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CARLOTTA PEREZ'S CONTRIBUTION  
TO THE RESEARCH PROGRAMME  
IN PUBLIC MANAGEMENT : UNDERSTANDING  
AND MANAGING THE PROCESS OF CREATIVE  
DESTRUCTION IN PUBLIC INSTITUTIONS  
AND ORGANISATIONS\*

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**Résumé:**

Cet article fait partie des “Mélanges” offert à Carlota Perez pour ses 70 ans, célébrés à l’Université de Tallinn (Estonie) en septembre 2009. A partir des travaux de Carlota Perez sur les cycles de conjonctures et les crises systémiques, on fait le lien avec l’évolution des institutions et la relation entre evolution de la technologie et destruction creatrice des institutions et des organisations publiques. A partir du constat que, dans l’histoire les pays gagnants ont piloté politiquement ce processus, on identifie des axes de travail pour le management public, qui vont à rebours des theories propagées par la “Nouvelle Gestion Publique”

**Mots clés:** Cycles technologiques, management public, crises systémiques, économie institutionnelle, histoire économique

**Abstract:**

This paper is a chapter of the Festschrift offered to celebrate Carlota Perez’s 70<sup>th</sup> birthday, on Sept. 2009 in Tallinn University (Estonia). Drawing on Carlota Perez works on technological cycles, long waves of development and systemic crises, the link is made between the evolution of technology and that of institutions. The relationship is made between the evolutionary dynamics of technology and the destructive creation process within institutions and public organizations. Building on the statement of facts that, in history, the leading countries have politically monitored this process, we draw an agenda for public management that runs counter the theories propagated by the New Public Management trend.

**Key words:** Business cycles, public management, systemic crises, institutional economics, economic history.

The publication of this book to crown the life and work of Carlota Perez in the service of research into technology cycles and their relationship with financial cycles comes at exactly the right time because, unfortunately, her analysis has proved to be absolutely right: about 30 years after the start of the fifth technology cycle based on information and communication technologies, the crisis is upon us. It is a global, systemic crisis similar to that of 1929, the one that separates the two phases of Kondratiev cycles (which do indeed always seem to last 50 to 60 years), even as those who waxed lyrical about the “new economy” were predicting their disappearance. Carlota Perez steadfastly maintained in recent years that the dot.com bust in 2001 was not the “real” crisis that, given the continuing split between the real and the virtual economy, was still to come. Her work helps give us a better understanding of the relationship between capitalism and society as a system based on disequilibrium, emphasising the specific role of a financial capitalism that first fuels then dampens entrepreneurial ardour, this being the genuinely new anthropological model of capitalism as identified by Schumpeter.

The cyclical hypothesis having proved its worth, we can therefore look forward to a period of great turbulence, accompanied by social and political strife if not war. October 2008 will go down in history as the time when the most orthodox of economic liberals were won over to the most radical state interventionism, to the point where *The Economist* was able to run the headline “*Re-bonjour, Monsieur Colbert*” (*The Economist*, 23 October 2008).

It is therefore high time to return to the role of public management in response to these challenges. In the English-speaking world, it has centred on a single concept: the efficiency of organisations, which has become, in Fred Thompson’s words (2006), the “Holy Grail” of administrators and the sole measure of good and bad. In the real world, however, other criteria are needed, those of the value judgment from which the effectiveness and relevance of public action can be evaluated.

That does not mean neglecting efficiency: far from it. Public systems and organisations designed to regulate the world defined by the previous socio-economic paradigm are now both unsuitable and expensive, creating a scissor effect between the cost of the State and its effectiveness at solving problems. The State’s inability to deal with problems becomes

a pretext for eliminating it, a process which I have dubbed the “bureaucratic euthanasia” of the State.<sup>1</sup>

For Carlota Perez (Perez, 2004), institutions are also subject to the process of Schumpeterian “creative destruction”, for which political leaders are ill-prepared. She sets the scene very clearly in the conclusion of her major work (2002: 166):

It is then possible to envisage the present model as an early-warning tool, providing criteria to guide policy making.... Could the bubble and its consequences be avoided? Could some institutional agent – or the capitalists themselves – identify the onset of maturity and facilitate the next revolution and its flourishing? Could the decline of the old industries be forestalled by conscious modernisation? Could the shift of power at the turning point be engineered without the recession and the social tension involved (...) The answers to those questions do not merely require research but a very deep understanding of the many human and social complexities involved.

But although the model gives us warning signs and the overall dynamic, there is no preordained strategy or universal recipe for managing the change.

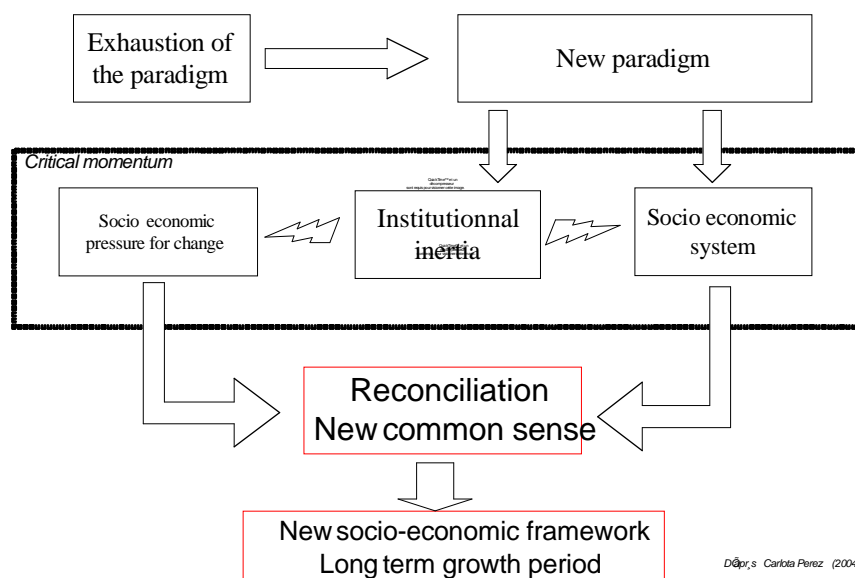
### ***Can the time-lag in the evolution of the State be managed?***

I summarise this problem in the following diagram, which I have taken from Carlota Perez. It shows two factors that introduce a time-lag between the evolution of the State and change in the industrial sector.

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<sup>1</sup> The first example of this type that I looked into was the reform of the *Poor Laws* in 1832 in response to the inefficiency and rent-seeking behaviour caused by the Speenhamland system: the inability to reform the system became the pretext for destroying it, with catastrophic consequences. See Claude Rochet, 2007, "Le Management Public comme Science Morale", [http://tel.archives-ouvertes.fr/index.php?action\\_todo=search&view\\_this\\_doc=tel-00202800&version=1](http://tel.archives-ouvertes.fr/index.php?action_todo=search&view_this_doc=tel-00202800&version=1)

**Figure 1. Time-lag between state and industry evolution.**



Source: Carlota Perez, 2004

The first factor is chronological. As far as the fifth Kondratiev cycle is concerned, information technologies affected firms' production methods first and the State later. In the second half of the 1990s, firms had to learn on the hoof how to rethink their business models and cope with innovation in products, in processes and above all in organisation. Innovation marked a radical change in which old industries that found it difficult to evolve were eliminated in a context of fierce competition between the most innovative firms at the leading edge.

There is no value judgment involved in this first element of the time-lag: the State and its organisations are merely affected later than the competitive sector. Another factor is that the State is a much bigger network of organisations than the competitive sector and, although broadly speaking the problems of how organisational and technological architectures evolve alongside each other are equally complex, they differ in their intensity and timing.

The other element of the time-lag, institutional inertia, is more problematical. Each paradigm shift is propagated at three interlinked levels (Perez, 2004):

- the new technological system rolled out in the productive sphere, in this case the impact of information technologies on production methods and the organisation of work;

- a set of better practices capable of reaping the benefit of the new technologies, which become standard practices that spread to all productive activities and create the innovation framework (like Japanese production methods in the automobile industry);
- the emergence of a new common sense, leading to the definition of a new institutional framework.

These three levels correspond to three partially overlapping waves. In order for the full potential of the new paradigm to be realised it has to reach Level 3, the institutional level. That is the process of creative destruction at institutional level: the institutions of the previous technology wave no longer provide an environment in which all the possibilities of the new technology can flourish and have to be rethought.

In historical terms it is a point of indetermination (Perez, 2004) in the history of nations. Those that are able to reforge the link between institutions and the techno-economic system see a considerable increase in their economic productivity, while the others are left behind. The time-lag is critical to the evolution of the State in response to technological change. It is critical because creative destruction also marks the destruction of social consensus, the decline of alpha social groups and the emergence of new groups. Historically, it marked the replacement of the domination of the landed aristocracy by the industrial bourgeoisie, of peasant farmers by the working class. Today, it is the appearance of a new form of entrepreneurship and the emergence of 'knowledge workers' replacing workers who sold their physical strength.

This critical time is also one where the cards are redistributed between nations, as Alexander Gerschenkron rightly pointed out, giving backward nations an opportunity to catch up with dominant nations through a strategy of institutional innovation. The old nations, having constructed institutional frameworks suited to the former paradigm, have to change them. In doing so, they face institutional resistance that is all the stronger because the institutions concerned have spawned bureaucratic organisations that are difficult to change.

### ***What history teaches us***

In his *History of Economic Analysis*, Schumpeter describes with interest John Stuart Mill's position on the condition of British bureaucracy in the middle of the 19<sup>th</sup> century:

“No serious administrator would have pretended at the time that [...], economic and social conditions and the agencies of public administration being what they were, any attempt to regulate the economy through State intervention would have resulted in anything but failure” (Schumpeter, *History of Economic Analysis*, Vol. II, 234).

British institutions had brought the country – the mighty fiscal and military State so well described by Patrick O'Brien – both prosperity and predominance. Because, contrary to what has become a stereotype, *plenty* derives from its interaction with *power*, and hence politics. Free-traders and *laissez-faire* theorists have presented mercantilist policies as being concerned solely with power, trade and industry being merely a means to an end. This interpretation is very much to the fore in the work of the Swedish historian of mercantilism Eli Hecksher, and Jacob Viner has shown its dogmatic nature (Viner, 1948).

On the contrary, the relationship between power and plenty has always been a balanced one in which neither power nor trade was an end in itself, assumed to be self-sufficient, but a self-sustaining dialectic with its roots in the first globalisation, the *Pax Mongolica*, whose dynamic is described in Findlay and O'Rourke's monumental masterwork (2008).

Britain devoted 20% of its GDP to the State budget (the State budget in France today, the butt of so much criticism, is only 16% of GDP), and 80% of that to the Royal Navy. The key to the Royal Navy's power was its capacity to keep up to 80% of its fleet and sailors at sea, through clever management of the logistics chain – repairs, crewing, victualling (Findlay, O'Rourke 2008:256) –, a figure that neither the French nor the Dutch were able to match. Captains were expected to engage the enemy as soon as possible, so that young officers and crew would gain more experience. The Royal Navy had understood the strategic nature of knowledge; that benefited the Merchant Navy, which in turn became a reservoir of skill in peacetime that could easily be converted into military might.

As a country becomes more highly developed, institutional inertia is compounded by the formation of vested interests; but Britain proved astute in the management of this change. After the Glorious Revolution of 1688, Parliament changed the policy for granting monopolies so as to protect not a particular entity (like the Merchant Adventurers) but industrial sectors against the main rival of the day, the Netherlands, which practiced a policy of granting monopolies to particular interests in contempt of the general interest. It

was the State's job to ensure national security and define the framework for competition between domestic entrepreneurs, a notion no different from the theory of educative protectionism that is at the heart of Friedrich List's "national system of political economy".<sup>2</sup>

The first need for adjustment between change in the socio-economic sphere and change in the socio-institutional sphere arose in the first half of the 19<sup>th</sup> century, in the final phase of the first Kondratiev cycle. The prevailing winds clearly favoured the supporters of *laissez-faire* and free trade, for two reasons. From the standpoint of managing the administrative bureaucracy, Schumpeter's argument remains valid: mercantilist policies had generated large and costly bureaucracies at a time when those policies were no longer useful to a Britain that had reached the pinnacle of its power. The fact that there was no technique of "public management" to reduce the bureaucracy justified John Stuart Mill's disillusioned stance in supporting *laissez-faire*, albeit unwillingly

"I confess I am not charmed with the ideal of life held out by those who think that the normal state of human beings is that of struggling to get on; that the trampling, crushing, elbowing, and treading on each other's heels, which form the existing type of social life, are the most desirable lot of human kind, or anything but the disagreeable symptoms of one of the phases of industrial progress."

John Stuart Mill, *Principles of Political Economy*, 1848.

But the shift towards *laissez-faire* and free trade had another cause: now that the country had acquired global supremacy, the residual protectionism of British policy had taken on a retrograde cast by defending the landed aristocracy against the assumption of power by industrialists. Friedrich List was not slow to point this out, highlighting the convergence between "the arguments of the cosmopolitical school" and Britain's interests:

"A country like England, which is far in advance of all its competitors, cannot better maintain and extend its manufacturing and commercial industry than by a trade as free as possible from all restraints. For such a country, the cosmopolitan and the national principle are one and the same thing [...] A quarter of a century since, the prohibitive and protective system of England operated to her detriment and to the advantage of her rivals" (List, 1841).

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<sup>2</sup> Adam Smith also said that " 'defence is of much more importance than opulence', " (Book IV of *The Wealth of Nations* 464-5) and defended the Navigation Acts because he saw the Merchant Navy as a reservoir of seamen for the Royal Navy.

The movement to repeal the Corn Laws was in fact a social movement against the high cost of living, reflecting the pressure for change emanating from the new socio-economic system and directed against institutions. The Corn Laws had become extremely unpopular because they kept grain prices high and had been championed by Lord Castlereagh, an openly reactionary minister who displayed utter contempt for the working classes. In the midst of the recession that hit Britain after the Napoleonic wars, Castlereagh was the architect of laws to suspend habeas corpus and the freedom of the press, passed by a House packed with landowners whose interests the Corn Laws defended. Unemployment among the working population of Britain in the 1830s and 1840s rose to between 20 and 30% even though the country had an abundance of wealth, albeit attended by a migration of economic activity from rural workshop to urban factory. The agitation led by Richard Cobden and his Anti-Corn Law League raised public awareness of the issue. Created in 1840, the League had become a political movement with representatives in Parliament. A harvest ruined by rain in 1845 made it impossible to maintain the Corn Laws. The crisis of 1845-47 was the last of the *ancien régime* type, a crop failure crisis that hit the whole of Europe (especially Ireland, where the potato famine left a million dead) and was a contributory factor to the political troubles of 1848 (Bairoch, *VD II*). Cobden received the support of Daniel O'Connell and the Irish nationalists. In modern terms, the fight against the Corn Laws was a 'left-wing' cause and the protectionists were the reactionaries. But it was truly intelligent management of the crisis of adjustment.

The abolition of the Corn Laws in 1846, presented as a triumph of *laissez-faire*, can be seen in a radically different light. For Richard Cobden, abolishing the Corn Laws meant weakening rival countries' industry by opening up the British market to them and encouraging them to cling to activities with declining returns:

The factory system would, in all probability, not have taken place in America and Germany. It most certainly could not have flourished, as it has done, both in these states, and in France, Belgium, and Switzerland, through the fostering bounties which the high-priced food of the British artisan has offered to the cheaper fed manufacturer of those countries.<sup>3</sup>

Free trade can therefore contribute to a policy of power: at the time it expressed Britain's national interests and was necessary for asserting the *Pax Britannica*. As history would have it, six months after the abolition of the Corn Laws in May 1846 Friedrich List, ill and

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<sup>3</sup> *The Political Writings of Richard Cobden*, 1868, William Ridgeway, London, vol. 1, p. 150.

beset by financial problems, committed suicide, helping to lend a symbolic dimension to the victory of free trade.

Free trade thus gained its credentials with a social alibi and scientific justification from the ideas of the classical economists, especially Ricardo, and the entire Saint-Simonian school. With the support of the Saint-Simonians, Richard Cobden was able to build up his network of treaties, first with Belgium, then (and more importantly) with the France of Napoleon III in 1860. Raymond Boudon (2006) argues that Cobden's policy can be regarded in the same light as today's 'Blairism', Cobden acting as a sort of latter-day Anthony Giddens with his 'third way' between liberalism and socialism, thanks to that historical convergence of the interests of social categories that were opposite in every other respect. Those were the conditions in which free trade became for Britain what Emmanuel Todd has called an 'identity myth'.

As far as public administration was concerned, the victory of *laissez-faire* did not lead to less state intervention. The administrative functions of the State mushroomed between 1830 and 1850. Even a supporter of *laissez-faire* like Chadwick (one of the two promoters of the 1832 Poor Laws reform) changed his position when faced with the expressions of hostility directed against him during the 1837 recession, the effects of which were considerably aggravated by the abolition of the Poor Laws. He was the author of a report on the health of the working classes in Britain, which recommended the establishment of a public health system, an idea initially rejected by the Tory government before being taken up by the Liberals in 1848.

The programme for state interventionism had been described in precise detail in Jeremy Bentham's utilitarian principles, which required more administrative intervention because, as Polanyi has elegantly put it, "*laissez-faire is not a way of doing things, it is the thing to be done*" (1983: 189). Doing *laissez-faire* implies a prodigal administrative activism. Bentham was in the tradition of logical positivism ahead of its time. As far as he was concerned, three things were essential to economic success: inclination, knowledge and power. Inclination is the preserve of the entrepreneur, but knowledge and power are more efficiently administered by the government than by private individuals. That presupposes a considerable expansion of the administration: "*Bentham's liberalism means that parliamentary action must be replaced by the action of administrative bodies*" (id.). There are parallels here with the modern-day introduction of New Public Management (NPM)

and what David Giauque calls its 'liberal bureaucracy', which has resulted in a considerable increase in regulation.

Polanyi notes that, whereas the plan had been to establish *laissez-faire* (while the return to this better-balanced system, governed by planning principles, occurred naturally – trade union law, workplace safety law, factory inspection, social insurance, public services, compulsory education, public health policy, etc.), the end of the 19<sup>th</sup> century would see the whole of Europe adopt social legislation that was not the work of ideologues or the application of beliefs: on the contrary, “all the evidence supports the hypothesis that legislators had their hand forced by objective and undeniable factors” (ibid., 199).

### ***The return of the State***

The issue here is not so much that of a return *per se*, for the State has never really gone away, but of its return into prevailing ideas about institutional strategies.

What is at stake? Let us assume the hypothesis of Chris Freeman (2001) according to which economic growth results from the congruence of five sub-systems: science, technology, culture, economics and politics. Performance is therefore an emerging property linked to the quality of the interactions between these sub-systems. This idea can already be found in Fernand Braudel (1985, 67-68)

“Any dense society can be broken down into several ‘sets’: the economic, the political, the cultural, the social hierarchical. The economic set can be understood only in relation with the other sets, permeating them but also open to its neighbours. There is action and interaction. The particular and partial form of the economic set that is capitalism can be fully explained only in the light of those adjacencies and overlappings: there it will finally assume its true face”.

At a time of technological disruption, performance will result from the emergence of a metasystem capable of incorporating and directing the complexity created by the appearance of a new technology. This process is at the heart of innovation.

Technology here should be taken in a broad sense to mean all the capital of operational knowledge available to create wealth through new processes, modes of organisation and products. It is “the measure of our ignorance”, to use the expression of Moses Abramovitz who, in 1956, calculated that the accumulation of physical capital accounted for only 10% to 20% of growth (Abramovitz, 1990).

The State plays several roles in this process. It defines the rules of the game even though it is also a player, as Douglass North has shown (1991). It defines the institutions that will

reduce transaction costs between players and between sub-systems, through the efficacy of the rules it sets. At the same time, it is an organisation which manages policies, like research and technology, the building of infrastructure and investment in education, that set the stage for all development and innovation.

Two options then arise: either progress is the result of a *laissez-faire* approach to innovation and the State is an infrastructure management cost that needs to be optimised, or it requires specific action by the State, a strategy whose cost-benefit ratio needs to be evaluated, and there is scope for proactive public policies.

- The first option is that of the neoclassical school which has engendered New Public Management, i.e. reform of the State reduced to reform of its administration by introducing market mechanisms into its operation.
- The other option is found in the neo-Schumpeterian current of thought as represented by Freeman & Soete (1997) and Carlota Perez (2003), who show that technological disruptions are opportunities for redistributing the cards of comparative advantage between nations. It requires a proactive policy on the part of the State, or in other words an industrial policy, anathema in European Commission doctrine until it suddenly found favour again after the global financial crisis in October 2008.

### ***Forging ahead, catching up or falling behind? The role of institutions***

So there is scope for countries lagging behind to take deliberate action to catch up the leaders, whose institutions and social consensus are subject to pressures likely to threaten their internal equilibrium and balance of power and undermine their leading position (falling behind), whereas they need to constantly push forward the frontiers of technology (forging ahead). It is the quality of the interactions between the five sub-systems that will determine the technological path between these three options.

In economies like those of France and northern European countries, where the public sector accounts for more than half of GDP, the right use and management of these resources is all the more important, especially when public spending has been funded by borrowing for the last thirty years. Public spending can finance R&D, the acquisition of technological assets, advances in strategic areas, infrastructure, education and an increase in 'human capital' in general – in a nutshell, investment in the future. It matters little that

the spending is deficit-financed since it helps to increase society's productive capacity, which can generate a surplus in better times. France's public sector deficit in 1946 was 145% of GDP, but it was completely wiped out by the growth that took place in the *Trente Glorieuses*, accompanied by a sound level of inflation that reflected the general increase in prices and wages and negative interest rates.

If public organisations slump in torpor in their acquired positions, not only do they no longer help to increase human capital, but they see their impact diminish even as the overall cost of the State rises. If this effect is compounded by a lack of internal productivity in public administration, the scissor effect between cost and value produced becomes unfavourable.

The institutions of the *Trente Glorieuses* made it possible to reap the benefits of mass production, in Europe's case mainly after 1945. Taxation represented 9% of GDP in France in 1913. By 1974, at the end of the cycle, that figure had risen to 35%, and in 2004 to 54%, though France could not be said to have entered the information society on a sound footing or to have come up with a suitable institutional framework for it. France devoted 6% of GDP to research in the late 1960s, compared with just over 2% now. Above all, 1974 marked the turning point at which the fall in industrial employment in mass production industries was not offset by job creation in other sectors, resulting in the emergence of structural unemployment. The disappearance of industrial policy under the influence of neoliberal thinking, combined with a policy of positive real interest rates, maintained sluggish growth, and what could and should have been a period of Schumpeterian creative destruction was nothing but a long and slow process of "destructive destruction" (Aglietta and Berrebi, 2007, Chapter IV).

*A scissor effect therefore exists between the growing cost of organisations and the decreasing yield of institutions.*

It is in fact what amounts to a classic problem of obsolescence in a dynamic of adaptive systems: organisational entropy combines with institutional resistance to block the evolution of the State and uncouple it from the evolution of the other sub-systems. Positive action to reform the State could re-establish the synchronisation, but that becomes impossible in practice because of the prevailing ideas about the State, derived from neoclassical theory, which give it merely a residual role of managing whatever the markets cannot do : the so-called 'market failures'.

Thus, *it is just when the State costs most that it becomes impossible to reform because of the impossibility of redefining its role*. Public debate seems to reach an impasse: ultra-liberals seek to prove the need to do away with the State entirely at last, while the vested interests of the protected system guaranteed by the State defend the status quo and the bureaucracy in the name of ‘defending public service’. It is that vicious circle which feeds the process of bureaucratic euthanasia.

To make this debate commensurable, we have to ask ourselves the question: *how can the State and public institutions in general create value?*

It is interesting that part of the answer should come from a former scion of the neoclassical school, Douglass North, one of the founders of cliometrics, or ‘New Economic History’, a movement which sought to apply the mechanical and positivist principles of neoclassical economics to history (Freeman and Louça, 2001). North gradually abandoned his initial neoclassical orientation (North & Thomas, 1973) in which the price mechanism served to eliminate obsolete institutions. He established that there can be inefficient institutions which are under no competitive pressure to reform, generally because they serve vested interests and not the public good (North, 1981). North defines institutions as reducers of uncertainty, establishing stable structures within which players in society can interact (1990: 6) and, in Freeman’s terminology, enabling the five sub-systems to converge towards a metasystem, i.e. a society capable of taking advantage of technological opportunities.

Institutions make it possible to identify opportunities (by creating the appropriate incentives), while organisations make it possible to exploit them: institutions and organisations are therefore linked in a process of co-evolution.<sup>4</sup>

### ***How do institutions evolve when industrial revolutions occur?***

But although North posits the link between institutions and organisations in an evolutionist model, he only partially defines the dynamics. His primary concern is to analyse which appropriate incentives institutions should introduce in order to have efficient organisations, thinking mainly of the United States, in terms of interactions between

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<sup>4</sup> "Both what organizations come into existence and how they evolve are fundamentally influenced by the institutional framework. In turn, they influence how the institutional framework evolves." (North 1990,5).

public institutions and private organisations. He supposes that learning by doing at an organisational level is sufficient, through feedback, to forge a new culture for those who conceive public institutions.

On the one hand, this view seems to be exclusively managerial and to ignore the cycle of ideas, which is autonomous in relation to that of organisations. Ideas may precede innovations and be a precondition for them, as in the Enlightenment. But when they congeal into ideologies, out of principle they take against the real so that dogma can prevail. The history of the 19<sup>th</sup> and 20<sup>th</sup> century is there to remind us that this perfect system in which practical experience acquired in organisations feeds back into the design of institutions is the exception, generally due to periods of crisis or exceptional circumstances, and that ideology prevails.

In his recent work (2005), North moves his analysis forward by considering, like Aoki (2001), that institutions are self-sustaining systems of shared beliefs. The development of economic social systems is a succession of ergodic phases (in which the future state of a system can be predicted from its state at a given time) when it evolves within the same socio-economic paradigm, and of non-ergodic phases when there is a paradigm shift resulting from industrial revolution. The key to change is in the capacity of the belief system to call itself into question.

On the other hand, it does not answer the fundamental question facing us: how can public institutions learn when faced with powerful professional state bureaucracies? Confronted with organisations regarded as unreformable, there is a strong temptation to enter into the rationale of the 'bureaucratic euthanasia of the State'. The public may be tempted, in the same movement, to reject not only the economic and social cost of an unbearable bureaucracy but also the very principle of public intervention. For managers, it is much easier to adopt the prevailing – and very convenient – ideas of *laissez-faire* than to devote time and energy to the difficult and unrewarding role of 'boss' of the public machine in order to reform it. Linked to the advance of individualism against the sense of the common good, it has been and still is the main factor of support for the 'liberal dogmatism' that Schumpeter denounces in his *History of Economic Analysis*. The State's management of the time-lag is therefore the critical time in a nation's evolution.

### ***Can the State learn?***

Let us start from the finding that private organisations do not have a specific genetic code that makes them more apt to learn and evolve than public organisations. I have shown (Rochet, 2007) that there is no bureaucratic fatality that makes the public sector incapable of evolving.

That being so, the evolution of the State becomes a locus of competition between nations: those that are better able to manage the evolution of their State, both institutionally and bureaucratically, and guide institutional innovation will be able to widen the gap. That is merely the reproduction, in new forms, of a historical process, the main constants of which have been accurately described by Erik Reinert (2007) and which follows in a direct line from Friedrich List's national system of political economy.

Shaping that evolution is a task to which we are called by the reference framework developed by Carlota Perez and which should be that of public management as an academic discipline.

Pragmatically, it comes down to asking whether the State, in its managerial methods, is lagging one industrial revolution behind. A classic example of this lag is the State's relationship with its information systems. The State still thinks in terms of 'computing', i.e. an accumulation of material capital, and not 'information systems' as a way of leveraging the transformation of organisations. It is a drain on the productivity of IT investment and a reason for the persistence of a 'Solow paradox' in public administration. In France as in many other developed countries, the State has not set up an information systems department (Rougier, 2003) responsible for defining a primary architecture and an interoperability policy, resulting in dissimilar systems that do not allow the necessary transition towards results-based management and, more importantly, in an anarchical procurement policy which, were it intelligently designed, could act as a lever of industrial policy and of support for innovative small businesses.

Many of these problems have been worked out in the industrial sector by trial and error. Lessons have been learnt and taken on board and could be applied to the public sector with little difficulty. The later the socio-institutional framework changes, the greater the gap and the more it costs to bridge.

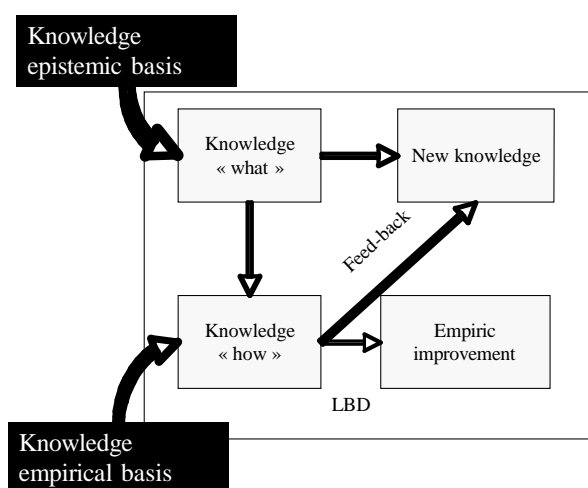
In a nutshell, the fundamental question is this: *does the State put itself into a position to learn in order to transform itself?* Not knowing is a problem that can be solved by learning, but not knowing that one doesn't know and not putting oneself in a position to learn is a mistake. In those circumstances, the natural lag becomes a culpable one, the result of practical incompetence and a lack of political vision.

To explore the hypothesis that the State and technology evolve synchronously, we consider technology as a knowledge base in Joel Mokyr's meaning of the term. *Societies are adaptive systems whose capacity to change depends on the knowledge base.* It is the knowledge base that will manage change as a selection process of new technologies and new political and social combinations. The dominant powers are those that find the right combination to secure both their internal equilibrium and that of their relations with other national systems of political economy.

The real driver of growth is therefore the knowledge base, embodied in formal and informal institutions in the theories of North and Landes, who have updated this distinction made in the late 19<sup>th</sup> century by Veblen and Commons.

Our basic model starts with Mokyr's concept (2002) of useful knowledge and may be represented as follows in Figure 2.

**Figure 2: the evolution of knowledge according to Joel Mokyr.**



Theoretical (or epistemic) knowledge consists of partly of the available scientific knowledge but above all of beliefs, i.e. what is considered plausible. It is knowledge for itself, produced by a small number of people for “the love of knowledge”, as David Hume puts

it in his 1742 essay *Of the Rise and Progress of the Arts and Sciences* and is generally the fruit of happenstance:

“Avarice, or the desire of gain, is an universal passion, which operates at all times, in all places, and upon all persons: But curiosity, or the love of knowledge, has a very limited influence, and requires youth, leisure, education, genius, and example, to make it govern any person. You will never want booksellers, while there are buyers of books: But there may frequently be readers where there are no authors. Multitudes of people, necessity and liberty, have begotten commerce in Holland: But study and application have scarcely produced any eminent writers”. (Hume, 1742)

It emerges before anyone knows how it may be used, which is the case with advances in science and technological progress. This process of knowledge generation itself follows an evolutionary selection process, which in turn will depend on the state of existing knowledge, in accordance with the principle of path dependence.

Empirical (or prescriptive) knowledge is the practical and operational knowledge engrained in artefacts. There is limited scope for empirical improvement of this knowledge base (learning by doing). For example, I can empirically improve my mastery of the computer on which I am typing this text. But if I want to design an information system I need to have access to the epistemic knowledge base on which my practical ability is founded. It is what Pisano (2002) has called “learning before doing”.

What evolutionary mechanism will underpin technological progress? For Mokyr, epistemic knowledge is the gene, while empirical knowledge is the phenotype. It is the capacity to establish interactions between the gene and the phenotype that drives technological evolution. Institutions as sets of rules are the reflection of this knowledge base gene, the belief system that underlies public action. Organisations are phenotypes that translate institutions into the real world. Unlike in pure biological evolution, the knowledge gene is less ‘selfish’, to use Richard Dawkins’ term. There is a possibility of feedback from empirical knowledge to epistemic knowledge, starting off virtuous cycles that generate technological progress. *These cycles are doubly self-reinforcing*: the larger the epistemic base the more it develops of itself, while the more the empirical base feeds back into the epistemic base the more it stimulates its development.

The quality of institutions is central to the workings of this process. How do they co-evolve with the knowledge base?

- First, public institutions are based on organisations: public services, administrations, autonomous operators. The question is then whether the knowledge base of these organisations is able to evolve when they are confronted with a new technological paradigm. In other words, *are public organisations capable of learning and of behaving like adaptive systems?*
- Second, institutions as sets of formal rules have their own evolutionary cycles. David Landes (2003: 199) remarks that although the pace of their evolution is a decisive factor, especially in the short term, it is not necessarily quick: it took over a century, pretty much until the third quarter of the 19<sup>th</sup> century, for the capitalism of the first industrial revolution to forge the institutional framework within which it could truly flourish.

Thus, the evolution of institutions as formal rule sets depends on the evolution of informal rules, i.e. ideas (North, 1991). We therefore need to study how these ideas evolve when confronted with the information technology revolution, since the issue at stake is quite clearly the capacity to build institutional comparative advantages (Amable, 2002).

### ***Linking evolution of the State and evolution of technology***

The question of the link between the evolution of technology and the evolution of the State may seem incongruous nowadays, though it was self-evident during the Enlightenment. In her comparative study of relations between the State and invention in France and England, Liliane Hilaire-Pérez (2000) shows that it became a concern of the State at a very early stage. She identifies a genesis: policy in Venice which, in 1474, became the first state to promulgate a law on inventors. It was seen differently in France and in England, demonstrating both the State's understanding of the importance of accumulating and safeguarding technology and the many different forms that the relationship between the State and technology could take. France, in the Venetian mould, maintained a very close link between policy and invention, whereas England took its distance in the 17<sup>th</sup> century with the royal prerogative. As Daniel Roche has said, "the craftsman inventor at the end of the 17<sup>th</sup> century was a social hero, more technician than scientist in England, more scientist than technician in France", pronounced national characteristics even today.

But both countries shared the same concern to free the inventor, through political intervention by the State, from both academic thralldom and the cult of short-term gain.

Likewise, the State does not only protect and promote the inventor: it also integrates technology in order to modernise its apparatus.

Not only do inventions consolidate the material foundations of power, for example in war; their integration makes the administration more rational and favours the bureaucratisation of a 'technostructure' State while also paving the way for the governmental project. (Hilaire-Pérez 2000, 36)

The State, technology and modernisation of the administration therefore very clearly evolve alongside each other to develop practices that would make a 21<sup>st</sup> century innovator and moderniser of public institutions green with envy, namely integration of the user into the process of validating the reality of the invention and its social utility and collegial work by administrations (inherited from Colbertism) to validate the exclusive privilege which is the inventor's reward. Inventions become the favoured means of reform. "The Enlightenment inaugurated the era of political technology, the '*politicisation of technology*', as Steven L. Kaplan has put it, and made invention an affair of State" (Hilaire-Pérez, 2000: 316). Whether English patents or French monopolies, in each case the State seeks to strike a balance between the monopoly that rewards the inventor and the spread of the invention.

This "*politicisation of technology*" is back on the agenda today with the development of national economic intelligence policies that seek to capture and protect a nation's tangible and intangible strategic assets.

The policy of technology clusters implemented in France since 2006, inspired by the success of such clusters elsewhere, helps to bring administrations closer to their role as architects of technological development. It is a radical change in the State's way of doing things. The success of a technology cluster results from the combination of two movements: one that is top-down, a national policy that provides strategic guidance and budgets, and one, doubtless more critical, that is bottom-up. In his analysis of Silicon Valley, Aoki identified the need for a player that would forge links between innovative small firms in a cluster, in this case the venture capitalist, and create synergies. How that goal is achieved depends on the local context, the culture, the quality of social relations, institutional incentives and the capacity to allocate responsibilities between the different levels involved, from national to local.

More importantly, when the game is being played at the frontiers of technology the dominant ideas that guide public action must be informed by the results of academic research. For instance, recent research by Roger Miller (2007) reveals that innovative practices cluster in a limited number of seven 'games of innovation' that are stable at the meso-economic level, while firms may play in different games at the micro-economic level. Miller shows that patents – a traditional focus of public policy for innovation in the former mass production paradigm – play only a small role (8% of players), that those who compete on costs (22% of players) need to re-innovate if they want to survive, and that one of the keys in the game of innovation is the 'battle for architecture', i.e. the ability to define architectures, either closed or open, not only through technologies but above all through common standards, ideas, practices, norms, etc.

One lesson of Miller's research is that these games of innovation do not fit with the traditional categories of 'strategic activity domains' that group the same kinds of industrial activity. For instance, retail banking and corporate banking play in two different games that obey different rules. The traditional definition of a cluster is a grouping of activities pertaining to the same group of industries. However, Miller demonstrates that a cluster should not play in only one game but must include all the games of innovation so that firms can cooperate. Structuring these clusters in such a way that they include all the games is a matter for public policy.

Thus, a public policy for innovation may be represented as follows:

- at the *macro-economic level*, the policy that sustains and funds a political strategy to lead the way in innovation. This includes basic research funding, cooperation between business and public institutions, initial and higher education, etc. and is the outline of what is commonly referred to as a 'national system of innovation';
- at the *meso-economic level*, an organisation of technological clusters that enables firms to understand the games of innovation and encourages them to cooperate;
- at the *micro-economic level*, a business intelligence policy that may help individual firms to understand the game of innovation they are playing in and the main opportunities and pitfalls they are confronted with. There is a particular need to support such an understanding of games of innovation within small businesses.

### ***Can public management at the present time help to meet these challenges?***

Three different disciplines need to come together if the evolution of institutions and the evolution of organisations are to be combined.

- **Public policy evaluation** focuses on the value of the policy: are the impacts consistent with the strategic challenges of public policies and is the link between outputs and outcomes relevant and effective? The value of the policy is a matter of political judgment and, although an attempt may be made to construct strategic metrics, they will never ultimately be the key-deciding factor.
- **Organisational efficiency** focuses on the strategic alignment of processes and, above all, on organisational learning so that public organisations can cope with their changing missions.
- **Management control** is a form of steering centred on the best value policy: do outcomes meet expectations at the best cost, so that the cost/value ratio is optimised? The best value policy is a management matter and can be measured by a metric which, though more difficult to frame and implement than in the commercial sector, is not beyond reach.

These three dimensions can be interlinked by means of the increasingly widely-used 'balanced scorecard', using information technologies that combine business-line architecture with technological architecture. The problem is that the academic discipline that has grown up under the title of 'public management' does so only to a very small extent.

The use of information technology in public administration is again revealing here. In the mainstream NPM framework, using IT is mainly conceived as a means of reducing costs. In an innovative and Schumpeterian framework what is at stake is the ability to integrate the transformative potential of IT to foster a collective learning process within the public sector. One of the main failures of the NPM mainstream, especially in the UK and New Zealand, is its policy of outsourcing IT to the private sector, which has deprived the public sector of the strategic capabilities to manage IT and contributed to the constitution of provider oligopolies, with high costs and poor reliability as a result (Dunleavy and

Margetts, 2003). Technology is not a heaven-sent miracle cure but a means of stimulating innovation through learning (Rochet, 2008-1).

I have shown that innovation is entirely possible in the public sector (Rochet, 2007), especially by taking advantage of crises (Rochet, 2008), provided that the 'one size fits all' recipes of NPM are avoided. Shunning NPM means returning to principles of organisational transformation based on human capital and a consideration of the context, integrating the potential of IT to make it a lever of endogenous transformation and not a sort of manna from heaven, as in the neoclassical view, that only needs to be adopted for problems to solve themselves.

**So what NPM turned inside out has to be turned right way round again.**

- That means, first and foremost, posing the question of value, in terms of the impact of public action by organisations on publics in the light of the political issues at stake in the context of the paradigm shift. Effectiveness must come before efficiency.
- Second, it means using the transformational potential of IT to come up with new processes of intervention, i.e. turning IT into an endogenous lever of innovation which makes things possible that otherwise would not have been, such as the modelling and automation of processes, the measurement of outcomes in real time and the possibility of building up a knowledge base. One of the most spectacular transformations of a professional activity has taken place in healthcare with the development of evidence-based medicine, in which decision-taking is informed by research data (epistemic knowledge base), clinical experience (empirical knowledge base) and the preferences of the patient and his or her immediate circle (contextualisation of the diagnosis and decision). Such innovations would be impossible if practitioners did not accept computerised knowledge management tools.
- Third, IT makes it possible to produce an overall design of processes and to align it with strategic objectives, thus enabling organisations to be efficient and reducing bureaucracy.

These tasks, in the conception of public mechanisms, are interactive but place the issue of the value of the policy at the forefront, whereas NPM puts efficiency first and neglects the process of endogenous innovation in administration.

### ***The fight to manufacture dominant ideas***

We come now to the last point to be included in the research programme in public management: the fight for dominant ideas. I have already pointed that, unfortunately, although innovation in public organisations is entirely possible, it has little influence on dominant ideas, on the ideas embedded in institutions, and that hence North's dynamic did not occur in this particular case. The minister at the head of an administration is not really a manager who knows his administration (which was one of NPM's basic pretexts for keeping the framing and the implementation of policy separate). It is always highly surprising, in discussions with politicians, to see how little they know about innovation in public administration and hence prevent it<sup>5</sup>. Dominant ideas do not form through trial and error in contact with administrations but in specific places where the great and good mingle (like Davos, where liberal thinking reigns supreme), with no concern for what really goes on in the day-to-day business of administrations or the innovation that takes place there despite everything.

The stakes are not insignificant. In conclusion, let us return to history. We have seen how Britain invented the '*myth of free trade*' once it had become the dominant power, managing to pass off as a universal value what was merely the reflection of its own interests. The United States used the same strategy in the second half of the 20<sup>th</sup> century. Manufacturing universal myths is one element of a domination strategy, but it can cut both ways.

The '*myth of free trade*' has blurred these lessons of history. Much has been written about the subject in the last ten years (a recent Google search on the string turned up 40,000 entries). Its correspondent in public management is New Public Management, nourished by the rise of the '*public choice*' school and neoclassical economics in contrast with the Weberian tradition.

While mythmaking may be a means of domination for incumbent countries standing on the technological frontier, allowing them to find commercial outlets for their products, it may also lead them to shoot themselves in the foot. Technological spillovers from leading

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<sup>5</sup> In a fascinating collection of essays, Sandford Borins (2008) reviews innovation in North American administrations and finds that it is mostly incremental because of the lack of political support for radical innovation.

countries to followers are increasing with globalisation (Baumol, 1986). Yet innovative activity consists mainly of imitation (Baumol, Litan, Schramm, 2008), giving countries that are in the process of catching up an advantage, since through trade they are able to benefit from technology transfers from developed countries. That is clearly China's strategy today.

Britain was the first to pay the price of such a strategy. The United States had almost entirely caught up by the end of the 19<sup>th</sup> century and Britain's institutional vigour had wilted. David Landes (2000) identifies the main cause as "entrepreneurial constipation":

The weakness of British enterprise reflected their combination of amateurism and complacency. Her merchants, who had once seized the markets of the world, took them for granted; the consular reports are full of the incompetence of British exporters, their refusal to suit their goods to the taste and pockets of the client, their unwillingness to try new products in new areas, their insistence that everyone in the world ought to read in English and count in pounds, shillings and pence. Similarly, the British manufacturer was notorious for his indifference to style, his conservatism in the face of new techniques, his reluctance to abandon the individuality of tradition for the conformity implicit in mass production. (Landes, 2003: 337)

Nicholas Crafts (2004) sums up these causes, in addition to loss of the spirit of enterprise, as lack of investment in human capital, lack of investment in general, firms that were too small for mass production, crumbling social consensus and, above all, excessive faith in the market's capacity to regulate the economy. Britain had ended up believing an argument that it had previously used against its competitors in order to hamper them in their development. It applied to itself what Friedrich List called, in Ha Joon Chang's nicely updated version (2007), the "strategy of taking away the ladder" and "shot itself in the foot".

When the virtuous circle of organisational learning and institutional evolution is no longer sufficient to enable the State to cope with a paradigm shift, public management, looking beyond the management of organisations, must go back to the fundamental issues of political philosophy, those of the 'good society' and the common good, which question the possible impacts of technology and do not regard it as a universal revealed truth that defines a sacrosanct course of history.

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