

Nineteen Eighty-Four: Twenty Years Later

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Introduction

I'd like to begin this lecture by quickly double-checking that we all know what the title refers to: it is, of course, the book *Nineteen Eighty-Four* by George Orwell. I'm sure that most of us know the basic facts surrounding that book and its author, but I'll recapitulate a few of them. George Orwell's real name was Eric Blair; it is thought that he took his pen name from the combination of the novelist George Gissing and the Orwell River in Suffolk. (Among the other candidates he considered for a pseudonym were "P.S. Burton," "Kenneth Miles," and "H. Lewis Allways." I think he made the right choice.)

Orwell was English, although he was born (on 25 June 1903) in India, where his father worked in the Opium Department of the Government of India. He was one of the first of a special breed: the purely political journalist and writer. Everything he wrote was somehow infused with politics, and this is what ultimately made him immortal. He spent time among the poor and downtrodden in Paris and London, producing the book *Down and Out in Paris and London*; he spent time fighting with the Republicans in the Spanish Civil War (where he was shot in the throat), and produced the book *Homage to Catalonia*.

In the thirties he flirted with Communism, like so many intellectuals of the time – but unlike many of those intellectuals, he quickly became disillusioned after becoming aware of what was going under Stalin's rule. And so in the early forties he began writing his masterpieces on totalitarianism. The first was *Animal Farm*, an allegory about the growth of fascism in a community. It was this book that brought him world fame. You probably recall the best-known quote from that book: "All animals are created equal, but some are more equal than others."

And then came *Nineteen Eighty-Four*. Orwell had also considered another title, *The Last Man in Europe*. Here, too, I think he made the right choice. Most of you have probably heard the story that he came up with the year 1984 by reversing the last two digits of the year in which he finished the book, 1948 (he started working on the book as early as 1943, and the book was actually published in June 1949). I suppose it's probably true, although I haven't personally seen it verified by reliable sources.

The book was immediately hailed as a "masterpiece of political speculation," as his biographer George Crick characterized it. *Nineteen Eighty-Four* gave us a treasure trove of expressions: **doublethink** (the ability to believe in two contradictory ideas at the same time); **thoughtcrime**; **Newspeak** – the official Party language that destroyed as many words as possible; **memory hole** – the hole next to the desks in the Ministry of Truth where history was erased; **unperson** – a person erased from history; **telescreen** –

the two-way television screen that monitored your every move; **speakwrite**, the device that automatically transcribed what you spoke into writing; the **proles** – the proletariat, the unwashed masses.

And of course, the immortal expression: **Big Brother is Watching You**, which gave us, among other things, the dubious gift of reality shows.

Orwell died less than a year after the book was published. He had been ill for years – much of his life, really. He was only 46 when he died, on 21 January 1950. Last year, in 2003, the hundredth-year anniversary of his birth was celebrated in print with a number of books and articles in journals. One biography, by Gordon Bowker, recounts the tale of how Orwell used voodoo on a fellow student at Eton, by tearing a leg off an effigy doll; the fellow student broke a leg and died of leukemia shortly afterwards. Orwell never got over it.

Biographer Bernard Crick was careful to note that Orwell wasn't necessarily trying to *predict* the future in *Nineteen Eighty-Four* – rather, he was parodying the totalitarian societies of the time, and giving us a warning about what *could* happen if we didn't watch out. Nevertheless, many if not most people seem to take the book as a prediction and enjoy looking back now and seeing what he “got right” and what he “got wrong.” He clearly got some things right: in 1984 a good deal of the world was under totalitarian rule, from Eastern Europe through the Soviet Union and China. On the other hand, five years later a good deal of it came tumbling down with the Berlin Wall.

But as amusing it is to reflect on what Orwell got right and wrong, that isn't the real topic of this lecture: the real topic is what *I* got right and wrong.

Twenty Years Ago in the News

The exact period in which the action of *Nineteen Eighty-Four* takes place is fixed in one of the very first scenes, in which the protagonist Winston Smith takes his first step toward oblivion at the hands of his totalitarian oppressors by beginning a diary: “He dipped the pen into the ink and then faltered for just a second. ... To mark the paper was the decisive act. In small clumsy letters he wrote: April 4th, 1984.” Twenty years ago this month.

A lot was happening in the world on April 4, 1984. On that date, American President Ronald Reagan was calling for an international ban on chemical weapons. Just a few weeks earlier, the CIA Beirut station chief William Buckley had been kidnapped by Islamic fundamentalists – later he would die in captivity. Just a few weeks later, the Soviet Union would announce a boycott of the Summer Olympic Games in Los Angeles, in an act of revenge against the U.S.-led boycott of the Moscow Games four years earlier.

And I was living in Germany. Through a rather unusual set of circumstances, I ended up involved in a rather unusual project. The Second German Television Channel, known as the ZDF or *Zweites Deutsches Fernsehen* – the “RAI 2” of Germany – was planning a nine-part series on data privacy and the citizen in the Orwellian year. It's important to understand that the concept of “data privacy” was in its infancy in those days, and the huge debate that would result in the passing of sweeping laws on the protection of

privacy was only beginning. The recent controversy in the United States and in Europe over personal privacy in the age of international terrorism is only the latest chapter.

Six of the episodes of the series were to address the social aspects of the Orwellian vision – in particular the collection, integration, and storage of personal data in large databases. These episodes were in the hands of journalists and sociologists who investigated the collection of personal data in contexts ranging from healthcare organizations to crime enforcement. The journalist with overall responsibility for these episodes and the accompanying book was Günter Myrell, who today is the head of the department *Abenteuer Wissen* (“Adventures in Knowledge”) at the Second German Television Channel.

The other three episodes were to address the technical dimension – that is, whether computer technology had in fact evolved to the extent and in the direction necessary to make the Orwellian nightmare become reality. I was co-responsible for the contents of these three episodes, together with my friend and colleague Günter Koch, who eventually became managing director of the European Software Institute and subsequently the Austrian Research Centers.

The Daten-Schatten Project

The overall series was given the name *Daten-Schatten*, which literally means “data shadow.” It refers to the trail of data a person leaves behind when he makes any transaction (usually involving computers), from telephone calls to credit card purchases. *Datenschatten* has become the word of choice in Germany for describing this phenomenon today. It has even acquired a certain amount of popularity outside Germany. I contacted Günter Myrell last month to ask him whether the expression *Datenschatten* had actually been coined for our series. He responded that he didn’t remember how they came up with the title, although he suspected that the expression had probably existed earlier. But he agreed that *after* the series was aired, the expression *Datenschatten* moved to the forefront of public consciousness and was at the center of the ensuing discussion of data privacy throughout Germany and the rest of Europe.

Our first job was to decide how to organize the three episodes under our direction. Re-reading Orwell’s *Nineteen Eighty-Four*, I looked for underlying themes that may be reflected in the technological issues of the day, and came up with these:

- **Man-machine interaction.** Has our interaction with computers enriched or impoverished our intellectual experience? What is the nature of our interaction with machines today? Are machines intelligent enough today to weave together strands of different information about us?
- **The storage and manipulation of information.** What is the capacity of computer technology today to store and manipulate massive amounts of information? How is all of this capacity being used?
- **The ubiquitous computer.** The pervasive, intrusive presence of machine technology represented by the ubiquitous image of Big Brother naturally leads to a comparison to the phenomenon of large-scale computer networking.

Then we began thinking about possible titles. During a conversation with co-author Günter on the topic of the first episode, I mentioned the fictional language *Newspeak* from the book *Nineteen Eighty-Four*, a language whose purpose was to impoverish the intellectual experience. Günter decided that it would make a perfect title for the first episode about man-machine interaction: *Die Neue Sprache* (“The New Language”). He quickly came up with titles for the other two episodes: *Das Neue Gedächtnis* (“The New Memory”) and *Die Neue Kommunikation* (“The New Communication”).

Setting the Orwellian Context

We decided to set the context by beginning each of our episodes with an appropriate scene from *Nineteen Eighty-Four*. After selecting the scenes, we set about finding the actors. Günter had a childhood friend named Hubertus Petroll who had entered the theatrical profession, but at the time was having some trouble finding theatrical work, and had managed to land a part-time job announcing the news late at night on the Second German Channel. So he was pleased to have the opportunity to play Winston Smith in our scenes. Two other actors were engaged, and our little ensemble was complete. Since there was no budget available for extravagant movie sets, we decided to film our scenes in the computing center of the Second German Channel’s headquarters in Mainz. The scripts of two of the scenes are included in the appendix of this lecture.

Years later, Hubertus Petroll remarked to us that his participation and exposure in the *Datenschatten* series had been a real break for him in the theatrical profession. Today he is a professor and director of the theatrical department at the Max-Reinhardt-Seminar, the music and theatrical conservatory of Vienna.

Creating a logo

The director of our episodes was faced with the problem of creating an attractive logo, which would be used to introduce each episode. He came up with the clever idea of a transparent Plexiglas pane, upon which *Datenschatten* was written, that would reflect the letters onto a background in the form of a shadow. For added effect, he wanted to show a continuous flow of anonymous data moving through the letters. He planned to achieve this by superimposing images from data moving across a computer screen onto the television image, but he had no such data. However, I happened to own a portable computer.



Osborne I portable computer

Today, that seems perfectly normal, but in those days, it was unique: it was an Osborne I, the world’s *first* portable computer. It was as large and heavy as a sewing machine, and had a screen that was only about four inches (about 10 cm.) square. I wrote a

program that produced row upon row of completely random data, and the cameraman zoomed in on that four-inch screen. A local composer wrote some snappy original synthesizer music to accompany the images, and the logo was ready for our three episodes.

The Filming

The episodes were filmed partly on location and partly in the ZDF studios in Hamburg. The studio filming was carried out over about a week in early 1984. Günter was the narrator and interviewer in the studio scenes. We were not the only production team filming at the Hamburg studios during that week – in the lunch canteen we often saw Michael Jackson, dressed in a shiny aluminum costume.



The Studio in Hamburg

The Broadcasts

The nine episodes of the *Datenschatten* series were broadcast over four months in early 1984. Our three episodes were broadcast during the period from late March to early April – very close to the time period in which the book itself was set.



Datenschatten logo

Episode 1: The New Language

In our first episode, we decided to concentrate on the relationship between man and machine. In the book, Orwell did describe some advanced man-machine interaction technology; in fact, it's unlikely that even he realized how advanced it was. The

Speakwrite was a device for what is now known as automatic speech recognition: the operator spoke into it, and some mysterious unnamed technology on the other side transcribed it into writing.

Such technology does exist today. IBM has a speech recognition product called ViaVoice[®], and Bill Gates of Microsoft has made it his declared objective for future versions of the Windows operating system. In our episode, we filmed an example of a primitive voice recognition system in a Ford manufacturing plant. Today, twenty years later, nobody can claim to have solved the voice recognition problem satisfactorily. Why? Because we have begun to understand that the voice recognition problem is tied up with the much larger problem of *artificial intelligence*.

To our credit, Günter and I did understand that, and we devoted part of the episode to taking stock of the current state of artificial intelligence. In 1984, Europe and the United States were in a panic over artificial intelligence, mainly because of a book that had been published just a year earlier, entitled *The Fifth Generation: Artificial Intelligence and Japan's Computer Challenge to the World*. In that book, authors Edward Feigenbaum and Pamela McCorduck had described an enormous Japanese government-sponsored project to develop a new generation of super-fast, thinking computers that "...will make our present computers look like children's toys." They managed to scare the daylights out of everybody, warning: "The Japanese could thereby become the dominant industrial power in the world." (A short while afterward Japan began its slide into a decade-long recession and the whole matter was quietly laid to rest.)

Our own treatment of the subject involved two initiatives. First, we paid a visit to the Max-Planck Institute in Garching, near Munich, in order to take a look at a so-called *supercomputer*: the Cray I, named after its inventor Seymour Cray. A marvel of computing technology at its time, it consisted of a tall, central element surrounded by a circle of padded elements that looked for all the world like seats. Our young production manager, Eric Nellessen, went wild with excitement, saying that he envisioned the establishment of a bar named "The Cray I," where customers would seat themselves comfortably on the padded elements surrounding this ten million dollar machine and drink their frozen daiquiris.

We then organized an interview with a former university classmate of Günter's named Joerg Siekmann, who had been one of the founders of the artificial intelligence research community in Germany (today Joerg Siekmann is a departmental director at the German Research Center for Artificial Intelligence).

During the interview, Joerg Siekmann demonstrated a clever program his group had developed: a virtual hotel reservation clerk. It held a "conversation" (through a computer terminal) with a prospective customer, describing the rooms available and handling the reservation. But the interesting part was this: the program understood human psychology and knew how to make deductions from diverse pieces of information. For example, if the prospective client asked whether the room had a television and in fact there was none, rather than responding simply "no" like a classic computer program, the virtual clerk would respond, "No, but there is a good radio." It would put the room in the best possible light and try to make the sale. It also knew enough to deduce that if a bed was new, then the mattress was probably firm.

We didn't realize it then, but we had seen an early demonstration of what has since become a profoundly important use of artificial intelligence techniques, with repercussions both for data privacy and the way in which electronic commerce is conducted. The most frightening aspect of the data privacy controversy is the possibility that computers will acquire the ability to combine data from many different sources – your medical records, financial records, police record, etc. – and make further deductions about you. That is one reason that much of the legislative battle has been about keeping different public databases separated from each other.

In the private sphere, the virtual hotel reservation clerk was an embryonic version of what we are now seeing in E-Commerce: computer programs that have the capability to record their interaction with you and make intelligent deductions about your habits, lifestyle, tastes, economic status, etc. One of the best examples of this can be found at the online bookstore Amazon.com. After only a few “visits” to Amazon.com to buy various items ranging from computer books to Brazilian music CDs to outdoor barbecue sets, an astonishingly complete profile of my buying preferences has been assembled. Now, whenever I return to Amazon.com to buy something, I am presented with “John's Store,” full of items personally – and automatically – selected for me according to my known preferences. In addition, I receive periodic electronic mail messages of the general form “We've noticed that people who have purchased Item X have also found Item Y interesting.” That is, not only do they register what I *do* like, they also make intelligent deductions about what I might *also* like.

All of this technology falls into the general category of automatic *profiling*. We had a general idea of its existence and possibilities back then, but were mostly concerned with its potential use in governmental invasion of privacy. In spite of Joerg Siekmann's eerily prescient demonstration of the virtual hotel clerk during our television episode, I can't claim that we had any idea of the vast applications it was eventually to have in the commercial arena.

Introducing the mouse

There was, however, a different human computer interaction technology whose importance we had understood. In our first episode, we gave one of the earliest demonstrations in Germany of a new way of interacting with the personal computer: the mouse. Personal computers with windows and menus and mice are so commonplace today that most of us don't even remember life without them. But this form of interaction only entered our lives just over twenty years ago, when Apple Computer introduced the Macintosh in January 1984. I had been aware of this technology already for some time, partly because some advanced computers already were equipped with mice, and partly because an old classmate of mine at the University of California at Berkeley, Andy Herzfeld, had gone on to work at Apple and had become one of the developers of the Macintosh. So I had been keeping a lookout for its arrival.

What many don't know, however, is that the Macintosh wasn't the *first* Apple product to feature this interface. The first was known as the Lisa, named after a former girlfriend of Steve Jobs, founder of Apple. I was also aware of this product, because an old colleague of mine in Paris had returned to the United States (I took over his apartment in Paris) and became the product manager of the Lisa. We contacted Apple Computer in Germany and made a request to demonstrate the Lisa computer on our first television

episode. They responded by simply giving us the computer, since nobody there really knew what to do with it. As a result, our first episode contains some of the first public broadcasting images of a man (Günter) patiently explaining to the television audience the nature of this funny little gadget for controlling a personal computer, known as a “mouse.”

Episode 2: The New Memory

The second episode of the series was both chronologically and thematically central to the series. It was entitled *The New Memory*, dedicated to the role of the computer in the preservation (or destruction) of history – and more generally, to the impact the computer can have on the world through its capacity to store information.

The amount of memory today

We included a discussion of the growth of computer memory capacity in this episode. We looked at the state of the art in computer storage capacity in 1984, and speculated on its future development, including a story on attempts to build molecular computers. We got that part right: the area of “nanotechnology,” as it is known today, has become a hot topic of research and development. We also correctly predicted some of the applications that would blossom with the availability of vast amounts of computer memory. For example, we showed an extensive segment of high-powered computer graphics, generated by the same people who would go on to found the company Pixar and create the computer animation masterpieces *Toy Story* and *Finding Nemo*.

To get an idea of how computer storage capacity has grown in the twenty years since 1984, consider the book *Nineteen Eighty-Four* itself. I have the book in electronic format. It’s about 600Kb in size. Let’s see how the computers I have owned since 1984 might store it. You needed seven Osborne I floppies to hold *Nineteen Eighty-Four*. My next portable computer was a Toshiba laptop. It needed one only one (700K) floppy to store *Nineteen Eighty-Four*. One (1.4Mb) floppy of my next computer could hold *two* copies of *Nineteen Eighty-Four*. A CD-ROM can hold over 1100 copies. A DVD-ROM can hold about 7800 copies. The disk inside my Sharp UM-20 laptop (20 gigabytes) can hold about 33 thousand copies. And the large disk I have inside my desktop computer (250 gigabytes) can hold just over 400 thousand copies of *Nineteen Eighty-Four*.

The history you can’t remember

The basic premise of *Nineteen Eighty-Four* was that history was being constantly rewritten. Facts disappeared down the *memory holes* of the Ministry of Truth and people and events literally vanished without a trace. The past was mutable. Nothing was guaranteed to remain. Of course, this was quite true in the totalitarian societies of Orwell’s time, and through the entire period of the Cold War. And it is still true today to some degree in those societies that are still totalitarian (such as China) and in the societies that replaced the ones that fell at the end of the Cold War (such as the Soviet Union).

Less than two months ago, on February 24, an article appeared in the *International Herald Tribune* entitled “In Russia, grim relics of the gulag.” The article told the story of the city of Norilsk, where a large mining company was built by slave labor during the

years of the Soviet Union. There is no memorial to the slaves who lived and died there (nobody knows how many died), and few people want to talk about it. The article notes,

Norilsk is far from unique. More than 12 years after entropy tore apart the Soviet Union, Russia remains reluctant to delve deeply into the grimmest facts of the Soviet legacy. Memory is selective, and history is – as it was – highly political.

The John Kerry and Jane Fonda Photo

Another example of retouching history that is closer to home – and demonstrates the power of the Internet – is a controversy that arose this winter around the U.S. Democratic Presidential candidate John Kerry. A photo began circulating the Internet and the news organizations that showed John Kerry (a decorated Vietnam War veteran) seated at the same anti-war rally in the early 1970s as the actress Jane Fonda, known as “Hanoi Jane” by her detractors for her visits to Hanoi during the War. It was not surprising to see them together at a rally, since he in fact co-founded the association of Vietnam Veterans Against the War. Veterans were quite upset about this photo, and Kerry engaged in the perfectly valid political discussion that arose around it.

But then something else happened: *another* photo emerged, put up on a web site supposedly sponsored by Vietnam Veterans Against John Kerry. This photo was even more inflammatory, showing Kerry seated right up at the podium next to Jane Fonda as she delivered an impassioned speech to the crowd. It quickly made the rounds of the news organizations and caused an even greater stir.

But the second photo was a fake.

The faker had superimposed *two separate photos* of Kerry and Fonda. The photo of Kerry had been taken at the Register for Peace Rally in New York on June 13, 1971. The photo of Fonda was taken over a year later (!) at a rally in Florida in August 1972. The original photo of Kerry that had been used in the fakery was recognized by its author, Ken Light, who now teaches photojournalism at Berkeley, and he exposed the forgery. In the *Washington Post* on February 28, 2004, Light wrote:

It's not that photographic imagery was ever unquestionable in its veracity; as long as pictures have been made from photographic film, people have known how to alter images by cropping. But what I've been trying to teach my students about how easy and professional-looking these distortions of truth have become ... – and how harmful the results can be – had never hit me so personally as the day I found out somebody had pulled my Kerry picture off my agency's Web site, stuck Fonda at his side, and then used the massive, unedited reach of the Internet to distribute it all over the world. ... So what do I do now about the conspiratorial Web site that's trying to convince its readers that my original picture was the hoax – that Fonda really was at that podium with Kerry, and somebody edited “Hanoi Jane” out? All I can do is pull [the original negative] out of the file cabinet again. It's my visual record, my un-retouched truth.

In this sense, the Internet makes powerful distortions of history possible, with the malleable nature of stored computer data and the power of the Internet to disseminate information quickly.

Selective memory

I was having a conversation recently with my friend and colleague Maria Sliwinska, who is head of the International Center for Information Management Systems and Services and one of the top library scientists in Poland. I asked her if she had ever read *Nineteen Eighty-Four*. She replied, “Yes, I read it at the time it was prohibited here. And I felt horrified reading it even though I was actually living in the society he was describing.”

Then she continued. “But life is actually even more controlled than what is described in the book. Do you know that archivists select for further generations only 5% of the documentation they are getting? It's really possible to erase history.” Then she went on to tell the amusing story of an archivist she knows in the town of Bydgoszcz, Poland who had been treated with disdain by the local VIPs there because they considered his job to be insignificant. But when he explained to them that he had the power to eliminate them from all historical memory by simply not selecting any news about them for archival, he suddenly became very popular.

Günter and I were right in our supposition that computer technology makes it even easier to erase history. Maria: “During the change from the old Communist regime, the leaders tried desperately to destroy all kinds of incriminating files. But they weren't always successful, because of the sheer mass of paper. With computer technology, it became easy: just erase the disks.”

“But it sometimes backfires,” she observed. “At King's College, the electronic mail system had a policy of deleting old messages – say, messages more than two years old. The old messages of one of their Nobel Prize winners were erased, and now they can't reconstruct the history of his prize-winning discoveries, because he had only corresponded with his colleagues through E-mail.”

The history you can't forget

However, neither Günter and I – nor Orwell himself – had correctly predicted another phenomenon: the problem today isn't the fact that so much history is being *erased* – rather, it's the fact that so much history is being *preserved*. To begin the discussion, consider these two numbers recently reported by TIME magazine:

- **5 billion gigabytes** – the volume of new data created globally in 2003, equivalent to 800 books per person.
- **30%** – the rate the volume of electronic information stored has grown per year since 1999.

What has contributed to this frightening growth in stored information? It is partly due to the financial scandals of the early 2000s, such as Enron and Tyco. The Sarbanes-Oxley Act (known in the trade simply as “Sarbox”) forces businesses to make available much more information on their finances and operations than previously. The Securities and Exchange Commission Rule 17a-4 requires trading firms to save copies of all emails for three years and keep them readily accessible for two. This requirement was used to nail Merrill-Lynch traders who were promoting stocks to their clients while at the same time deriding them privately among themselves – all of it was captured in the e-mail

archives. In the Microsoft antitrust case, several e-mails from Bill Gates were used against him.

A company named Zantaz, based in California, is making a lot of money now doing what is called “outsourced e-mail archiving.” Companies simply give all of their e-mail messages to Zantaz, and the company keeps it for them. It has developed sophisticated procedures to sift through all the messages when necessary. It is a huge business, and will continue to grow. All of corporate history being preserved for posterity.

Your personal history preserved

But not only corporate history is being preserved. *Personal* history is also being preserved, and one of the places where it is being preserved is the Internet itself, within the billions of pages in the World Wide Web. In an article in the Italian newspaper *Corriere della Sera* on 9 November 2003, the popular Italian journalist and author Beppe Severgnini wrote about the effect that the so-called Internet *search engines* have had on our lives. By far the most popular of these search engines is called Google, which is so much more powerful than any previous search engines that it has changed the way that we look at the Internet.

For those in a public profession, Google is a kind of repository of memory: our lives are contained in it, with information, images, sounds. Before writing this article I navigated around the 8080 sites on which my name appears: I remembered forgotten trips as well as conferences I’d rather forget, I re-read articles, looked at photographs, listened to interviews. My public soul is in there, together with those of many others. Whoever wants to spend an hour on the Internet starting with Google will know more about me than all of my relatives do. Of course, on the day when this stops being entertaining, things could get unsettling. But there won’t be anything we can do about it. The Google genie is out of the bottle now, inside that parallel universe of the Net, and it’s not going back in.

While writing this lecture I tried Severgnini’s Google experiment myself. I entered my own name, and Google came back with 6910 Web pages that concerned me. I’m not quite as popular as Beppe Severgnini, but there’s still plenty of information on me out there. And what information! I found not only information about my past and present professional life, which I expected, but other kinds of information such as old e-mail messages I wrote to discussion groups asking for a chocolate recipe or giving my opinion on a particular piece of music. Fleeting, careless, private moments, preserved forever in the public domain.

The nightmare of having your past preserved in the public domain was described eloquently by Richard Cohen of the *Washington Post*, in a column on 27 November 2003 entitled “We’ll Always Have Paris.” The title makes a clever reference to Humphrey Bogart’s immortal line spoken to Ingrid Bergman in the film *Casablanca*, but the subject of the column is another Paris: the young hotel chain heiress Paris Hilton. Last year a scandal erupted when a very explicit homemade erotic video involving Ms. Hilton and her boyfriend started circulating on the Internet – a wild moment born of the youthful exuberance that so many of us also remember. We all made mistakes in our youth, and we can present a different face to the world now. But

for Paris Hilton it's different. She won't be able to rewrite her past, like we all do. We'll always have Paris Hilton, captured on videotape in countless Internet archives. She'll never be able to hide this past from her children and grandchildren. The New Memory has preserved it forever.

Episode 3: The New Communication

Our last episode began with a description of the Orwellian telescreen. The telescreen was the most obvious example of ubiquitous surveillance in Orwell's book. In a sense, Orwell did guess right there: think of the ubiquitous video camera watching over the public in stores, banks, shopping centers, and increasingly even public places, especially those which are potential terrorist targets. Even more insidious are the cellular telephones, of course. My contacts in law enforcement in Italy confirm that you only need to turn on your cellular telephone and they can find you any time, any place. Günter and I didn't foresee this at all, because we didn't foresee cellular telephones at all. This has led to what William Gibson has called ubiquitous information transparency. As Richard Cohen writes:

The sense we all once had that we are secure in our own person is gone, probably irrevocably so. Espionage has been democratized. Cell phones come equipped with little cameras so that people in the locker rooms of health clubs have to worry about someone pretending to make a call. Clothing, after all, is the most common of deceptions, because the clothes you wear are your sense of who you are – how you show you are rich, or a football fan, or whatever. The vicious little cameras take you down to your essentials. Videocams are everywhere – placed there by the police for traffic or public safety reasons or just haphazardly running because someone is taping his cute grandchild and you happen to be in the background.

Orwell was writing at the time of broadcast media, particularly the radio. The ultimate broadcast medium, the television, was only in its infancy, and he didn't live to see it dominate our lives. He was certainly right about the power of broadcast media in the hands of the totalitarian state: I have personal memories of watching East German television in 1984 and it was exactly as Orwell described in the book. But he had no idea about computer networks – in fact, he had little or no idea about computers at all. Therefore he was completely unequipped to contemplate the implications of a connected world.

But I knew all about computer networks in 1984, as one of the very first users of the Internet's predecessor, the ARPANET, and so it is reasonable to evaluate my own success in predicting the implications of this new phenomenon. We'll begin with the things I got right. I did correctly foresee the explosive growth of computer networks of all kinds. Not only the so-called wide area networks (e.g. the Internet itself) were growing at that time, but another kind of network known as the local area network, installed inside the premises of a single institution (such as a company, or a university). In this episode we showed the local area network in Lufthansa headquarters in Cologne – one of the first installations of its kind in Germany at the time.

I was right about the need for mechanisms for protecting privacy in information transmitted over computer networks, and wrote at length in the accompanying book

about the new so-called *public key encryption* technology. This technology has since become commonplace in data security, serving as the basis for a number of applications ranging from data encryption to digital signatures.

But that's about all I got right. I grandly predicted that computer networks would serve as a democratizing factor in the world, making totalitarian states collapse as they failed to prevent their oppressed people from gaining access to information. But the Soviet Union collapsed for different reasons; and China is still with us in the same form as before, in spite of a thriving Internet presence. Furthermore, I assumed that the Internet would be chiefly a force for good – but it has become an equally important tool for terrorists and criminals of all types today.

I also failed utterly to predict another problem of enormous magnitude: the rise of computer “hacking” and the computer virus, often perpetrated on the world by young teenage boys. The problem is well described in this quote:

There is an explosive situation brewing. On the one hand, the press, television, and movies make heroes of vandals by calling them whiz kids. On the other hand, the acts performed by these kids will soon be punishable by years in prison. I have watched kids testifying before Congress. It is clear that they are completely unaware of the seriousness of their acts. There is obviously a cultural gap. The act of breaking into a computer system has to have the same social stigma as breaking into a neighbor's house. It should not matter that the neighbor's door is unlocked. The press must learn that misguided use of a computer is no more amazing than drunk driving of an automobile.

A recent speech by a government official? A quote from a recent newspaper article? No. It is a quote from the Turing Award lecture (computer science's highest honor) by Ken Thompson (the inventor of the Unix operating system), *given in August 1984*, only a few months after our own episodes were broadcast. When Thompson gave that lecture, everybody thought he had gone crazy – typically, only he had understood.

The ten-year anniversary of the World Wide Web

But there was another even more important development in computer networking that I didn't foresee in 1984. April 2004 also marks another anniversary: the tenth anniversary of the World Wide Web. *This* was the revolution that made the world truly networked. The Web actually had existed for a number of years before 1994. But it was the invention of the so-called *browser* that made it explode onto the scene, and that happened in the spring of 1994. I was in California then, and I remember a friend telling me about this new “killer application” that would make the World Wide Web truly useful. This was the Mosaic browser, and it was eventually marketed by my former professor at Berkeley, Jim Clark, through the company called Netscape. The rest is history, of course. In fact, many people, when they think of the Internet today, are really thinking of the World Wide Web.

A Failure of Imagination

In these difficult days, there is a well-publicized debate in the United States over who carries responsibility for the horrible events of September 11, 2001. Was it a failure of

intelligence? Was it a failure of will? Thomas Friedman, the foreign affairs columnist for the *New York Times*, believes otherwise. He claims it was a *failure of imagination*: nobody could have imagined (for perfectly good reasons) that 19 young men would have hijacked four airplanes and flown them into the Pentagon and the twin towers of the World Trade Center, killing thousands of innocent people, for no stated reason.

Something analogous happened in *Nineteen Eighty-Four* and *Datenschatten*. When Günter and I – and even Orwell himself – were wrong about this or that technological advance, it wasn't a failure of intelligence or analytical ability or anything like that: it was a failure of imagination. The author Michael Crichton (*Jurassic Park*) once remarked that a person living in the year 1900 might have contemplated all the human beings who would be on the planet in the year 2000, and wondered how it would be possible to obtain enough horses for everyone. And that was my problem, twenty short years ago: nobody can even imagine what will be invented, even a few years hence. As former Vice President Dan Quayle once said, "It's hard to predict – especially the future."

Resources

Daten-Schatten, Rowolht Verlag, 1984.

"Orwell Up Close," TIME Magazine, 30 June 2003

George Orwell: A Life, by Bernard Crick, Penguin Books, 1980.

Scene from *The New Language*

Syme “Don't you see, Winston, that the whole aim of Newspeak is to narrow the range of thought? In the end we shall make thoughtcrime literally impossible, because there will be no words in which to express it. Every concept that can ever be needed, will be expressed by exactly one word, with its meaning rigidly defined and all its subsidiary meanings rubbed out and forgotten. Already [today] we're not far from that point.”

Scene from *The New Memory*

Winston: “Do you realize that the past, starting from yesterday, has been actually abolished? If it survives anywhere, it's in a few solid objects with no words attached to them, like that lump of glass there. Already we know almost literally nothing about the Revolution and the years before the Revolution. Every record has been destroyed or falsified, every book has been rewritten, every picture has been repainted, every statue and street and building has been renamed, every date has been altered. And that process is continuing day by day and minute by minute. History has stopped. Nothing exists except an endless present in which the Party is always right. I know, of course, that the past is falsified, but it would never be possible for me to prove it, even when I did the falsification myself. After the thing is done, no evidence ever remains. The only evidence is inside my own mind, and I don't know with any certainty that any other human being shares my memories. Just in that one instance, in my whole life, I did possess actual concrete evidence after the event – years after it.”

Julia: “And what good was that?”

Winston: “It was no good, because I threw it away a few minutes later. But if the same thing happened today, I should keep it.”

Julia: “Well, I wouldn't! I'm quite ready to take risks, but only for something worth while, not for bits of old newspaper. What could you have done with it even if you had kept it?”

Winston: “Not much, perhaps. But it was evidence. It might have planted a few doubts here and there, supposing that I'd dared to show it to anybody. I don't imagine that we can alter anything in our own lifetime. But one can imagine little knots of resistance springing up here and there – small groups of people banding themselves together, and gradually growing, and even leaving a few records behind, so that the next generations can carry on where we leave off.”

Julia: “I'm not interested in the next generation, dear. I'm interested in us.”

Winston: “You're only a rebel from the waist downwards.”

She thought this brilliantly witty and flung her arms round him in delight.