

## **INDUSTRIALIZATION AND TECHNOLOGICAL CHANGE**

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### **Introduction**

When asked about the first act announcing the birth of civilization, Margaret Mead replied that, in her eyes, it was a broken femur that had been nursed back to health. At first glance, this discovery marks the healing of a physical problem, symbolizing an act of solidarity towards another. Indeed, this wounded individual was not abandoned as a danger to a group struggling for survival, but cared for so that he could continue to live and move about. Far from a sentimental interpretation of this response from the illustrious anthropologist, this act of care may also have been done in order not to lose a hunter and breeder, necessary for the life of the group in a potentially dangerous environment. More prosaically, what can't be denied is that this is a technical object, testifying to an act and mastery by prehistoric man. But to claim that such a discovery marks the birth of civilization is to be over-hasty, for civilization is something that goes far beyond an act of care. We'll go further back in time than Margaret Mead, in the company of James c. Scott, to around 400,000 BC with the domestication of fire by *Homo erectus*.

It may indeed have been the technical mastery of fire that marked a decisive turning point in the history of hominids. In a dangerous world, this new technique enabled the species to reverse the balance of power with predators such as bears and felines, and to occupy an exceptional position within the living world: physically weaker than most predatory animals (carnivores or omnivores), it nonetheless asserted its domination over them, becoming a daytime or nocturnal hunter, but also enabling it to shape an adapted environment, to heat itself, but also to influence its biological evolution. In fact, being able to heat food and diversify his diet not only shortened his intestine, but also enlarged his brain. For James C. Scott, this domestication of fire was a resounding success, but with an ambivalent outcome: we have succeeded so well in domesticating fire that its use has become so widespread that our survival has become dependent on it!

"We have literally been domesticated by fire"<sup>1</sup>

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<sup>1</sup> James C. Scott, James C. Scott, *Against the Grain: A Deep History of the Earliest States*, Yale University Press, New Haven, p. 37 to 42 (*Homo Domesticus, une histoire profonde des premiers Etat* P 53 à 59)

This remote prehistoric example clearly illustrates the ambivalence of adopting and then developing a revolutionary technique, or at least the technical mastery of an element. The domestication of fire totally transformed the species, enabling it to take over the world. But this success made it dependent on the domesticated, who became indispensable and master of the master. Fire is also the object, as witnessed by the myth of Prometheus, which we are still debating today (isn't the subject of this article an indirect reflection on Prometheus and the offence he committed against Zeus?)

Today, we're living in a crisis situation, in the sense that the paths we take will determine our survival or death. The health crisis we're currently facing follows a series of ecological disasters, all of which bear witness to an environmental disruption that is in no way harmless or natural. Already, the domestication of fire has generated a "thin anthropocene" (Scott), limited in its impact by the weakness of techniques and its energy consumption, the small number of people using it (and the number of people living in general) and finally its localized impact. What can we say, then, about the techniques of the modern world, which are industrial, energy-intensive and exploit the resources of every square meter that allows them, or tends to!<sup>2</sup>

The health situation that first hit China in 2019, then other countries and continents in 2020, continues to drag on, raising social, political and cultural questions. While public authorities have imposed restrictions on populations that initially complied, in a number of countries, the measures taken seem more political and social than sanitary. Following the Chinese model, neoliberal governments are taking measures that have more to do with security and the maintenance of order than with health: a health-security policy. In France, while the numbers of victims of the scourge were being repeated daily, and measures to strengthen the police arsenal were being adopted by the government, the administration continued to pursue a policy of destroying public hospitals, cutting beds and systematically sabotaging treatment possibilities using molecules repositioned as inexpensive through biased or fraudulent trials.<sup>3</sup> In 2021, the government is suspending nursing staff who are reluctant to accept compulsory injections of new products of which there is no certainty, while the forces of law and order are

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<sup>2</sup> Countries like Russia hope to exploit the untapped hydrocarbon potential of the Arctic:

Jackie Northam, *Russia's oil drilling plans may be in jeopardy without the West's support*, April 15, 2022:40 PM ET: [Russia's oil drilling plans may be in jeopardy without the West's support : NPR](#)

as well as private Western companies in which Jeff Bezos or Bill Gates have invested:

Jacob Gronholt –pedersen, *Mining firm backed by Bezos and Gates to begin Greenland drilling*, March 24, 2022, 10:48 AM GMT+1, Last Updated 5 months ago

[Mining firm backed by Bezos and Gates to begin Greenland drilling | Reuters](#)

<sup>3</sup> After the announcements of Professor Didier Raoult and the IHU Marseille on his protocol, we saw controversies explode in the media, launched by professors encumbered with conflicts of interest and being part of the entourage more or less close circles of power. The Discovery and Recovery trials never respected the IHU dosage and the fraudulent Surgisphere study published in the Lancet was used as a pretext by the Minister of Health, Mr. Olivier Veran, to prevent the use of the protocol. advocated by the IHU, without ever going back on its decision, while this trial has become the paragon of scientific fraud and corruption of the medical world by *Big Pharma*. Note that Mr. Véran also conveyed fake news within the very walls of the National Assembly. On corruption in the world of scientific publications: Carlton Gyles, *Skeptical of medical science reports?*, 2015 Oct; 56(10): 1011–1012. Published in PubMed Central (PMC): <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4572812/>

not subject to the same obligation. The French government and the entourage of President Emmanuel Macron have opted for coercion.

The covid19 pandemic is not strictly a health problem, but a question of civilization as a whole! The attempt to establish a free pass for trivial matters raises the spectre of a totalitarian world worthy of the best dystopian novels, where new technologies weave a web over a controlled humanity, hostage to its own desires. The new mRNA "vaccine" technology being promoted by companies with a long track record (Pfizer in particular) is both intriguing and frightening. All the more so in view of the haste and incoherence of the public authorities, whose haste and authoritarianism do little to inspire confidence in questioning minds.<sup>4</sup> In Canada, during the campaign, Justin Trudeau referred to unvaccinated Canadians refusing to be injected as enemies of the people, and asserted that his role as head of government would be to protect Canadians from such people. During the same campaign, he also expressed his admiration for the model implemented in China under Xi Jinping.<sup>5</sup>

Klaus Schwab, President of the Davos Forum (which has moved to Singapore in 2021), has been announcing a new industrial revolution for several months now, and sees the Covid19 epidemic as a window of opportunity to change the world and launch an eco-technocratic revolution that will never be ecological, but only technocratic, via sustainable development programs and other greenwashing:

"It's up to us to take the bull by the horns. The pandemic gives us that chance: it "represents a rare but narrow window of opportunity to reflect, re-imagine and re-initialize our world."<sup>6</sup> And this, despite the fact that he himself acknowledges that this disease is ultimately not very serious, if not for its political, social and economic consequences!<sup>7</sup>

Already during the Great Plague, which devastated the world (with the exception of America, still isolated from the other 3 great continents, Asia-Africa-Europe), a cultural revolution took place in its wake, followed later on by an economic revolution.<sup>8</sup> In a word, for Klaus Schwab, an engineer by training, Covid19 is a godsend for launching a vast industrial, technical, social, biological and of course economic and political revolution. This problem is by no means a historical novelty.

In the present contribution, we will attempt, from a historical perspective, to shed light on the dialectical or symbiotic relationships between technical and economic transformations, and from a multi-disciplinary approach, to draw out the cultural, social, but also psychological impacts. We'll start by taking a tour of Mesopotamia with James C. Scott, followed by ancient

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<sup>4</sup> Not being vaccinated forces you to undergo regular tests, which for people on average incomes represents an expense they cannot afford, and in fact amounts to imposing compulsory vaccination on a socially vulnerable population.

<sup>5</sup> Licia Corbella, *Le soutien honteux de Trudeau au régime chinois menace le Canada*, date de publication : 29 mai 2021 : <https://calgaryherald.com/news/local-news/corbella-trudeaus-shameful-support-of-the-chinese-regime-threatens-canada>

<sup>6</sup> Klaus Schwab, *COVID-19 : La Grande Réinitialisation*, trad. Thierry Malleret, Forum Publishing p. 197

<sup>7</sup> *Ibid.*, p.66

<sup>8</sup> Majid Rahnema, *Quand la misère chasse la pauvreté*, Acte Sud, col. Babel, Paris, 2004 p. 86

China with the author. Scott, then to ancient China with the builder of the post-ancient Chinese state, before exploring the case of modernity.

### **Agriculture and early Mesopotamian states**

In 2017, political science professor and ethnology author James C. Scott published *Against the grain*. If we choose to follow him in our observation of the emergence of the state in Mesopotamia, it's because one of the qualities of this work, based on 20 years of published articles in archaeology between the end of the 20th century and the publication of this book in 2017, is to highlight the political, economic,<sup>9</sup> social, technical and environmental processes and their interactions.

It was around 12,000 years ago in Mesopotamia that we date the emergence of agriculture, i.e. the birth of a technical attitude towards the environment, the adoption of plant selection and sowing techniques for the purpose of organized, human-controlled production, and the establishment of reproducible technical processes. Later, between 8,000 and 6,000 BC, people began to domesticate animals (sheep, cattle) as well as more elaborate plants (cereals, vegetables, chickpeas, lentils). Such techniques are closely linked to a change in lifestyle and society: what we'll later call sedentarization, or settling permanently (or so they hope) in one place. At the time, nomadism and semi-nomadism were the norm. Sedentary communities began to appear, and while they were not determined to become archaic states (there was a 4,000-year gap between the so-called "Neolithic revolution" and the appearance of the state), they laid the foundations for what was then only a possibility.<sup>10</sup> This change in lifestyle led to the creation of adapted techniques and inventions, such as drainage. It was towards the end of the 4th millennium that the state emerged.

In his book *"Against the grain"*, James C. Scott relates technical, social, political, ecological, sanitary and physical transformations. For this book, he studied 20 years of publications and archaeological research since the end of the 20th century. He highlights the relationship between technical inventions, social, political, physiological and cultural transformations, and the ecological and demographic consequences.

For him, the invention of the *domus*, described as a specific concentration of plants, animals, people, fields, reserves, etc., but also of undesirable hosts (commensals, parasites of all kinds and their semi-invited predators such as cats and dogs)<sup>11</sup> does not necessarily herald the formation of states, but sets in place certain ingredients for its emergence. In fact, he describes the *domus* as an innovative, even revolutionary ecological and social complex. Indeed, from an ecological point of view, archaeologists have noted a reduction in the diversity of flora and fauna in the areas where this new organization developed, as well as the dependence of most

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<sup>9</sup> Here, we're talking about the economy as an institutionalized process, organizing production, exchange and redistribution within the new social organizations that were emerging at the time: the state.

<sup>10</sup> In *Zomia* (James C. Scott), in sub-Saharan Africa (Dogons, Mandingos, Pygmies, Bushmen) or in North Africa (Kabyles, Chaouis, Rifains), as well as in America (Pierre Clastres' Guaranis, among others), populations that have become sedentary have strived not to form a state...

<sup>11</sup> James C Scott, *Homo Domesticus* op.cit., p. 99-100 aussi changements morphologiques des plantes)

domesticated species on the master. This impoverishment is not without consequences for the physiological evolution of species. We observe physical and genetic transformations in animals reduced to the state of milk production, but also of muscular strength (and more rarely of meat), a shrinking of bodies and defenses, as well as a male-female differentiation that tends to disappear. The same applies to their behavior: they become less fierce, less lively, less combative, etc., and their brain size decreases (by between 20% and 30%). The animals are adapted to this context of concentration and reduced mobility, but are also selected to reproduce these characteristics.<sup>12</sup>

Similarly, the gradual adoption over several centuries of a sedentary lifestyle (moving back and forth between nomadism and sedentarism) for some humans had major repercussions.<sup>13</sup> It wasn't until around 5,000 BC that hundreds of villages in the Fertile Crescent began to cultivate domesticated cereals as their main food source. Scott points out that, according to archaeological data from the Middle East, agriculture was not an alternative to the disappearance of game. As in the case of animals, this new lifestyle and its routine, far removed from the hunter-gatherer lifestyle, influenced the physiological evolution of homo sapiens. The bodies found reveal physical disorders (muscular and skeletal disorders and other lesions), bone shrinkage, iron deficiencies caused by poorer and less varied nutrition, as well as a more restricted environment, increasing population density and greater risk of infection.<sup>14</sup>

Scott then poses the question of human self-domestication: while we think we are the doers of domestication, aren't we in fact the domesticated? Indeed, he observes that the domus shaped a new existence that would itself shape homo-sapiens. The complexity of life in the wild was replaced by life in a simplified ecosystem, with routine activities and repetitive tasks. He describes farmers as chained to meticulous movements, a meticulous rite that ultimately shapes the body and creates and accentuates a new model of social relationship. The domus is an ecosystem, and agricultural activities (mainly the cultivation of cereals) form the basis of calendars, determine rites and public life, but also shape language and speech.<sup>15</sup>

He goes on to describe the emergence and appearance of the state, which was not determined by sedentary life and agriculture. The state is described as a layer of civil servants specialized in calculating and collecting taxes, dependent on one or more superiors, who exercise power within the framework of a hierarchical society, and in which there is a division of labor, an armed force, walls, a monumental ritual center and a palace.<sup>16</sup> The archaic state is presented as a precarious factor for the subjugated populations, aggravating famines that can be managed as disasters:

"The archaic state was like the vagaries of the weather: an additional threat rather than a benefactor".<sup>17</sup>

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<sup>12</sup> Ibid., p. 91 à 97

<sup>13</sup> Ibid., p. 76

<sup>14</sup> Ibid., p. 98-99

<sup>15</sup> Ibid., p. 101 à 106

<sup>16</sup> Ibid., p. 133

<sup>17</sup> Ibid., p. 139

These entities depended on the production of agricultural surpluses to feed the non-food-producing strata of society (craftsmen and other skilled trades, civil servants, clerics, aristocrats), thus triggering an ecological transformation (landscapes, fauna, flora and land).<sup>18</sup> Also, caught up in a whirlwind where the need to produce surplus generated more need to produce surplus (for various reasons, infrastructure maintenance, trade, wars, concentration and overpopulation), these collapsed under the weight of their growth.<sup>19</sup>

It's a comprehensive overview of Mesopotamian societies and the great transformations that took place over several millennia: sedentarization, agriculture and the creation of the state. However, while Scott describes the formation of such political, social and ecological entities, what is perhaps missing is an analysis of the spirit of these transformations, which we shall see by studying the case of a theorist and state-builder in China: Shang Yang.

### **Shang Yang (商鞅) builder of the Chinese state**

In addition to Mesopotamia, the Yellow River valley was also a place where states and dynasties emerged. Without wishing to explore the origins of civilization and the establishment of the state in China, it's a later phenomenon that attracts our attention. Shang Yang's period of the "warring kingdoms" laid the foundations for what was to become the imperial state. In his principles, reasoning and logic, he made a radical break with the discourse, mores, thoughts and values of both his own and earlier times.

During the Zhou dynasty, up until the Warring Kingdoms, order and hierarchies were regulated by a skilful blend of virtue (the equivalent of *virtutem* in Latin, from the word *Vir* meaning "man", the term virtue designating virile qualities such as strength, boldness or courage during battle, then an activity reserved for the few) and rite. Rites were the most common means of settling conflicts, asserting hierarchies and illustrating power relationships, in a more or less pacified manner. Thus, the classics of warfare and strategy, such as the *Wuzi* and *Sima fa*, which served as the basis for officer training right up to the Qing dynasty, began with a reminder of the values and virtues that maintained order and asserted the prince's power without the need to resort to the use of weapons.

The Spring and Autumn period saw a transformation of power, with the kingdoms that made up the empire around the Yellow River becoming more structured, employing more and more civil and military officers, and tending to centralize. From the 5th century BC onwards, warfare underwent a similar transformation, as battles between small groups of expert soldiers, highlighting the virtues of the aristocracy, gave way to mass warfare involving ever-increasing numbers of conscript troops. As a result, military campaigns became increasingly costly in terms of money, equipment and commodities, calling for a transformation of production and economic structures!<sup>20</sup> From the 3rd century BC onwards, a demographic explosion and a period of agricultural boom began, giving rise to a series of technical innovations adapted to the new production objectives. One of these technical revolutions was the technique not of

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<sup>18</sup> *Ibid.*, p. 139 à 145

<sup>19</sup> *Ibid.*, p. 205 à 222

<sup>20</sup> Jacques Gernet, *Le monde chinois, T. 1 De l'âge de bronze au Moyen Âge, 2100 avant J.C. – Xe siècle après J.C.*, Armand Colin, Paris 1972, réédit., 2005 p. 93 à 97

forging, but of iron casting, enabling mass production of tools that were stronger and more practical than those made of wood or stone. From 400 BC onwards, this activity developed into mass production. From the 3rd century B.C. onwards, smelting was producing increasingly sturdy tools.<sup>21</sup>

"If the Warring Kingdoms were one of the richest periods in history in terms of technical innovations, this was undoubtedly due to the needs of increasingly fierce warfare".<sup>22</sup>

During the period of the Warring Kingdoms, after the spread of Chinese civilization to more distant lands (the vast kingdoms surrounding the center) and the expansion of the empire, new players entered the scene, and if the empire of the Zhou dynasty still existed in form, its values and ritual order exploded. A skilful blend of ritual, virtue and strategic pragmatism was replaced by deception, cynicism and betrayal, which were elevated to the level of political culture and practice, and became a form of normalcy. Civil servants, officers, diplomats, military men, advisors and learned thinkers (sophists) and even concubines intrigued endlessly in their personal interests, even working for two rival kingdoms at once, paying for their services and loyalties. It was a period of permanent conflict, endemic warfare and chronic instability.

It was against this backdrop of permanent war, betrayal and endemic intrigue that Shang Yang introduced his reforms to the Qin kingdom. The main source on his life is the Han dynasty historian Sima Qian, written around 91 BC. Born around 390 BC, he was himself a civil servant who arrived at the government of the Qin kingdom in search of a position. He was appointed chief minister by the Qin monarch and implemented a policy based on cruel punishments, widespread surveillance, ruthless exploitation of subjects and regular warfare. Although his reforms initially seemed to satisfy the kingdom, restoring order and security against brigands and enemies, the situation soon changed and turned against its initiator, who fled in disgrace. A victim of his own system of generalized surveillance and foreign policy, he was captured and executed around 338 BC.<sup>23</sup>

From his ideas and policies, we can draw three main conclusions:

### **1: wiping the slate clean of past heritage and tradition**

In the very first chapter of his book, *The Book of Prince Shang*, Shang Yang urges his opponents, in the presence of the Qin monarch, to wipe the slate clean of tradition and inherited values, in order to impose strong, effective measures in the short-to-medium term.

In the very first chapter of his book, *The Book of Prince Shang*, Shang Yang urges his opponents, in the presence of the Qin monarch, to do away with tradition and inherited values, and impose strong, effective measures in the short-to-medium term.

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<sup>21</sup> Ibid., p. 99

<sup>22</sup> p.101

<sup>23</sup> 司馬遷《史書》-列傳-商君列傳：[商君列傳](#)

Or what he calls the 10 vermin (十者):

「國有禮有樂，有詩有書，有善有修，有孝有弟，有廉有辯：國有十者」

“ten evils: rites, music, odes, history, virtue, moral culture, filial piety, brotherly duty, integrity and sophistry”<sup>24</sup>

## 2: building a system based on agricultural overproduction and war

Shang Yang advocated a general mobilization of production and war.<sup>25</sup> As such, he repressed non-agrarian activities such as trade, travel and even arts and culture. He also advocated making alcohol and meat inaccessible, in order to accustom the people to contenting themselves with little and overproducing without risking complaints from them, as well as establishing state monopolies on resources.<sup>26</sup>

The legislator's avowed aim was to set up a system of agricultural overproduction, by exploiting and even overexploiting the population forced to devote itself to this unique activity. Thus, in Shang Yang's mind and policy, the territory of the kingdom was no longer reduced to a mere space, a stock of resources to be exploited to the maximum, a network, and the population a mass of "labor power"<sup>27</sup> to be exploited. Under his leadership, the kingdom was reduced to a productive military machine. Shang Yang wanted to invent a new kind of man: the peasant soldier.

## 3: debasing the people

The third major thrust of his policy is what he himself calls 弱民 (Weakening the People). In this chapter, Shang Yang explains that it's very important to weaken the population in order to keep it submissive, obedient and mobilized. In it, he explains that a country is weakened by having a strong people, who would be reluctant to obey laws and would be susceptible to what he designates as vices, but that a miserable people aspires to nothing but wealth and is therefore corruptible.

For Shang Yang, it's a question of keeping them in a precarious state of equilibrium: neither so miserable as not to aspire to wealth, nor so rich as to work hard and depend on rewards. It's also a question of striking a balance between cruelty in punishment and laxity, so as not to incite revolt while at the same time instilling the terror that leads to obedience and zeal for agricultural work and war. He placed the State and society in contradiction, the weakness of one making the strength of the other, naturally siding with the State against society.

During a period of political, technical and social revolution, Shang Yang organized a political system that was also revolutionary in institutional, political and anthropological terms. Indeed, the period of the Spring and Autumn, but above all of the Warring Kingdoms, prepared the

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<sup>24</sup>商鞅《商君書》Shang Jun Shu : reform of law- 《去強 - Elimination of Strength》 - Chinese Text Project (ctext.org) : [Shang Jun Shu - Chinese Text Project \(ctext.org\)](http://ctext.org/Shang-Jun-Shu-Chinese-Text-Project)

<sup>25</sup> Shang Yang, *Le livre du prince Shang*, Présentation et trad., Jean Levi, Flammarion, Paris, 2005 p. 53 à 55

<sup>26</sup> Shang Jun Shu : Reform of the Law - Chinese Text Project (ctext.org)

<sup>27</sup> The use of an anachronistic term here is deliberate, for want of a contemporary term. Nevertheless, in Shang Yang's work, the people are seen as nothing more than a mass of labor to be exploited.



way for the Chinese Empire by profoundly transforming not only the social order and its legitimacy, but also its economy and production structures, and finally the relationship of the Empire's subjects to themselves and the world around them. Although he remained less than 25 years

in business, his legacy is striking: he enabled the kingdom of Qin to become a war machine capable of defeating all its rivals, and to become an empire 117 years later. But this was at the cost of extreme violence, a terrorized population, a dislocated society, and a culture decomposed by a system of generalized surveillance combined with a system of rewards and sanctions, resulting in the moral corruption of its subjects.

This system, mobilizing all available forces for conquest and hegemony, was to impose itself on the whole of Chinese civilization, profoundly marking the empire's institutions and its political and administrative thinking right up to the present day. Nevertheless, the megalomania of the 1st emperor 秦始皇 Qin Shi Huang would push the system of exploitation, debasement and deculturation to its climax, and bring the system to its demise. The next dynasty, the 漢朝 Han, would take over the imperial institutions inherited from the Qin, but with the softening necessary to perpetuate them for several centuries before collapsing and giving way to a 60-year period of war.

### **The Industrial Revolution**

We have just seen that a revolution never consists of simple technical or political changes, but more profoundly of anthropological, social, cultural and other upheavals. The Industrial Revolution was no longer a spontaneous or rapid phenomenon born of the invention of the steam engine or the reflections of Adam Smith, but has its roots in more ancient times. Lewis Mumford, in addition to his architectural criticism, was also a thinker on the history of technology. In 1934, he hypothesized that the industrial revolution began in the 10th century with the invention of the mechanical clock.

Time and space, from the mechanical clock to the steam engine

"Alongside the history of technology, we need to consider social and cultural history. For the transition is not only that from ancient to modern time, but also that from an ecclesiastical division of time to a secular division of time."<sup>28</sup>

The clock appeared (or reappeared) in the monasteries of Christendom in the 10th century. Prior to this, time was conceived as cyclical, linked to environmental phenomena (the seasons, the sun's movements during the day, migratory or reproductive cycles, etc.), ordered and ritualized to the rhythm of steeples by the Church. The mechanical clock in its inventor's monastery would give rise to a new concept of time: orderly, regular, mechanical, such a machine seemed remarkably well-suited to the strictly regulated life of the monastery. But it would eventually spread beyond the confines of the isolated monastic establishment into society, setting off a cultural, paradigmatic, psychic, technical and political chain reaction that would last for centuries. Initially, within monasteries, time was to be cut up and reorganized as

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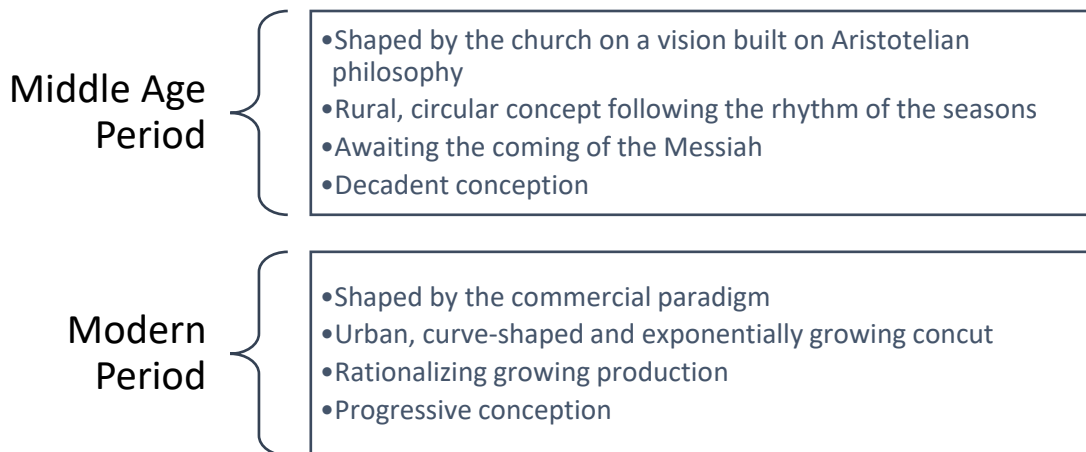
<sup>28</sup> Gustav Bilfinger, *Die mittelalterlichen Horen und die modernen Stunden. Ein Beitrag zur Kulturgeschichte*, 1892, cit.in., Jacques Le Goff, *Pour un autre Moyen Âge*, Gallimard col. Tel, Paris, 1977, ed. numérique 2013

productive work was reorganized, no longer on the basis of the movements of the cosmos, but of the movements of a regular mechanism:

"The clock not only marks the hours, it synchronizes human actions".<sup>29</sup>

Time became detached from the world and the lives of people in it, to serve as an instrument of a power that was beginning to change. From the 13th century onwards, but especially in the 14th century, mechanical clocks began to spread throughout the city, as a movement of urban emancipation emerged. Until then, the organization and definition of time in hierarchical societies had been the function of power, whether administrative (imperial China) or symbolic (the medieval Church). Here, the organization and definition of time becomes independent of political power, and becomes the function of a machine. Gradually, in cities that emancipated themselves from feudal powers, urban conceptions took over as rural powers (feudal lords and the Church) declined, and the urban patricians' conception of time replaced the Aristotelian conception of the Church.

***Bagan 1. Middle Ages and Modern Conception***



***Bagan 2. Time and space for both the scholar and the merchant are transformed together.***<sup>30</sup>

<p>Shaped by the Church, time is considered to belong to God, and cannot be an object of profit. Conceived from the Holy Scriptures (the Bible and the Fathers of the Church).</p> <p>From a theological point of view, time has a beginning and an end, and therefore a goal, which is the apocalypse, i.e. the return of the Messiah to earth. From a strictly theological point of view, time is linear and fixed towards a goal.</p> <p>However, since life in the real world is rural, the cyclical concept is also essential: it is the time of life and of the daily activities of men, mainly peasants, whose aim is subsistence and the payment of taxes, not gain.<sup>31</sup></p>	<p>Secularization: the city clock dominates the city, symbolizing the power and prestige of the urban elite. A symbol of government "efficiency" (then a new value).</p> <p>Shaped by commercial reason, time became a source of gain through credit and usury, but also shaped new ways of working and producing.</p> <p>With the rise of the bourgeoisie and humanism, time no longer belonged to the Church, but to the individual man. However, unlike the laborer, who had to devote their time to work in order to live, the merchant humanist could organize his time between work, leisure and social activities.<sup>32</sup></p>
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<sup>29</sup> Lewis Mumford, *Technics and Civilization*, Routledge & Kegan Paul PLC, 1934 p. 14

<sup>30</sup> Jacques Le Goff, *Pour un autre Moyen Âge*, Gallimard col. Tel, Paris, 1977, ed. Numérique 2013 chap. *Le temps du travail dans la « crise » du XIVe siècle : du temps médiéval au temps moderne*

<sup>31</sup> Ibid.,

<sup>32</sup> Ibid.,

During the Late Middle Ages, accounting techniques developed in the Italian peninsula that took into account time and wear and tear on fixed capital (such as means of transport like ships). So, for the merchant, the journey through space also became a question of time, and therefore of loss and gain. Indeed, space is measured in the time it takes to cover a distance. However, it's worth breaking a cliché: while medieval man's space was localized and not very vast, men and families were highly mobile! One of the reasons put forward by Jacques Le Goff is that land could be the object of use rights that were embedded in society, highly ritualized and organized, while land ownership was an almost unknown concept.<sup>33</sup> Also, although medieval people traveled a great deal, their journeys were very long and their means of transit slow.<sup>34</sup> Finally, the world outside Christianity was the home of the extra-ordinary (beyond the ordinary), considered to be rife with monsters and extraordinary peoples.<sup>35</sup>

Here again, from the 11th century onwards, a chain of technical events was to revolutionize human perceptions. The natural environment, wind and water: if the use and exploitation of rivers and streams was already known (Roman aqueducts are a spectacular example), from the late Middle Ages onwards, elements such as water were linked to complex mechanisms, mechanical mills or dams, for productive purposes.<sup>36</sup> From the 12th century onwards, the harnessing of wind was added to the exploitation of water, with vertical-pivot mills to power grain mills.<sup>37</sup> The environment became a supplier of energy for mass exploitation, and techniques were developed to increase production. Even more so, with the weakening of the feudal system, the decline of the old order (lords and the Church) and the rise of new powers (kings and merchants), space tended to become a space to be controlled, a territory, as what would become the "State" took shape.

From the 14th century onwards, the new ideas and representations of the world coming out of the trading cities of the northern Italian peninsula were to consecrate and crystallize these transformations into a coherent but not yet theorized whole. With the development of new accounting techniques that quantified time and space, a new, abstract relationship to the world was born! Time, space, matter, fauna, flora etc. became quantity, measurement, classification: numbers. The world thus became abstract, and a historical movement was set in motion that is still self-sustaining today: everything was henceforth to be measured in money, requiring a continuous increase in trade and production.<sup>38</sup> So the world beyond Christianity was no longer one of adventure and wonder, but of trade routes to the Indies, and then the New World.

### **Men and society**

From the 12th century onwards, the merchant began to enjoy a positive image. They were portrayed as conscientious, competent and honest. Between the 12th and 16th centuries, the ascendancy of this category of people also led to the rise of new values for a new morality based on technique and work. With the emergence of universities between the 12th and 16th

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<sup>33</sup> Jacques Le Goff, *La civilisation de l'occident médiévale*, Flammarion 1982, réédit. 2008, Paris p. 109

<sup>34</sup> *Ibid.*, p. 112

<sup>35</sup> *Ibid.*, p. 114 & suiv.

<sup>36</sup> Jean Gimpel, *La Révolution industrielle du Moyen Age*, Éditions du Seuil, 1975, version numérique 2016

<sup>37</sup> *Ibid.*,

<sup>38</sup> Lewis Mumford, *Technics and Civilization*, Routledge & Kegan Paul PLC, 1934 p. 18 to 26

centuries, a new quality appeared: "competence". Possessing "knowledge" became a quality, even for government service.<sup>39</sup> Indeed, from the Renaissance onwards, trade and its expansion became a means of reinforcing the power of the monarch and the strength of the kingdom. In the minds of civil servants and political theorists, the kingdom no longer consisted of land and subjects, but rather a territory and a mass of men and women to be controlled and organized for productive purposes. In both France and England, there was a simplification of legislation, in the sense of a strengthening of scholarly written laws, and a weakening of customs with immemorial origins. In the latter country, the enclosure movement began in the early 17th century, imposing the enclosure of communal land, depriving a mass of poor peasants of their means of subsistence. This marked the beginning of an increasingly violent opposition between "habitation" and "improvement":

"the poor man shall be satisfied in his end, habitation and the gentleman not indered in his desire, improvement".<sup>40</sup>

This passage, taken up by Karl Polanyi in *The Great Transformation*, sums up the story of the Industrial Revolution as follows:

"This formula seems to take for granted the essence of purely economic progress: improvement at the cost of social upheaval."<sup>41</sup>

Clearly, the Lords' priority was to give primacy to the desire for Improvement (purely economic) over habitation, i.e. the goal of the poor man who wants to preserve his habitat (social, cultural and natural environment). This is how Sir Walter Raleigh came to see the rules hindering enclosure as an attack on the "Englishman's desire":

"I do not like the constraining of them to use their Grounds at our wills but rather let every man use his Ground to that which it is most fit for, and therein use his own Discretion."<sup>42</sup>

This "improvement" affected the means of production, society and even nature. The improvement of society meant the adoption of bloodthirsty legislation by the Tudors to break the customs, ways and rhythms of life of the people.<sup>43</sup> They became a mass of "labor power" to be bought and sold on the market, and crowded into production centers where factories were built. Alongside this commodification of human beings comes the commodification of the earth, i.e. nature, man's natural environment, socialized, institutionalized and ritualized:

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<sup>39</sup> Olivier Grenouilleau, *Et le marché devint roi*, Flammarion, 2013 p. 97 à 102

<sup>40</sup> *Consideration of the cause in question Before the Lords Touching Depopulation*, cit. in, 1995

The Seventeenth-Century Revolution in the English Land Law, Charles J. Reid Jr., *Cleveland State Law Review* p. 36

<sup>41</sup> K. Polanyi, *La Grande Transformation, aux origines politiques et économiques de notre temps*, Trad. de l'anglais (États-Unis) par Maurice Angeno et Catherine Malamoud. Préface de Louis Dumont, Gallimard, collection Tel, Paris 1983 re-édit.

<sup>42</sup> Quoted in Maurice Beresford, *Habitation Versus Improvement: The Debate on Enclosure By Agreement*, in *Essay in the economic and social history of Tudor and Stuart England in honour of the R.H. Tawney* 40,44-5 (F.J. Fisher, ed., 1961). Cit., in: *The Seventeenth-Century Revolution in the English Land Law*, Charles J. Reid Jr., *Cleveland State Law Review* p. 36

<sup>42</sup>Karl Marx, *Capital, book I, section 8*, Primitive Accumulation : <https://www.marxists.org/archive/marx/works/1867-c1/index.htm>

<sup>43</sup> Ibid.,

"But labor is nothing other than those human beings themselves of which every society is made, and the earth, than the natural environment in which every society exists. To include them in market mechanisms is to subordinate the substance of society itself to the laws of the market."<sup>44</sup>

This led to the desertification of the countryside and overpopulation of cities. A process of social and cultural dislocation began.

Men's lives were also disrupted by machines, created to improve them. The steam engine launched a self-perpetuating revolution: it made it possible to develop coal mining (already exploited in the 16th century, but for local use) and transportation, enabling the development of steam engines that facilitated and massively increased the extraction and transportation of coal, and the concentration of populations in growing industrial centers, far from the sources from which energy was extracted, making a radical change from water and wind. Sociologist Alain Gras calls this phenomenon the "delocalization of power"<sup>45</sup>, and technology gradually became a total social phenomenon. Nevertheless, it wasn't until the 19th century that the steam engine made a definitive impact.

Nevertheless, as early as the 18th century, people were already aware of the consequences that this "improvement" in society would have, first and foremost on the ecological environment, but also on society as a whole. For the observers of the 18th and 19th centuries, the new productive structures that were emerging and taking hold were shaping a new society, new institutions and social relationships, and a new man, with his new culture and way of thinking.<sup>46</sup>

### **Social and ecological consequences**

This industrial transformation was not without consequences. The transformation of society into an immense productive machine was to generate its share of intellectual and cultural dislocations. From Adam Smith to Ivan Illich two centuries later, it was clear that the emergence and triumph of industrial civilization was alienating people and rendering them impotent. Adam Smith thought he observed that, thanks to the diversity of his activities, his environment and his tools, the poorest peasant enjoyed conditions more likely to develop his intellect than the alienated worker, the prisoner of piecework.<sup>47</sup> Uprooted and separated from his structuring environment, the proletariat sinks into a state of indescribable degeneration, except in the harshest terms. Reduced to the status of commodity "labor power", social relations are de-ritualized, giving way to extreme violence and power struggles. This led to the emergence of methods of mass coercion, such as the Workhouses, a kind of institution for training the poor in the discipline of work, which begins in childhood:

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<sup>44</sup> K. Polanyi, *The Great transformation, The Political and Economic Origins of Our Time*, foreword BY Joseph E. Stiglitz introduction by Fred Block BEACON PRESS BOSTON, 1944, reedit. 2001 p. 75

<sup>45</sup> Alain Gras, *Fragilité de la puissance, Se libérer de l'emprise technologique*, Fayard, Paris, 2003 p. 32 et suiv.

<sup>46</sup> Edward Palmer Thompson, *The making of the english working class*, VINTAGE BOOKS· A Division of Random House New York p. 189

<sup>47</sup> Adam Smith, *An Inquiry into the nature and cause of wealth of nation, books I, II, III, IV, V*, Digital edition, Mealibri, 2007 p. 603

"It is quite useful that they should, in one way or another, be permanently employed at least twelve hours a day, whether they earn their living or not, for, by this means, we hope that the coming generation will be so accustomed to constant activity that it will in time appear to them pleasant and distracting."<sup>48</sup>

The lord's "subject" became a mass of "swinish multitude".<sup>49</sup>

It's interesting to note that the Great Transformations that affected the countries of Europe, first England, then France and finally Germany, found their extension in the colonies of Africa, the Middle East and Asia. Edward Palmer Thompson observed that while the great port cities were growing rich from the slave trade between England, Africa and the Americas, the poor Englishman was suffering from enclosures and the Industrial Revolution, with its share of bloody legislation (in the words of Karl Marx, "Chapter XXVIII: Bloody legislation against the expropriated from the end of the 15th century. - The Wage Laws"), such as the deportation of white slaves to the antipodes or the proliferation of offenses punishable by death by hanging (Black Act, Frame-Breaking Act etc.). Karl Polanyi saw colonialism as an extension of the Industrial Revolution in Europe, particularly in England:

"For anyone studying the beginnings of capitalism, the parallel is full of meaning. The conditions in which certain indigenous African tribes live today undoubtedly resemble those of the English working classes in the early years of the nineteenth century."<sup>50</sup>

This brings us to the problem of the world after 1949. Indeed, in that year, President Harry Truman introduced the notion of "development" to the world, an idea that was to shake up post-colonial societies even more profoundly, and lead to a new Great Transformation, no longer on the scale of a kingdom or nation, but on a global scale. This idea defined what a correct policy, an acceptable society or a dignified way of life should be, based on industrial, technical, utilitarian and economic criteria. It was the emergence of a "development economy" that would inspire students, intellectuals and political leaders in what, from the Bandung conference onwards, became known as the "Third World".<sup>51</sup> as well as the new elites of empires seeking historical rehabilitation after the humiliations of the 19th century. Governments were about to embark on so-called "development" policies, with all their attendant social and cultural dislocations. Societies no longer reasoned in their own terms and criteria, but in those of the former colonizer who, having physically evacuated his colonies, retained intellectual, moral and cultural hegemony via the nation's intellectuals and elites trained in Western universities. Claude Levi Strauss thus prophesied a difficult return to reality:

"Even if, in the intoxication of their newly-acquired independence, many of these peoples tend to consider that old beliefs, old superstitions, all that, is an obstacle to progress, an obstacle to

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<sup>48</sup> Cit., Edward Palmer Thompson, *Customs in Common*, Penguin book, 1993 P. 387

<sup>49</sup> E. P. Thompson, *The making of the english working class*, op.cit., p. 33 & 118

<sup>50</sup> K. Polanyi, *The Great transformation*, op.cit., p. 165

<sup>51</sup> Gilbert Rist, *Le développement. Histoire d'une croyance occidentale*, Presses de Science-Po, 2001 p. 118 à 133

development, very quickly they will realize that a people who are not attached to their roots, who do not try to know them, have before them a strictly poor and miserable destiny!"<sup>52</sup>

The consequence of this path is to provoke "disvalue", i.e. the losses and destruction caused by the substitution of common goods and economies producing use-value for exchange-value production<sup>53</sup>, trapping poor populations in "modernized poverty", i.e. the appearance of new needs and new goods required to be able to live in society, resulting in new costs and expenses, as well as dependence on institutions.<sup>54</sup> This brings us to an unprecedented problem: the standardization of the world, as observed by Claude Levi Strauss:

"What "underdeveloped" countries criticize others for at international meetings is not that they are Westernizing them, but that they are not giving them the means to Westernize them fast enough [...] But the phenomenon is underway, and we don't yet know the results. Will it end with complete Westernization?"<sup>55</sup>

### **The impasse at the start of the 21st century**

The situation at the start of the 21st century is extremely worrying! Faced with the terrible environmental, social, demographic and political challenges we face, national and international political players have no other way of thinking than to strengthen population control and the means of coercion. In countries with representative regimes such as France and Australia, brutality and states of exception are becoming the norm, testifying to the chronic inability of governments and administrations to solve problems. Worse still, they are becoming counter-productive, adding to the problem by passing "sani-safety" laws and launching "eco-safety" ideas (while waiting for other measures in other sectors). Such policies, made possible by new technologies, herald a future worthy of twentieth-century dystopias.<sup>5657</sup>

The super-powerful GAFAMs are imposing their laws on companies, and governments don't seem prepared to put up the slightest resistance. What's more, some see them as political interlocutors.<sup>58</sup> This development is not without danger, including for the existence of all forms of life on Earth. If the old revolutions were about replacing an old order and its technologies with new ones, the 21st century is about replacing humanity in its very essence. For example,

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<sup>52</sup> Claude Levi-Strauss entendu dans *le siècle de Levi-Strauss*, Pierre Assouline, 2015

<sup>53</sup> Ivan Illich, *In the mirror of the past*, Marion Boyars Publishers, 1991, ebook edition 2011 P. 35 to 37

<sup>54</sup> Ivan Illich, *Deschooling society*, Harbrow books, 1971, p. 4 & 5

<sup>55</sup> Claude Lévi-Strauss, *Race et Histoire*, UNESCO 1952, éd. Folio, coll. « Essais », 1989 p. 52 et suiv.

<sup>56</sup> *Guillaume Zambrano*, « *Le pass sanitaire est un moyen extra-judiciaire de désactiver socialement les gens* », Interview d'Alessandra D'Angelo, Le Poste, Publié le jeudi 07 octobre 2021 à 17:51 : <https://lpost.be/2021/10/07/guillaume-zambrano-le-pass-sanitaire-est-un-moyen-extra-judiciaire-de-desactiver-socialement-les-gens/>

<sup>57</sup> « *Carte carbone : plutôt qu'une taxe, un quota pour chaque citoyen ?* » by Anne-Dominique Correa, Socialter, publié le 12 juin 2019 : [Plutôt qu'une taxe, une carte carbone pour tous ? \(socialter.fr\)](https://socialter.fr/plutot-qu'une-taxe-une-carte-carbonne-pour-tous/)

<sup>58</sup> Luc Vinogradoff, Le Danemark va envoyer un « ambassadeur numérique » au pays de Google et Facebook, 07 février 2017 à 18h17 - Mis à jour le 08 février 2017 [https://www.lemonde.fr/big-browser/article/2017/02/07/le-danemark-va-envoyer-un-ambassadeur-numerique-au-pays-de-google-et-facebook\\_5076124\\_4832693.html](https://www.lemonde.fr/big-browser/article/2017/02/07/le-danemark-va-envoyer-un-ambassadeur-numerique-au-pays-de-google-et-facebook_5076124_4832693.html)

Mark Zuckerberg is launching his company on a journey to change materiality: to replace rootedness in the material world with complete uprooting in digital immateriality.<sup>59</sup>

Another problem is the development of widespread surveillance techniques. These new techniques are proving invasive, endangering the very existence of societies and creating a kind of leaderless totalitarianism. Karl Polanyi had already foreseen this problem in the mid-twentieth century:

"As we shall see, we may in this respect have to recognize the existence of a link, more intimate than it appears at first sight, between the enormous advances we are witnessing towards a technical civilization and the threat to freedom, which is currently latent throughout the world."<sup>60</sup>

The difference between "democracy", "dictatorship", "freedom", "oppression" or enslavement is no longer a political question, but the question of our relationship to technology! Whatever the language, we speak the same language, made up of "control", "growth", "progress", "performance", "development", "modernization", "catching-up", "technology transfer", "gain in production" and so on. Technological development is leveling out differences and standardizing the world, obliterating the diversity necessary to all human life.<sup>61</sup>

In the face of these challenges, twentieth-century modes of reasoning seem obsolete, or at least unable to help us understand the situation. For Karl Polanyi, this is due to an adherence to a deterministic vision of history, composed of the idea of economic determinism, stemming from the ideologies of the 19th century, which distorted our vision of mankind and society<sup>62</sup>. Indeed, under the influence of Adam Smith's anthropology, where the quantitative takes precedence over the qualitative, we slide from anthropological reasoning to economic reasoning. This anthropology is coupled with a determined vision of history, which he divides into stages. In this way, human existence is conceived only in progressive terms, moving forward in "the direction of history", towards a progress that will always be conceived in the mode of growth. From his point of view, "Increase", "Improvement" and "Progress" are used synonymously.<sup>63</sup>

The opposition between "the past", "conservatism", "reaction" and "modernity", "progress", "movement" is therefore dated and localized: the 18th-century West and progressive history are no more the nature of man, than there is an inexorable sense of history. Polanyi spoke of the "Habitation versus Improvement" clivage (Habitation of the poor and Improvement of the

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<sup>59</sup> Enter the metaverse: the digital future Mark Zuckerberg is steering us toward, Dan Milmo Global technology editor, jeudi 28 octobre 2021 20h14: [Enter the metaverse: the digital future Mark Zuckerberg is steering us toward | Meta | The Guardian](#)

<sup>60</sup> K. Polanyi, Freedom and technology, cit., in *Essais de Karl Polanyi* p. 539

<sup>61</sup> C. Levi Strauss, *Race et histoire*, op.cit., p. 11

<sup>62</sup> *Essais de Karl Polanyi*, Dir Jérôme Maucourant, Michele Cangiani, Seuil, Paris, 2008 p. 521

<sup>63</sup> Christian Marouby, *l'économie de la nature essai sur Adam Smith et l'anthropologie de la croissance*, le seuil, Paris, 2004 p. 87 à 89



rich) as a "revolution of the rich against the poor"<sup>64</sup>, and Ivan Illich spoke of a "war against subsistence"<sup>65</sup> with dramatic consequences.

The commodification of man and nature as a whole, reduced to a state of exploitable matter by the state or the corporation, generates social and cultural catastrophes which in turn generate ecological catastrophes; the South American, African and Asian proletariat is reduced to destroying its social and natural habitat on pain of starvation. One example is deforestation. Uprooted, people's environment is no longer the home, the village, the street, the fields or the forest, but the factory, the housing estate, the department store (or shopping mall) and the screen. They find themselves trapped in a vicious circle where the needs created by a technostucture multiply as the habitat degrades.

This production of fictitious goods (things not created by man with the aim of being sold) is rooted in a vision of the environment marked by scarcity. Adam Smith saw the condition of primitive man as miserable, and imagined an awareness of this state and a desire to escape it as the driving force of history<sup>66</sup>. The commodification of land and people, then subjected to the industrial regime in a self-regulating market system, would give birth in a self-realizing movement to this impression that things are scarce. This led to the emergence of relationships based on this premise and this feeling of scarcity: the exploitation of other people and of nature, reduced to the state of a stock of materials. Ecological and health problems are first and foremost expressions of our psyche and our relationship with the world.

## Conclusion

Les transformations techniques, politiques, sociales, culturels mais aussi biologiques et environnementaux sont donc intimement liées et forment un ensemble interagissant. James C. Scott a parfaitement soulevé cette problématique en mettant en lumière la corrélation entre transformations, parlant de modules sociaux, productifs et environnementaux. Dans la Chine pré-impériale, Shang Yang réuni tous ses aspects dans une politique cohérente. Cela afin de transformer le royaume qu'il sert en machine productive de denrées agricoles et de puissance militaire. Néanmoins, si les transformations en Mésopotamie se font sur des temps très longs, les réformes de Shang Yang ont lieu sur un temps très court qui en dépit de l'héritage politique et institutionnel qu'il a laissé, ne tiendra lui-même qu'un petit peu plus d'un siècle. C'est l'assouplissement de ce régime par les administrations à suivre qui donnera une plus grande pérennité aux dynasties qui suivantes.

C'est sur un temps relativement long qu'a lieu la révolution industrielle moderne, jamais fait d'une planification méthodique, mais des trajectoires empruntées par à-coups, lançant de lentes transformations. Le monde devient petit à petit un espace, des routes et réserves de matières à convertir, le temps une mesure du travail productif et un instrument de discipline et les hommes une matière à exploiter indistinctement. Dans ces conditions, la politique devient une affaire de gestion des réserves des matières et d'organisation de production, une modification que l'école St Simonienne définie comme le remplacement du « *gouvernement*

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<sup>64</sup> K. Polanyi, *The great transformation*, op.cit., p. 37

<sup>65</sup> Ivan Illich, *Shadow Works*, Marion Boyars Publishers, 1981

<sup>66</sup> Christian Marouby, *l'économie de la nature*, op.cit., p. 57 à 62

*des hommes par l'administration des choses* ». Déracinés, incapables d'avoir recours aux leçons du passé, les hommes pris en otage dans des institutions devenues contre-productives semblent bien désarmés devant la nuit qui tombe.

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