Introduction

The air we breathe is awash with electromagnetic waves; under the streets we walk is a torrent of underground copper and fibre-optic cables. The telecommunications network is everywhere, but most of it is beyond our purview. And yet, its technology pervades our work day, our entertainment evenings – in short, our entire life. It is in fact an invisible empire ruling over our information society.

When I wrote *L'empire invisible*, from 1989 to 1991, telecommunications was still a game for experts, mainly engineers and regulators. Decisions took place behind closed doors and rarely made the news, except for rate hikes. All consumers cared about was hearing the dial tone when they lifted their receiver. Telecommunications was indeed an "invisible" empire.

Everything changed with the 1992 electoral victory in the United States of President Bill Clinton and Vice-President Al Gore; Gore had used the "information superhighway" as a major plank in his platform. For the first time ever, telecommunications had become a major political topic. Almost simultaneously, in January, 1993, the Mosaic browser came on the market, allowing people access to the World Wide Web and the Internet that underlay it. From one day to the next, telecommunications became news. And it has remained news ever since.

Much of this book is about a world that has, for the most part, disappeared: telecommunications as a public service. The various ownership modes of Canadian telecommunications companies did not hide the fact that there was essentially no difference between private enterprise and Crown corporations in this sector: both were operating public services as regulated monopolies. Regulation was intended to mitigate the harmful effects of the monopoly by standing up for consumers and, to a lesser extent, business users.

When I began to write this book, I wanted to analyze a situation that seemed obvious at the time. Canada is a world leader in telecommunications. My fundamental question was: Why? Today, as a new world dawns, the symbol of which is the Internet, the issue seems even more important. Will telecommunications remain a significant industry in the information economy? Will Canada be a major player in the new power structure that is being formed?

There is another, more personal reason that I decided to write this book. I worked for about ten years at Bell Canada, and for another ten years as a consultant in telecommunications and new media, and I have gotten to know the telephone business from the inside. In North America, there is a telephone community that has existed at least since the turn of the century, with its own language, common values, meaningful silences, heroes, and exploits – in short, its own culture.

Three values are central to telephone people: network reliability, public service, and a fair return on shareholders' investment – in no particular order. I know that critics of telecommunications companies would say that profit is the engine for these institutions. It is true. It was, in fact, one of the few public services in North America that for over a century didn't lose money. Every decision is scrutinized for its profitability.

Network reliability, public service, and a fair profit – all of these concepts are collective, overarching, evolutionary, and this has made telephone people "conservative." Introducing a new technology into the telecommunications network makes no sense unless it can be integrated into an overall plan, so that it doesn't interrupt the service of entire groups of subscribers or cause all older equipment to be replaced. Innovation must always be submitted to the imperatives of continuity.

Recently, this culture has been subjected to a severe re-evaluation. In the United States, a circumstantial alliance of populists, survivors of the civil-rights movement, and free-trade crossbreeds has succeeded in destroying the greatest industrial galaxy in the world: the Bell System. In Canada, the federal government's lack of vision has added a factor of uncertainty to the situation. The CRTC decision in June, 1992, to open long-distance service to competition falls within the free-market mania started during the presidency of Ronald Reagan (1981–89) in the United States. The Canadian Telecommunications Act adopted in June, 1993, does not add a definitive purpose to the introduction of competition in telecommunications. The only clear part of the law – the limit on foreign ownership of telecommunications companies – was flouted soon after it was adopted.

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What will replace the monopoly held up to now by telecommunications carriers? Superficial observers shout their response, in unison: competition! The law of the market! Free enterprise! But the American example shows that the reign of engineers is being replaced by the reign of lawyers. The Bell System was destroyed by the lawyers of its

competitor, MCI, and the Department of Justice; since then, American telecommunications has been subjected to contradictory regulation by federal regulators, state regulators, and judges in various jurisdictions. North America has fallen headlong into excessive "judicialization" of all economic processes, and telecommunications is not escaping this trend.

The true change does not come from the decision artificially to open long-distance to competition; the real challenge is in local service, the opening up of which is not a fait accompli in either Canada or the United States. And yet, local service is the very basis of telecommunications. It is also the gateway to the "cyber age." Without opening up the local-service market, long-distance competition will remain simply an experiment in economics. I feel that regulators and legislators have tried to put the cart before the horse by introducing long-distance competition. But it was so tempting: the artificially high prices of long-distance, it was felt, would provide rapid profits to new entrants into the telecommunications market. This is a short-term view of things.

In fact, real competition had already existed in the telecommunications technology sector. By going digital, telecommunications networks became computers – or, rather, data-processing systems. There is a body of literature going back to the 1950s on the convergence of telecommunications and computer technology. However, reality has not followed the literature: far from seeing two technologies and industries converge, we are seeing computers invade telecommunications – one industry taking over another. Again, the Internet must be considered representative of this process. The Internet was created by computer companies, and not by telecommunications companies. It has invaded the telecommunications networks because the telecommunications companies did not understand – did not even see – the revolution spreading through their own infrastructures. While the telecommunications companies kept searching for the Holy Grail of the information society through the hierarchical, stable model of videotex (which in Canada was called Telidon), the computer industry had its own brainchild: the Internet.

The Internet is a concept radically foreign to telecommunications: it is a pure product of the most idiosyncratic aspect of the computer industry: software. Its name comes from a standard (Transmission Control Protocol/Internet Protocol) designed to enable computers of different brands to intercommunicate. The Internet is a network, but it is a virtual network designed to be as independent as possible from its physical support.

For their part, the telecommunications companies were founded on the very notion of the physical network, which is their main asset. The entire corporate culture valorizes the network, which must be universal and infallible. Everyone can remember the most recent

electricity failure; who can remember the last telephone outage? The symbol of this stability at any cost is the telephone exchange: a true fortified bunker, with no windows and steel-clad doors, it offers the public no access at all.

The marketing of Mosaic propelled the Internet to the forefront of telecommunications. It was the "user-friendly" application that all telecommunications companies had sought in videotex in the previous decade. But no telecommunications company in the world (with the notable exception of the American long-distance carrier MCI and, to a certain extent the regional Canadian carrier NB Tel) had understood the importance of the Internet as reshaped by Mosaic and its successors, Netscape Communicator and Microsoft Explorer.

The Internet was tailor-made to perplex the telecommunications companies, starting with how its major application was marketed: Mosaic and its successors were (and still are) distributed free of charge. No one controls the Internet. This network doesn't belong to anyone. It is the sum of all the servers that people attach to it. And it is not reliable. The Internet gets slow, it freezes, it bombs, without anyone being able to do anything about it. Customers would never accept such amateurism in their communications, said the telephone people. And yet, this unstable system was accepted because it was built on the model of the microcomputer. A microcomputer gets slow, freezes, and bombs, but no company would think of being without it.

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If one pushes the computer/telecommunications analogy further, one might look at IBM's 360 series mainframe computers in the 1960s. They never broke down – or rarely. IBM kept a close eye on them and maintained them at a constant temperature behind locked doors. What is a switch if not a giant computer specializing in the routing of telephone calls? The processing power of such a system is huge compared to that of a fragile microcomputer. And yet a switch's services are limited to dialing the caller's number, routing calls, three-person conference calls, and a few other applications (Bell's Star services). A total of a dozen services – useful, certainly, but inflexible.

The situation of Bell and the other telecommunications companies is comparable to that of IBM when microcomputers came into use. IBM thought that its enemy was Apple; everyone was expecting a battle between the IBM PC and Apple's Macintosh. Instead, the battle lines have been drawn between IBM and Microsoft. When the PC had to yield to the

MS/DOS operating system and its successor, Windows, everyone realized that power had passed from the computer makers to the software publishers.

And it was these war-hardened adversaries that confronted the telecommunications companies, whose position was much more tenuous than had been that of the computer makers fifteen years earlier. In fact, the telecommunications companies had no tradition of creativity or of marketing of content. A century of monopoly had created islands of technological planning that knew nothing about marketing. Their national nature was an anachronism at a time of transnational commerce. Finally, their principal asset, the narrowband fixed network, was becoming a "natural resource" with a low added value.

The Internet does not need the centralized switching of the telecommunications networks. Each packet finds a path in the network through its internal addressing. On the other hand, the Internet needs power, capacity, and speed. The cable network is better configured to meet these needs. The cable modem tested by the cable company COGECO in May, 1995, and marketed by Videotron in June, 1996, offers the capacity needed to transform the Internet into a mass-distribution channel. But cable will not be alone on the market. A new technology with the paradoxical name "wireless cable" (or, in Industry Canada's jargon, local multipoint communications system) has just come on the market and promises to make accessible to users a microwave sea equivalent to some hundred television channels.

Does this mean that the telecommunications companies are doomed? Not at all. IBM didn't die from its battle with Microsoft. It still makes mainframe computers. But its competitive edge comes from software innovations and, above all, from consulting services that pertain to turnkey business solutions. And no mainframe computer has since reached the quasi-monopolistic domination of the 360 series. Telecommunications companies will have to change, and this change will be infinitely more radical than the one the computer makers underwent.

Possession of a telecommunications network is no longer a decisive competitive advantage. From now on, what counts, above all, is access to the network – that is, the part of the telecommunications infrastructure that has been most neglected, is technologically aged, and has long been considered a burden by the telecommunications companies. Now, telecommunications companies will have to find ways to create efficient, attractive applications and market them. The challenge isn't technological, it is cultural. Are the telecommunications companies up to it?

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To evaluate whether telecommunications companies will succeed in their cultural revolution, we must understand the nature of these firms. Little has been written on the subject. The few books that have been published deal with sectorial aspects, generally legal and regulatory. There are two historiographies, both funded by telecommunications companies, but their focus is institutional, and they are about twenty years old – an eternity in this effervescent sector.[1] A more recent book, written by someone who is systematically contemptuous of telecommunications companies, reflects his prejudices and not reality; after all, the fact is that Canadian telephony has been a success, not a failure![2] More interesting are journalist Lawrence Surtees's books on Jean de Grandpré, president of Bell and founder of BCE,[3] and on the advent of competition in the long-distance market.[4]

I should warn readers that *The Invisible Empire* is no friend to ideologies. Although private initiative is one of my explicit themes, its shortcomings will be clearly pointed out; on the other hand, when the governments accomplish something positive, I recognize it fully. (We shall see that this was often the case in the Prairie provinces.) Any ideology interprets reality through a particular analytic grid, reducing to mundaneness the iridescent world that shimmers, bright and furtive, before our eyes. What I have tried to do is uncover the facts and hold them up so that they illuminate the evolution of the telecommunications industry.

In *The Invisible Empire*, facts are judged according to four parameters that are as objective as possible: the rate of penetration of telephones in society, the telecommunications industry's economic performance, its degree of innovation, and the quality of life of its employees. Canada has always had one of the highest telephone-penetration rates in the world. Of course, as telephony became universal in Western countries, this parameter lost its importance and had to be replaced by that of rates. Residential-service rates in Canada are among the lowest in the world; in particular, they are on average lower than those in the United States. On the economic side, Canada is now a net exporter of telecommunications equipment. Its pace of innovation is one of the best in the world. Canadians developed the first digital switches: Northern Telecom's DMS line; the result has been a highly digitized public telecommunications network. As for industrial relations, the unions themselves recognize that working conditions for telephone employees in Canada are generally among the best in the world. The real living conditions of these

[1] Collins, *A Voice from Afar*; Ogle, *Hello, Long Distance!*
2 Babe, *Telecommunications in Canada*.
3 Surtees, *Pa Bell*.

employees, expressed in purchasing power, is second in the world, after those in the United States.

There is a fifth, very different criterion: national identity. Canada was built around east–west infrastructures, countering the natural north–south tendency. Telecommunications is one of the main infrastructures to which Canada entrusted its national destiny. *The Invisible Empire* judges Canadian telecommunications as a function of this parameter, which is subjective but always invoked by the builders of the industry. It must be stated that a Canadian national identity has existed in North America since 1867, in spite of its injustices, fragilities, and unsettled issues.

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Finally, I would like to mention that this book is not an academic work. I am a field worker, and I want this book to provoke thought about an industry of growing importance. It is my hope to encourage dialogue between the corporate and academic worlds and to contribute, in my fashion, to forge links between these two great sectors of human activity.

The extreme compartmentalization of Canadian telecommunications has led me to highlight certain aspects of the industry. While I am aware of the incomplete nature of such an undertaking, I wanted to offer an overview, looking at the service aspect as well as manufacturing; reviewing developments province by province; examining regulatory, technological, and power issues; and integrating the oft-neglected subject of labour relations. Any part of this book could give rise to an in-depth study: my only aim is to provide a survey of the main points of Canadian telecommunications and to encourage other researchers to take this work further.

The Bell group is at the centre of the entire Canadian telecommunications industry; along with its associated telecommunications carriers, Bell accounts for 60 per cent of Canadian telecommunications, not including manufacturing. This book thus naturally reflects Bell's dominance. The company evolved in three distinct phases, and so I have divided the history of telecommunications in Canada into three periods, with their own values and few links between them.

4 Surtees, *Wire Wars*.

First, from 1880 to 1915, under the long reign of Charles Fleetford Sise, a dynamic but stubborn autocrat, Bell acted as a predator, trying to construct a monopoly as cheaply as possible in moves typical of the unfettered capitalism of the nineteenth century. Bell failed to reach this goal, and barely avoided nationalization. The technological basis of the company was the manual exchange. There was no network per se, but a constellation of exchanges.

The second period in Canadian telecommunications was marked by the triumph of the ideas of Theodore Vail, the president of AT&T during the preceding period. Vail's great plan – universality of telephone service – was attained in fifty years. The telephone companies' monopoly was counterbalanced by a policy of transparency regarding the public and the state, and by social benefits for employees that were clearly ahead of their time. Vail's ideas were introduced to Canada by Bell, which imposed technological and managerial standards throughout the industry through an association of companies. This broad policy, however, kept Canada within the American sphere of influence.

The last major period began in 1956 with the Consent Decree between AT&T and the American Department of Justice, which ended the privileged relations between American and Canadian manufacturers. The separation of Bell and AT&T, already begun during the previous period, was accelerated. With its great survival instinct, Bell Canada and its subsidiary, Northern Electric (the forebear of Northern Telecom) staked everything on digital technology and launched a Canadian research-and-development effort for the world market, checkmating the United States in its own market. This period ended in 1992, with the introduction of competition in long-distance and, ultimately, in all telecommunications.

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Thus, *The Invisible Empire* traces the history of an industry from its birth to its current metamorphosis. It is the story of a success, since Canada is among the world leaders in telecommunications. And it was this very success that precipitated the current debate. Before, telecommunications was an important activity in the economy, but not a strategic one. Today, telecommunications is becoming the central activity in a number of economic sectors. Financial institutions, the media, and transportation companies are, first and foremost, communications systems. Their other activities are simply specialized applications.

The question is whether yesterday's telecommunications success guarantees the success of tomorrow's new media. The answer is not clear. If the computer industry is imposing itself on telecommunications, Canada has a way to go: the Canadian computer industry is

fragile and highly dependent on the United States and Japan. The traditional telecommunications industry was, in essence, national. The new-media industry is global.

This book leaves the reader in a fluid, unpredictable world where major forces are at work and direction seems to have escaped all control. For many years, Bell was the great unifier of Canadian telephony (through the Trans-Canada Telephone System, Telecom Canada, the Stentor group). But newcomers are protesting the rules of the game: the heirs to the old telegraph companies are modernizing; fast-growing cable companies, computer manufacturers, resellers of enhanced services, and even existing telecommunications companies such as the Alberta-based Telus are suddenly discovering the advantages of freedom, including the freedom to compete against Bell.

If Canadian telecommunications are still to be prominent in the world of new media, it will be thanks to a completely new coalition of service providers, manufacturers, and new types of actor – applications providers and even content creators. A new operational mode based on consulting and provision of integrated business solutions is on the rise. Telecommunications companies will have to learn to listen to their customers. Previously, they provided a solution; today, they must work with their customers, taking account of their particular business issues and adapting to their respective corporate cultures. This approach is so foreign to their traditions that telecommunications companies have to acquire consulting firms in order to make the transition.

Even more difficult, perhaps, is the discovery of the world of owners of general and specialized content (TV and radio stations, film producers, record companies, print-media companies, museums, etc.). These cultural industries have nothing in common with the engineering culture of the telecommunications companies, and the inevitable rapprochement between the two industries will no doubt cause much gnashing of teeth.

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In any case, Bell's role of great unifier is obsolete; its lack of expertise in computers, its bi-provincial (not even national) nature, and its traditional telecommunications culture do not exactly make it an asset for Canada. But this should not lead to pessimism.

On the threshold of a new millennium, industrial leadership in integrated communications has fallen into Nortel's hands. Bell's former subsidiary is now the engine of Canadian industrial development. Its massive investment in research and development and its

resolutely international outlook have made it a great asset to Canada. With its recent interest in the Internet, everything points to a continuation of the love affair that has always existed between Canada and communications.