POWER RELATIONS AND TRANSITIONS TO SUSTAINABILITY IN HISTORICAL PERSPECTIVE: AN OPPORTUNITY FOR PROACTIVE EQUALITY?

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Resumen

El deterioro ambiental plantea la amenaza de una catástrofe climática. Preservar la sustentabilidad requiere cambios profundos e interconectados en las principales relaciones sociales y en la generación y uso de conocimiento. El análisis de sus posibilidades lleva a estudiar las fuentes de poder y sus configuraciones cambiantes, con particular atención a sus diferentes consecuencias en los países centrales y periféricos. El desafío planteado por la insustentabilidad ambiental se ve agravado por el de la desigualdad, que en promedio ha venido creciendo durante las últimas décadas y se espera que siga haciéndolo en el futuro previsible. La relevancia de este desafío resulta subrayada por el estudio de sus causas y por una historia que parece mostrar que la mayor igualdad se ha conectado en general con procesos catastróficos más bien que con cambios enteramente pacíficos. Las configuraciones de poder dominantes hoy dificultan más de lo que promueven las transiciones hacia más sustentabilidad y menos desigualdad. Tal situación y las amenazas resultantes pueden abrir algunos espacios para formas proactivas de igualdad, entendidas como procesos en los cuales la agencia de grupos no privilegiados y la expansión de sus capacidades, particularmente en relación al conocimiento, juegan un papel relevante.

Abstract

Environmental damages pose the threat of a climatic catastrophe. Sustainability requires deep and intertwined changes in main social relationships as well as in knowledge generation and use. Analyzing its possibilities leads to study the sources of power and its changing configurations, with particular attention to its different consequences in central and peripheral countries. The challenge posed by lack of sustainability is compounded by the challenge of inequality, which on average has been rising during the last decades and is expected to keep rising in the visible future. The relevance of such challenge is underscored both by the study of it causes and by a history that seems to show that equalization has been connected in general with catastrophic processes rather than stemmed from entirely pacific changes. Dominant configurations of power today hamper more than foster transitions to more sustainability and less inequality. Such situation and ensuing threats may open some spaces for proactive types of equalization, understood as processes where the agency of non privileged groups and the expansion of its capabilities, particularly in connection with knowledge, play a relevant role.

Key words: Inequality; sustainability; power; transitions; proactive equality.

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1. INTRODUCTION

"The First Deep Transition has fed the double challenge of environmental degradation and social inequality: the Second Deep Transition might emerge as a response to this challenge". (Schot & Langer, 2018) The First Deep Transition can be seen as the transition to industrial societies and the Second one as a process still in its initial stages and oriented to overcome some fundamental problems created by the First. This paper elaborates the notion of proactive equality (Arocena & Sutz, 2003) as a possible clue for such transition. Proactive equality denotes the various ways of diminishing asymmetries of technological and organizational power that have subordinated groups as main agents and are based on the expansion of capabilities of such agents, particularly concerning knowledge.

Challenges ahead demand looking at the roots and configurations of power. That is the subject of the following chapter 2. There Mann's theory of power is recalled and the role it assigns to science and technology is critically considered. Taking into account Marx´s theory of history, an alternative conceptual scheme is sketched.

Chapter 3 looks from such framework the emergence of a capitalist knowledge society, seen as the main contemporary configuration of power shaping the perspectives of new "deep transitions"; the notions of peripheral condition and underdevelopment are revisited; the different role of advanced knowledge in central and peripheral countries is discussed.

The challenges of lack of sustainability and of rising inequality are discussed in chapter 4. The evolution of inequality and the main ways to diminish it that history has shown, as presented by Scheidel (2017), are commented. The negative aspects of innovation are related to the aggravation of environmental damage and the threat of climatic holocaust. The increasing role of knowledge is presented as a main trend that, in its prevailing ways, compounds the challenges under consideration.

Causes of rising inequality are considered in chapter 5, with particular attention to the role of knowledge in such process. The ensuing threats to democracy, that in turn fosters inequality, open the possibility of a vicious circle.

In chapter 6 the main question is if the agency of subordinated actors can significantly redress inequalities. A telling comparison between Scandinavia and some Latin American countries is recalled. Three broad ways of diminishing are presented: patient equality, reactive agent equality and proactive equality.

Transitions that expand sustainability and diminish inequality require the combination of different democratizing processes; related issues include the interstitial emergence of alternative combinations of technologies and institutions; they are considered in chapter 7.

Following a welcome suggestion of one of the reviewers of the first version of this paper, two figures are inserted as a (very rough) sketch of some main assertions, one after chapter 3 and the other after chapter 6.

2..ABOUT POWER

In this chapter we briefly present a modification of Mann's theory about the "Sources of Social Power" (Mann, 1986, 1993, 2012, 2013) aimed at highlighting the role of technology in general and advanced knowledge in particular. The result can be called a Marx-Mann conceptual scheme for the study of power (Arocena and Sutz, 2015; Arocena, 2018a, b) .

That theory starts by asserting that "A general account of societies, their structure, and their history can be given in terms of the interrelations of what I call the four sources of social power: ideological, economic, military, and political (IEMP) relationships." Power is defined as "the ability to pursue and attain goals through mastery of one's environment" (Mann, 1986: 6), natural and social. Power relations include in general cooperation and conflict, frequently in mixed ways; collective power refers to the power that an organized group has over nature or other people; distributive power is the power within an organized group that is held by those with a major role in coordination and direction. There is no collective power without distributive power. (Mann, 1986: 5-6) The primacy attributed to Ideological, Economic, Military and Political (IEMP) relations comes "from the particular organizational means each possesses to attain human goals, whatever these may be." (Mann, 1986: 2) IEMP relations have such an outstanding role in society because they originate in needs and problems that human beings must try to cope with. "Ideological power derives from the human need to find ultimate meanings in life, to share norms and values, and to participate in aesthetic and ritual practices." (Mann 1993: 7) "Economic power derives from the need to extract, transform, distribute, and consume the resources of nature." (Idem) "Military power is the social organization of physical force. It derives from the necessary of organized defense and the utility of aggression." (Op. cit.: 8) "Political power derives from the usefulness of territorial and centralized regulation. Political power means state power." (Op. Cit.: 9) The focus on IEMP relations as sources of social power characterizes Mann´s IEMP model. In it there is no privileged type of social relation that can open the way to a mono causal interpretation of history. "Distinguishing between four distinct power sources generates a model which is in some ways pluralist. Ideological, economic, military and political power, though entwined, are not normally merged. Capitalism, states, ideologies and militaries are not normally staffed by the same people, serving the same interests, mobilizing the same emotions." (Mann, 2006: 387)

The IEMP model does not give an adequate place to science (Goldstone, 2006). Mann somehow accepts such critique and tries to solve it by adding more science to the four sources of organizational power (Mann, 2006). But that does not look satisfactory. First, because science is relatively a latecomer in the history of power while technology has been with Humankind from the very beginning (McClellan and Dorn, 2015) and it often makes a difference that cannot be reduced to organizational power, although it is always combined with it. Two similarly trained and organized armies of the same size but one provided with musketry of the 17th century and the other one with rifles of the 20th century have very different power. In his history of social power, Mann shows several times how technological changes may induce great transformations in social relations. For example, with the appearance of iron the "balance of power shifted"; changes in agriculture and war "amounted to a technologically unified revolution. Iron inaugurated a social revolution" (Mann, 1986: 185).

At the very start of his magnum opus Mann makes an assertion that can be taken as the basis for a conceptual scheme that includes the IEMP model but does not neglect science and technology: "The pursuit of almost all our motivational drives, our needs and goals, involves human beings in external relations with nature and other human beings. Human goals require both intervention in nature -a material life in the widest sense- and social cooperation." (Mann, 1986: 5)We require "a material life" that can be seen as the source of technological power. We require "social cooperation" that generates organizational power as described by the IEMP model. We require in fact combining material life and social cooperation, so the mutual influences between technology and social relations come to the forefront.

To consider technology, social relations and their mutual influences, an inspiring source is Marx's theory of productive forces and relations of production. One approach to such theory sees productive forces as determinants of relations of production, in a way akin to what is called technological determinism (Ribeiro, 1983). It can be defended by reference to the famous Prologue of the Contribution to the Critique of Political Economy published by Marx in 1859. Alternatively, the emphasis on class struggle as the motor of history privileges the role of relations of production. It can be backed by reference to the Communist Manifesto, published in 1848.

Our reading of Marx suggests that a given society is highly conditioned by its technological basis but cannot be characterized only by means of it; the fundamental social relations must also be considered. The South of the US during the 19th century was an agrarian society, as England or Holland circa 1700, but they were very different societies. Very different were also the industrial societies of the US and the USSR circa 1950.

Bell (1999: xxix) elaborates what is being suggested as follows: "The appeal of Marxism as a sociological theory is that it is probably the only one that is both synchronic and diachronic, namely a theory of social structure (the synchronic) and a theory of changes (the diachronic). The difficulty is that while Marx's two dimensions, social relations and techne, are yoked together, if one looks at the changes in modes of production over time, there is no clear and consistent relation between the two […]. What I suggested, therefore, is that there is a considerable gain from Marx's scheme if we 'de-couple' the two dimensions". Those two dimensions correspond approximately to "material life" and "social cooperation" in Mann's previously quoted formulation.

The above considerations suggest a "Marx-Mann conceptual scheme" that includes the technological power generated by the "material life" of human beings, the organizational power generated by the fundamental social relations, and the mutual influences between technology and social relations.

Two main elements of such scheme stem from the materialist conception of history. The first one is the relevance of technological power and consequently of science. "Productively relevant scientific knowledge does pertain to the material task to be performed, and therefore is a productive force." (Cohen, 2001: 47) Since relevant "material tasks" are not only producing (unfortunately killing is also a material task with great historical consequence) it is better to say that scientific knowledge has become a source of technological power the importance of which increases systematically. The second element in that scheme that stems from Marxist theory is the relevance assigned to interactions between technology and social relations (Cohen, 2001: 386) which characterizes also the work of Castells (1996: 18). Such interactions are seen as a not deterministic set of mutual influences between technology and social relations.

Referring to the title of the last volume of The Cambridge World History, which is discussed in its initial essay (Pomeranz and McNeill, 2015), particular attention should be given to productive, destructive and connective technologies. We are not speaking of separated sets of technologies. If productive technologies are used for connecting – transporting and communicating – connective technologies play an evident role in the expansion of productive and destructive forces. Productive technologies are the core of the material basis of economic power relations, which have to do with the production and distribution of goods and services. Destructive technologies, the material basis of military power relations, have expanded in the last centuries perhaps more than any other technology. Already in the 18th century the "ballistic revolution" showed the relevance of mathematics and rational mechanics for military technologies (Mokyr, 2017: 271, note 6). Connective technologies give a material basis for all power relations: "Without effective passing of messages, personnel and resources, there can be no power." (Mann, 1986: 136) The role of technology was crucial in the expansion of Western Imperialism (Diogo and Laak, 2016: 16, 277). That becomes evident by considering "three measures of collective power: the capacity to mobilize large numbers of people, the capacity to extract energy from nature, and the capacity of this civilization [i.e. Western] to exploit others collectively." (Mann, 1993: 12-13)

Thus the Marx-Mann conceptual scheme assumes that power stems fundamentally (but surely not only) from:

(1) Technologies enabling the use of material resources in ways that have been greatly increased and diversified since the so called "marriage of science and technology".

(2) Social relations that generate organizational power by coordinating different activities, mainly ideological, economic, military and political.

(3) Mutual influences between technologies and social relations.

Now: "No conceptual scheme ever exhausts a social reality. Each conceptual scheme is a prism which selects some features, rather than others, in order to highlight historical change or, more specifically, to answer certain questions." (Bell, 1999: lxxxviii) Some of the main questions to be considered by means of this conceptual scheme have to do with the possibilities of knowledge democratization by means of collective agency that includes subordinated sectors of society.

3. THE CAPITALIST KNOWLEDGE SOCIETY AND UNDERDEVELOPMENT

In this chapter the conceptual scheme presented above is put to work in order to describe the main power configuration of our time and what it means in terms of international dominance, particularly by the North, and subordination, particularly in the Global South.

The "deep transition" of the last 250 years has gone beyond industrial societies. The way towards it was opened in the 18th century by the so called Revolution of Energy that lead to the mechanization of manufacture and can be symbolized by the steam engine. The major environmental challenge of our age emerged forcefully during the 20th century in both industrial societies that by then coexisted.

A comparable world historic transformation was fostered during the last decades of that century by the Revolution of the Technologies of Information and Communication (TICs). Mutual influences between such revolution and social relations had very different consequences in the different types of industrial society. In state socialism the expansion of the new productive forces and of innovation processes in general was hampered rather than promoted by economic, political and ideological relations; by now such type of industrial society has almost disappeared. In the most powerful capitalist societies, technological changes were fostered by dominant social relations that in turn were strengthened by such changes. A knowledge-based and financially-dominated capitalism became the main power configuration of today, located in the North and shaping the second globalization.

"Economic networks exercise the most massive impact on collective power in the cumulative long term. Industrial capitalism may have changed the whole population's lives more than any other power process in human history." (Mann, 2006: 386) Perhaps the emergence of a capitalist knowledge society will lead to even bigger changes in human lives. In any case, scientific and technological knowledge is today the main technological vector of production, destruction and connection. A powerful trend towards the privatization of knowledge is inherent to such society. An example of that concerns the knowledge commons. The agrarian enclosure movement refers to "the process of fencing off common land and turning it into private property" (Boyle, 2003: 1). A "second enclosure movement" has emerged today in the broad world of ideas and "facts of nature" unearthed by intellectual efforts, leading to the "the enclosure of the intangible commons of the mind", where "things that were formerly thought of as either common property or uncommodifiable are being covered with new, or newly extended, property rights". (Ibid: 37)

When capitalist industrial societies dominated the center periphery world system, the peripheral could be characterized, in a first and broad approach, by lack of industrialization. A direct justification for that stemmed from the differences in power between industrialized and not industrialized countries. A less direct but not less important justification was given by the identification of industry and technical advance, which was strongly stressed since the Industrial Revolution. At present, when the centers are knowledge-based and innovation-driven economies, the peripheral condition can be characterized

by the weak technological positions shaped by specialization in producing goods and services with comparatively low added value stemming from advanced knowledge and high qualifications. That weakness can happen in very different degrees, but something similar happened yesterday: in 1930 the degree of industrialization of Argentina and Bolivia was quite different, but neither could be considered an industrialized country. The knowledge content of production in Brazil and Paraguay today is quite different but neither is an example of a knowledge-based and innovation-driven economy.

Top peripheral countries are often described as being caught in the "middle-income trap", facing a slowdown of growth because their wage rates are too high to compete with low-wage manufacturers and their technological capability are too low to compete with strong innovators (Lee, 2013: 5) Characterizing such phenomenon as the "middle-income trap" suggests that the solution is to diminish incomes; seeing it as the problem that appears when countries are more or less near the top of the peripheral condition suggests, on the contrary, that escaping the trap requires overcoming the peripheral condition. That is exactly what Scandinavian and some East Asian countries did in different periods of contemporary history.

The peripheral condition was one aspect of underdevelopment, as theorized for example by classical Latin American scholars of development. It is said that Sen's conception of development has opened the way to a change of paradigm in development thinking. That seems correct, but in such conception underdevelopment is almost neglected. That is unfortunate because underdevelopment is a main factual obstacle to development understood in normative terms as the expansion of freedoms and capabilities. It is also a relevant cause of inequality in dimensions that include not only incomes but mortality rates, physical conditions and even abilities (Deaton, 2013: 164)

Underdeveloped countries could be characterized, around 1950, by being peripheral countries in a world system where the "division of labor" (and of power) prevented them from industrializing in ways similar to those (supposedly) followed before by central countries. Nowadays underdevelopment can be characterized by (many different combinations of) the peripheral condition and external subordination. The last is rooted in asymmetries of technological power between central and peripheral countries. Such subordination is seen in various aspects of economic, political, military and ideological relations. A good example of that is given by a number of international agreements and treaties on trade and investment. Economic and political subordination, and even ideological dependence, generate normative frameworks that sharply curtail the policies available to developing countries (ECLAC, 2016: 150, 151). Thus, if the peripheral condition opens the way to external subordination, the latter can consolidate the former. Underdevelopment is a major case of mutual influences between technology and social relations.

To study such influences in central and peripheral countries the National Innovation System (NIS) is an adequate framework that pays special attention to what different collective actors do. An overview of that framework, its strengths and weaknesses is given by one of its founding fathers (Lundvall, 2010). Following Freeman and Soete (1997: 291) the NIS can be understood as the set of actors and institutions and the linkages between them that, at the level of a given nation, promote technological innovation; main components are public policies, production activities, generation and diffusion of science and technology, and higher education.

The collective power of a NIS has received great attention, particularly since Freeman (1987) explained the economic success of post war Japan by the strength of its NIS. The outcomes of the social process of innovation, that includes both cooperation and conflict, are also shaped by the internal distribution of power. To analyze issues of power in NIS it is useful to consider an older model, elaborated in Latin America in order to study the connections between science, technology, development and dependence. It became known as "the Sabato triangle" (Sabato and Botana, 1968) because it highlights the role of the productive structure, the government, and the scientific and technological infrastructure, which can be seen as the vertexes of a triangle where the connections between them are represented by the sides of the triangle. It can be considered as the core triangle of a given NIS because such 'macro' actors are the main protagonists of innovation processes while the more or less 'systemic' nature of those process

depends fundamentally on the linkages between the three vertexes. One vertex is the site of economic power while another vertex is the site of political and military power; they define the "upper side" of the triangle. The third vertex can be seen as the technological basis of the NIS.

The upper side of the triangle – the alliance between the commanding heights of the States and business – played a well known role in the catching-up process of East Asia during the second half of the 20th century. The 'developmental state' (Johnson, 1982) elaborated and pursued systematically a successful strategy for technological upgrading. It was positively combined with political power – state capabilities, enhanced by a Weberian type bureaucracy -, economic power of big firms and ideological power of "technonationalism" oriented to catch up with the West. (Thurbon and Weiss, 2016: 638; Nelson, 1993: 3) The process of expanding the collective power of the NIS included very skewed distribution of power against labor (Evans, 1995: 231). A more open role was played by the upper side of the core triangle during the period of regulated capitalism in the West (Evans, 1995: 241), when strong relations were often established between the state, firms and trade unions which were in some sense incorporated to the NIS in collaborative processes that increased the collective power of the nation and decreased the differences in the distribution of power within the system.

In industrializing processes the "strategy that is most likely to be effectively implemented and enforced in a country can depend amongst other things on its internal distribution of organizational power." (Khan and Blankerburg, 2009: 337) The configuration of power shapes national innovation processes, the internal distribution of its gains and losses as well as its consequences for the position of the country in the international order.

The "technological vertex" of the core triangle in NIS becomes more relevant than ever with the emergence of the capitalist knowledge society, and so do its linkages with the other two vertexes, the State and the productive sector. Since knowledge becomes more involved in a wider set of activities, the distributed aspect of innovation – stressed by the scholars who elaborated the notion of NIS – becomes more notorious, meaning that new actors and linkages between them are now components of the Innovation System. The collective power of the system as such expands while conflict within also expands and deepens. The distribution of power related with innovation process shapes the priorities for research and innovation, the consequences of technical change for working opportunities and conditions, access to sophisticated and expensive health technologies, environmental impacts and living conditions, access and success in higher education.

Low skilled workers are among main losers, particularly in highly industrialized countries, where they are damaged both by the increasing knowledge content of productive activities and by the transference of manufacturing activities to countries with much lower salaries, a distinctive trait of the second capitalist globalization. The loss of organizational economic power of such workers has been notorious for decades, particularly in the weakening of their trade unions. Recently their political power has increased as they became one of the fundamental supports of the right wing reaction against globalization in the main sites of the capitalist knowledge society.

The NIS in peripheral countries is usually weak, reduced to little more than a small upper side with second tier state organisms in one vertex and a few firms able to profit from innovation policies in the other vertex. Possibilities of overcoming the peripheral condition are highly dependent on whether the technological vertex expands and becomes effectively integrated in the NIS by strengthening its linkages with the other two vertexes as well as with other actors involved in innovation processes.

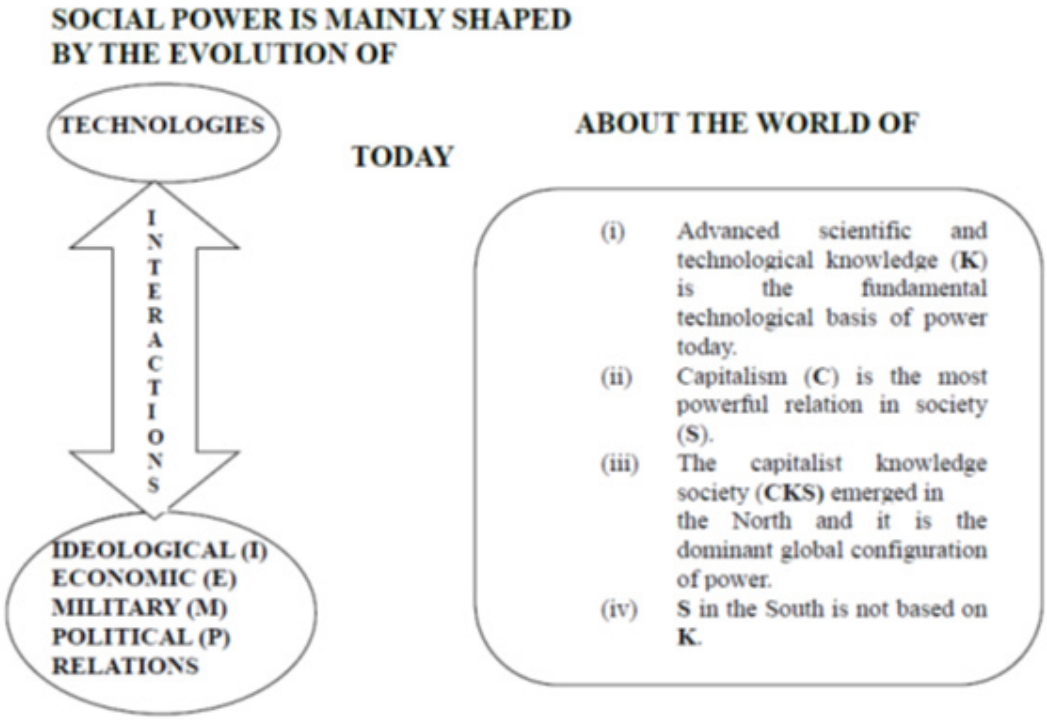
The world historical most impressive process of overcoming the peripheral condition is taking place in China. Up to now it is the main winner as a nation of the second globalization fostered by the capitalist knowledge society. The technological and organizational collective power stemming from its NIS is evidently expanding. The upper side of its core triangle is characterized by the alliance between the Party-State and global capitalist networks, where Chinese entrepreneurs play an increasingly important role. Up to now prevailing IEMP relations seem to reinforce each other: the strength of the upper side

connects economic power with political power and also military power, in ways closely attuned with ideological power based on what can be called the nationalism of a coming back empire. The internal distribution of that power – stemming from the fast industrialization of China and its remarkable incorporation of knowledge to some productive activities – is highly asymmetrical. Inequality and lack of sustainability have been on the rise.

At a world scale it is difficult to imagine that overcoming the peripheral condition can mean today or tomorrow, as it meant yesterday for countries like Taiwan and South Korea, catching-up with the West. An environmental catastrophe looks unavoidable if China and other countries catch-up with Western levels of production, consumption and waste. Thus it should not be assumed that desirable technological and social innovations will necessarily come from the North while "it is clear that diverse pathways are possible and that local generation and adaptation within a complex process of system transformation should be embraced." (Schot and Steinmueller, 2016: 21)

When catching-up with the West becomes less and less feasible or desirable, it is worthwhile recalling that different types of ideological power have played a not small role in overcoming the peripheral condition. As already remarked, technonationalism was relevant in the East Asian cases. Aiming at social inclusion characterized the expansion of the welfare orientated Nordic NIS; the distributional power of elites was relatively diminished while, in comparison with most other cases, innovation became more distributed and a broader set of actors were incorporated to the Innovation System. The Danish case is a good example of all that. (Mjøset, 2016; Lundvall, 1985, 2002; Christensen et al., 2008)

Figure 1. The Marx-Mann scheme and the world of today



Source: own elaboration

4.TWO GREAT CHALLENGES

The notion of Human Development has oriented several efforts to improve the quality of life during the last decades. Achievements tend to be related with equality in general as well as in connection with education and gender (Stewart et al, 2018: 94). The "clearest negative comes from the environment and sustainability dimension" […]. It "has worsened […] particularly among countries which were successful in basic Human Development and economic growth." (Stewart et al, 2018: 228). This is perhaps the central tension of our time, between economic growth and environmental sustainability. The former

looks in general as a necessary – though surely not sufficient – condition for improving the quality of life. But, at least in the prevailing ways, it generates damages that make increasingly difficult to keep improving such quality and in many cases are already diminishing it. Such problem is compounded by the phenomenon of rising inequality. It seems that techno-economic expansion and social inequality come frequently together. It appears that lack of environmental sustainability and inequality are the great challenges for humankind today and tomorrow. Here we look at past facts and present trends, starting with inequality.

It is usually accepted that the emergence of agriculture was a momentous change in human history, a techno-economic revolution not to be matched until more or less two hundred years ago. Some scholars see it as a consequence of deteriorating living conditions, a challenge to the hunter-gatherers way of life that generated agriculture as a response. That response made it possible to feed more people. But life got worse for many while the world became more unequal. (Deaton, 2013: 78)

Scheidel (2017) offers a very general interpretation of the historical roots of rising inequality and the exceptional phenomena that have caused its redress since the Paleolithic.

A first remarkable assertion is that in fact a long period of comparative equality characterized the evolution of hominids, but that it does not extend indefinitely in the past. It appeared as a leveling of previous higher inequality. From about 300.000 years ago to the onset of agriculture perhaps "novel ways of organizing and threatening violent action" were critical "in the first great leveling in human history." That world was defined "by low levels of inequality and a strong egalitarian ethos". (Scheidel, 2017: 28) "For all we can tell, social or economic inequality in the Paleolithic remained sporadic and transient." (Scheidel, 2017: 32)

The Marx-Mann scheme seems useful for analyzing the main thesis presented by Scheidel:

> "increases in inequality were driven by the interaction of technological and economic development and state formation […] effective leveling required violent shocks that at least temporarily curtailed and reversed the disequalizing consequences of capital investment, commercialization, and the exercise of political, military, and ideological power by predatory elites and their associates." (Scheidel, 2017: 86)

It seems fair to understand that inequality has been fostered by the interaction of techno-economic development with the political, military, and ideological power of elites that coordinated and controlled such development as well as profited from it.

The book under consideration asserts that there is a kind of in-built dynamics in human history that, in "normal" conditions, fosters inequality. It appears already to put an end to the low inequality of Paleolithic times. Domestication favored coercion and predation; state formation favored the top fortunes "and lopsidedness of political power relations." (Scheidel, 2017: 390) If some ways of organizing had previously contributed to diminish inequality, the new combination of technological and organizational changes pointed in the other direction. Perhaps the complexity of such changes, particularly those related with irrigation agriculture in Sumer, Egypt and beyond, enhanced the distributive power of commanding elites. The unequal consequences of great transitions are not restricted in this approach to the emergence of agriculture and states: "In the broadest terms, there can be little doubt that economic transitions promote inequality – not only from agrarian to industrial systems but already from the foraging to the agrarian mode and, in the present, from an industrial to a postindustrial service economy." (Scheidel, 2017: 374)

Chris Freeman, the great scholar of technological innovation, observed that when a new techno-economic paradigm appeared the increase of inequality should be expected. Relevant innovations can benefit some people – who are able to sell new objects or produce in cheaper ways or reach new markets

or finance big investments or expand destructive power or strengthen governments by faster and more reliable communication systems – and damage some other people, those whose jobs simply disappear and many others. He thought that when the new techno-economic paradigm reached maturity a compensating trend towards less inequality would forcibly appear. (Freeman, 2000) It has been argued that industrialization in Britain points in that direction. In some sense Kuznetz's inverted U thesis say something akin with that. That is not how Scheidel reads history: "Across recorded history the periodic compressions of inequality brought about by mass mobilization warfare, transformative revolution, state failure, and pandemics have dwarfed any known instances of equalization by entirely peaceful means." (Scheidel, 2017: 443) Such four factors are what the author calls the Four Horsemen of Leveling, because the ways by which they compressed the gaps of inequality have been simply apocalyptic

Thus the "Great Compression", that is, the great leveling of inequality that took place from 1914 to 1945, was made possible by war and "not harmonious democratic or economic rationality" as Scheidel asserts by quoting Piketty (2014: 275). Only in the context of war and revolutions inequality was redressed. "Military mass mobilization, progressive graduation of tax rates, and the targeting of elite wealth on top of income constituted the three main ingredients of fiscal leveling." (Scheidel, 2017: 144) A discussion of counterfactual scenarios for the 20th century and the Great Compression (Scheidel, 2017: 398-9) "strongly suggests that without major violent shocks, developed countries would currently experience considerably higher levels of income and wealth inequality than they actually do." (Scheidel, 2017: 400) What happened during the catastrophic period 1914-1945 was in itself a great leveling that opened the way to a much more prosperous and still comparatively egalitarian age in the decades following World War II. But, in this conceptual framework, that could not last: when the Four Horsemen are not galloping, inequality tends to prevail.

> "From the first time since the Black Death, and on a scale perhaps unrivaled since the fall of the Western Roman empire, access to material resources came to be distributed much more equally – and, uniquely, across large parts of the globe. By the time this 'Great Compression' had run its course, commonly in the 1970s or 1980s, effective inequality both in the developed world and in the most populous developing countries of Asia had plunged to depths that had been unknown since the transition to sedentism and food domestication thousands of years earlier." (Scheidel, 2017: 112)

It is worthwhile stressing two exceptions that Scheidel points out concerning his overall explanation of why inequality diminishes in history.

One is what he calls the "Athenian anomaly": direct democracy and military mass mobilization contained economic inequality during the fifth and fourth centuries BCE in Athens while the Greek city-state culture of about 800-300 BCE also achieved comparatively outstanding levels of economic development. The combination of extended citizenship, comparatively low levels of inequality, unusual economic growth and cultural creativity in classical Greece in the relatively long period 800-300 BCE has been carefully studied by Josiah Ober. He describes a strongly citizen-centered path which made the Greek city-state civilization an unusual case in premodern history of moderate inequality (Scheidel, 2017: 84, 87, 188, 198).

Another exception of leveling without the catastrophic action of the Four Horsemen is seen in the recent evolution of inequality in Latin America. Nevertheless: "Even what just a few years ago would have seemed the most promising candidate for peaceful leveling, Latin America, may yet disappoint." (Scheidel, 2017: 391) Since the continent is usually considered the most unequal region in the world, such assertions deserve close attention. "Policy changes from 2000 reversed the apparently inexorable trend towards greater inequality in the majority of Latin American countries […] while social dimensions were given a central role, the dominance of the (now global) market was not challenged." (Stewart et al, 2018: 190)

The author of this paper has neither the intention nor the competence to analyze in depth Scheidel's "macro theory". It has been considered above, first, because it seems important to take it into account when discussing the perspectives of inequality and, second, because what it says about promises and disappointments concerning peaceful leveling in Latin America is a stimulus for thinking about not less peaceful but less disappointing types of equalization.

We now turn our attention to the other great challenge stressed at the beginning of this section. Half a century ago the notion that the environment was being seriously damaged went beyond small concerned circles and became a widespread concern. The last in turn fostered the emergence of the environmental movement. That movement and the second wave feminism can be considered the two most influential social movements of the last decades.

The expansion in the use of energy, made possible by technological change and fueled by consumption, has not only damaged the environment: "Both coal and oil turned to be mass killers in the world´s cities. […] From 1950 to 2015, air pollution probably killed thirty to forty million people, lately most of them Chinese, roughly equal to the death toll from all wars around the world since 1950." (McNeill & Engelke, 2014: 21, 24) Originally, industry and transportation seemed to be the culprits of contamination. Cities have been seen as contaminated places since long ago. More recently the role of agriculture has appeared to be highly relevant in the trend "to pollute the earth—in part because of its energy- and chemical intensity, but also because its role in land clearance removes forests which would otherwise lock up carbon." (Moore, 2015: 271)

While some environmental problems highlighted in the 1970s and 1980s "have been addressed fairly well with incremental clean technologies", main problems of today will "require more substantive 'transitions' in the coming decades" (Geels, 2010: 495). Sustainability "will need a fundamental change in the socio-technical systems for food, energy, material, mobility, healthcare, and communication provision." (Schot and Steinmueller, 2016: 16)

Such changes do not look easy. But perhaps expanding fear will help. In recent decades fear has escalated from pollution to an overall climatic catastrophe. It is the second man-made possibility of holocaust. The first one, an atomic war, has been managed up to now. Both threats have been made possible by the advancement of science and technology. Coping with the second probably requires a thorough renewal in the combination of knowledge generation, production styles and social relations. A quick look to prevailing trends in knowledge generation and use in can be useful.

Most probably the role of knowledge will keep on rising as a fundamental basis of power in social relations that, moreover, transforms "nature and the environment – and with it the social world" (Schroeder, 2007: 49, emphasis in the original). Probably, tomorrow as it happened yesterday, it will be seen that: "Scientific progress and technological change are not neutral. New S&T helps some, but hurts others." (Taylor, 2016: 187, emphasis in the original) Innovation policies should keep in mind "that the negative impacts or externalities of innovation can be greater than the positive contributions." (Schot & Steinmueller, 2016: 21)

An ever increasing demand for new knowledge stems from its decisive contribution to the expansion and diversification of goods and services production. The last has, at the same time, damaged the environment and improved some of the living conditions of a lot of people; even more people became aware of the possibilities that some have for accessing to really high levels of consumption. Thus economic growth is nowadays a clue of political legitimacy and governmental stability almost everywhere. Prevailing ways of knowledge generation and use are shaped in last analysis by the demand of those who can pay directly or indirectly for it. Thus they contribute to increase rather than to decrease inequality and environmental damage. A closer look to the first part of such assertion will be given in the sequel.

5. ON SOURCES AND CONSEQUENCES OF INEQUALITY

Poverty deserves of course paramount attention because of ethical motives, particularly when accepting a normative notion of development that sees it as the expansion of freedoms and capabilities of people to lead lives they have reasons to value (Sen, 1999). But so does inequality: "No concept of poverty can be satisfactory if it does not take adequate note of the disadvantages that arise from being excluded from shared opportunities enjoyed by others." (Sen, 2000: 50) It can be said that inequality plays an organizing role in social science: "In the broadest meaning possible, equality is the major 'leitmotif' of social science. In economics, the stress is on the distribution (and utilization) of scarce resources; in political science more on power; and in sociology on social stratification." (Esping-Andersen, 1999: 6)

The action of three intertwined factors in the contemporary rise of inequality is suggested by the Marx-Mann conceptual scheme.

A first factor is located in social relations and stems from organizational power. Elites use their economic, political and ideological power to improve their position in detriment of other sectors of the population (OXFAM, 2016; Stiglitz, 2012). A second factor in the promotion of inequality is connected with technological power. Its increasing role favors capital facing manufacturing labor. It also widens income polarization between highly educated and less qualified people (Milanovic, 2016: 54). Even the entrepreneurial realm tends to be polarized because technological chance allows cheap replication of the most economically successful procedures so a "winner-takes-all" situation expands to the benefit of a comparatively small fraction of producers (Brynjolfsson and Mac Afee, 2014: 69). A third source of growing inequality is located in the interactions between technology and social relations. Those who control knowledge production and distribution tend to be increasingly favored by their positive consequences, and also less affected by related damages; notorious examples can be seen in areas as health, food, environment and violence (Tilly, 2005: 122)

When advanced knowledge emerges as the fundamental basis of the whole set of power relations, some of its specific traits seem to be relevant factors of growing inequality which should be stressed as a complement to those previously considered. It should be remembered that knowledge is a resource that increases when it is used, particularly in connection with learning. Studying at an advanced level connected with research empowers people to keep on learning and also to work in creative environments where coping with challenging problems is a fundamental source of interactive learning and capacity building, specifically the capacity to innovate. Conversely, knowledge is not expanded but diminished when it is not used, due to scarce opportunities for studying at advanced level or when only routine type jobs are available.

Merton (1968) explained that the reward system in science increases differences between researchers. In order to stress and explain such process he coined the term "Matthew Effect" because the Matthew Gospel says that: "For unto every one that hath shall be given, and he shall have abundance: but from him that hath not shall be taken away even that which he hath." A "generalized Mathew effect" seems to be operating in society at large: knowledge and learning are obviously fundamental for expanding the collective power of countries, firms, regions, social groups; consequently they have an increasing influence in the distribution of power, that is, in social stratification; given the self-reinforcing traits of using knowledge (and the self-defeating consequences of not using it), stratification points to polarization.

What has been said in this section suggest that neoliberal ideologies and policies are not the only main cause of expanding inequality and, also, that social and distributional policies will be far from enough to cope with it.

Some years ago it was stressed that the winners of globalization may threaten democracy: since less privileged people may push in another direction, "the focus of the rich is on democracy suppression" (Milanovic, 2016: 200). The evolution of the United States since the 1970s shows "the political and economic threats to well being that come from plutocracy." (Deaton, 2013: 14)

The actual situation seems to be even more complex: if main winners of globalization foster plutocratic styles of government, losers from knowledge-based and capitalist-driven globalization are backing in the rich West a turn to chauvinism and personalized government that also threatens democracy. Its social and political base has been strengthened by increasing inequality. It is strong among people harmed by deindustrialization; they don't have many employment opportunities due in particular to their low educational levels (Tregenna, 2016: 725), so they feel that immigration is their great problem. Such reaction will damage their less favored supporters in particular and humankind in general; in fact they challenge the welfare state, taxing the rich, financial regulations, international cooperation and environmental protection.

One of the saddest paradoxes of our time is that both neoliberal globalization and right wing reaction against globalization harm political democracy and the welfare state, that are both needed for common people to retain "a degree of control over their collective fate" and have some protection from "the unpredictable forces of economic change." (Judt, 2008: 424-425)

6. PROACTIVE EQUALITY

History seems to show that: (i) there are strong trends to increasing inequality related with the economic and technological change; (ii) substantial redressing of inequality has been sporadic and usually linked with catastrophic events as those that generated the "great compression"; (iii) the rise of a knowledge-based economy fosters knowledge-based inequality. If so, reducing inequality may tend to be in general an increasingly difficult process. Are there ways of diminishing inequality that may be self-sustainable instead of self-defeating? A vision of society where the interests and power of different groups have fundamental influence in what actually happens suggests that the answer to that question can only be affirmative if those directly interested in diminishing inequality are able in the long run to increase their capabilities for pursuing such aim. When that happens it may be said that we are witnessing modalities of proactive equality (Arocena and Sutz, 2003), a notion that in the sequel is revisited and further elaborated.

The guiding problem just posed is if the agency of subordinated groups can be a relevant factor in redressing inequality. That would mean overcoming asymmetries of technological and organizational power. On the one hand, technological asymmetries between subordinated and dominant groups have probably been widened as the role of advanced knowledge in power relations increases. On the other hand, dominant groups frequently have an organizational superiority over the rest of the society that stems from the role they play in the coordination and control of relevant social relations, especially when such relations expand their spatial realm.

Agency assumes "the capacity to process social experience and to devise ways of coping with problematic situations. […] It requires organisation." Individuals or groups are social actors if they "can be said to have agency". Giving priority to human agency implies that actions don´t follow directly from structural conditions because actors can give different answers to similar circumstances. (Long, 2001: 182, 241, 20) As it happened several times in history, although today perhaps with a wider range of possibilities, the mutual conditioning between structure and agency will define which of alternative feasible trajectories is actually followed: "the second Deep Transition can happen in different ways with a range of outcomes, the agency of various actors crucially shaping the process. There is, therefore, no guarantee that current developments would necessarily lead to the reduction of inequality or address climate change in a way many would recognize as sustainable development" (Schot & Langer, 2018).

In order to relate inequality and agency, it may be useful to go back to a comparison that gives important clues about the role of equality in development processes. The better performance in technological and economic terms of Scandinavia than three Latin American countries (Argentina, Brazil, and Uruguay) has been explained basically in terms of "inequality, especially in the distribution of land and political

power." (Lingarde and Tylecote, 1999: 108-9) Other factors, including geopolitical context, deserve attention, but differences between Latin America and the Nordic countries concerning inequality are really remarkable and help to explain their different historic trajectories. But that approach does not explain the poor performance of Argentina and Uruguay, two countries that in the Latin American context appear to be comparatively egalitarian. In a comparison even with several European countries Uruguay shows progress towards diminishing inequality by building, already in the first decades of the 20th century, a quite efficient and pioneer Welfare State. The strong egalitarian vocation of Uruguayan citizenship backed the extension of public education and social security. So in the Latin American context, it is not inequality per se the factor that can explain the Uruguayan trajectory. The comparison must take into account not only differences concerning inequality but also different ways of fostering equality.

Let us consider different examples of overcoming the peripheral condition. That was accomplished by the Scandinavian countries, Japan and, more recently, South Korea and Taiwan. Such processes have been quite different, but they seem to share some main traits like the following: (i) an important progress towards less inequality was deliberately fostered, with special attention given to education, not only basic but also advanced; (ii) diminishing inequality was combined with a positive technological imaginary; (iii) long term industrial and technological policies opened opportunities for upgrading jobs. Now: "The difference between successful Asian and less successful Latin American economies is the priority given to policies that enhance long-term growth potential, technology, and specifically higher education." (Lee, 2013: 190)

Even in the comparatively egalitarian cases of Argentina and Uruguay, the capabilities of lower sectors were underrated. The dominant culture gave low value to technology, technical teaching and manual work. That did not foster technological and organizational initiatives of workers. A different general landscape is detected in the Nordic countries (Lingarde y Tylecote, 1999). In the case of Denmark, a crisis of exports during the second half of the 19th century led to a new "mode of innovation" where a high degree of agency was shown by "the formation of strong democratic and decentralised producer co-operatives" of farmers closely connected with a "high regard for decentralised general education and for learning in general", so "the major role of the state [was] to support local initiatives." (Lundvall, 2002: 191-192)

Diminishing inequality in ways that enhance collective learning and innovation capabilities, thus enabling further economic and social progress, may be termed proactive equality; diminishing inequality without expanding such capabilities is not in general sustainable and can be called reactive or defensive equality. Going back to the comparison between the Southern Cone of Latin America and Scandinavia it can be said that: (i) inequality has been much bigger in the first case, a fact that helps to understand why the peripheral condition persisted; (ii) proactive types of equality in Scandinavia were main levers for overcoming the peripheral condition; (iii) in Brazil quite important innovative efforts were fettered by very high inequality; (iv) stronger egalitarian trends in Argentina and Uruguay had their effects curtailed by the prevailing reactive types of equality.

Such notions can be seen as special types of agency. Agency oriented mainly against damaging processes or situations may be called reactive agency. Subordinated sectors are very often capable of showing reactive agency in ways that improve their situation. But also very often limitations appear. Trade unions frequently obtain improvements in pay and working conditions, but the rhythm of technological change and the organized power of capitalists do not make easy to advance in that direction, especially in industrial activities. Populations harmed by polluting activities often mobilize against them and even obtain some environmental improvements. But when big firms are the big contaminants, there is usually a great asymmetry of technical and legal expertise as well as of economic power and political influence between them and those who suffer related damages. Such asymmetry is even bigger in backward regions where most people are poor and some of them so badly need any type of job that they back the involved firms, while other people are first of all worried by environmental damage, so a fight between two sectors of poor people frequently follows. Reactive agency was on the rise in Latin America during

the first years of this century when governments supported by popular coalitions took office and fostered distributional policies that diminished inequalities; they were less able to promote economic strategies at variance with prevailing ones; thus redistribution found its limits quite quickly when the external bonanza started withering and further progress in that direction became very difficult.

Thus the limits of reactive agency lead to explore the possibilities of proactive agency, understood as the capability of an actor not only of acting against something (neoliberal policies, workers exploitation, contaminating activities, etc.) but also for the promotion of its own project. Examples are given by groups acting in the context of innovation systems in order to foster projects for knowledge generation and use that benefit them. Given the increasing role of advanced knowledge in power relations, it is difficult to imagine a long term process of proactive agency that does not involve learning processes.

The dichotomy between proactive and reactive equality may suggest an identification of each of them with agents and patients. That would be simply wrong. Reactive equality can be exemplified by agent behavior - reactive agency – as when great mobilizations aim to resist, often more or less successfully, prevailing power relations. Such mobilizations may redress inequalities, for example by fostering distribution, without necessarily improving collective capabilities for learning and innovating, thus curtailing further progress. In any case, reactive equality of agents should be distinguished from patient equality, echoing the fundamental distinction stressed by Sen (1999) between agents and patients. Thus we refine as follows the previous definitions:

(i) proactive equality means diminishing inequality in ways where subordinated actors are protagonists and such that their collective learning and innovation capabilities are enhanced;

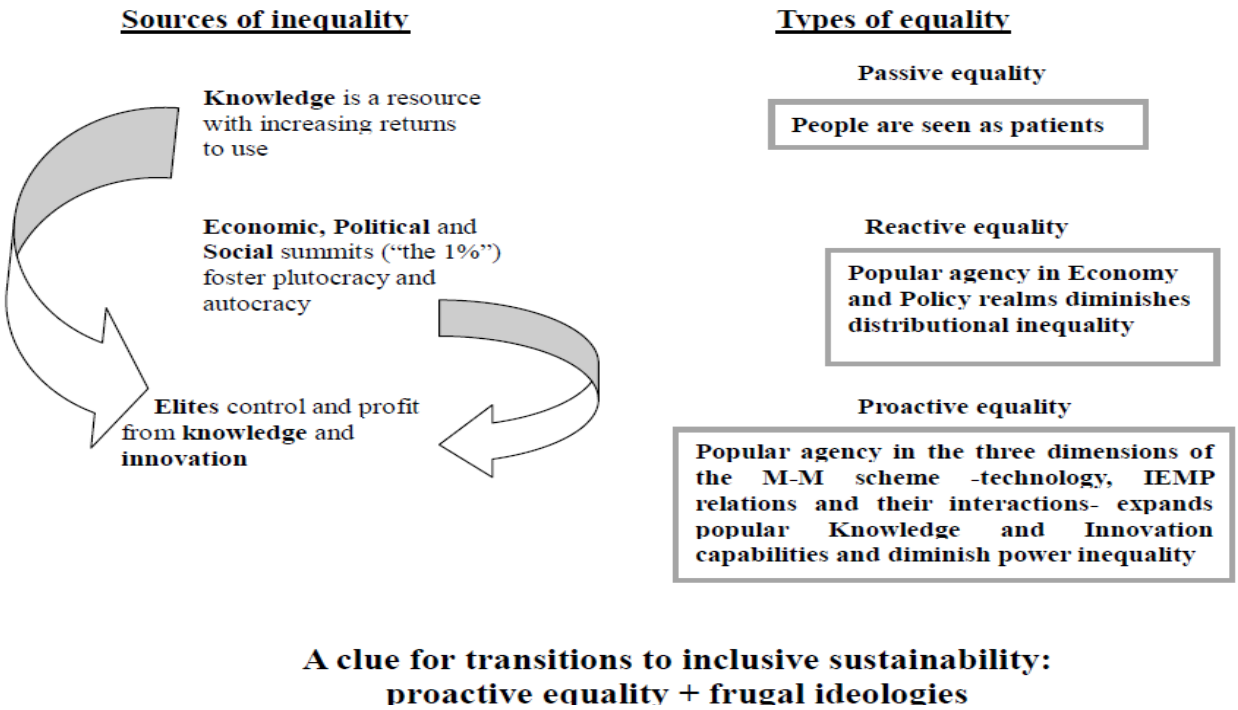
(ii) reactive agents equality means diminishing inequality in ways where subordinated actors are protagonists but their learning and innovation capabilities are scarcely expanded;

(iii) patients equality refers to the ways of diminishing inequality where those whose situation is improved are considered and behave more like patients than agents.

Examples of each category are given by different types of the European Welfare State. Patient equality looks close to the Conservative Welfare Regime (Esping-Andersen, 1999: 81-86). Reactive agents equality seems akin to the historical experience of labour movements in the context of the Welfare State: “Capitalists would create wealth, socialists would then drag as much of it from them as they could. Capital initiates, labour reacts. That is roughly what labour parties and trade unions do.” (Mann, 1992: 231) But in such experience came quite near proactive equality in some European countries where labour had “an economic strategy aimed deliberately at creating more wealth, with the cooperation of unions and workers in income policies and productivity deals, in return for economic expansion and welfare redistribution at the end.” (Mann, 1992: 232) In the same direction points Esping-Andersen's description of the Social Democratic Welfare Regime which “is virtually synonymous with the Nordic countries” and “implies that the welfare state must guarantee that all people have the necessary resources and motivation to work (and that work is available).” (Esping-Andersen, 1999: 78, 80) Such commitment with working opportunities is based on active labour policies where training and retraining programs play an outstanding role.

In any case, antecedents of proactive equality look weak, especially when seen from Scheidel's approach to the history of inequality. But perhaps the growing tension between economic growth and environmental sustainability will enlarge spaces where collective agency fosters inclusive and frugal types of innovation.

Figure 2. Sources of inequality and types of equality



Source: own elaboration

7.TRANSITIONS AND DEMOCRATIZATION

Exploring the possibilities of proactive equality in this age of macro challenges poses many problems. Transitions to sustainability face big difficulties, including prevailing strong values and beliefs. Changes in production and consumption should be profound, but immediate incentives for private actors to engage in transforms are weak. (Geels, 2010: 507) Moreover, a core alliance between policy makers and firms, with increased power and neoliberal discourse, opposes fundamental changes (Geels, 2014: 27) Perhaps "sustainable innovation journeys can be facilitated by the creation of technological niches, i.e. protected spaces that allow nurturing and experimentation with the co-evolution of technology, user practices and regulatory structures" (Geels & Schot, 2010: 80). Niches are related with Mann´s concept of interstices as places where profound changes may have humble starts.

> "Many networks remain interstitial […] to the dominant configurations […] insterstitial interaction eventually produce a more powerful emergent network, centered on one or more of the four power sources, and induce a reorganization of social life and a new dominant configuration. And so the historical process continues." (Mann 1986: 30)

Mann's ideas about interstices are inspired by Marx's description of the emergence of bourgeois society between the "pores" of feudal society: power configurations "can never be fully institutionalized or insulated from influences coming 'interstitially' from cracks within and between them. Social changes results from a dialectic between the institutionalization and the interstitial emergence of power networks." (Mann, 2006: 343)

It may be conjectured that we are witnessing the possible interstitial emergence of a main historical transformation, the Second Deep Transition:

It "has gradually started to unfold since the 1970s in specific niches, not as a mainstream development but rather as an undercurrent of historical change. Examples include renewable energy development, alternative food production practices, emergence of new types of mobility services, and many others." (Schot & Langer, 2018)

The Marx-Mann conceptual scheme suggests that the transformation that seems to be unfolding can only become really deep if it combines major changes at the level of technological power – particularly concerning dominant forms of generating and using advanced knowledge – with major changes at the level of Ideological, Economic, Military and Ideological power relations.

Changes must include both the democratization "of control over innovation production and diffusion" and "alternative technologies" (Schot & Steinmueller, 2016: 18). Prevailing combinations of technology and social relations foster rather than hamper inequality and lack of sustainability. Historians of technology are summoned to "challenge the view that there are no real alternatives" (Schot, 2016).

Searching for such alternatives has to do with how and why does technological change happen. According to the evolutionary theory of economic and technological change (Nelson and Winter, 1982; see also Mokyr, 2002: 11), inspired by Schumpeter, different new technologies appear as "mutation" and the economic environment "selects" among them. A careful reading of the history of technology (for example, Mokyr, 1990: 275-278) tends to confirm what the Marx-Mann conceptual scheme suggests: the four IEMP power relations have relevant roles in the selection of technologies. The point seems to be not only of academic interest but a fundamental one for gauging the possibilities of transitions to sustainability. The last are not fostered by dominant economic trends and networks. Geels (2010: 507) argues that, consequently, public authorities and civil society have a crucial role for sustainability transitions. Such assertion has, as one of its implications, that if "alternative" political and ideological networks (those that challenge prevailing configurations of power) are not able to strongly influence technological change, then transitions to more sustainability (and less inequality) are hardly feasible. So knowledge democratization (Arocena and Sutz, 2017) is required.

Democratization in general can be understood as empowering people seen as agents and not patients. It demands expanding collective power, particularly of deprived sectors, while at the same time countervailing the expansion of distributive power. That is not easy because social power rests fundamentally on organization, so creating collective power usually generates distributive power as well. (Mann, 2006: 366)

Mutual influences between technology and social relations have in recent times fostered the accelerated expansion of knowledge-based collective power and, more often than not, also the increase of distributive power, particularly due to how elites control the generation and use of scientific and technological knowledge.

Democratizing agency requires mobilization of subordinated groups which, in general, is needed for states to remain relatively autonomous from economic elites as well as connected or "embedded" in society (Evans, 1995: 246). Such mobilization can lead to forging large popular coalitions able to win elections, organize new governments and implement relevant social policies, as it happened recently in Latin America. Concentration of power, at least during some years, was diminished; in several senses democracy was expanded; nevertheless the connection of social power with advanced knowledge was scarcely challenged.

In terms of the National Innovation System framework, it can be said that the so called progressive turn in Latin American politics during the first years of this century had very modest results. The upgrading of production of goods and services by the expansion of research and innovation was not remarkable in general and quite absent in most cases: the external power of each nation, its collective power, as it stems from its Innovation System was not significantly increased. Progressive parties in office did not care much of strengthening the technological vertex of the core triangle and its linkages with the State. The

internal distribution of power in each NIS was not significantly altered either; in particularly, integrating popular actors to the Innovation System was seldom a main concern.

When the bonanza withers away and new demands appear – in no small measure because the most pressing ones were contemplated before – distributional coalitions show their limitations. It has been asserted that "upgrading coalitions" (Doner and Schneider, 2016) are required to overcome the "middle income trap". As said, here it is understood that such trap stems from the peripheral condition, rooted in a productive structure with, generally speaking, low content of advanced knowledge and high qualifications. It can be said that upgrading coalitions are needed to overcome the peripheral trap, especially by strengthening the NIS and expanding it by effectively incorporating new actors. Upgrading coalitions in the catching-up processes of South Korea and Taiwan were not popular coalitions and they did not emerge in democratic contexts. Upgrading coalitions in democratic contexts need to have a broad social base: they need to be popular coalitions. For that they need to be distributional coalitions. Can popular coalitions be also upgrading coalitions? A positive answer requires democratizing capabilities at the level of knowledge and technological power, at the level of Ideological, Economic, Military and Ideological relations, and at the level of mutual influences between technology and social relations.

8. SUMMING UP

This paper has considered three types of equalizing processes. Of the first one, called patients equality, some rather benign examples can be given but it seems that by far the most relevant historical cases are directly related with catastrophes generated by Scheidel's "Four Horsemen of Leveling". Of the second equalizing process, reactive agents equality, the main examples considered in this paper are related with the Latin American experience during the first years of this century. Of the third such process, proactive equality, illustrated by Scandinavia, examples are not abundant in history. But if they do not expand, a Deep Transition that copes with environmental degradation and social inequality will perhaps be blocked. In such case the Fifth Horseman of climatic catastrophe is not sure to be leveling but living with it is sure to be nasty and brutish.

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