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How competition drove social complexity: the role of war in the emergence of States, both ancient and modern

Como a competição promoveu a complexidade social: o papel da guerra no surgimento dos Estados, tanto antigos como modernos

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RESUMO: A origem da ultrassociabilidade humana – a habilidade para cooperar em sociedades enormes de indivíduos não-aparentados geneticamente – sempre interessou teóricos sociais e evolucionários. Neste artigo, usamos a chamada seleção cultural de grupo ou multinível para explicar como os traços culturais necessários para viabilizar sociedades complexas surgiram necessariamente como resultado da competição entre grupos culturais. Nós aplicamos a teoria a duas transformações particulares: (i) a emergência dos primeiros Estados e sociedades hierárquicas, e (ii) a ascensão dos Modernos Estados-Nação e a consequente Grande Divergência de renda entre o Ocidente e o "Resto" que começou no século XVIII.
PALAVRAS-CHAVE: Evolução cultural; guerra; complexidade social; Estados; grande divergência.

ABSTRACT: The origin of human ultrasociality – the ability to cooperate in huge groups of genetically unrelated individuals – has long interested evolutionary and social theorists. In this article, we use cultural group or multilevel selection theory to explain how cultural traits needed to sustain large-scale complex societies necessarily arose as a result of competition among cultural groups. We apply the theory at two key particular junctures: (i) the emergence of the first States and hierarchical societies, and (ii) the Rise of Modern Nation-States and the associated Great Divergence in incomes between the West and the "Rest" that began in the eighteenth century.
KEYWORDS: Cultural evolution; war; social complexity; States; great divergence.
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INTRODUCTION

One recent trend of social sciences is to integrate the great historical transitions into the broad perspective of Deep History, i.e.,, to situate them in a common narrative that incorporates contributions of archeology, biology, primatology, anthropology and evolutionary psychology (Shryock & Lord Smail, 2011; Henrich, 2015). This work assumes a Deep History perspective to interpret two major transitions in human history. It offers first a brief synthesis of the multilevel cultural selection theory and the hypothesis of the "social brain", both originating from biology and anthropology as theoretical bases to analyze how cooperation and conflict, as well as social cohesion and war, influence political organization and economic development in the long term. In particular, two major transitions will be considered: a) The emergence of States and Complex Societies; b) The Great Divergence in the rates of economic growth between the West and the Rest of the World as a result of the Industrial Revolution.

From the perspective of multilevel cultural selection, the main difference between Homo Sapiens and other animals is the ability of humans to accumulate culture and cooperate with strangers (Richerson and Boyd, 2005). Many animals display "cultural traits", but their abilities to learn from their peers, to teach, transmit, and, therefore, to accumulate culture are limited compared to ours. With limited aptitudes for teaching and learning, most non-human animals must stand on their own to learn from their environment. Humans, on the other hand, build on behaviors and beliefs inherited from the past. We distinguish ourselves by our sophisticated aptitude to incorporate knowledge, myths, and questions. Our individual intelligence is irrelevant to any practical effect if we discount our ability to cooperate with others. Adam Smith himself pointed to language as the foundation of cooperation, exchange, division of labor and wealth.

Cultural accumulation, understood as the systematic acquisition of traits not inherited in our genes, is what allows us to develop new and practically unlimited varieties of social organization. The ability to accumulate culture facilitates our remarkable plasticity of behavior. Although the conditions for learning and teaching are tributary to our biology, culture generates original habits and adaptations, qualities without which our expansion from the African Savanna to all terrestrial environments, from the Arctic to the Himalayas, would have been impossible. It is because of these precious social skills that humans are not automatons forced to follow a fixed genetic script. Without this social repertoire, cooperation would not be possible beyond kinship and the limited universe of beings with whom one has close and frequent interactions. In other words, humans are unique in their capacity to recognize and identify with strangers. Thanks to these skills we cooperate with relative independence from our limited memory and restricted brain computing capabilities. According to Dunbar (1996), our cognitive abilities limit the number of people with whom we can maintain stable social relationships to about 150 – not much more than the size of the biggest bands of hunter-gatherers. This means that our capacity to process, remember episodes and guess thoughts and feelings

of others is progressively reduced as the number of participants increase and, therefore, societies bigger than hunter-gatherer and small village communities generally require "cultural traits" such as rules, laws, and enforced norms to maintain a cohesive group. This larger cohesive groups, in turn, seem to be the consequence of another singular aptitude: our capacity to create imaginary communities. It is through symbolic bonds and institutions, such as universal religions, legal systems, states, and markets, that we sustain seemingly well-functioning societies of anonymous individuals (Anderson, 1983).

Perhaps the emergence of the first States and Complex Societies has been the most important social transformation in human history. For tens of thousands of years our ancestors lived in small communities of a few dozen members. In these societies the relationships are face to face, everyone knows each other and collective action usually arises by deliberation. Intentions are transmitted by gestures, facial expressions and gossip. But a few thousand years ago, individuals began cooperating through sophisticated social "technologies" such as states, markets and universal religions. Many cultural innovations were necessary for this 'miracle' to have been possible: writing, money, banks, laws, moral doctrines, Great Gods (Norenzayan, 2013). And although it may sound strange, these achievements were not mainly the result of human creativity exercised peacefully. Violent wars and conquests, as well as extreme forms of exploitation, are at the root of every civilization. The emergence of the first archaic states represented a profound break with the traditions of "primitive egalitarianism" (Boehm, 1999). The archaic states of Egypt and Mesopotamia, to name but a few, were probably the most unequal, those that showed the greatest economic and even nutritional differences between a divine hereditary elite and an impoverished peasantry. Farmers had to wait a couple thousand years before this pattern of inequality began to reverse (Turchin, 2016).

It was only at the time Karl Jaspers once described as the Axial Age (approximately 800-200 BC) that new ways of thinking appeared, such as Universal Religions and Philosophy, in a surprising parallel course, in distant places such as Persia, India, China and the Greco-Roman world. These new 'ideologies' accentuated the idea of universal man and introduced new links between subjects and rulers. The axial era was also the time when the first mega empires arose, ultraterritorial[1] constructs that transposed ethnic and linguistic borders and housed in their territories tens of millions of tribute-paying subjects. The new ideologies and religions were fundamental to unite different communities. They gave shared identities to territories divided by heterogeneous communities of tax-paying peasants and income-hungry imperial lords.

The Great Technical, Military and Economic Divergence between Western Europe and the Rest of the World beginning in the 18th century is another of the great topics of the historiographical debate of the last decades. Although the debate has its origins in the field of economic history, the studies that have addressed the issue

[1] On the concept of Ultraterritoriality, see Paiva (2019).

combine the most varied disciplines and currents of thought. Approaches that prioritize political and institutional explanations played a prominent role in recent debates. The common denominator of these studies is that the main determinants of the 'European Miracle'[2] should be sought in Western European states' unique political development. However, these approaches do not integrate a unified body. They differ in the institutions they consider relevant and in the historical and geographical circumstances that favored their emergence. Some authors, such as Douglass North (1990), and Acemoglu and Robinson (2012), consider that the role of representative bodies in safeguarding property rights were instrumental in enabling capital accumulation in the West. Others identify advantages in the European states' "infrastructural power", which "enormously increased their fiscal and manpower exactions, caging their subjects onto the national terrain and thus politicizing them" (Mann, 2012: 20; Johnson & Koyama, 2017). This work builds on the second tradition and interprets the political development of Western Europe in terms of the specific geopolitical pressures that affected the region since the fall of the Western Roman Empire.

As human groups are organized according to their respective social and natural environments, political and economic institutions often evolve slowly. When these environments remain unchanged, or change slowly, ideas and institutions usually crystallize into watertight forms. The main argument we are putting forward in this paper is that cultural change and innovations are normally very costly and that, absent strong selective pressures, social organization tends to crystalize into rigid forms. Put differently, it is much easier to mimic and follow one's parents and peers' footsteps and copy what is considered successful than it is to devise new ways of thinking, building, and organizing. Besides, people tend to protect first and foremost their kith and kin and normally do not establish strong cooperation with strangers that might not be trusted. And while there are many selective forces that can help bring about cultural evolution, few have been as intense as war.

Wars are often triggers that mobilize and unleash social change. Usually people experience armed conflicts as unpredictable shocks with disastrous and lasting consequences. But in certain circumstances the persistent influence of armed conflicts, the incessant armed competition among human groups, also demands social cohesion and institutional, organizational and technological readjustment. It is not war as such but its organization that usually has spillover effects on political and economic development.

In addition to this introduction, the second section presents the concepts of competition and cooperation from an evolutionary perspective as bases for cultural and institutional evolution. The third section discusses the emergence of the first States and Complex Societies based on this analytical framework. The fourth section does the same with the Industrial Revolution and the Great Divergence. Last section offers some final conclusions.

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[2] Jones (1981).

COMPETITION AND COOPERATION: BASES OF CULTURAL EVOLUTION

War was decisive in certain critical junctures of our natural and institutional adaptation. We cannot understand how we got here without first understanding how violence influenced our organic formation and how it shaped human groups, the 'societies' we inhabit. All forms of life combine cooperation and competition, unity and autonomy, harmony and violence. On the one hand, cooperation is an inseparable part of organic and cultural life. Every living being is made up of differentiated parts. Some of them, like the mitochondria that provide energy to our cells, in the past functioned as independent biological units (Smith and Szathmáry, 1995). It was through a process of natural selection that they gradually fused into organisms of greater complexity as they increased their chances of survival by 'cooperating', or integrating, with other organisms. The theory of multilevel or group selection indicates that under the persistent pressure of group competition the units tend to cooperate in increasing scales, that is, competition in scales of increasing complexity tends to generate organic and cultural traits that favor cooperation. That is why cooperation and violence cannot be thought of separately, as irreconcilable antitheses.

Competition is the mother of all change. The "social brain" hypothesis explains the accelerated growth of our cerebral cortex as a result of the selective pressure exerted by group competition in our ancestors. The need to form coalitions was the main environmental constraint that guided our "recent" biological evolution. Most of our properly human skills did not arise only as a result of the influences from our natural environment, such as climate changes, threats from predatory species or the conquest of new ecological niches. They arose as a consequence of a highly complex intraspecific competition that shaped our ancestral social environment. Our ability to communicate with third parties, to remember those who helped or betrayed us, our obsession to identify reliable candidates for cooperation and our refined 'instinct' to detect free riders, are all adaptations whose foundations must be sought in the complex intraspecific interactions that guided our evolution. Charles Darwin himself (1871) pointed out that our obsession with the image people have of us, and our involuntary bodily reactions such as blushing before facts that embarrass us are features of incontestable social origin. The pleasure we feel in watching our acquaintances gossip and pass on rumors, our expertise to infer feelings from looks and gestures, as well as the attention we give to body language, are unique human evolutionary features, capabilities that were selected as a result of our complex social life.

This competitive social environment also drove the capacity to form and sustain coalitions and made our brain first and foremost a "social tool", a "lethal weapon" of group competition (Alexander, 1990). In other words, once human beings rose to the top of the food chain, the main force that drove our cultural evolution and selected our strictly human traits ceased to be the physical need to survive against threats from the environment or other animals, and became the very

need to thrive in an inherently conflictive social environment. In the words of Flinn, Geary and Warda (2005: 12) "these competencies (intelligence, personal memory, etc.) do not appear to be adaptations for tracking prey or collecting fruit, nor spurious outcomes of neurogenesis or other developmental processes". In fact, the Aristotelian view of man as a "political animal" (zoon politikon) finds increasing support in primatology and evolutionary psychology. Our Darwinian struggle for survival was first and foremost a struggle with other human groups for the control of vital resources, territories and women (Gat, 2006). The rise to a dominant ecological position postulated by Alexander's Ecologically Dominant-Social Competition Theory rejects the idea that a hostile external environment was what promoted our brain development. On the contrary, the relaxation of external constraints would have facilitated the development of the competitive and complex social life that ended up selecting our specific traits. The domestication of fire, as Richard Wrangham (2009) points out, would have catapulted humans into a dominant ecological position, facilitating demographic growth and the sophistication of life, thus deepening selective pressures of a social nature.

Besides being political, our brain is decisively tribal (Haidt, 2012). In any culture, human beings are divided into groups that compete with other groups. We play in teams. Although our ability to cooperate extends far beyond relatives and acquaintances, it is not indiscriminate. We cooperate to compete. We unite to fight. We are hardwired to adhere to certain divisions, to take sides in confrontations, to identify ourselves with symbols and rites of certain tribes in opposition to other tribes, whether they are religious groups, countries or even football clubs. Our intellectual aptitudes, far from granting us analytical objectivity and emotional distance from tribes and their conflicts, invariably tend to place us at the service of one of the sides. We see the world with tribal blinders. Behavioral studies indicate that we are more concerned with recognition within the group than understanding a certain reality. Although we do it unconsciously, we are more inclined to accept information that is in favor of the cause of our tribe and to reject any news that oppose it. Confirmation biases are commonplace in any study of evolutionary psychology. Fieldwork even indicates that the most educated and intelligent people are even more tribal than ordinary people (Barkow, Casmides and Tooby, 1992). For the survival of our ancestors reputation was more important than the truth. In the words of Jonathan Haidt (2012):

> Why do we have this weird mental architecture? As hominid brains tripled in size over the last 5 million years, developing language and a vastly improved ability to reason, why did we evolve an inner lawyer, rather than an inner judge or scientist? Wouldn't it have been most adaptive for our ancestors to figure out the truth, the real truth about who did what and why, rather than using all that brainpower just to find evidence in support of what they wanted to believe? That depends on which you think was more important for our ancestors' survival: truth or reputation. (Haidt, 2012: 86)

Since our ancestors reached ecological dominance, group conflict, as well as the cultural and institutional creations that co-evolved with it, became the determining factor in the selection of our traits. As we will see in the next section, it is in the connection between conflict and cooperation that we can identify the origin of politics.

COMPLEX SOCIETIES: BEYOND KINSHIP

States did not arise from the voluntary association of independent groups or individuals. Wars, conquests and invasions are at the base of all human civilizations. Hunter-gatherer and small village communities are extremely horizontal compared to state societies and would not simply give up their autonomy and egalitarianism absent conquest or the threat thereof. Christopher Boehm (1999) points out that humans, unlike most primates, are eminently egalitarian. The mastery of the first rudimentary weapons, such as spears or axes, prevented an alpha male from imposing himself on his fellowmen without the mediation of allies, as well as shared consensus, persuasion, rules, and institutions. Power relations since then could only work on the basis of coalitions based on consent. According to Boehm, this evolutionary transition gave birth to morality and to the egalitarian propensity of humans. This "physical equalization" brought on by the advent of weapons made it more difficult to impose domination based only on sheer force and would eventually open the way for new relations of domination based on justifications of a legal, economic or religious nature. But members of small-scale tribal societies would invariably resist the formation of hierarchies and their various forms of intraspecific exploitation. Only in the last few millennia, after the long and conflictive process that led to the formation of states, was inequality reinstated in human life as an apparently natural phenomenon (Clastres, 1974).

The first states arose in specific ecological contexts where the practice of agriculture had already existed for several thousand years. Contrary to what was previously thought[3], there was no straight and automatic path from the domestication of plants and animals to the first States and Complex Societies (Scott, 2017). In different places around the planet some varieties of agriculture eventually arose, many of which, like the slash and burn practice, do not involve the formation of sedentary societies, the use of large-scale irrigation or other forms of intensive cultivation, demographic agglomerations, cities and hierarchies. According to Carneiro (1970), the first states emerged in territories that were "ecologically circumscribed", that is, oases of high fertility surrounded by large deserts, where people could not move to without losing their traditional livelihoods. According to Carneiro, these circumscribed territories were the ecological niches where the first civilizations germinated not mainly because they produced an agricultural surplus,

[3] See, for example, Gordon Childe (1942).

but because the growing population that this fertile areas produced quickly found itself in a bloody dispute for the few remaining circumscribed areas, a dispute that selected for communities that were increasingly hierarchical, as hierarchy has been historically associated with military success.

Bearing on Carneiro's original paper (1970), authors such as Mayshar et al. (2017) have pointed out that the mere existence of agriculture does not automatically generate taxable surpluses or States. People only choose to produce surpluses when they are forced to feed a growing population in circumscribed ecologies and where farming consists of products that are simultaneously seasonal, storable and visible, such as cereals. When the products are not visible to the naked eye and the eventual agents of the state cannot verify the potential surplus, taxation finds a material limit regardless of the level of productivity. The same happens when they are not storable or when their production does not adjust to a seasonal regularity. In other words, the State does not arise automatically when a surplus appears, but a surplus appears when the exercise of power coincides with natural conditions to extract and appropriate it. In Mayshar's words:

> The transforming feature of the Neolithic Revolution that gave rise to social hierarchy was the increased appropriability of crops rather than increased productivity[…] Even after the adoption of highly productive agriculture, state institutions did not emerge in regions where farming relied on nonseasonal roots and tubers that are typically perishable and largely nonappropriable. Complex hierarchies and state institutions emerged only in regions of the world, such as the ancient Near East, where farming relied on seasonal and nonperishable cereal crops, since such crops require storage from one harvest to the next and are thus highly vulnerable to appropriation. (Mayshar et al., 2017: 12)

If humans are inherently egalitarian and tend to reject the formation of hierarchies, how were stratification and inequality sustained in the last 6.000 years? The answer lies in intergroup competition. We now know that the economies of scale of extended cooperation are not a sufficient condition to explain the rise of complex societies (Carneiro, 1970, 2012). Were it not for the existence of strong selective forces, people would not have gone through the trouble of "intensive weeding, land leveling, augmenting the irrigation system, and other tasks that require a great deal of labor" (Athens, 1977: 375) because these efforts to maintain an artificial ecosystem – not to mention states, markets and militaries – normally require clear political and economic stratifications, what is in stark contrast with simple societies' egalitarianism. Nonetheless, although inequality has borne great psychological costs and has thus been widely resisted (Clastres, 1974; Boehm, 1999), hierarchical organizations often defeat non-hierarchical tribes. Nothing in human nature condemns us to live in stratified societies, but in disputes among different forms of social organization, large hierarchical groups eventually impose themselves on small egalitarian ones (Turchin, 2016).

But the victory of hierarchical societies was seldom complete. The first state societies were very extractive and unstable, being subject to permanent rebellions and vulnerable to the incursions of foreign invaders, especially of tribal and egalitarian peoples located on the margins of the state (Turchin, 2016). In other words, primitive states' military rule was fragile and ephemeral, and the original state-building process was often reversible (Scott, 2017). It never went beyond hierarchies based on kinship and immediate personal ties. These early states were patrimonial and, although more complex than tribes and chiefdoms, still very different from the entities based on impersonal cooperation and bureaucratic rule that would predominate many centuries later. It is in China that we see the first clear systems of hierarchical rule that did not depend extensively on kinship, for it was probably the first place to regularize a Weberian-like merit-based civil service that selected candidates through written examinations (Fukuyama, 2011).

The Ancient Chinese Empire is a prime example of what we earlier described as ultraterritorial states, empires that bypassed language and ethnic frontiers and governed its subjects with something more than sheer force. As we noted before, Karl Jaspers himself had hypothesized that the mega empires of the so called Axial Age (800-200 BC) had been created though the selective pressure of a new "weapon" that revolutionized the Eurasian continent. This new selective pressure was the technology of mounted archery, first developed in the 9th century BC by Iranian-speaking nomads and that soon became the weapon of mass destruction of the Eurasian steppes, unrivaled in its destructive powers by any other technology until the rise of modern firearms (Turchin, 2016). This new threat to sedentary societies triggered forces that transformed the internal organizations, beliefs and habitual ways of thinking in various Eurasian state societies. From the Sahara in the West to the Gobi in the East we see a new belief in Great Gods (Norenzayan, 2013), moralizing and omniscient guardians that helped promote prosocial behavior within the newly created communities of god-fearing subjects. That new religions and ideologies of the Axial Age provided a moral basis to agglutinate and cushion tensions, a necessary condition to face the civilizational clash of the nomads. Ideas like those of a common humanity and the essential dignity of every human being were consolidated. The cultural legacy of this spiritual explosion was one of the main ideological tools that facilitated the cyclopean task of creating cohesion among individuals without ties of kinship. Interestingly, all the main religious and philosophical matrices that still hold sway over much of the planet's population come from the Axial Age: the Judeo-Christian tradition, Confucianism, Taoism, the Brahmin, Buddhist and Jain doctrines of India, Persian Zoroastrianism, and Greek philosophy. With the Axial Age Revolution we all became "children of God" and learned to yearn for a common destiny. Although the first mega empires were still very unequal and hierarchical, equality and freedom were at least present in the world of ideas. And though the next big revolution in ruler-subject affairs would only come with the rise of nationalism and the modern nation-state, after the Axial Age cultural evolution accelerated as competing ideological and religious groups exerted pressures on each other to encompass an ever-growing number of people.

Another key characteristic of the first states and empires was the development of writing, bookkeeping and accounting. Writing accelerated cultural evolution and transmission by overcoming our brain's limited computing capabilities and allowing information to be accumulated independently of our biological limitations (Scott, 2017; Goody, 1986). Similarly, the administration of Great Empires and the mobilization of military forces along large territories demanded new ways to transfer tribute from one site to another in different periods. To achieve this goal, the empires began to tax not in kind, but in currencies minted by themselves. This meant that whoever had to pay monetary taxes was obliged to offer part of their production in exchange for money. The monetization of tribute was thus the main force driving the commodification of surplus, that is, it sponsored the development of markets (Mann, 1986; Fiori, 2010; Crespo & Cardoso, 2011).

MODERN STATE AND INDUSTRIAL REVOLUTION

The second great evolutionary transition towards more complex societies was the ascension of the Modern State in Western Europe, beginning in the sixteenth century. In Europe, nation-states were born as pieces of a complex interstate system in permanent competition. Competition with units of similar characteristics implies for each state limits and restrictions different from those prevailing in other regions. In this situation of permanent rivalry, war and preparation for war were a decisive factor in political and economic development. In other words, the modern state was born as a chronic war machine. The European system of fragmented political sovereignty was thus a fertile ground for the consolidation of this unprecedented form of territorial power, working in close connection with capitalist-organized economies.

Notwithstanding Europe's perennial power fragmentation, military and political rivalries eventually selected the polities best able to withstand these intense selective pressures. This can be seen in Europe's secular trend towards territorial centralization: from around 1,000 political units in the fourteenth century AD there remained only about 500 in the sixteenth century. By 1900 the number had been reduced to 25 sovereign states. What is interesting is that since the fall of the Western Roman Empire no similar Continental Empire managed to impose its control over Europe. All later attempts were frustrated with surprising brevity, were they the Carolingian Empire, the Habsburg Empire, Napoleonic France or Imperial and Nazi Germany. After each incipient unification, the continent invariably re-fragmented as if inexorable centrifugal forces dominated European power relations. Some authors point to the politics of alliances and balance of power as the determining factor of this secular containment of imperial tendencies (Hui, 2005). The Europeans were only successful at consolidating colonial territories and overseas empires, far from their original disputes. This competitive fragmentation is one of the most important features that differentiate Western Europe from the rest of Eurasia and that help us interpret the Great European

Divergence (Pomeranz, 2000). The continental empires were the predominant political organization in the rest of Eurasia until the late eighteenth and early nineteenth centuries, when they began to suffer Western influence or direct European colonization.

The competitive pressures on the Empires whose borders coincided with the great steppes of Central Asia were very different. As argued by Ko et al. (2018), the "precocious" political centralization China experienced in its struggle with the steppe nomads hindered further technological and military development. Likewise, Chase (2003) gives us a hint to why the states of the so called 'exposed' regions were already lagging, by the 17th century, in the development of firearms in comparison with Western Europe. While Europe experienced since the late Middle Ages rapid evolution of both military and political technologies, such as very expensive fortifications that could resist siege cannon, the Asian empires' most potent and terrifying adversaries were, up until the 1600s, the mounted archers of the steppes against whom artillery was much less effective. Therefore, the unique context of the European state competition generated a military great divergence much before the great divergence in actual incomes and civil technologies, which only really took off in the 19th century. In other words, the main military threats to the Asian Empires remained the raids of the ancestral nomadic peoples that thousands of years ago had triggered the advent of the Axial Era. Military competition with non-state peoples involves technological and organizational challenges that are very different from those arising from interstate competition. Because of that in Asia there were no forces that gave impulse to the Military Revolution (Parker, 1988) and the consequent transformation of Imperial States into Modern States. In Western Europe, competitive pressures forced technical and organizational transformations in the art of war. Continuous interstate competition consolidated a symbiotic relationship between economic development and the formation of centralized states. Fiscal-military states imposed themselves in Europe and abroad and routinely used military power to wage trade wars and stifle competition. In other words, it was the military and colonial endeavors of warring European states that created the economic *loci* that allowed capital to be accumulated – via public debt, tax-farming, trade monopolies, etc. – at unprecedented rates (Braudel, 1977; Fiori, 2010; Appel, 2017). To those European rulers and capitalists, power and plenty were inseparably connected.

From the analysis of the empirical evidence two fundamental stylized facts can be inferred. First, until the nineteenth century there is no evidence that Western Europe had obvious technical or economic advantages over the rest of Eurasia. Recent research has shown that, far from being unique, in the late 1700s "the most developed parts of Western Europe seem to have shared crucial economic features – commercialization, commodification of goods, land, and labor, market-driven growth… – with other densely populated core areas in Eurasia" (Pomeranz, 2000: 107). Similarly, there does not seem to be convincing evidence that European stan-

dards of living or productivity were appreciably higher[4]. Third, there is also no significant evidence that economic growth had been a systematic phenomenon prior to the Industrial Revolution. In the best of cases, since the Neolithic Revolution there had been what Goldstone (2002) calls 'efflorescences', that is, large but sporadic spurts in technical conditions and productivity in delimited sites, such as Ancient Greece, the Roman Empire, China during the Tang Dynasty and the Netherlands during the 17th century. Except for these localized efflorescences, stagnation of per capita yields would have been the dominant trend.

But since the late Middle Ages, the political units of Western Europe were subject to forces that tended to modify the economic and political landscape, albeit slowly. The so-called gunpowder revolution made medieval fortifications obsolete and selected the fiscal-military states that amassed the most taxing and administrative power. The aristocratic and mercenary armies of the Renaissance increasingly gave way to state-commission armies. The ever-increasing size of these armies meant they could no longer rely on the network of loyalties that a feudal lord or feudal liege might be able to create, but they were rather dependent on an ever-increasing and permanent fiscal budget. Thus, already in the eighteenth century European states collected taxes and spent proportions of their GDPs much higher than any Eurasian Empire (Vries, 2012, 2015; O'Brien, 2013[5]). Between 40% and 95% of these expenses were used to finance wars or prepare for new conflicts (Hoffman, 2015). This remarkable expansion of the State during the long eighteenth century (1688-1815) was sustained by a continuous growth of the tax pressure, the bureaucratization of tax-collection, a gradual elimination of fiscal privileges and the development of modern financial systems supported by public debt. In England the option for indebtedness in times of crisis facilitated the mobilization of huge volumes of resources without resorting to sudden tax increases (Dickson, 1993). The English State proved to have more bureaucratic and tax capabilities than the rest of its European rivals, not to mention the Eurasian Empires[6].

Did increased military spending and indebtedness have positive or negative effects on Europe's economic development? In other words, did the European economies take off during this stage thanks to (or despite) the Military Revolution? These questions abound in the specialized bibliography. In this article we defend

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[4] However, see Robert Allen (2009).

[5] "In the beginning of the 19th century the British state drew almost a third as much tax revenue as the Chinese state from a population 20 to 25 times smaller" (Appel, 2017: 179).

[6] "By 1815, [English] public debt reached 830 million pounds, or more than 250% of GDP (O'Brien, 2006)" (Appel, 2017: 179-180). In contrast, Peer Vries' (2012, 2015) thorough survey of the Chinese system of public finance in the period stretching from the consolidation of Qing rule in 1683 to the outbreak of the First Opium War (1839) reveals a state that was in almost all relevant financial aspects completely different from Early Modern European states. In China we see no upward trend in the collection of taxes, no development of constitutional constraints on the executive, no consolidation of public debt, no discernible system wherein revenue was traded off for property (and monopoly) rights, no consolidation of state-sponsored charted companies, etc.

two potential favorable effects. First, the literature on the "Military Revolution"[7] provides solid evidence of systematic improvements in the production of weapons since the sixteenth century. The production costs of firearms fell steeply with each century. The effectiveness and precision of these weapons improved continuously, much more rapidly than productivity in other activities such as agriculture or civil manufacturing. Similarly, the effectiveness of the warships, where the innovations introduced by the shipyards of the Royal Navy of England stood out, advanced significantly from the 16th century on and especially during the 18th century. In a period of relative stagnation of aggregate productivity, the existence of a "Military Revolution" implies that the production of arms led the European technological development for at least two centuries. As with the Great Powers at present, the intense interstate competition forced the European monarchies to build Military-Industrial Complexes, i.e.,, centers specialized in the study and improvement of war technologies (Mann, 2012; Medeiros, 2003; Medeiros and Trebat, 2014). The defense industry eventually had spillover effects on the rest of the economy, especially in the production of metals such as iron and steel, coal mining – which in the case of England was displacing wood as an energy source – and the design of various technical devices demanded by these activities. Recall that the first steam engines and the initial railways prototypes, the emblematic technologies of the Industrial Revolution, were born in coal mining (Wrigley, 2010). Although the proportion of aggregate public expenditure was small compared to contemporary levels, the share destined for military spending accounted for the largest part, which is to say that the share of GDP accounted by military spending at that time exceeded the percentage now allocated by the great powers[8]. Additionally, some authors consider that the aggregate demand growth has effects on the level of activity even in the long term[9], although this hypothesis has not yet been sufficiently tested in economic history studies and is rejected explicitly by some relevant authors in the area (Mokyr, 1977). Storrs summarizes the consequences of the European Military Revolution in these terms:

> All agreed that the European way of war and the military establishments which the various states maintained were very different in 1700 from what they had been in 1500. Armies were much larger, more complex in composition and structure, and more permanent; they were also much more expensive, not least because they acquire a whole range of services – arms, provisions and other supplies – all of which required the elaboration of more complex administrative structures and, of course, money

[7] See Parker (1988), Chase (2003) and Hoffman (2015).

[8] "In 1752, for example, French military expenditure amounted to somewhere between 3 and 7 per cent of GDP (a fraction comparable to defense spending in the US or the USSR at the end of the Cold War), despite it being a year of peace" (Hoffman, 2015).

[9] See Harrod (1939), Kalecki (1971), Garegnani (2015) and Serrano (1995).

> to pay the troops and the suppliers. Not surprisingly, these developments also impacted on the wider economy and society. (Storrs, 2009, p. 3)

The States that prevailed in these secular disputes, those of Northern Western Europe, were those that followed and enhanced the initial footsteps of Ancient China, in the sense of building hierarchies based on merit, instead of kinship and personal bonds (Ertman, 1997). The European interstate competition contributed to demolish old feudal vestiges and favored the centralization of political, bureaucratic and tributary powers in 'absolute' monarchs. In this way, it fostered the unification of national markets and the construction of 'infrastructural powers' as a way to penetrate territories, populations and cultures at unequaled scales (Mann, 1986[10]). A more significant leap forward would come still with the later industrialization of war, especially after the Crimean War and the American Civil War. Since the French Revolution, wars had to be legitimized in all social strata, for thereupon newly created "citizens" had to be counted on to defend the nation-state. The path for "Total War" had then been open, whose most dramatic manifestations were observed during the two world wars of the 20th century. The creation of the modern nation-state and the need to defend it also made the citizen a soldier, and it thus provided a revision in state to subject relations as revolutionary as that which occurred during the Axial Era. The total wars marked the culmination of a long period of fiscal and military centralization. As one scholar noted, they converted "Peasants into Frenchmen"[11]. In other words, the era of total wars that the French Revolution inaugurated brought about a new social contract because now the requirements of war in terms of resource and human mobilization were so steep that people could demand, in turn, political participation and access to social benefits that were deemed unimaginable in the past[12]. This way, in this new era of intense selective pressures, states that provided more *inclusive* social and political infrastructures faired – on average – militarily better than states whose elites refused to share power or innovate institutionally. The social and political repercussions of these military transformations laid the foundations of the zigzagging process of democratization that continues to this day. Despite the massive destruction and irrecoverable losses, the Revolutions and the two World Wars of the twentieth century triggered unprecedented social transformations. From the 1930s to at least the 1970s the distribution of income in the West became more egalitarian and Western societies became more democratic (Halperin, 2004). We finish with a ques-

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[10] See Johnson & Koyama (2017) for a review of the literature linking war-driven state capacity to economic growth.

[11] Eugen Weber (1976).

[12] In a recent article, Scheve and Stasavage (2012) use empirical data to argue that, against long prevailing opinions, democratization and the expansion of the political franchise are not necessarily correlated with more progressive tax systems, but that, on the other hand, mass mobilization for war has been a much stronger force leading to more equitable tax burdens, such as high inheritance taxes. See also Scheidel (2017).

tion: if popular participation in war and the welfare state have historically shown a close connection (Morris, 2014; Scheidel, 2017), what happens when total wars become a thing of the past, that is, when war becomes so limited and surgical that it has minimal effects on social organization and can be practically ignored by the larger population? Does this mean that, if the incessant pressure of war ceases to operate, the social advances referred above can be reversed?

CONCLUSION

Often wars leave the social order unaltered but have disastrous consequences in human and productive terms. The recurrent conflicts of the Paleolithic, excluding its very slow influence on the development of our brain pointed out in the second section, did not cause great technical or organizational advances. The recurrent conflicts that Asian Empires waged against stateless peoples had some cultural impacts (the Axial Era was one of its most significant consequences), but they did not exert the kind of pressure that led to the formation of Modern States and the Industrial Revolution. However, under certain circumstances, group competition may favor cohesion, encourage new forms of social organization and become a trigger for cultural evolution and technical innovation. As pointed by Karl Marx (1867, chapter 24), "Force is the midwife of every old society pregnant with a new one. It is itself an economic power".

In this paper we identified two historical junctures where recurrent war played a leading role in cultural and institutional evolution. In geographical areas characterized by fertile oases suitable for intensive and sedentary agriculture and circumscribed by steppes or deserts, wars and conquests facilitated the creation of States and Cities, organizations that promoted markets through the monetization of their taxes and that encouraged the accumulation of ideas and experiences through writing. The interstate competition that characterized the geopolitical panorama of Western Europe since the Middle Ages facilitated the strategic and organizational transformations that culminated in the Military Revolution. This in turn imposed renewed fiscal, financial and technological requirements on the competing political units. Thus, war and the preparation for war created the Modern State. Military production, as it happens today, led the technological change and the productivity improvements that later had spillover effects on the civil sector.

It is not possible to specify the exact circumstances that turn wars into triggers of cultural evolution. However, there are quite distinguishable historical conditions which can be analyzed scientifically. When conflicts demand greater organization, social cohesion and centralization of political power, it is to be expected that they will also impact on technical and institutional development. Conversely, many conflicts have disorganizing consequences and dissolve the social cohesion of the respective political units. This is the case of numerous civil conflicts or class struggles in modern societies when these are not subordinated to some superior organizational level, such as the need to organize against external threats. This distinction

coincides with the classification offered by Morris (2014) between 'productive' and 'unproductive' wars. The difference between the former and the latter lies in the scale and level of selection in which conflicts develop. Political power, and politics in general, arose from the complex conflict-cooperation relationship we outlined in this article. The art of politics consists in attenuating conflicts on lesser scales, for example, conflicts within a given national territory, and projecting them onto a larger organizational scale, such as conflicts with other states. The failure of politics restores unproductive war in everyday life.

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