

For Emma Kiselyova-Castells,
without whose love, work, and support
this book would not exist

The Rise of the Network Society

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Prologue: The Net and the Self

"Do you think me a learned, well-read man?"

"Certainly," replied Zi-gong, "Aren't you?"

*"Not at all," said Confucius. "I have simply grasped one thread which links up the rest."**

Toward the end of the second millennium of the Christian Era several events of historical significance have transformed the social landscape of human life. A technological revolution, centered around information technologies, is reshaping, at accelerated pace, the material basis of society. Economies throughout the world have become globally interdependent, introducing a new form of relationship between economy, state, and society, in a system of variable geometry. The collapse of Soviet statism, and the subsequent demise of the international communist movement, has undermined for the time being the historical challenge to capitalism, rescued the political left (and Marxian theory) from the fatal attraction of Marxism-Leninism, brought the Cold War to an end, reduced the risk of nuclear holocaust, and fundamentally altered global geopolitics. Capitalism itself has undergone a process of profound restructuring, characterized by greater flexibility in management; decentralization and networking of firms both internally and in their relationships to other firms; considerable empowering of capital *vis-à-vis* labor, with the concomitant decline of influence of the labor movement; increasing individualization and diversification of working relationships; massive incorporation of women into the paid labor force, usually under

* Recounted in Sima Qian (145-ca. 89BC), "Confucius," in Hu Shi, *The Development of Logical Methods in Ancient China*, Shanghai: Oriental Book Company, 1922; quoted in Qian 1985: 125.

discriminatory conditions; intervention of the state to deregulate markets selectively, and to undo the welfare state, with different intensity and orientations depending upon the nature of political forces and institutions in each society; stepped-up global economic competition, in a context of increasing geographic and cultural differentiation of settings for capital accumulation and management. As a consequence of this general overhauling of the capitalist system, still under way, we have witnessed the global integration of financial markets, the rise of the Asian Pacific as the new dominant, global manufacturing center, the arduous economic unification of Europe, the emergence of a North American regional economy, the diversification, then disintegration, of the former Third World, the gradual transformation of Russia and the ex-Soviet area of influence in market economies, the incorporation of valuable segments of economies throughout the world into an interdependent system working as a unit in real time. Because of these trends, there has also been an accentuation of uneven development, this time not only between North and South, but between the dynamic segments and territories of societies everywhere, and those others that risk becoming irrelevant from the perspective of the system's logic. Indeed, we observe the parallel unleashing of formidable productive forces of the informational revolution, and the consolidation of black holes of human misery in the global economy, be it in Burkina Faso, South Bronx, Kamagasaki, Chiapas, or La Courneuve.

Simultaneously, criminal activities and mafia-like organizations around the world have also become global and informational, providing the means for stimulation of mental hyperactivity and forbidden desire, along with any form of illicit trade demanded by our societies, from sophisticated weaponry to human flesh. Besides, a new communication system, increasingly speaking a universal, digital language is both integrating globally the production and distribution of words, sounds and images of our culture, and customizing them to the tastes of identities and moods of individuals. Interactive computer networks are growing exponentially, creating new forms and channels of communication, shaping life and being shaped by life at the same time.

Social changes are as dramatic as technological and economic processes of transformation. For all the difficulty in the process of transformation of women's condition, patriarchalism has come under attack, and has been shaken in a number of societies. Thus, gender relationships have become, in much of the world, a contested domain, rather than a sphere of cultural reproduction. It follows a fundamental redefinition of relationships between women, men and children, and thus, of family, sexuality, and personality.

Environmental consciousness has permeated down to the institutions of society, and its values have won political appeal, at the price of being belied and manipulated in the daily practice of corporations and bureaucracies. Political systems are engulfed in a structural crisis of legitimacy, periodically wrecked by scandals, essentially dependent on media coverage and personalized leadership, and increasingly isolated from the citizenry. Social movements tend to be fragmented, localistic, single-issue oriented, and ephemeral, either retrenched in their inner worlds, or flaring up for just an instant around a media symbol. In such a world of uncontrolled, confusing change, people tend to regroup around primary identities: religious, ethnic, territorial, national. Religious fundamentalism, Christian, Islamic, Jewish, Hindu, and even Buddhist (in what seems to be a contradiction in terms), is probably the most formidable force of personal security and collective mobilization in these troubled years. In a world of global flows of wealth, power, and images, the search for identity, collective or individual, ascribed or constructed, becomes the fundamental source of social meaning. This is not a new trend, since identity, and particularly religious and ethnic identity, have been at the roots of meaning since the dawn of human society. Yet identity is becoming the main, and sometimes the only, source of meaning in a historical period characterized by widespread destructuring of organizations, delegitimation of institutions, fading away of major social movements, and ephemeral cultural expressions. People increasingly organize their meaning not around what they do but on the basis of what they are, or believe they are. Meanwhile, on the other hand, global networks of instrumental exchanges selectively switch on and off individuals, groups, regions, and even countries, according to their relevance in fulfilling the goals processed in the network, in a relentless flow of strategic decisions. It follows a fundamental split between abstract, universal instrumentalism, and historically rooted, particularistic identities. **Our societies are increasingly structured around a bipolar opposition between the Net and the Self.**

In this condition of structural schizophrenia between function and meaning, patterns of social communication become increasingly under stress. And when communication breaks down, when it does not exist any longer, even in the form of conflictual communication (as would be the case in social struggles or political opposition), social groups and individuals become alienated from each other, and see the other as a stranger, eventually as a threat. In this process, social fragmentation spreads, as identities become more specific and increasingly difficult to share. The informational society, in its global manifestation, is also the world of Aum Shinrikyo, of American Militia,

of Islamic/Christian theocratic ambitions, and of Hutu/Tutsi reciprocal genocide.

Bewildered by the scale and scope of historical change, culture and thinking in our time often embrace a new millenarism. Prophets of technology preach the new age, extrapolating to social trends and organization the barely understood logic of computers and DNA. Postmodern culture, and theory, indulge in celebrating the end of history, and, to some extent, the end of Reason, giving up on our capacity to understand and make sense, even of nonsense. The implicit assumption is the acceptance of full individualization of behaviour, and of society's powerlessness over its destiny.

The project informing this book swims against streams of destruction, and takes exception to various forms of intellectual nihilism, social skepticism, and political cynicism. I believe in rationality, and in the possibility of calling upon reason, without worshipping its goddess. I believe in the chances of meaningful social action, and transformative politics, without necessarily drifting towards the deadly rapids of absolute utopias. I believe in the liberating power of identity, without accepting the necessity of either its individualization or its capture by fundamentalism. And I propose the hypothesis that all major trends of change constituting our new, confusing world are related, and that we can make sense of their interrelationship. And, yes, I believe, in spite of a long tradition of sometimes tragic intellectual errors, that observing, analyzing, and theorizing is a way of helping to build a different, better world. Not by providing the answers, that will be specific to each society and found by social actors themselves, but by raising some relevant questions. This book would like to be a modest contribution to a necessarily collective, analytical effort, already underway from many horizons, aimed at understanding our new world on the basis of available evidence and exploratory theory.

To walk preliminary steps in this direction, we must take technology seriously, using it as the point of departure of this inquiry; we ought to locate this process of revolutionary technological change in the social context in which it takes place and by which it is being shaped; and we should keep in mind that the search for identity is as powerful as techno-economic change in charting the new history. Then, after saying the words, we will depart for our intellectual journey, following an itinerary that will take us to numerous domains, and will cross through several cultures and institutional contexts, since the understanding of a global transformation requires a perspective as global as possible, within the obvious limits of this author's experience and knowledge.

Technology, Society, and Historical Change

The information technology revolution, because of its pervasiveness throughout the whole realm of human activity, will be my entry point in analyzing the complexity of new economy, society, and culture in the making. This methodological choice does not imply that new social forms and processes emerge as consequences of technological change. Of course technology does not determine society.¹ Neither does society script the course of technological change, since many factors, including individual inventiveness and entrepreneurialism, intervene in the process of scientific discovery, technological innovation, and social applications, so that the final outcome depends on a complex pattern of interaction.² Indeed, the dilemma of technological determinism is probably a false problem,³ since technology is society, and society cannot be understood or represented without its technological tools.⁴ Thus, when in the 1970s a new technological paradigm, organized around information technology, came to be constituted, mainly in the United States (see chapter 1), it was a specific segment of American society, in interaction with the global economy and with world geopolitics, that materialized into a new way of producing, communicating, managing, and living. That the constitution of this paradigm took place in the United States, and to some extent in California, and in the 1970s, probably had considerable consequences for the forms and evolution of new information technologies. For instance, in spite of the decisive role of military funding and markets in fostering early stages of the electronics industry during the 1940s–1960s, the technological blossoming that took place in the early 1970s can be somehow related to the culture of freedom, individual innovation, and entrepreneurialism that grew out from the 1960s culture of American campuses. Not so much in terms of its politics, since Silicon Valley was, and is, a solid bastion of the conservative vote, and most innovators were meta-political, but in regard to social values of breaking away from established patterns of behavior, both in society at large and in the business world. The emphasis on personalized devices, on interactivity, on networking, and the relentless

¹ See the interesting debate on the matter in Smith and Marx 1994.

² Technology does not determine society: it embodies it. But neither does society determine technological innovation: it uses it. This dialectical interaction between society and technology is present in the works of the best historians, such as Fernand Braudel.

³ Classic historian of technology Melvin Kranzberg has forcefully argued against the false dilemma of technological determinism. See, for instance, Kranzberg's (1992) acceptance speech of the Award to Honorary Membership in NASTS.

⁴ Bijker et al. (1987).

pursuit of new technological breakthroughs, even when it apparently did not make much business sense, was clearly in discontinuity with the somewhat cautious tradition of the corporate world. The information technology revolution half-consciously⁵ diffused through the material culture of our societies the libertarian spirit that flourished in the 1960s movements. Yet, as soon as new information technologies diffused, and were appropriated by different countries, various cultures, diverse organizations, and miscellaneous goals, they exploded in all kinds of applications and uses that fed back into technological innovation, accelerating the speed, broadening the scope of technological change, and diversifying its sources.⁶ An illustration will help us to understand the importance of unintended social consequences of technology.⁷

As is known, the Internet originated in a daring scheme imagined in the 1960s by the technological warriors of US Defense Department Advanced Research Projects Agency (the mythical DARPA) to prevent a Soviet takeover or destruction of American communications in case of nuclear war. To some extent, it was the electronic equivalent of the Maoist tactics of dispersal of guerrilla forces around a vast territory to counter an enemy's might with versatility and knowledge of terrain. The outcome was a network architecture that, as its inventors wanted, cannot be controlled from any center, and is made up of thousands of autonomous computer networks that have innumerable ways to

⁵ There is still to be written a fascinating social history of the values and personal views of some of the key innovators of the 1970s Silicon Valley revolution in computer technologies. But a few indications seem to point to the fact that they were intentionally trying to undo the centralizing technologies of the corporate world, both out of conviction and as their market niche. As evidence, I recall the famous Apple Computer 1984 advertising spot to launch Macintosh, in explicit opposition to Big Brother IBM of Orwellian mythology. As for the countercultural character of many of these innovators, I shall also refer to the life story of the genius developer of the personal computer, Steve Wozniak: after quitting Apple, bored by its transformation into another multinational corporation, he spent a fortune for a few years subsidizing rock groups that he liked, before creating another company to develop technologies of his taste. At one point, after having created the personal computer, Wozniak realized that he had no formal education in computer sciences, so he enrolled at UC Berkeley. But in order to avoid embarrassing publicity he used another name.

⁶ For selected evidence concerning the variation of information technology diffusion patterns in different social and institutional contexts see, among other works: Guile (1985); Landau and Rosenberg (1986); Wang (1994); Watanuki (1990); Bianchi et al. (1988); Freeman et al. (1991); Bertazzoni et al (1984); Agence de L'Informatique (1986); Castells et al. (1986).

⁷ For an informed and cautious discussion of relationships between society and technology, see Fischer (1985).

link up, going around electronic barriers. Ultimately ARPANET, the network set up by the US Defense Department, became the foundation of a global, horizontal communication network of thousands of computer networks (admittedly for a computer literate elite of about 20 million users in the mid-1990s, but growing exponentially), that has been appropriated for all kinds of purposes, quite removed from the concerns of an extinct Cold War, by individuals and groups around the world. Indeed, it was via the Internet that Subcomandante Marcos, the leader of Chiapas' *zapatistas*, communicated with the world, and with the media, from the depth of Lacandon forest, during his escape in February 1995.

Yet, if society does not determine technology, it can, mainly through the state, suffocate its development. Or alternatively, again mainly by state intervention, it can embark on an accelerated process of technological modernization able to change the fate of economies, military power, and social well-being in a few years. Indeed, the ability or inability of societies to master technology, and particularly technologies that are strategically decisive in each historical period, largely shapes their destiny, to the point where we could say that while technology *per se* does not determine historical evolution and social change, technology (or the lack of it) embodies the capacity of societies to transform themselves, as well as the uses to which societies, always in a conflictive process, decide to put their technological potential.⁸

Thus, around 1400, when the European Renaissance was planting the intellectual seeds of technological change that would dominate the world three centuries later, China was the most advanced technological civilization in the world, according to Mokyr.⁹ Key inventions had developed in China centuries earlier, even a millennium and a half earlier, as in the case of blast furnaces that allowed the casting of iron in China by 200BC. Also, Su Sung introduced the water clock in AD1086, surpassing the accuracy of measurement of European mechanical clocks of the same date. The iron plow was introduced in the sixth century, and adapted to wet-field rice cultivation two centuries later. In textiles, the spinning wheel appeared at the same time as in the West, by the thirteenth century, but advanced much faster in China because there was an old-established tradition of sophisticated weaving equipment: draw looms to weave silk were used in Han times.

⁸ See the analyses presented in Castells (1988b); also Webster (1991).

⁹ My discussion on China's interrupted technological development relies mainly, on the one hand, on an extraordinary chapter by Joel Mokyr (1990: 209-58); on the other hand, on a most insightful, although controversial book, Qian (1985).

The adoption of water power was parallel to Europe: by the eight century the Chinese were using hydraulic trip hammers, and in 1280 there was wide diffusion of the vertical water wheel. Ocean travel was easier for the Chinese at an earlier date than for European vessels: they invented the compass around AD960, and their junks were the most advanced ships in the world by the end of the fourteenth century, enabling long sea trips. In military matters, the Chinese, besides inventing powder, developed a chemical industry that was able to provide powerful explosives, and the crossbow and the trebuchet were used by Chinese armies centuries ahead of Europe. In medicine, techniques such as acupuncture were yielding extraordinary results that only recently have been universally acknowledged. And of course, the first information processing revolution was Chinese: paper and printing were Chinese inventions. Paper was introduced in China 1,000 years earlier than in the West, and printing probably began in the late seventh century. As Jones writes: "China came within a hair's breadth of industrializing in the fourteenth century."¹⁰ That it did not, changed the history of the world. When in 1842 the Opium Wars led to Britain's colonial impositions, China realized, too late, that isolation could not protect the Middle Kingdom from the evil consequences of technological inferiority. It took more than one century thereafter for China to start recovering from such a catastrophic deviation from its historical trajectory.

Explanations for such a stunning historical course are both numerous and controversial. There is no place in this Prologue to enter the complexity of the debate. But, on the basis of research and analysis by historians such as Needham,¹¹ Qian,¹² Jones,¹³ and Mokyr,¹⁴ it is possible to suggest an interpretation that may help to understand, in general terms, the interaction between society, history, and technology. Indeed, most hypotheses concerning cultural differences (even those without implicitly racist undertones), fail to explain, as Mokyr points out, the difference not between China and Europe but between China in 1300 and China in 1800. Why did a culture and a kingdom that had been the technological leader of the world for thousands of years suddenly become technologically stagnant precisely at the moment when Europe embarked on the age of discoveries, and then on the industrial revolution?

Needham has proposed that Chinese culture was more prone than

¹⁰ Jones (1981: 160), cited by Mokyr (1990: 219).

¹¹ Needham (1954-88, 1969, 1981).

¹² Qian (1985).

¹³ Jones (1988).

¹⁴ Mokyr (1990).

Western values to a harmonious relationship between man and nature, something that could be jeopardized by fast technological innovation. Furthermore, he objects to the Western criteria used to measure technological development. However, this cultural emphasis on a holistic approach to development had not impeded technological innovation for millennia, nor stopped ecological deterioration as a result of irrigation works in Southern China, when the conservation of nature was subordinated to agricultural production in order to feed a growing population. In fact, Wen-yuan Qian, in his powerful book, takes exception to Needham's somewhat excessive enthusiasm for the feats of Chinese traditional technology, notwithstanding his shared admiration for Needham's monumental life-long work. Qian calls for a closer analytical linkage between the development of Chinese science and the characteristics of Chinese civilization dominated by the dynamics of state. Mokyr also considers the state to be the crucial factor in explaining Chinese technological retardation in modern times.¹⁵ The explanation may be proposed in three steps: technological innovation was, for centuries, fundamentally in the hands of the state; after 1400 the Chinese state, under the Ming and Qing dynasties, lost interest in technological innovation; and, partly because of their dedication to serve the state, cultural and social elites were focused on arts, humanities, and self-promotion *vis-à-vis* the imperial bureaucracy. Thus, what does seem to be crucial is the role of the state, and the changing orientation of state policy. Why would a state that had been the greatest hydraulic engineer in history, and had established an agricultural extension system to improve agricultural productivity since the Han period, suddenly become inhibited from technological innovation, even forbidding geographical exploration, and abandoning the construction of large ships by 1430? The obvious answer is that it was not the same state; not only because they were of different dynasties, but because the bureaucratic class became more deeply entrenched in the administration due to a longer than usual period of uncontested domination.

According to Mokyr, it appears that the determining factor for technological conservatism was the rulers' fears of the potentially disruptive impacts of technological change on social stability.¹⁶ Numerous forces opposed the diffusion of technology in China, as in other societies, particularly the urban guilds. Bureaucrats content with the status quo were concerned by the possibility of triggering social conflicts that could coalesce with other sources of latent opposition in a society that had been kept under control for several centuries. Even the two enlightened Manchu despots of the eighteenth century, K'ang Chi and Ch'ien Lung, focused their efforts on pacification and order, rather than on unleashing new

¹⁵ Nothing has about the alphabet, movable type printing, popular libraries, encyclopedias, scientific literature, technical documentation, and design.

development. Conversely, exploration and contacts with foreigners, beyond controlled trade and acquisition of weapons, were deemed at best unnecessary, at worst threatening, because of the uncertainty they would imply. A bureaucratic state without external incentive and with internal disincentives to engage in technological modernization opted for the most prudent neutrality, as a result stalling the technological trajectory that China had been following for centuries, if not millennia, precisely under state guidance. The discussion of the factors underlying the dynamics of the Chinese state under the Ming and Qing dynasties is clearly beyond the scope of this book. What matters for our research purpose are two teachings from this fundamental experience of interrupted technological development: on the one hand, the state can be, and has been in history, in China and elsewhere, a leading force of technological innovation; on the other hand, precisely because of this, when the state reverses its interest in technological development, or becomes unable to perform it under new conditions, a statist model of innovation leads to stagnation, because of the sterilization of society's autonomous innovative energy to create and apply technology. That the Chinese state could, centuries later, build anew an advanced technological basis, in nuclear technology, missiles, satellite launching, and electronics,¹⁵ demonstrates again the emptiness of a predominantly cultural interpretation of technological development and backwardness: the same culture may induce very different technological trajectories depending on the pattern of relationships between state and society. However, the exclusive dependence on the state has a price, and the price for China was that of retardation, famine, epidemics, colonial domination, and civil war, until at least the middle of the twentieth century.

A rather similar, contemporary story can be told, and will be told in this book (in volume III), of the inability of Soviet statism to master the information technology revolution, thus stalling its productive capacity and undermining its military might. Yet we should not jump to the ideological conclusion that all state intervention is counter-productive to technological development, indulging in ahistorical reverence for unfettered, individual entrepreneurialism. Japan is of course the counter-example, both to Chinese historical experience and to the inability of the Soviet state to adapt to the American-initiated revolution in information technology.

Historically, Japan went, even deeper than China, through a period of historical isolation under the Tokugawa Shogunate (established in

¹⁵ Wang (1993).

1603), between 1636 and 1853, precisely during the critical period of formation of an industrial system in the western hemisphere. Thus, while at the turn of the seventeenth century Japanese merchants were trading throughout East and Southeast Asia, using modern vessels of up to 700 tons, the construction of ships above 50 tons was prohibited in 1635, and all Japanese ports, except Nagasaki, were closed to foreigners, while trade was restricted to China, Korea, and Holland.¹⁶ Technological isolation was not total during these two centuries, and endogenous innovation did allow Japan to proceed with incremental change at a faster pace than China.¹⁷ Yet, because Japan's technological level was lower than China's, by the mid-nineteenth century the *kurobune* (black ships) of Commodore Perry could impose trade and diplomatic relations on a country substantially lagging behind Western technology. However, as soon as the 1868 *Ishin Meiji* (Meiji Restoration) created the political conditions for a decisive state-led modernization,¹⁸ Japan progressed in advanced technology by leaps and bounds in a very short time span.¹⁹ Just as one significant illustration, because of its current strategic importance, let us briefly recall the extraordinary development of electrical engineering and communication applications in Japan in the last quarter of the nineteenth century.²⁰ Indeed, the first independent department of electrical engineering in the world was established in 1873 in the newly founded Imperial College of Engineering in Tokyo, under the leadership of its Dean, Henry Dyer, a Scottish mechanical engineer. Between 1887 and 1892, a leading academic in electrical engineering, British professor William Ayrton, was invited to teach at the College, being instrumental in disseminating knowledge to the new generation of Japanese engineers, so that by the end of the century the Telegraph Bureau was able to replace foreigners in all its technical departments. Technology

¹⁶ Chida and Davies (1990).

¹⁷ Ito (1993).

¹⁸ Several distinguished Japanese scholars, and I tend to concur with them, consider that the best Western account of the Meiji Restoration, and of the social roots of Japanese modernization, is Norman (1940). It has been translated into Japanese and is widely read in Japanese universities. A brilliant historian, educated at Cambridge and Harvard, before joining the Canadian diplomatic corps Norman was denounced as a communist by Karl Wittfogel to the McCarthy Senate Committee in the 1950s, and then submitted to constant pressure from Western intelligence agencies. Appointed Canadian Ambassador to Egypt he committed suicide in Cairo in 1957. On the contribution of this truly exceptional scholar to the understanding of the Japanese state, see Dower (1975); for a different perspective, see Beasley (1990).

¹⁹ Matsumoto and Sinclair (1994); Kamatani (1988).

²⁰ Uchida (1991).

transfer from the West was sought after through a variety of mechanisms. In 1873, the Machine Shop of the Telegraph Bureau sent a Japanese clockmaker, Tanaka Seisuke, to the International Machines exhibition in Vienna to obtain information on the machines. About ten years later, all the Bureau's machines were made in Japan. Based on this technology, Tanaka Daikichi founded in 1882 an electrical factory, Shibaura Works, that, after its acquisition by Mitsui, went on to become Toshiba. Engineers were sent to Europe and to America. And Western Electric was permitted to produce and sell in Japan in 1899, in a joint venture with Japanese industrialists: the name of the company was NEC. On such a technological basis Japan went full speed into the electrical and communications age before 1914: by 1914 total power production had reached 1,555,000 kw/hour, and 3,000 telephone offices were relaying a billion messages a year. It is indeed symbolic that Commodore Perry's gift to the Shogun in 1857 was a set of American telegraphs, until then never seen in Japan: the first telegraph line was laid in 1869, and ten years later Japan was connected to the whole world through a transcontinental information network, via Siberia, operated by the Great Northern Telegraph Co., jointly managed by Western and Japanese engineers and transmitting in both English and Japanese.

The story of how Japan became a major world player in information technology industries in the last quarter of the twentieth century, under the strategic guidance of the state, is now general public knowledge, so it will be assumed in our discussion.²¹ What is relevant for the ideas presented here is that it happened at the same time as an industrial and scientific superpower, the Soviet Union, failed this fundamental technological transition. It is obvious, as the preceding reminders show, that Japanese technological development since the 1960s did not happen in an historical vacuum, but was rooted in a decades-old tradition of engineering excellence. Yet what matters for the purpose of this analysis is to emphasize what dramatically different results state intervention (and lack of intervention) had in the cases of China and the Soviet Union, as compared to Japan in both the Meiji period and the post-second World War period. The characteristics of the Japanese state at the roots of both processes of modernization and development are well known, both for *Ishin Meiji*²² and for the contemporary developmental state,²³ and

²¹ Ito (1994); Japan Informatization Processing Center (1994); for a western perspective, see Forester (1993).

²² See Norman (1940) and Dower (1975); see also Allen (1981a).

²³ Johnson (1995).

their presentation would take us excessively away from the focus of these preliminary reflections. What must be retained for the understanding of the relationship between technology and society is that the role of the state, by either stalling, unleashing, or leading technological innovation, is a decisive factor in the overall process, as it expresses and organizes the social and cultural forces that dominate in a given space and time. To a large extent, technology expresses the ability of a society to propel itself into technological mastery through the institutions of society, including the state. The historical process through which such development of productive forces takes place earmarks the characteristics of technology and its interweaving in social relationships.

This is not different in the case of the current technological revolution. It originated and diffused, not by accident, in a historical period of the global restructuring of capitalism, for which it was an essential tool. Thus, the new society emerging from such a process of change is both capitalist and informational, while presenting considerable historical variation in different countries, according to their history, culture, institutions, and to their specific relationship to global capitalism and information technology.

Informationalism, Industrialism, Capitalism, Statism: Modes of Development and Modes of Production

The information technology revolution has been instrumental in allowing the implementation of a fundamental process of restructuring of the capitalist system from the 1980s onwards. In the process, this technological revolution was itself shaped, in its development and manifestations, by the logic and interests of advanced capitalism, without being reducible to the expression of such interests. The alternative system of social organization present in our historical period, statism, also tried to redefine the means of accomplishing its structural goals while preserving the essence of these goals: that is the meaning of restructuring (or *perestroika*, in Russian). Yet Soviet statism failed in its attempt, to the point of collapsing the whole system, to a large extent because of the incapacity of statism to assimilate and use the principles of informationalism embodied in new information technologies, as I shall argue in this book (volume III) on the basis of empirical analysis. Chinese statism seemed to succeed by shifting from statism to state-led capitalism and integration in global economic networks, actually becoming closer to the developmental state model of East Asian capitalism than to the "Socialism with Chinese

characteristics" of official ideology,²⁴ as I shall also try to discuss in volume III. Nonetheless, it is highly likely that the process of structural transformation in China will undergo major political conflicts and institutional change in the coming years. The collapse of statism (with rare exceptions, for example, Vietnam, North Korea, Cuba, which are, however, in the process of linking up with global capitalism) has established a close relationship between the new, global capitalist system shaped by its relatively successful *perestrojka*, and the emergence of informationalism, as the new material, technological basis of economic activity and social organization. Yet both processes (capitalist restructuring, the rise of informationalism) are distinct, and their interaction can only be understood if we separate them analytically. At this point in my introductory presentation of the book's *idées fortes*, it seems necessary to propose some theoretical distinctions and definitions concerning capitalism, statism, industrialism, and informationalism.

It is a well-established tradition in theories of postindustrialism and informationalism, starting with classic works by Alain Touraine²⁵ and Daniel Bell,²⁶ to place the distinction between pre-industrialism, industrialism, and informationalism (or postindustrialism) on a different axis than the one opposing capitalism and statism (or collectivism, in Bell's terms). While societies can be characterized along the two axes (so that we have industrial statism, industrial capitalism, and so on), it is essential for the understanding of social dynamics to maintain the analytical distance and empirical interrelation between modes of production (capitalism, statism) and modes of development (industrialism, informationalism). To root these distinctions in a theoretical basis, that will inform the specific analyses presented in this book, it is unavoidable to take the reader, for a few paragraphs, into the somewhat arcane domains of sociological theory.

This book studies the emergence of a new social structure, manifested under various forms, depending on the diversity of cultures and institutions throughout the planet. This new social structure is associated with the emergence of a new mode of development, informationalism, historically shaped by the restructuring of the capitalist mode of production towards the end of the twentieth century.

The theoretical perspective underlying this approach postulates that societies are organized around human processes structured by historically determined relationships of *production, experience, and*

²⁴ Nolan and Furen (1990); Hsing (1996).

²⁵ Touraine (1969).

²⁶ Bell (1973). All quotes are from the 1976 edition, which includes a new, substantial "Foreword 1976."

power. Production is the action of humankind on matter (nature) to appropriate it and transform it for its benefit by obtaining a product, consuming (unevenly) part of it, and accumulating surplus for investment, according to a variety of socially determined goals. *Experience* is the action of human subjects on themselves, determined by the interaction between their biological and cultural identities, and in relationship to their social and natural environment. It is constructed around the endless search for fulfillment of human needs and desires. *Power* is that relationship between human subjects which, on the basis of production and experience, imposes the will of some subjects upon others by the potential or actual use of violence, physical or symbolic. Institutions of society are built to enforce power relationships existing in each historical period, including the controls, limits, and social contracts achieved in the power struggles.

Production is organized in class relationships that define the process by which some human subjects, on the basis of their position in the production process, decide the sharing and uses of the product in relationship to consumption and investment. Experience is structured around gender/sexual relationships, historically organized around the family, and characterized hitherto by the domination of men over women. Family relationships and sexuality structure personality and frame symbolic interaction.

Power is founded upon the state and its institutionalized monopoly of violence, although what Foucault labels the microphysics of power, embodied in institutions and organizations, diffuses throughout the entire society, from work places to hospitals, enclosing subjects in a tight framework of formal duties and informal aggressions.

Symbolic communication between humans, and the relationship between humans and nature, on the basis of production (with its complement, consumption), experience, and power, crystallize over history in specific territories, thus generating *cultures and collective identities*.

Production is a socially complex process, because each one of its elements is internally differentiated. Thus, humankind as collective producer includes both labor and the organizers of production, and labor is highly differentiated and stratified according to the role of each worker in the production process. Matter includes nature, human-modified nature, human-produced nature, and human nature itself, the labors of history forcing us to move away from the classic distinction between humankind and nature, since millennia of human action have incorporated the natural environment into society, making us, materially and symbolically, an inseparable part of this environment. The relationship between labor and matter in the process of work involves the use of means of production to act upon

matter on the basis of energy, knowledge, and information. Technology is the specific form of this relationship.

The product of the production process is socially used under two forms: consumption and surplus. Social structures interact with production processes by determining the rules for the appropriation, distribution, and uses of the surplus. These rules constitute modes of production, and these modes define social relationships of production, determining the existence of social classes that become constituted as such classes through their historical practice. The structural principle under which surplus is appropriated and controlled characterizes a mode of production. In the twentieth century we have lived, essentially, with two predominant modes of production: capitalism and statism. Under capitalism, the separation between producers and their means of production, the commodification of labor, and the private ownership of means of production on the basis of the control of capital (commodified surplus), determined the basic principle of appropriation and distribution of surplus by capitalists, although who is (are) the capitalist class(es) is a matter of social inquiry in each historical context, rather than an abstract category. Under statism, the control of surplus is external to the economic sphere: it lies in the hands of the power-holders in the state: let us call them *apparatchiki* or *ling-dao*. Capitalism is oriented toward profit-maximizing, that is, toward increasing the amount of surplus appropriated by capital on the basis of the private control over the means of production and circulation. Statism is (was?) oriented toward power-maximizing, that is, toward increasing the military and ideological capacity of the political apparatus for imposing its goals on a greater number of subjects and at deeper levels of their consciousness.

The social relationships of production, and thus the mode of production, determine the appropriation and uses of surplus. A separate yet fundamental question is the level of such surplus, determined by the productivity of a particular process of production, that is by the ratio of the value of each unit of output to the value of each unit of input. Productivity levels are themselves dependent on the relationship between labor and matter, as a function of the use of the means of production by the application of energy and knowledge. This process is characterized by technical relationships of production, defining modes of development. Thus, modes of development are the technological arrangements through which labor works on matter to generate the product, ultimately determining the level and quality of surplus. Each mode of development is defined by the element that is fundamental in fostering productivity in the production process. Thus, in the agrarian mode of development, the source of increasing

surplus results from quantitative increases of labor and natural resources (particularly land) in the production process, as well as from the natural endowment of these resources. In the industrial mode of development, the main source of productivity lies in the introduction of new energy sources, and in the ability to decentralize the use of energy throughout the production and circulation processes. In the new, informational mode of development the source of productivity lies in the technology of knowledge generation, information processing, and symbol communication. To be sure, knowledge and information are critical elements in all modes of development, since the process of production is always based on some level of knowledge and in the processing of information.²⁷ However, what is specific to the informational mode of development is the action of knowledge upon knowledge itself as the main source of productivity (see chapter 2). Information processing is focused on improving the technology of information processing as a source of productivity, in a virtuous circle of interaction between the knowledge sources of technology and the application of technology to improve knowledge generation and information processing: this is why, rejoining popular fashion, I call this new mode of development informational, constituted by the emergence of a new technological paradigm based on information technology (see chapter 1).

Each mode of development has also a structurally determined performance principle around which technological processes are organized: industrialism is oriented toward economic growth, that is toward maximizing output; informationalism is oriented towards technological development, that is toward the accumulation of knowledge and towards higher levels of complexity in information processing. While higher levels of knowledge may normally result in higher levels of output per unit of input, it is the pursuit of knowledge

²⁷ For the sake of clarity in this book, I find it necessary to provide a definition of knowledge and information, even if such an intellectually satisfying gesture introduces a dose of the arbitrary in the discourse, as social scientists who have struggled with the issue know well. I have no compelling reason to improve on Daniel Bell's (1973: 175) own definition of *knowledge*: "Knowledge: a set of organized statements of facts or ideas, presenting a reasoned judgment or an experimental result, which is transmitted to others through some communication medium in some systematic form. Thus, I distinguish knowledge from news and entertainment." As for *information*, some established authors in the field, such as Machlup, simply define information as the communication of knowledge (see Machlup 1962: 15). However, this is because Machlup's definition of knowledge seems to be excessively broad, as Bell argues. Thus, I would rejoin the operational definition of information proposed by Porat in his classic work (1977:2): "Information is data that have been organized and communicated."

and information that characterizes the technological production function under informationalism.

Although technology and technical relationships of production are organized in paradigms originating in the dominant spheres of society (for example, the production process, the military industrial complex) they diffuse throughout the whole set of social relationships and social structures, so penetrating and modifying power and experience.²⁸ Thus, modes of development shape the entire realm of social behavior, of course including symbolic communication. Because informationalism is based on the technology of knowledge and information, there is a specially close linkage between culture and productive forces, between spirit and matter, in the informational mode of development. It follows that we should expect the emergence of historically new forms of social interaction, social control, and social change.

Informationalism and capitalist *perestroika*

Shifting from theoretical categories to historical change, what truly matters for social processes and forms making the living flesh of societies is the actual interaction between modes of production and modes of development, enacted and fought for by social actors, in unpredictable ways, within the constraining framework of past history and current conditions of technological and economic development. Thus, the world, and societies, would have been very different if Gorbachev had succeeded in his own *perestroika*, a target that was politically difficult, but not out of reach. Or if the Asian Pacific had not been able to blend its traditional business networking form of economic organization with the tools provided by information technology. Yet the most decisive historical factor accelerating, channeling and shaping the information technology paradigm, and inducing its associated social forms, was/is the process of capitalist restructuring undertaken since the 1980s, so that the new techno-economic system can be adequately characterized as *informational capitalism*.

The Keynesian model of capitalist growth that brought unprece-

²⁸ When technological innovation does not diffuse in society, because of institutional obstacles to such diffusion, what follows is technological retardation because of the absence of necessary social/cultural feedback into the institutions of innovation and into the innovators themselves. This is the fundamental lesson that can be drawn from such important experiences as Qing's China, or the Soviet Union. For the Soviet Union, see vol. III. For China, see Qian (1985) and Mokyr (1990).

ented economic prosperity and social stability to most market economies for almost three decades after the Second World War, hit the wall of its built-in limitations in the early 1970s, and its crisis was manifested in the form of rampant inflation.²⁹ When the oil price increases of 1974 and 1979 threatened to spiral inflation out of control, governments and firms engaged in a process of restructuring in a pragmatic process of trial and error that is still underway in the mid-1990s with a more decisive effort at deregulation, privatization, and the dismantling of the social contract between capital and labor that underlay the stability of the previous growth model. In a nutshell, a series of reforms, both at the level of institutions and in the management of firms, aimed at four main goals: deepening the capitalist logic of profit-seeking in capital-labor relationships; enhancing the productivity of labor and capital; globalizing production, circulation, and markets, seizing the opportunity of the most advantageous conditions for profit-making everywhere; and marshaling the state's support for productivity gains and competitiveness of national economies, often to the detriment of social protection and public interest regulations. Technological innovation and organizational change, focusing on flexibility and adaptability, were absolutely critical in ensuring the speed and efficiency of restructuring. It can be argued that without new information technology global capitalism would have been a much-limited reality, flexible management would have been reduced to labor trimming, and the new round of spending in both capital goods and new consumer products would not have been sufficient to compensate for the reduction in public spending. Thus, informationalism is linked to the expansion and rejuvenation of capitalism, as industrialism was linked to its constitution as a mode of production. To be sure, the process of restructuring had very different manifestations in areas and societies around the world, as I shall briefly survey in chapter 2: it was diverted from its fundamental logic by the military Keynesianism of the Reagan Administration, actually creating even greater difficulties for the American economy at the end of the euphoria of artificial stimulation; it was somewhat limited in Western Europe because of society's resistance to the dismantling of the welfare state and to one-sided labor market flexibility, with the

²⁹ I presented years ago my interpretation of the causes of the 1970s worldwide economic crisis, as well as a tentative prognosis of avenues for capitalist restructuring. Notwithstanding the excessively rigid theoretical framework I juxtaposed to the empirical analysis, I think that the main points I made in that book (written in 1977-8), including the prediction of Reagonomics under that name, are still useful to understand the qualitative changes operated in capitalism during the last two decades (see Castells 1980).

result of raising unemployment in the European Union; it was absorbed in Japan without dramatic changes by emphasizing productivity and competitiveness on the basis of technology and cooperation rather than by increasing exploitation, until international pressures forced Japan to offshore production and to broadening the role of an unprotected, secondary labor market; and it plunged into a major recession, in the 1980s, the economies of Africa (except South Africa and Botswana) and Latin America (with the exception of Chile and Colombia), when International Monetary Fund policies cut money supply, reduced wages and imports, to homogenize conditions of global capital accumulation around the world. Restructuring proceeded on the basis of the political defeat of organized labor in major capitalist countries, and the acceptance of a common economic discipline by countries of the OECD area. Such discipline, although enforced when necessary by the Bundesbank, the Federal Reserve Board, and International Monetary Fund, was in fact inscribed in the integration of global financial markets that took place in the early 1980s using new information technologies. Under conditions of global financial integration, autonomous, national monetary policies became literally unfeasible, thus equalizing basic economic parameters of restructuring processes throughout the planet.

While capitalism's restructuring and the diffusion of informationalism were inseparable processes on a global scale, societies did act/react differently to such processes, according to the specificity of their history, culture, and institutions. Thus, to some extent it would be improper to refer to an Informational Society, which would imply the homogeneity of social forms everywhere under the new system. This is obviously an untenable proposition, empirically and theoretically. Yet we could speak of an Informational Society in the same way that sociologists have been referring to the existence of an Industrial Society, characterized by common fundamental features in their socio-technical systems, for instance in Raymond Aron's formulation.³⁰ But with two important qualifications: on the one hand, informational societies, as they exist currently, are capitalist (unlike industrial societies, some of which were statist); on the other hand, we must stress the cultural and institutional diversity of informational societies. Thus, Japanese uniqueness³¹ or Spain's difference³² are not going to fade away in a process of cultural indifferenciation, marching anew towards universal modernization, this time measured

³⁰ Aron (1963).

³¹ On Japanese uniqueness in a sociological perspective, see Shoji (1990).

³² On the social roots of Spanish differences, and similarities, *vis-à-vis* other countries, see Zaldivar and Castells (1992).

by rates of computer diffusion. Neither are China or Brazil going to be melted in the global pot of informational capitalism by continuing their current high-speed developmental path. But Japan, Spain, China, Brazil, as well as the United States, are and will be more so in the future, informational societies, in the sense that the core processes of knowledge generation, economic productivity, political/military power and media communication are already deeply transformed by the informational paradigm, and are connected to global networks of wealth, power, and symbols working under such a logic. Thus, all societies are affected by capitalism and informationalism, and many societies (certainly all major societies) are already informational,³³ although of different kinds, in different settings, and with specific cultural/institutional expressions. A theory of the informational society, as distinct from a global/informational economy,

³³ I should like to draw an analytical distinction between the notions of "information society" and "informational society," with similar implications for information/informational economy. The term information society emphasizes the role of information in society. But I argue that information, in its broadest sense, e.g. as communication of knowledge, has been critical in all societies, including medieval Europe which was culturally structured, and to some extent unified, around scholasticism, that is, by and large an intellectual framework (see Southern 1995). In contrast, the term informational indicates the attribute of a specific form of social organization in which information generation, processing, and transmission become the fundamental sources of productivity and power, because of new technological conditions emerging in this historical period. My terminology tries to establish a parallel with the distinction between industry and industrial. An industrial society (a usual notion in the sociological tradition) is not just a society where there is industry, but a society where the social and technological forms of industrial organization permeate all spheres of activity, starting with the dominant activities, located in the economic system and in military technology, and reaching the objects and habits of everyday life. My use of the terms informational society and informational economy attempts a more precise characterization of current transformations, beyond the commonsense observation that information and knowledge are important to our societies. However, the actual content of "informational society" has to be determined by observation and analysis. This is precisely the object of this book. For instance, one of the key features of informational society is the networking logic of its basic structure, which explains the use of the concept of "network society," as defined and specified in the conclusion of this volume. However, other components of "informational society," such as social movements or the state, exhibit features that go beyond the networking logic, although they are substantially influenced by such logic, as characteristic of the new social structure. Thus, "the network society" does not exhaust all the meaning of the "informational society". Finally, why, after all these precisions, have I kept *The Information Age* as the overall title of the book, without including medieval Europe in my inquiry? Titles are communicating devices. They should be user-friendly, clear enough for the reader to guess what is the real topic of the book, and worded in a fashion that does not

will always have to be attentive to historical/cultural specificity as much as to structural similarities related to a largely shared techno-economic paradigm. As for the actual content of this common social structure that could be considered to be the essence of the new informational society, I'm afraid I am unable to summarize it in one paragraph: indeed, the structure and processes that characterize informational societies are the subject matter covered in this book.

The Self in the Informational Society

New information technologies are integrating the world in global networks of instrumentality. Computer-mediated communication begets a vast array of virtual communities. Yet the distinctive social and political trend of the 1990s is the construction of social action and politics around primary identities, either ascribed, rooted in history and geography, or newly built in an anxious search for meaning and spirituality. The first historical steps of informational societies seem to characterize them by the preeminence of identity as their organizing principle. I understand by identity the process by which a social actor recognizes itself and constructs meaning primarily on the basis of a given cultural attribute or set of attributes, to the exclusion of a broader reference to other social structures. Affirmation of identity does not necessarily mean incapacity to relate to other identities (for example, women still relate to men), or to embrace the whole society under such identity (for example, religious fundamentalism aspires to convert everybody). But social relationships are defined *vis-à-vis* the others on the basis of those cultural attributes that specify identity. For instance, Yoshino, in his study on *nihonjiron* (ideas of Japanese uniqueness), pointedly defines cultural nationalism as "the aim to regenerate the national community by creating, preserving or strengthening a people's cultural identity when it is felt to be lacking, or threatened. The cultural nationalist regards the nation as the product of its unique history and culture and as a collective solidarity endowed with unique attributes."³⁴ Calhoun, although rejecting the historical newness of the phenomenon, has also emphasized the decisive role

depart excessively from the semantic frame of reference. Thus, in a world built around information technologies, information society, informatization, information superhighway, and the like (all terminologies originated in Japan in the mid-1960s – *Johoka Shakai*, in Japanese – and were transmitted to the West in 1978 by Simon Nora and Alain Minc, indulging in exoticism), a title such as *The Information Age* points straightforwardly to the questions to be raised, without prejudging the answers.

³⁴ Yoshino (1992: 1).

of identity in defining politics in contemporary American society, particularly in the women's movement, in the gay movement, in the civil rights movement, movements "that sought not only various instrumental goals but the affirmation of excluded identities as publicly good and politically salient."³⁵ Alain Touraine goes further, arguing that "in a post-industrial society, in which cultural services have replaced material goods at the core of production, *it is the defense of the subject, in its personality and in its culture, against the logic of apparatuses and markets, that replaces the idea of class struggle.*"³⁶ Then the key issue becomes, as stated by Calderon and Laserna, in a world characterized by simultaneous globalization and fragmentation, "how to combine new technologies and collective memory, universal science and communitarian cultures, passion and reason?"³⁷ How, indeed! And why do we observe the opposite trend throughout the world, namely, the increasing distance between globalization and identity, between the Net and the Self?

Raymond Barglow, in his illuminating essay on this matter, from a socio-psychoanalytical perspective, points at the paradox that while information systems and networking augment human powers of organization and integration, they simultaneously subvert the traditional Western concept of a separate, independent subject: "The historical shift from mechanical to information technologies helps to subvert the notions of sovereignty and self-sufficiency that have provided an ideological anchoring for individual identity since Greek philosophers elaborated the concept more than two millennia ago. In short, technology is helping to dismantle the very vision of the world that in the past it fostered."³⁸ Then he goes on to present a fascinating comparison between classic dreams reported in Freud's writing and his own patients' dreams in the high tech environment of 1990s' San Francisco: "Image of a head . . . and behind it is suspended a computer keyboard . . . I'm this programmed head!"³⁹ This feeling of absolute solitude is new in comparison to classic Freudian representation: "the dreamers . . . express a sense of solitude experienced as existential and inescapable, built into the structure of the world . . . Totally isolated, the self seems irretrievably lost to itself."⁴⁰ Thus, the search for new connectedness around shared, reconstructed identity.

³⁵ Calhoun (1994: 4).

³⁶ Touraine (1994: 168; my translation, his italics).

³⁷ Calderon and Laserna (1994: 90; my translation).

³⁸ Barglow (1994: 6).

³⁹ *Ibid.*: 53.

⁴⁰ *Ibid.*: 185.

However insightful, this hypothesis may be only part of the explanation. On the one hand, it would imply a crisis of the self limited to a Western individualist conception, shaken by uncontrollable connectedness. Yet the search for new identity and new spirituality is on also in the East, in spite of a stronger sense of collective identity and the traditional, cultural subordination of individual to the family. The resonance of Aum Shinrikyo in Japan in 1995, particularly among the young, highly educated generations, could be considered a symptom of the crisis of established patterns of identity, coupled with the desperate need to build a new, collective self, significantly mixing spirituality, advanced technology (chemicals, biology, laser), global business connections, and the culture of millenarist doom.⁴¹

On the other hand, elements of an interpretative framework to explain the rising power of identity must also be found at a broader level, in relationship to macroprocesses of institutional change, to a large extent connected to the emergence of a new global system. Thus, widespread currents of racism and xenophobia in Western Europe may be related, as Alain Touraine⁴² and Michel Wieviorka⁴³ have suggested, to an identity crisis on becoming an abstraction (European), at the same time that European societies, while seeing their national identity blurred, discovered within themselves the lasting existence of ethnic minorities in European societies (a demographic fact since at least the 1960s). Or again, in Russia and the ex-Soviet Union, the strong development of nationalism in the post-communist period can be related, as I shall argue in volume III, to the cultural emptiness created by 70 years of imposition of an exclusionary ideological identity, coupled with the return to primary, historical identity (Russian, Georgian), as the only source of meaning after the crumbling of the historically fragile *sovetskii narod* (Soviet people).

The emergence of religious fundamentalism seems also to be linked both to a global trend and to an institutional crisis. We know from history that ideas and beliefs of all brands are always in stock waiting to catch fire under the right circumstances.⁴⁴ It is significant that fundamentalism, be it Islamic or Christian, has spread, and will spread, throughout the world at the historical moment when global networks of wealth and power connect nodal points and valued

⁴¹ For the new forms of revolt linked to identity in explicit opposition to globalization, see the exploratory analysis undertaken in Castells, Yazawa, and Kiselyova, (1996b).

⁴² Touraine (1991).

⁴³ Wieviorka (1993).

⁴⁴ See, for instance Kepel (1993); Colas (1992).

individuals throughout the planet, while disconnecting, and excluding, large segments of societies, regions, and even entire countries. Why did Algeria, one of most modernized Muslim societies, suddenly turn to fundamentalist saviors, who became terrorists (as did their anti-colonialist predecessors) when they were denied their electoral victory in democratic elections? Why did the traditionalist teachings of Pope John Paul II find an undisputable echo among the impoverished masses of the Third World, so that the Vatican could afford to ignore the protests of a minority of feminists in a few advanced countries where precisely the progress of reproductive rights contributes to diminishing the number of souls to be saved? There seems to be a logic of excluding the excluders, of redefining the criteria for value and meaning in a world where there is shrinking room for the computer illiterate, for consumptionless groups, and for under-communicated territories. When the Net switches off the Self, the Self, individual or collective, constructs its meaning without global, instrumental reference: the process of disconnection becomes reciprocal, after the refusal by the excluded of the one-sided logic of structural domination and social exclusion.

Such is the terrain to be explored, not just declared. The few ideas advanced here on the paradoxical manifestation of the self in the informational society are only intended to chart the course of my inquiry for the reader's information, not to draw conclusions beforehand.

A Word on Method

This is not a book about books. While relying on evidence of various sorts, and on analyses and accounts from multiple sources, it does not intend to discuss existing theories of postindustrialism or the information society. There are available several thorough, balanced presentations of these theories,⁴⁵ as well as various critiques,⁴⁶ including my own.⁴⁷ Similarly, I shall not contribute, except when

⁴⁵ A useful overview of sociological theories on postindustrialism and informationalism is Lyon (1988). For the intellectual and terminological origins of notions of "information society," see Ito (1991a) and Nora and Minc (1978). See also Beniger (1986); Katz (1988); Salvaggio (1989); Williams (1988).

⁴⁶ For critical perspectives on postindustrialism, see, among others, Lyon (1988); Touraine (1992); Shoji (1990); Woodward (1980); Roszak (1986). For a cultural critique of our society's emphasis on information technology, see Postman (1992).

⁴⁷ For my own critique on postindustrialism, see Castells (1994, 1995, 1996).

necessary for the sake of the argument, to the cottage industry created in the 1980s around postmodern theory,⁴⁸ being for my part fully satisfied with the excellent criticism elaborated by David Harvey on the social and ideological foundations of "post-modernity,"⁴⁹ as well as with the sociological dissection of postmodern theories performed by Scott Lash.⁵⁰ I certainly owe many thoughts to many authors, and particularly to the forebears of informationalism, Alain Touraine and Daniel Bell, as well as to the one Marxist theorist who sensed the new, relevant issues just before his death in 1979, Nicos Poulantzas.⁵¹ And I duly acknowledge borrowed concepts when I use them as tools in my specific analyses. Yet I have tried to construct a discourse as autonomous and nonredundant as possible, integrating materials and observations from various sources, without submitting the reader to the painful revisiting of the bibliographic jungle where I have lived (fortunately, among other activities) for the past 12 years.

In a similar vein, while using a significant amount of statistical sources and empirical studies, I have tried to minimize the processing of data, to simplify an already excessively cumbersome book. Therefore, I tend to use data sources that find broad, accepted consensus among social scientists (for example, OECD, United Nations, World Bank, governments' official statistics, authoritative research monographs, generally reliable academic or business sources), except when such sources seem to be erroneous (such as Soviet GNP statistics or the World Bank's report on adjustment policies in Africa). I am aware of limitations in lending credibility to information that may not always be accurate, yet the reader will realize that there are numerous precautions taken in this text, so as to form conclusions usually on the basis of convergent trends from several sources, according to a methodology of triangulation with a well-established, successful tradition among historians, policemen, and investigative reporters. Furthermore, the data, observations, and references presented in this book do not really aim at demonstrating but at suggesting hypotheses while constraining the ideas within a corpus of observation, admittedly selected with my research questions in mind but certainly not organized around preconceived answers. The methodology followed in this book, whose specific implications will be discussed in each chapter, is at the service of the overarching purpose of its intellectual endeavor: to propose some elements of an

⁴⁸ See Lyon (1993); also Seidman and Wagner (1992).

⁴⁹ Harvey (1990).

⁵⁰ Lash (1990).

⁵¹ Poulantzas (1978: esp. 160-9).

exploratory, cross-cultural theory of economy and society in the information age, as it specifically refers to the emergence of a new social structure. The broad scope of my analysis is required by the pervasiveness of the object of such analysis (informationalism) throughout social domains and cultural expressions. But I certainly do not intend to address the whole range of themes and issues in contemporary societies, since writing encyclopedias is not my trade.

The book is divided into three parts that the publisher has wisely transformed into three volumes, to appear within the span of approximately one year. They are analytically interrelated, but they have been organized to make their reading independent. The only exception to this rule concerns the General Conclusion, in volume III, that is the overall conclusion of the book, and presents a synthetic interpretation of its findings and ideas.

The division into three volumes, while making the book publishable and readable, raises some problems in communicating my overall theory. Indeed, some critical topics that cut across all the themes treated in this book are presented in the second volume. Such is the case, particularly, of the analysis of women and patriarchalism, and of power relationships and the state. I warn the reader that I do not share a traditional view of society as made up of superimposed levels, with technology and economy in the basement, power on the mezzanine, and culture in the penthouse. Yet, for the sake of clarity, I am forced to a systematic, somewhat linear presentation of topics that, while relating to each other, cannot fully integrate all the elements until they have been discussed in some depth throughout the intellectual journey on which the reader is invited by this book. The first volume, in the reader's hands, deals primarily with the logic of what I call the Net, while the second (*The Power of Identity*) analyzes the formation of the Self, and the interaction between the Net and the Self in the crisis of two central institutions of society: the patriarchal family and the national state. The third volume (*End of Millennium*) attempts an interpretation of current historical transformations as a result of the dynamics of processes studied in the two first volumes. It is only at the end of the third volume that a general integration between theory and observation, linking up the analyses concerning the various domains, will be proposed, although each volume concludes with an effort at synthesizing the main findings and ideas presented in the volume. While volume III is more directly concerned with specific processes of historical change in various contexts, throughout the whole book I have tried my best to accomplish two goals: to ground analysis in observation, without reducing theorization to commentary; to diversify culturally my sources of observation and of ideas, as much as possible. This approach stems

from my conviction that we have entered a truly multicultural, interdependent world, that can only be understood, and changed, from a plural perspective that brings together cultural identity, global networking, and multidimensional politics.

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The Information Technology Revolution

Which Revolution?

"Gradualism," wrote paleontologist Stephen J. Gould, "the idea that all change must be smooth, slow, and steady, was never read from the rocks. It represented a common cultural bias, in part a response of nineteenth century liberalism to a world in revolution. But it continues to color our supposedly objective reading of life's history. . . . The history of life, as I read it, is a series of stable states, punctuated at rare intervals by major events that occur with great rapidity and help to establish the next stable era."¹ My starting point, and I am not alone in this assumption,² is that, at the end of the twentieth century, we are living through one of these rare intervals in history. An interval characterized by the transformation of our "material culture"³ by the works of a new technological paradigm organized around information technologies.

By technology I understand, in straight line with Harvey Brooks and Daniel Bell, "the use of scientific knowledge to specify ways of doing

¹ Gould (1980: 226).

² Melvin Kranzberg, one of the leading historians of technology, wrote "The Information Age has indeed revolutionized the technical elements of industrial society" (1985: 42). As for its societal effects: "While it might be evolutionary, in the sense that all changes and benefits will not appear overnight, it will be revolutionary in its effects upon our society" (ibid. 52). Along the same lines of argument, see also, for instance, Perez (1983); Forester (1985); Dizard (1982); Nora and Minc (1978); Stourdze (1987); Negroponte (1995); Ministry of Posts and Telecommunications (Japan) (1995); Bishop and Waldholz (1990); Darbon and Robin (1987); Salomon (1992); Dosi et al. (1988b); Petrella (1993).

³ On the definition of technology as "material culture" which I consider to be the appropriate sociological perspective, see the discussion in Fischer (1992: 1-32, esp): "Technology here is similar to the idea of material culture."