CHAPTER 1

The Race for Size, 1870–1960

The first twentieth century initiates a sharp turnaround from all previous trends. Democratization, free trade, relative peace and small-scale wars, the European balance of powers and the Enlightenment's philosophy of progress are supplanted by imperialism and total war, economic protectionism, state control, a radical rejection of the market, and political totalitarianism. The civilization begot by the scientific, economic and cultural revolution of the eighteenth century takes a dramatic leap backwards.

The Great Cycle starts with the size expansion of all organizations, economic as well as political. Gradually, business firms turn into giant corporations—at least compared to what they were before—while states compete with each other to form the largest colonial empire and, internally, control a growing share of their domestic economy.

Centralization, gigantism, bureaucracy and standardization develop simultaneously in corporations, in the state's organization and politics, and in social and cultural matters. Hence the peculiar style which defines the new century: it is the era of hierarchy, command economy, mass meetings and war economy. It is the Iron Age of reactionary autocracy. The large bureaucratic organization wields a

competitive advantage over smaller structures and favors authoritarian and centralizing social and cultural doctrines.

This first phase is characterized by a reinforcement of centralization and command power, reduced economic, political and intellectual freedom, and it defines the general tone of this Iron Age. Undeniably, Stalin was well inspired to choose a pseudonym meaning "steel" in Russian.

The industrial and administrative revolution marked the advent of big firms, while states became addicted to imperialism and dirigisme. Taken to extremes, these new organizational structures result in totalitarianism, the ultimate stage of centralization, and bring about the very particular moral atmosphere of the hierarchical society.

THE SECOND INDUSTRIAL REVOLUTION AND THE EMERGENCE OF THE LARGE CORPORATION

At the beginning of the century, the big issue, as suggested by Lenin in *The State and The Revolution*,[1] was to transform the whole society into a single firm and a huge factory. This view is shared in a more limited way by Joseph Schumpeter, a former Finance minister and Austrian economist living in the U.S. According to him, private capitalism inevitably turns into socialism given that big companies are more efficient and innovative, and thus concentration is unavoidable. But are very big firms and centralized states essential to secure prosperity? And is it really possible to centralize a whole society just like a big corporation?

The end of the century vindicates the superiority of decentralization celebrated by Ronald Coase and Friedrich Hayek as well as, recently, the new internauts. But it only occurred after seventy years of centralization during which the hierarchical and centralized organization advocated by Ford, Stalin and Hitler was gradually considered

1. International Publishers, undated, p. 84.

as the solution to the society's problems. This revolution is not only political and Russian. It concerns all countries and organizations.

It results from changes to the structure of the commercial and craft society of the late nineteenth century. According to economist Kenneth E. Boulding, it "was mostly a consequence of communicative advances (telephone, telegraph, typewriter, photocopier) and possibly of a strengthening of the managerial structure. All these changes took place in the 1870s and enabled an enormous expansion of organizations, thus giving birth to giants like General Motors, the U.S. department of defense and the Soviet Union, as well as many institutions which were inconceivable before 1870."[2]

Adam Smith's invisible hand, governing trade between individuals on free markets, was thus replaced by Alfred Chandler's "visible hand,"[3] that is, the centralized and bureaucratic handling of human affairs. This managerial hand governed the big business companies which first appeared in transportation before spreading to all the other sectors. Bureaucracy replaced both the market and the autarkic farming methods of the pre-industrial system.

The real organizational novelty was to apply to these newly-born business and industrial companies the methods that were until then only used by the state and church to manage things and human beings—but not without substantial improvements. This is the administrative innovation that had been foreseen by Auguste Comte and Saint-Simon, and whose contents were later analyzed by Max Weber.

This is a totally new phenomenon. The First Industrial Revolution—usually dated 1780–1860—took place in societies where firms were only small craft undertakings. This revolution was "more than

2. Kenneth E. Boulding, "Economics as a Not Very Biological Science," in Thomas Wiegele (ed.), *Biology and the Social Sciences: An Emerging Revolution*, Westview Press, 1982.

3. Alfred Chandler, *The Visible Hand, The Managerial Revolution in American Business*, Belknap Press, 1977.

industrial"[4] in the sense that it also had repercussions on family, religion and politics.

More than a time of industrial expansion, this was the true birth of factories and companies. Until then, there were hardly more than 1,800 firms or so-called commercial and financial "houses" in Great Britain and production took place at home and mostly in the country.

But it is in fact the second wave of technological breakthroughs, the Second Industrial Revolution, that lays the durable foundations of the twentieth century. Although it is built on the same determinants that gave birth to factories and manufactures, the second revolution radically amplified the new organizational advances. Centralization accelerated, hierarchical structures deepened and the workforce soared, while the managerial staff increased sharply in order to control growing production flows. And as markets expanded rapidly, their own growth simultaneously determined a huge development of private bureaucratic pyramids.

To understand the causes of this transformation, it is necessary to explain why factories supplanted industrial subcontracting, especially as it is the same centralizing factors that transformed with an increased intensity both business firms and public administrations during the Second Industrial Revolution.

The Birth of the Corporation

Before 1750, there was no clear distinction between the company and the family.[5] Since the invention of farming in the Neolithic age, the

4. As pointed out by Joel Mokyr in his foreword and his article "Are We Living in the Middle of an Industrial Revolution?" Federal Reserve Bank of Kansas City, *Economic Review*, second quarter, 1997.

5. This date also marks the beginning of the "world frontier" phenomenon: the large expansion of European people gradually caused the extinction of many civilizations on other continents, due to more sophisticated arms, but also to the spreading of infectious diseases to which native people were not immune. William H. McNeill, *The Global Condition, Conquerors, Catastrophes, and Community*, Princeton University Press, 1992.

family cell had remained the basic framework of production in all societies. Companies often consisted of a tradesman who subcontracted work to home workers or to independent craftsmen who worked in their own workshop and sold their products on markets or in small shops. During the first half of the eighteenth century, the production of cotton fabrics was the first major non-farm activity. It was usually organized on a small scale and financed by tradesmen/manufacturers, who subcontracted the spinning and weaving of raw cotton to farmers/workers working at home. The production unit was thus very small and based on family work. Spinning wheels and weaving shuttles provided work for a couple and its children. Some tradesmen had thus thousands of people under them and owned hundreds of weaving looms scattered in the country without directly supervising everyone's work. Besides, the equipment investment per worker remained very low.

Admittedly, there were already large joint-stock companies before the Industrial Revolution. A good example is the companies in charge of overseas trade in the United Kingdom or big pre-industrial firms such as Chatham's naval dockyard or London's Whitbread brewery. Joint-stock companies had already been quite successful in France in Law's time but the great commercial or manufacturing units belonged to the state, like for instance the royal manufactures, the naval dockyards and the big naval trading corporations. Before the mid-nineteenth century, the largest organizations were the first bureaucratic state bodies. In the Caribbean Islands and in America, the great sugar or cotton-growing slave plantations had a rather impressive labor force, which was subjected to an extremely tight control that foreshadowed totalitarian systems.

As Leslie Hannah noted:

> Although there were big-sized firms before the beginning of the industrial revolution, it was the introduction of new mechanical techniques and the application of the steam machine to the industrial process which, from the late 18th century, radically transformed

> the nature of the capitalist company and created an economy where factories employing hundreds (and sometimes thousands) of workers became the standard form of production units.[6]

It is only during the Industrial Revolution that all the workers started being concentrated in a same factory, the English "mills" which were referred to as "satanic mills" in the Socialist literature of the time. This new organization of work was made possible by falling transportation costs, economies of scale thanks to the development of centralized energy sources and innovations such as the introduction of gaslight in cities which enabled longer work in winter.

But this revolution was mainly due to the use of new and cheaper energy sources, such as coal and steam power. This changed radically the production process and made transportation much easier with its introduction in the shipping, and especially, the railway industries.

Szostak suggests that the changes in transportation techniques and means, especially in Great Britain, during the decades that preceded the First Industrial Revolution were the decisive causal factor.[7] At the time, various legal initiatives were undertaken to create shipping corporations, lease the construction of toll roads and build or renovate canals. At the dawn of the Industrial Revolution, Great Britain—already favored by its geographical advantage—had the best waterway and road network in the world. It followed that transportation became cheaper and quicker for goods and passengers and the domestic market became more united as it was given a new national dimension.[8]

The growing markets generated by this transport revolution in turn led to an organizational revolution. Indeed, the substantial in-

6. *The Rise of the Corporate Economy*, Methuen, 1976, p. 8.

7. "The Organization of Work: The Emergence of the Factory Revisited," *Journal of Economic Behavior and Organization*, 11, 1989, pp. 343–358.

8. Quoting several specialists, Szostak noticed a few elements of interest. For instance, from 130 hours in 1660, the travel time for the journey from Manchester to London fell to 60 hours in 1760 and only 25 in 1785. Following the digging of new canals and rivers (especially the Bridgewater Canal), the price of coal fell by half in the late eighteenth century in Manchester and Birmingham.

crease of the trade of goods and commodities soon determined major changes. To solve the control and organizational crises caused by these suddenly amplified flows, administrative centralization was undertaken. This very ancient technique, first used in ancient Egypt and Mesopotamia during the agricultural revolution in the beginning of structured societies, proved a much better way to deal with mass production than geographically dispersed subcontracting.

Factories reduced substantially transportation needs as they avoided the first stage in the production process, which consisted of fetching the goods at the subcontractor's workshop before delivering them to the client. Instead of spending his time on the road as a traveling salesman, the company head could focus on organizing production and supervising its employees with the help of permanent executives. As a consequence, productivity and the work pace increased, while cheating and petty theft decreased. Stocks of commodities and goods could now be reduced, while costly machines and tools could be used almost continuously, thus improving depreciation and allowing an increase in investment. Employees could get about more easily. They came from farther away and ate for cheaper at lunchtime as food transportation costs decreased.

It is in the cotton-oriented textile industry that the old workshops were first transformed into modern, highly-mechanized, capital intensive factories and firms. With several innovations in the cotton production processes, and later on the use of steam machines, it became crucial to control more tightly the workers and centralize production. This was the only way to benefit fully from the economies of scale resulting from the use of modern equipment and steam engines.[9]

As soon as 1784, Sir Robert Peel's Bury-based calico company employed 7,000 people. However, the average textile firm used to employ a few hundred only. Indeed, in 1822, textile companies in Manchester were composed of 100 to 200 workers with a capital of 50 to

9. Leslie Hannah, op. cit., p. 9.

90 pounds per employee, that is 5,000 to 18,000 pounds per firm. But in the 1830s this amount rose to 80,000 pounds, reflecting the sharp increase in the capital intensity of the new fabrics.

However, faced with the consumption boom, companies first multiplied instead of increasing their size as the efficient size of each firm was probably strictly limited. The integration of production within factories eventually started in the 1820s and 1830s, but factories were still rather small-sized.

Although the centralization of production units early in the nineteenth century was an organizational revolution, we must keep in mind that the number of employees per company was still much lower than nowadays. The "Representative Firm" mentioned by Alfred Marshall, whose celebrated *Principles of Economics* was the reference text in economics at the beginning of the twentieth century, was still closer to what we would now call a small- or medium-sized company.

But industrial concentration accelerated sharply during the second half of the nineteenth century and paved the way for the radical changes of the first twentieth century.

Mass Production, Distribution and Consumption

While firms were born in Great Britain during the 1780–1860 Industrial Revolution, the large modern corporation first appeared in the United States during the Second Industrial Revolution, the era of mass production, distribution and consumption. According to Alfred Chandler's reference study, the advent of big firms took place in the U.S. during the 1840–1920 period, when the existing farm economy was replaced by a mostly urban and industrial economy.

Factory production only really took off when coal became available in large quantities in the mid-1830s, as the United States lagged behind Great Britain from this point of view.[10] With the availability

10. The only exception was the textile industry which had been a precursor as the equipment and production were concentrated in a single place: the fabric or the

of coal and steam power, the whole production process changed. It became possible to use new machines, develop the steel industry and build railways. This created a need not only for rails, wheels, mechanical parts but also glass, leather work and rubber. Thanks to cheap energy and heating and new fast, high-capacity transportation means, factories spread in the 1840s and 1850s.

In the mid-1840s, the price of coal fell from 10 to 3 dollars a ton. The railway network spread to all eastern states. Transit and travel became 3 to 10 times faster within a decade, while for centuries the speed of transportation had depended on draft animals' walking pace. Steam-powered railways supplanted river and sea transportation and this increased even more the volumes transported, as railways could be used all year long unlike canals which were impassable in winter and in times of flood.

Coping with Faster Production Flows

Factories' turnovers rose substantially as the harnessing of energy also enabled the industry to mass produce at unprecedented rates. And this mass production could be distributed to a great number of remote markets through the railway network. The industrial process's overall speed increased significantly.

The organization of the production process and the architecture of the capitalist system were transformed by the acceleration of production flows. This is the central insight of Chandler, who viewed this mutation as the origin of the "administrative revolution," which drove the most industrialized countries into the first twentieth century, some three decades before 1900. This analysis was taken up and completed by James Beniger in a remarkable review of what he calls the "control revolution."[11]

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factory like in Great Britain. At that time, manufacturing activity was mainly rural and seasonal. Workers were recruited when necessary among the people of the local farms and were paid either in kind or with money.

11. James R. Beniger, *The Control Revolution*, Harvard University Press, 1986.

Since the beginning of human history, the speed of transportation of material goods had always depended on draft animals' walking pace or on wind speed. But suddenly, within a few decades, these standards became obsolete as everything accelerated. Production increased substantially in the factories and was sent across the world from one continent to another. For the first time ever, production flows almost exceeded the human capacity of control. This is why in the mid-nineteenth century some companies were faced with a control crisis which then spread to the whole U.S. material economy during the following decades.

At that time, the society lacked the technical and organizational means to manage flows that big and quick. These required constant, abundant and very precise information. Such a degree of coordination had never been seen before, except maybe during the Napoleonic Wars, after the French Revolution of 1789 which had resorted to mass conscription and tremendous execution speed in military matters. As specialists often underline, war is basically a question of logistics and this is exactly the kind of problem the big firms of the New Industrial Revolution suddenly had to tackle.

The Control Crisis and the Resurgence of Bureaucracy

The control crisis first materialized in the form of big railway safety problems. Then, it spread to the distribution of goods through the new and complex transportation and warehouse network, and eventually to the production process itself as speed often caused technical accidents and administrative backlogs.

Logically, the first response to this crisis was to develop new information systems, given information is always necessary to transform energy and materials into products. But more importantly, the answer came from the development of bureaucracy, which had been invented at the dawn of our civilization precisely to control and coordinate the agricultural production boom three to four millennia BC.

> As the control crisis spread through the material economy from the 1840s to the 1880s, it inspired a continuing stream of innovations that enhanced information processing, administrative methods and communications. [. . .] These permanent innovations in transportation, production, distribution and mass marketing reached their height in the 1870s and 1880s; on the eve of the new century, the crisis had been substantially resolved."[12]

These modernized bureaucratic methods allowed producers to deal with mass markets, the major economic breakthrough that resulted from the first two industrial revolutions. And this bureaucratic solution to the control problem which overwhelmed not only the United States but also Great Britain, France and Germany came to dominate all the evolutions of the first twentieth century.

World War II would bring in a bundle of non-bureaucratic (if not anti-bureaucratic) new control techniques but we will detail them later on. For the time being (in the late nineteenth century), the large bureaucratic firm is still the best way to control mass production. According to many historians, these new management methods were born from war, and notably during World War I. But in fact, they date essentially from the mid-nineteenth century and were first intended for managing U.S. railways, which played a major role during the industrial revolution.

This example is very instructive in terms of the solutions found. On the first high-speed single-track two-way railroads, traffic management was necessary but difficult in the absence of control techniques, centralized communications, telegraphs, standardized procedures, coded signals, precise timetables, and synchronized chronometers aboard the trains. Serious accidents were frequent and generally resulted from head-on collisions between two trains on a single line. Obviously, the best solution to avoid those organizational and communication problems was centralized planning. In other words, all the traffic had to be managed by a single company.

12. Ibid., p. 220.

The Springfield, Massachusetts-based Western Railroad Corporation decided to reorganize its bureaucracy, planning, data processing and communications. As Alfred Chandler pointed out, this was the first time ever that a U.S. company took the time to draw precisely its organizational structure as a single systemized chain of command represented by organizational charts.[13]

All the necessary bureaucratic procedures were then defined: prefixed rules, distribution of tasks and responsibilities, work planning, systematic information collection and hierarchical reporting, control with feedback, use of the telegraph to announce the traffic expected and timetable changes, employees in uniforms mentioning their exact position, organizational charts, coded signals, and collection of normalized statistics.

These were the elements of the rational administrative control theory that Frederick Taylor and others called "Scientific Management" in the 1890s. Chandler then renamed it the "managerial revolution," but in fact James Burnham was the first to use this term in the title of his book published in 1941.

This was not the only industrial sector that was affected by the acceleration of production flows. As distribution speed had improved, companies were tempted to increase the rate of production. For example, in the 1890s, a single blast furnace could produce 1,000 tons per week instead of only 60 in the late 1860s. Obviously, this required some synchronization and coordination of many operations and the production rate had to be adapted to the capacity and frequency of the railroad freight.

For all the production processes composed of a great number of successive stages, it became necessary to integrate them vertically within a single firm to achieve centralized coordination. This method was applied to sewing machines in the 1850s, repeating guns in the

13. Chandler, op. cit., p. 97, quoting Stephen Salsbury's monograph, *The State, the Investor, and the Railroad: The Boston and Albany, 1825–1867*, Harvard University Press, 1967, p. 187.

1860s, typewriters in the 1870s, electric motors in the 1880s, and eventually the first U.S. cars in the 1890s.

Similarly, in the agricultural distribution sector, vertical integration was undertaken and organized markets developed to simplify the transportation of farm produces from the hundreds of thousands of producers to the thousands of stores. This resulted in the introduction of new forms of organization, wholesalers, department stores and concepts such as marketing, advertising and trademarks.

All in all, it seems that mass production and mass distribution were inexorably leading to an administrative revolution.

The Administrative Revolution

Middle managers were given the responsibility for the coordination of these rapidly-growing production flows and this required the development of more accurate accounting methods. Bureaucratic control is performed by an army of executive supervisors who never work on the actual production but manage, measure and coordinate the production and behavior of the field workers, who really make finished products out of raw materials. Such an administrative and hierarchical superstructure governs the production-process employees. This business administration is the precise reflection of the state administrations set by the European monarchies during the seventeenth and eighteenth centuries, but with much more modern technical capacities.

This revolution was accompanied by an impressive number of innovations—many of which are now common use: the mass production of mail envelopes (1839), precise organizational charts and the first business school (1842), the first shorthand magazine (1848), the hierarchical data collection and processing system in railway companies (1853), the use of blotting paper instead of sand to mop up damp ink (1856), the first distinction between workers and executives in companies according to the line-and-staff concept (1857), the first

telegraph ticker that gave prices in continuous time in a brokerage firm (1867), the first patented typewriter (1868), the first automatic filing system for hospital patients (1874), the first modern offices with forms, filing cabinets, telephone books and telephones (1880s), the first collegiate business school (Wharton in 1881), the first accounting firm (1883), the first patented dictating machine (1885), the first business calculator with a keyboard (Comptometer in 1887) and the first card tabulator (the Hollerith system in 1889).[14]

It is against this background of continuous innovation in administrative techniques that Frederick Winslow Taylor started working for Midvale Steel, where he was about to rationalize the ordering system and establish standard times for each element of specialized workers' work. There, he developed his original concept of "scientific management" which not only improved the processing of material flows by using standardized spare parts and coordinating operations, but also formalized human behaviors in order to integrate the whole company into a unified product transformation process.

As he points out tellingly in *Principles of Scientific Management* (1911), "In the past the man has been first; in the future the system must be first." And this is a brief but striking description of the principle that ruled the organization of totalitarian systems for whole societies a few years later.

This move continued in the early twentieth century when Henry Ford built the Highland Park Plant in 1913 to produce the Model T. This marked the beginning of the moving assembly line, which was inspired by the continuous flows in oil refineries. The idea is to make the car assembly process as smooth as possible in order to maximize productivity and avoid dead times and pressure surges that prevent liquids from flowing in pipes. He thus took to their extremes these new concepts, the spare part technique and the idea of standardizing products and work.

14. Beniger, op. cit., pp. 282–283.

Other industries had already adopted these principles looking for greater productivity through the mechanization of all work-stages, as for example Gustavus Swift's meat-packing and -cutting line in Chicago in the 1880s.

In turn, the generalization of factory mass production led to a wave of technical innovations that improved the automation of the production control process during the first decades of the century, just like the development of manufactures during the first Industrial Revolution had resulted in the invention of new and costly machines that modern "mills" could easily amortize.

The control of these rapidly-growing flows was thus achieved by the centralization of several production activities under a common authority, that is the integration of these various processes into a single big organization. As we will see in the second part of the book, coupled with the latest technological advances, centralized organization was a good way to collect and concentrate the costly information necessary to control fast-increasing flows and make the best of it—which was impossible with existing decentralized procedures. It also enabled amortization of the data collection and processing costs resulting from indivisible and costly investments over a large number of units produced and sold.

And it is the economies provided by this centralized administrative process that contributed to the success of ever-larger companies. As administrative management capacity improved, private and public administrations grew bigger.

A New Capacity to Manage Large Organizations

The production of the information necessary to the control of the rapidly-growing flows resulted in the vertical integration of the successive stages of the production process, starting with the extraction of raw materials and ending with the retail sale of finished products, but also in the geographical integration of the factories producing the

same goods for regional clienteles, and consequently, in a general increase in companies' size.

Hence the strong growth of production units during the second half of the century from 1860 to 1890. Over that period, companies became multi-unit business enterprises both to deal with the market expansion generated by transportation innovations and to increase the vertical integration of all the production-process stages, from the extraction of raw materials to marketing and distribution. With these developments, end-of-the-century firms gained a much bigger dimension.

The traditional enterprise was a single unit belonging to an individual or a small number of owners operating out of a single office their trade, factory, bank or transportation business. These enterprises had only one economic purpose and dealt in a single product line or service within a single geographic area. Thus, before the birth of the modern firm, the activities of these single unit enterprises were coordinated and monitored directly by the market reactions.[15]

The business head, which was often the only owner, directed and supervised by himself a small number of workers, journeymen or apprentices with little administrative support and, consequently, no work supervisors. Only a few of these companies employed directors with responsibilities similar to those of middle managers in modern firms. But there was no stratified administration where top executives supervised the work of middle executives who in turn superintended field workers.[16]

In contrast, the modern business enterprise is managed by a vast hierarchy of salaried executives and generally composed of several production units geographically spread. Each is specialized in a particular field and produces a wide range of goods and services. As they are commonly owned, the trade between them is internalized and they

15. *Chandler*, op. cit., p. 3.
16. Ibid., p. 3.

are not subjected to market and price mechanism. Decision-making and control are performed by the owner's salaried executives. Such an administrative structure of middle and top executives had never been seen before.

Bureaucracies: Public and Private

On the eve of World War I, modern firms had become the dominant institutions in many sectors of the U.S. economy. By the mid-century, they employed hundreds to thousands of middle-management and top executives to supervise the work of tens to hundreds of production units with up to several hundred thousands workers. Such a quick and major institutional change achieved in so short a period had no historical precedent.

This is in deep contrast with the early nineteenth century organizational methods on both the political and economic fronts. As late as the 1830s, for example, the Bank of the United States, then the nation's largest and most complex institution with twenty-two branch offices and profits fifty times those of the largest mercantile house, was managed by just three people: Nicholas Biddle and two assistants.[17] And President Andrew Jackson and 665 other civilians ran all three branches of the federal government in Washington.

At the end of the period, bureaucracy had spread to all human activities, but it had a bad reputation as several perceptive observers underlined. As early as 1837, John Stuart Mill wrote, for example, of a "vast network of administrative tyranny . . . that system of bureaucracy, which leaves no free agent in all France, except the man at Paris who pulls the wires."[18] And Thomas Carlyle, in his *Latter-Day Pam-*

17. Fritz Redlich, 1951, *The Molding of American Banking, Men and Ideas*, pp. 113–124, quoted by Beniger.

18. R. W. Burchfield (ed.), *A supplement to the Oxford English Dictionary*, Oxford University Press, 1972, p. 391, quoted by Beniger.

phlets, published in 1850, complained of "the Continental nuisance called 'Bureaucracy.'"

But it is Max Weber who first theorized bureaucracy in *Economy and Society* (1922), defining its main characteristics as follows: dehumanization of the information processed ("cases" and "files"); formalized and predefined rules to make decisions, answer questions and solve problems; well-defined tasks and duties; high division of labor; hierarchical authority system and separated decision-making and communication functions. The stability of the system was purportedly reinforced by the practice of regular promotion based upon seniority.

The mechanism is mainly based on the possibility to "rationalize" work, a term by which Weber meant the reduction of the volume of information processed by removing or ignoring the data that are not absolutely necessary to manage the process. Never mind if the executives or workers like sport or art. What really matters is their experience, position in the hierarchy, how quickly they process files and the number of mistakes they make for each hundred files processed.

When applied to people, bureaucratic mechanization explains the widespread use of administrative forms, which reduce people to a handful of precise characteristics: civil status, occupation, curriculum and a few others depending on the organization's needs. This depersonalizing approach neglects everything that is original, particular, specific, indescribable or unclassifiable. But when people are not reduced to mere standardized objects, big human groups become almost uncontrollable with the existing knowledge and technologies.

The same organizational concerns and principles of the Ford and General Motors factories, the Napoleonic army, and the Swift meatpacking company in Chicago were then adopted by the mass parties (Nazis and Communists) in the '30s and the state bureaucracies managing industrial sectors, general education or the whole national production. The problems had not changed and neither had the few remedies.

However, these global organizational changes were only noticed

much later with the usual lag between perception and understanding and the evolving realities which accompanies every transformation or revolution. Economists continued to analyze production almost only in terms of markets and prices, considering the business enterprise as if it was a single isolated person or a craftsman without taking into account its internal organization and administrative methods for resource allocation. Strangely, the business enterprise as an organization was not mentioned in economics textbooks and was thus nonexistent in theory.

And yet, there were many proofs of the new role of both large-scale bureaucracies and centralized and hierarchical organizations. Once again, the railway industry was at the origin of the first major professional executive body. The 1880s and 1890s saw the construction of integrated systems in transport companies, with a cartelization between companies and the support of professional consultants, managers, investors and speculators.

In 1891, the Pennsylvania Railroad employed 110,000 people against only 39,492 in the U.S. army. Even the United States Postal Service, the largest civil service organization at the time, only employed 95,440 people. Two years later, federal tax receipts amounted to $385 million, while the Pennsylvania Railroad only made $135 million of revenue, but its stock market capitalization of $842 million was to be compared with a federal debt of $155 million.

On the contrary, in Europe, the army and civil services were much bigger employers than private companies. It followed that most managers and administrators came from the public sector, while in the United States they originated from private railway companies. Similarly, transportation and communication infrastructures were financed by the state in Europe and by private investors in the United States.

But, in both cases, companies' race for expansion and production bureaucratization was to take another step forward just before the end of the century.

Mergers and Acquisitions: The Era of Trusts

On the eve of the twentieth century, existing activities entered a phase of obsolescence because of technological advances and heavy investment in new and fast-growing industries. Then appeared phenomena that we would now describe as "macro-economic" but were tellingly called "general overproduction crises" at the time. These were the first major economic crises that were not due to undersupply following bad harvests (classical agricultural crises) but to demand crises resulting from either overproduction or a discrepancy between supply and demand.

Overcapacity became evident in several sectors during the first Great Recession (or Depression) of 1873–1896, when newly-born companies faced natural selection after a period of rapid and uncontrolled growth. As unfortunately the euphoria could not last forever, some companies had to exit, which led to an increasing concentration in a same sector, that is horizontally this time.

The Second Industrial Revolution was distinguished by a shift to more capital-intensive production, rapid growth in productivity and living standards, the formation of large corporate hierarchies, the progressive accumulation of overcapacity, and eventually, closure of facilities.

Although attempts were made to eliminate overcapacity through the creation of trade associations and cartels, not until the 1890s' mergers and acquisitions boom was the problem substantially resolved.[19] The production capacities of merged companies were reduced substantially through internal restructuring and the liquidation of unprofitable companies. During the decade from 1895 to 1904,

19. See Alfred Chandler, "The emergence of managerial capitalism," Harvard Business School Case n. 9-384-081, revised by Thomas J. McCraw, 1992, quoted by Michael Jensen, "The Modern Industrial Revolution, Exit, and the Failure of Internal Control Systems," *Journal of Finance*, July 1993.

more than 1,800 manufacturing firms merged into 157 consolidated corporations.[20]

This movement was partly due to the Great Recession of 1873–1896.[21] As Naomi Lamoreaux underlined, mergers seemed the best way to deal with the ongoing recession. The solvent demand for goods dropped because of falling wages and income, while production capacities increased continuously, which explains the general decline in prices. They were now generally below costs, especially as the reduction in the volumes that companies could produce and distribute on the market resulted in higher unit costs. Business enterprises could no longer benefit from economies of scale. With such small quantities, it became harder to amortize fixed costs.

As the market contracted, companies could only find new customers by engaging in a price war against their competitors and thus worsening deflation. The only solution for a firm was to acquire the clientele of one or several competitors to be able again to amortize its own fixed costs with larger sales volumes. In other words, it was necessary to acquire rival companies. As these operations took place in industries where the number of firms had not risen because of the crisis, they resulted in fewer independent enterprises and widespread concentration.

The increase of the average size of firms was sped up by the late century formation of the first trusts and monopolies, during the great merger wave of 1890–1914. The purpose of these mergers was also to reduce overcapacity by correcting the prior flood of new products, markets and industries.

The 1880s mergers resulted in the formation of big trusts in the oil, whiskey, sugar, lead, cordage and tobacco industries. This movement accelerated from 1890 to the 1920s despite the passage of the

20. Jensen, op. cit., p. 835, quoting among others Naomi Lamoreaux, *The Great Merger Movement in American Business, 1895–1904*, Cambridge University Press, 1985, p. 100.

21. Described notably by Touchard and al.

1890 Sherman Antitrust Act. And the development of electricity and heating distribution systems in the 1920s represented the biggest breakthrough of large organizations since the introduction of railroads in the late nineteenth century.

The layoffs and other social consequences of the expansion of big firms and merger movement explain the existing political turmoil—the protests against the "Robber Barons" and large-scale capitalism—and the efforts to deprive businessmen of the chance to gain political power. Hence, the antitrust laws and the typical U.S. restriction of banks' role in industry.

On the contrary, there were no such concerns in Europe where state bureaucracies were numerous and big private companies still rare. Big trusts were less of a threat given they generally had much less influence than on the other side of the Atlantic. And when they did, they usually cooperated with large state bureaucracies in the same "clubby" atmosphere of connivance that would characterize corporatist systems later on.

Finally, the modern companies, born in the early nineteenth century during the First Industrial Revolution, turned into industrial giants during the Second Industrial Revolution of the late nineteenth century and their role was not analyzed in economic literature before the 1930s, in particular in the work of Berle and Means, Schumpeter, Galbraith and Chandler.[22] All these authors have stressed central role of size and the general trend towards expansion in these big organizations. A crucial factor that mainstream economists did not recognize precisely because business concentration had become so common and omnipresent in the twentieth century, but also because they focused on the price mechanism in perfectly competitive markets.

22. Adolf A. Berle and Gardiner C. Means, *The Modern Corporation and Private Property*, McMillan, 1932, Joseph A. Schumpeter, *Capitalism, Socialism and Democracy*, Harper and Row, 1942, but also Edward H. Chamberlin, *The Theory of Monopolistic Competition*, Harvard University Press, 1932, Joan Robinson, *The Economics of Imperfect Competition*, McMillan, 1933 and more especially Ronald Coase, *The Nature of the Firm*, Economica, 1937, and Alfred Chandler, *The Visible Hand*, op.cit.

The development of the industrial giants was made possible by the use and significant improvement of the administrative techniques previously used by states only.

Yet, at the time, states were also moving towards gigantism. It was the Age of Imperialism, described by Lenin in *Imperialism: The Highest Stage of Capitalism*, and it lasted until the end of World War II. But, contrary to what Lenin upheld, political imperialism does not result of an economic need for new markets. All social organizations, whether public or private, simultaneously tended towards gigantism from the late nineteenth century to the second half—or rather the last third—of the twentieth century. World War I was not caused by unbridled capitalism but rather by the rise and expansion of state structures.

IMPERIALISM AND STATISM

During this first twentieth century, the discreet state of the nineteenth century became imperialist outside the country and dirigiste within. Admittedly, there had already been large states or empires in the past. Their population was smaller in absolute terms than that of the twentieth century empires because the world population itself was much lower before the Industrial Revolution. Yet, a few empires like the Roman or Chinese empires gathered a very large proportion of the world population at their time.

Imperialism reemerged worldwide at the end of the nineteenth century, sustained this time by the extraordinary technical advances of the two industrial revolutions which were much greater than those that had promoted navigation and military conquest in the sixteenth century.

The External Growth of States: Imperialism

While the first wave of imperialism had resulted in the creation of trading posts and fortified towns and various kinds of pillage rather

than direct colonization or permanent administration of large countries by the Europeans (except in South America, where the Spanish empire could exploit militarily and pillage vast mineral resources, as the populations were very small), the second wave of colonization saw a new occupational mode by large foreign civilian populations developing new economic activity and benefiting not only from advanced military techniques but also from more efficient agricultural and industrial production techniques and improved methods of administrative management and communication.

The former remotely controlled colonies were quite independent thanks to the long distance and the difficult communication. The home country had little control over the colony. On the contrary, twentieth century colonies were directly connected to their home countries by rapid air transports, by the telegraph, the phone and the radio.

With economic and administrative advances, European nations now expanded into world empires through migration of their population rather than only by pillage and the creation of trading posts. It is that new capacity of wealth creation and the centralized management of the "home country" that enabled such an intense outward expansion of European nations.

This imperialism, the outward expansion of states, was also accompanied by intense inward expansion, a proof of their improved efficiency in the management of people and things. Within the initial geographical dimension of the nation-state, the proportion of the national product managed by the state increased constantly. The state itself became a huge firm whose dimensions competed again with those of large expanding businesses. In the twentieth century, the state regained its status of largest organization in the country which it had almost lost during the expansion of the late nineteenth century giant businesses. The new century was marked by an omnipresent reminder of the state's new big dimensions and was a time of statism, dirigisme and public centralized planning.

E. J. Hobsbawm entitled his book devoted to that period *The Age of Empire, 1875–1914*.[23] Admittedly, that move was not totally new for the states: we mentioned above the Portuguese and Spanish empires set up in the sixteenth century. But in the nineteenth century, they became generally widespread and European occupation intensified. The great powers shared out the world and successfully managed their colonies, now partly inhabited by their own citizens who controlled and supervised local economic activities with their own administrative methods. The states succeeded in managing larger populations. At their apex in 1939, European empires' population reached respectively 485 million inhabitants for the United Kingdom (including 388 million in India), 71 million for France, 70 for the Netherlands, 14 for Italy, and 10 for both Belgium and Portugal.

Touchard et al. canned the 1870–1939 period as "the colonial era": "In 1870, Europe was caught in expansionist fever." As Jules Ferry stated in 1890: "From 1815 to 1850, Europe was unadventurous and stayed at home. Today, we annex entire continents."

The Western conquest ended in 1890 in the United States, simultaneously with the Eastern conquest in Russia and the sharing out of Africa and Asia between Europeans. While colonization had been criticized until 1914 in France (the press in particular condemned it until 1890), it gradually gave way to expansionary nationalism. From 1870 to 1939, Europeans drew a new map of the world.

The second international wave of colonization largely outstripped the first, which had begun with the rise of the states in the mid-fifteenth century and reached its climax in the mid-seventeenth century. Albert Bergesen and Ronald Schoenberg drew a telling chart presenting the total number of colonies from 1415 to the late '60s.[24] After a double peak between 1640 and 1700, the rate plummeted during the whole eighteenth century and most of the nineteenth century,

23. See Weinfeld and Nicholson, 1987.

24. "Long Waves of Colonial Expansion and Contraction, 1415–1969," in Albert Bergesen (ed.), *Studies of the Modern World-System*, Academic Press, 1980.

despite brief spells of colonization, and eventually surged to the high of the 1930s, between the lows of 1880 and 1945. The late nineteenth and the first half of the twentieth century were the most intense periods of colonization in modern times. And indeed, by 1900, there remained only forty-six independent states in the world, all the other countries being under various forms of external control.

Those two waves of colonialism correspond precisely, and quite logically, to periods of restricted international trade. At that time, trade concentrated within the empires and involved mainly the home countries and their colonies. Conversely, free trade re-emerged at times of low colonization, which coincided with the disappearance of mercantilist regulations and state-controlled trade. It was the case in the early nineteenth century after the Napoleonic wars and until 1870. It is also true of the current globalization period, started in the wake of the decolonization wave after World War II.

Wars also tended to coincide with these great waves of concentration of the population of nations: they were particularly frequent when the first colonial wave was at its height, from the second half of the seventeenth century to 1820. Then, a long period of peace accompanies the first decolonization and free trade period from 1820 until the end of the century. And we know what conflagrations accompanied the intense colonization of the twentieth century.

This is no mere coincidence. As states extend their control areas, risks of inter-state conflicts increase. In the colonizing race for the conquest of the world, the rivalry between nation-states (soon to become European empires) were exacerbated. The outward expansion of states reached its limits as the world was not infinite. Now expansion was inevitably carried out to the detriment of another state or empire. In game-theory terms, the outward expansion became a zero-sum game, as a state could only profit from another state's loss. International territorial conflicts thus became much more bitter.

And the correlation with free trade can also be explained easily. International trade was either indiscriminate or preferential, that is

with all willing partners or only with the colonies being controlled within some kind of imperial "common market." The larger the empire, the greater the variety of resources available within that vast internal common market and the smaller the need to trade with third-party countries. The home country interest groups could thus impose mercantilism and abandon free trade more easily, and at a lower cost. Conversely, each time colonization faded the home countries only had access to their small and less-diversified domestic market, and they found renewed interest in trading with other partners: free trade was better accepted, when more necessary. The economic needs of a country determine its policy.

Disrupting international non-imperial trade, World War I strengthened the British and French empires. The relationship between home countries and colonies intensified during the inter-war period. The Great Depression of the 1930s was used as a pretext to return to mercantilism and imperial preference.

Indeed, the trend towards the concentration of the overall population of independent nations has been continuous since the last quarter of the nineteenth century despite the collapse and disintegration of the Central Empires following World War I. The gradual concentration of this "nation-states industry" resulted in the formation of two cartels of states after World War II and the suppression of the Axis nations as independent players. Both cartels fought a final duel, known as the East-West "duopoly" of the Cold War—this term being exaggerated given that a full political integration of both superpowers and all their respective allies, whether colonies or protectorates, had never been seriously considered. A cartel is not a fully integrated single firm. Thus a dual cartel is not exactly a duopoly.

The Internal Growth of States: Statism, Dirigisme and Corporatism

States' growth was not only external and geographical. Their dimension also increased within their frontiers through higher tax receipts

and the provision of a wide range of new services, new political interventions, regulation of private trade or production of goods and services in place of private firms. Technically, most of these goods and services were still private as they could be manufactured and sold by private businesses. But the state's new economic and administrative capacities enabled it to supplant smaller-sized business companies, just like small- and medium-sized private businesses had been replaced by large trusts or giant companies. These new large-scale management capacities explain why twentieth-century states developed a new range of redistribution activities and intervened as a manufacturer or regulator in all economic and social activities.

In other words, the state's greater involvement in the social and economic life of its country parallels its outward expansion. It is thus unlikely that the increased internal role of the state results solely from the independent development of dirigiste, corporatist or socialist ideologies. If such was the case, it would also imply that the doctrines of dirigisme, socialism and corporatism tend to advocate imperialism and colonialism. Indeed this is what we observe but there is no theoretical rationale for this relation, and initially the socialist ideology opposed nationalism and imperialism.

On the contrary, the organizational approach easily explains that if the state's efficient dimension increases significantly, this has both international (increased colonialism and imperialism) and domestic consequences (the state, as a growing organization, uses a larger proportion of the country's resources: it employs more civil servants and increases its production of public services). Internal and external growth can be pursued simultaneously if there is enough available geographic free space at the frontier or they become substitutes when one of the two expansion modes (international or national) becomes impossible because of specific barriers.

And logically, if public organizations' dimension increases, so should private organizations', that is firms. This is exactly what all the ideologies of the first twentieth century advocated despite all their

other differences: as dirigisme was thought to be more efficient to control large-sized than small-sized enterprises, it favored big "national champions" over small- and medium-sized companies. Corporatism organizes the collusion of big private firms gathered together in professional cartels, with the state being one of the country's biggest firms. Finally, socialism simply favors the nationalization of private enterprises to integrate them into the vast capitalist monopoly that the state is.

These different ideologies share the belief in the virtue of large-scale organizations. This belief is in all likelihood the common basis of their various ideologies, while it is unlikely that they developed under the influence of independent determinants leading by happenstance to the same preference for large bureaucracies.

CULTURE AND THE MORAL ATMOSPHERE OF HIERARCHICAL SOCIETIES

Since the beginning of the twentieth century, large hierarchies had existed in all developed societies and spread to the others through colonialism. As these societies' organizational structure changed, the relations between the individuals that composed them also evolved and these new social institutions gave birth to a new culture.

The surprising and yet unexplained evolutions observed during the twentieth century (for instance, the burgeoning of ideologies and totalitarian regimes) resulted in fact from universal organizational transformations.

Each type of organization calls for specific behaviors, specific relations between the individuals that constitute its culture. It is almost sure that the culture of Ancient Egypt would not have met the needs nor adapted itself to the environment of the Amazonian tribal societies, the Inuit of the Arctic or the sixteenth century French society, and vice-versa. The type of organization depends on the technique used and different techniques call for different cultures. This is es-

pecially true when it comes to information transmission modes. For instance, mail, literature, cinema, telephone and television determine different cultures. The same is true of horses, sailboats, cars or supersonic jets. A society's culture depends on its social organization.

To be effective, the triumphant bureaucracy of the first twentieth century needed an appropriate culture that it gradually generated: impersonal file processing, forms, formalized procedures, hierarchical relations. These features are incomprehensible to New Guinean aborigines or to Amazonian Yanomamo tribes not because they are intellectually unable to grasp the complexity of these methods but because these methods have no social function in their lives.

The main peculiarity of the bureaucratic culture lies in the atomization of individuals by the hierarchy to isolate them from their fellows and thus impose on them an almost exclusive vertical relation with their superiors. Once they are thus deprived from all personal relations and left with no other social institution to relate to other than the hierarchy which employs them, this culture must also create rules for structuring their private life. Totalizing ideologies thus supplant horizontal social relations, introducing subordination and supervision in all the aspects of individuals' lives, whether private or political, both aspects that gradually merge.

Those specificities contribute to depersonalizing individuals so much that they can be treated in a hardly human (or humanist) way and even in an inhuman way. As they are merely a number lost in an anonymous crowd, the psychological cost to the bureaucrats of inflicting inhuman or criminal treatments on standardized and dehumanized individuals are significantly lowered.

The bureaucratic culture of the first twentieth century thus accounts for the state's criminality and explains why mass murders and crimes against humanity were so common at the time.

From Organization to Culture

The individuals and organizations which compose a society must comply with broadly accepted rules of behavior, institutions without which living among large human groups would be impossible. The bouts of anarchy seen here and there obviously show that, in such conditions, all human activities become difficult and often impossible, so that order—even in its most oppressive form—is often preferred to anarchy because it allows a prosperity which would otherwise be impossible, as Mancur Olson underlines. Undoubtedly, this is one of the reasons behind the stability of autocratic regimes, which look unbearable to the fortunate people living in civilized democratic countries but which the people concerned most probably prefer to the other typically anarchic alternatives.[25]

Thus, almost no human society is totally deprived of institutions, especially the most informal, custom and tradition.

The institutions which we tend to consider as "things" (organizational charts, jobs or buildings) are in fact only sets of rules defining the acceptable terms of interaction between individuals belonging to the same group.

In the contemporary world, these rules are most often written, but they can also be customary, written in the people's memory and transmitted through precedents.

Private and public contracts, the internal rules and regulations of companies, universities or administrations, states' political constitutions, the Geneva Convention relative to the Treatment of POWs are all institutions. Business and labor law institutions define the relations within and between companies. Civil law institutions define the relations within families, among others. Political institutions define the relations between the individuals and the various interest groups within the state organization. Thus, a constitution defines all the po-

25. This view is developed by Gordon Tullock in *Autocracy*, Kluwer, 1987.

litical rules and how power should be exercised, be it democratic or dictatorial, presidential or parliamentary.

It is only by convenience that the Constitutional Council and the European Court of Justice are referred to as institutions while they are only bodies in charge of enforcing institutions. Like other economists such as Douglass North, we distinguish the institutions (the rules of behavior) from the bodies which implement them or which they are ruled by.[26]

Institutions and customs are part of a society's culture. And customs can be considered as non-written institutions conveyed through precedents and enforced by the exclusion of any individual who does not comply with the usually codified behaviors from the group, partially or totally.

The notion of culture is often exclusively understood from an educational and literary point of view because our modern civilization has been dominated by written texts. But to a larger extent, it represents all the knowledge acquired that enables the members of a society to communicate, notably by developing the common tastes and judgments (preferences and values) that will then frame and determine individual behaviors. There are thus classical music, pop, scientific, political, literary or movie cultures which represent as many open social groups that individuals can freely join or support.

But there are also business cultures each encompassing predefined rules and behaviors, specific knowledge, past experiences and a savoir-faire peculiar to a given production organization. They play an essential role in promoting and accelerating communications which is absolutely necessary for good teamwork.

Thus, organizational advances are accompanied by cultural transformations, a phenomenon which is particularly obvious in the busi-

26. "Institutions are the rules of the game in a society, or, more formally, the humanly devised constraints that shape human interactions" quoted from Douglas North in *Institutions, Institutional Change and Economic Performance*, Cambridge University Press, 1990, p.3.

ness world at times of mergers and acquisitions. When transformations are broad and affect all the organizations of a society, it is understandable that they can alter its whole culture.

The common evolution undergone by all organizations in the first twentieth century, a move towards a large size that was accompanied by the development of the hierarchical superstructures necessary to manage them, changed the usual or "dominant" type of organization—dominant in a purely statistical sense, which means the most commonly observed. Large hierarchies soon dominated modern societies and replaced smaller structures as well as non-exclusively vertical interpersonal relationships.

And large hierarchies gave a new twist to human relationships and the moral and intellectual conceptions which limit and govern them, making them quite different from those seen in poorly hierarchized societies or those suitable to the good functioning of markets.

Indeed, the hierarchical relation—the essence of hierarchy—consists in the subordination of most of the organization's members to the decisions and directives of only a few, their immediate and higher level superiors, and so on until the company head who stands alone at the top of the pyramid. This implies that subordinates voluntarily submit to the executives and leaders, who in turn control them through monitoring and coercion measures so that they follow faithfully the orders and directives given by the company head.

As a result, there are two diametrically opposite cultures: the market culture which relies on individuals' initiative and diversity and on the non-exclusive bilateral relationships from equal to equal, and the hierarchical culture which requires standardized individuals who submit to the leader's will as part of asymmetric and exclusive bilateral relationships.

Endogenous Cultures

Most studies on culture work on the assumption that the ideas and other representations of culture are arbitrary: "there's no point arguing about taste" *(De gustibus non disputandum est)*. The members of a society would thus be collectively responsible for their overall culture, whose characteristics would be both discretionary (that is, inexplicable) and transmissible, thus forming the "people's spirit." Although the latter concept is mostly discredited nowadays, it still influences a number of pseudo-sophisticated analyses.

Wondering about the lasting differences between culinary cultures, Paul Krugman puts forward the hypothesis that French traditions stem from the astounding variety and quality of local products. It would explain why France's gastronomic taste is by no means comparable to that of quickly urbanizing England which suffered from relative poor food supply during the Industrial Revolution.[27] The existing transportation and refrigeration techniques did not allow to supply the crowded big cities with high-quality fresh products. And so ordinary people, and even the middle classes, were forced into a cuisine based on canned goods, preserved meats and root vegetables that did not need refrigeration (as potatoes for instance). According to Krugman, urban Britons got so used to eating low-quality food that they could no longer tell the difference. When better products became available, the taste inherited from several centuries of bad food persisted. Only very slowly did their taste improve and come closer to the French taste. Gastronomic culture is thus endogenous.

In the economic literature, Schumpeter is among the very few who does not consider culture as an arbitrary assumption. In *Capitalism, Socialism and Democracy*, he explains that the "civilization of capitalism" declined because of the very nature of that system, and more precisely the gradual bureaucratization of big firms where individualist

27. Paul Krugman, "Supply, Demand, and English Food," *Fortune*, July 20, 1998.

entrepreneurs were replaced with private bureaucrats, thus undermining the social foundations upon which the system was based.

This is one of the most telling examples of an endogenous conception of culture. It is the production methods and social structures that generate a certain culture, which meets best their specific needs and "reflects" the material conditions of the society. We recognize here the materialist theory of general political and cultural superstructures developed by Marx.

But the confrontation of the two modern organizational modes used by Marx and Schumpeter—capitalism and socialism—does not really explain the cultural differences observed between the first and the second twentieth century. As underlined by Niskanen, the culture of a very large U.S. firm such as Ford or General Motors is not fundamentally different from that of the Department of Defense or the State Department, which itself is not very different from that of the Ministry of Industry or the Planning Ministry in a Communist country.

In fact, if capitalism is defined as the intensive use of capital equipment (especially machines) and the conversion (the "capitalization") of the future revenues of an investment to their current value, then Schumpeter does not predict the demise of capitalism when he mentions the bureaucratization of very large firms and the disappearance of individualist entrepreneurs. What he really describes is the decline of individualist entrepreneurs and how they were supplanted by large hierarchies and how, as a consequence, the market culture was replaced by the bureaucratic culture. In other words, what Schumpeter explains is the decline of one kind of capitalism, or how market capitalism was replaced by "hierarchical capitalism."[28]

As this transformation was merely due to the almost unavoidable changes in mentality that it generates, capitalism as such did not dis-

28. This expression is notably used by John H. Dunning in *Governments, Globalization, and International Business*, Oxford University Press, 1997.

appear. What occurred in the twentieth century was rather the convergence of a hierarchical capitalism towards an also bureaucratic socialism because of the universal organizational mutations which led to the replacement of market mechanisms by large hierarchies. And, as a consequence, the market civilization was supplanted by the hierarchical civilization.

Depending on whether markets or hierarchies are the prevailing mode of organization and coordination of production and exchanges within a society, one of the two cultures will have a predominant impact on the individual behaviors it will shape, and which will eventually influence more or less all the aspects of social life other than working relations. Thus, the market and hierarchical cultures spread from work to all the other aspects of social life. This will determine, through the unity of individual behavior, the overall culture of the society.

The invention of the factory is a telling example of the radical social and cultural changes that organizational transformations can generate. Originally, farmers and craftsmen worked part-time in rural societies attached to well-established old traditions, but with the First and Second Industrial Revolutions, they moved to large cities where traditions were often non-existent and were yet to be established. These periods also saw the establishment of a very strict discipline, especially regarding the timing of work inside factories and firms. As a result, individuals' freedom to manage their work and organize their personal time was substantially reduced. There was great reluctance to comply with these new constraints.

Obviously, the way work is organized depends on the size of the organization and the society's degree of concentration: work is not carried out the same way in a ten-person workshop as in a ten-thousand-person firm. The regrouping of a large number of individuals favors their anonymity. In such conditions, it is easier to be a "free-rider" (that is to refuse to pay a fee for a service), cheat or even commit crimes since culprits are difficult to identify and thus to pun-

ish. As the probability for a cheater to be caught and punished decreases with the number of people gathered together, the gain expected from such a behavior increases proportionately. That is why these kinds of behavior are more common in great cities than in small villages where everybody is acquainted with one another, and also in large firms rather than in craft workshops where everybody knows exactly what his neighbor does.

A fundamental problem in large-scale organizations is thus to supervise the productive performance of each of their members. But their big dimension also affects the degree of cooperation or collusion between the organizations. As we will underline later on, this explains the characteristics of the organizational culture and the moral atmosphere in hierarchical societies.