crush it but how we should steer it in a different

 direction.

 END

 If you would like to comment on this book, please write to

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 Underground -- Glossary and Abbreviations

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 AARNET Australian Academic Research Network

 ACARB Australian Computer Abuse Research Bureau, once called CITCARB

 AFP Australian Federal Police

 Altos West German chat system and hacker hang-out, connected to X.25

 network and run by Altos Computer Systems, Hamburg

 ANU Australian National University

 ASIO Australian Security Intelligence Organisation

 Backdoor A program or modification providing secret access to a

 computer system, installed by a hacker to bypass normal security. Also

 used as a verb

 BBS Bulletin Board System

 BNL Brookhaven National Laboratory (US)

 BRL Ballistics Research Laboratory (US)

 BT British Telecom

 CCITT Committee Consultatif Internationale Telegraph et Telephonie:

 Swiss telecommunications standards body (now defunct; see ITU)

 CCS Computer Crime Squad

 CCU Computer Crimes Unit (Australian Federal Police)

 CERT Computer Emergency Response Team

 CIAC Computer Incident Advisory Capability: DOE's computer security

 team

 CITCARB Chisholm Institute of Technology Computer Abuse Research

 Bureau (now defunct. See ACARB)

 COBE Cosmic Background Explorer project: a NASA research project

 DARPA Defense Advanced Research Projects Agency (US)

 DCL Digital Command Language, a computer programming language used on

 VMS computers

 DDN Defense Data Network

 DEC Digital Equipment Corporation

 DECNET A network protocol used to convey information between

 (primarily) VAX/VMS machines

 DEFCON (a) Defense Readiness Conditions, a system of progressive alert

 postures in the US; (b) the name of Force's computer program which

 automatically mapped out computer networks and scanned for accounts

 DES Data Encryption Standard, an encryption algorithm developed by

 IBM, NSA and NIST

 Deszip Fast DES Unix password-cracking system developed by Matthew

 Bishop

 Dial-up Modem access point into a computer or computer network

 DMS-100 Computerised telephone switch (exchange) made by NorTel

 DOD Department of Defense (US)

 DOE Department of Energy (US)

 DPP Director of Public Prosecutions

 DST Direction de la Surveillance du Territoire-- French secret service

 agency

 EASYNET Digital Equipment Corporation's internal communication network

 (DECNET)

 GTN Global Telecommunications Network: Citibank's international data

 network

 HEPNET High Energy Physics Network: DECNET-based network, primarily

 controlled by DOE, connected to NASA's SPAN

 IID Internal Investigations Division. Both the Victoria Police and the

 AFP have an IID

 IP Internet Protocol (RFC791): a data communications protocol, used to

 transmit packets of data between computers on the Internet

 IS International Subversive (electronic magazine)

 ISU Internal Security Unit: anti-corruption unit of the Victoria

 Police

 ITU International Telecommunications Union, the international

 telecommunications standards body

 JANET Joint Academic Network (UK), a network of computers

 JPL Jet Propulsion Laboratory--a California-based NASA research centre

 affiliated with CalTech

 LLNL Lawrence Livermore National Laboratory (US)

 LOD Legion of Doom

 Lutzifer West German computer, connected to the X.25 network, which

 had a chat facility

 MFC Multi Frequency Code (Group III): inter-exchange

 telecommunications system used by Telstra (Telecom)

 MILNET Military Network: TCP/IP unclassified US DOD computer network

 MOD Masters of Deception (or Destruction)

 Modem Modulator De-modulator: a device used to transmit computer data

 over a regular telephone line

 NCA National Crime Authority

 Netlink A Primos/Dialcom command used to initiate a connection over an

 X.25 network

 NIST National Institute of Standards (US)

 NIC Network Information Center (US), run by DOD: a computer which

 assigned domain names for the Internet.

 NRL Naval Research Laboratory (US)

 NSA National Security Agency (US)

 NUA Network User Address: the `telephone' number of a computer on an

 X.25 network

 NUI Network User Identifier (or Identification): combined

 username/password used on X.25 networks for billing purposes

 NorTel Northern Telecom, Canadian manufacturer of telecommunications

 equipment

 PABX Private Automatic Branch Exchange

 PAD Packet Assembler Disassembler--ASCII gateway to X.25 networks

 PAR `PAR?'--command on PAD to display PAD

 parameters

 RMIT Royal Melbourne Institute of Technology

 RTG Radioisotope Thermoelectric Generator, space probe Galileo's

 plutonium-based power system

 RTM Robert Tappan Morris (Jr), the Cornell University student who

 wrote the Internet worm, also known as the RTM worm

 Scanner A program which scans and compiles information, such as a list

 of NUAs

 SPAN Space Physics Analysis Network: global DECNET- based network,

 primarily controlled by NASA

 Sprint US telecommunications company, an X.25 network provider

 Sprinter Word used by some Australian and English hackers to denote

 scanner. Derived from scanning attacks on Sprint communications

 Sprintnet X.25 network controlled by Sprint communications

 Sun Sun Microsystems--a major producer of Unix workstations

 TCP Transmission Control Protocol (RFC793): a standard for data

 connection between two computers on the Internet

 TELENET An X.25 network, DNIC 3110

 Telnet A method of connection between two computers on the Internet or

 other TCP/IP networks

 Trojan A program installed by hackers to secretly gather information,

 such as passwords. Can also be a backdoor

 Tymnet An X.25 network controlled by MCI, DNIC 3106

 Unix Multi-user computer operating system developed by AT&T and

 Berkeley CSRG

 VAX Virtual Address Extension: series of mini/mainframe computer

 systems produced by DEC

 VMS Virtual Memory System: computer operating system produced by DEC

 and used on its VAX machines

 WANK Worms Against Nuclear Killers: the title of DECNET/VMS-based worm

 released into SPAN/DEC/HEPNET in 1989

 X.25 International data communications network, using the X.25

 communications protocol. Network is run primarily by major

 telecommunications companies. Based on CCITT standard # X.25

 Zardoz A restricted computer security mailing list

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 NOTES

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 2. I have relied on numerous wire service reports, particularly those

 of UPI Science Reporter William Harwood, for many of my descriptions

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 9. The Age, 22 April 1996, reprinted from The New York Times.

 10. DEC, Annual Report, 1989, listed in `SEC Online'.

 11. GEMTOP was corrected to GEMPAK in a later advisory by CIAC.

 12. `Officially' was spelled incorrectly in the original banner.

 13. This advisory is printed with the permission of CIAC and Kevin

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 2. FIRST was initially called CERT System. It was an international

 version of CERT, the Computer Emergency Response Team, funded by the

 US Department of Defense and run out of Carnegie Mellon University.

 3. OTC was later merged with Telecom to become Telstra.

 4. Stuart Gill is described in some detail in Operation Iceberg;

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 Victoria, October 1993.

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 2. The full text of the articles, used by permission News Ltd and

 Helen Meredith, is:

 3. From Operation Iceberg; Investigations and Recommendations into

 Allegations of Leaked Confidential Police Information, included as

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 2. Rupert Battcock, `The Computer Misuse Act Five years on--the Record

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