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Sustainable Development presupposes Science and Technology

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Abstract: Despite the abundance of facts to show that the development of societies has always been intrinsically associated with the use of science and technology as an essential basis for any sustainable development, to date we have seen the defense of ideas metaphysic and antiscientific. This fact, if, on the one hand, evidences the very force of historical materialism to demonstrate that all phenomena are interconnected, interconnected, interdependent and, therefore, in constant movement, transformation and evolution, also highlights the need for permanent development of science and technology as the most appropriate tools depart to face these obscure ideas and provide the necessary subsidies for sustained development, even because development does not occur in a way that occurs rectilinear, which explains the temporal "resurgence" of obscure ideas. It is the expression of the dialectical principle that "the new denies the old man and the old man denies the new", evidencing that such ideas, for the sake of truth, have always been latent in the different stages of our evolutionary process. Moreover, without the competition of science and technology, we will see a mere predatory economic growth, based on production conceptions, or the eternal process of subsistence advocated by the santuarist currents. The use of science and technology, therefore, is the basis for promoting effective sustainable development, based on the sustainable conception.

Keywords: Sustainable development, Science and technology, Environmental currents.

1. **Introduction**

Epicurus of Samos (2005), who lived between 341-270 a. C., already maintained that only knowledge releases and that "there is not possible happiness for man while he is tormented by the fear of death and the fear of the gods; therefore, it is necessary to free him from this fear, making him aware of the laws and principles of nature".

The role of science in the development of societies has been demonstrated over time. From Democritus and Epicurus to contemporary actors, passing by Lewis Henry Morgan, Charles Darwin and Marx & Engels, there is a solid theoretical basis to support such assertiveness, that, however, does not prevent that eventually obscurantist ideas sprout inclusive because scientific knowledge is not something abstract.

Nevertheless, it´s necessary to emphasize that knowledge is not the primacy of the academy, although metaphysical conceptions seek to establish it usually, the systematization of empirical experiences of certain social groups, whose practice is ignored or denied by the academic world because it does not correspond to its technical and scientific standards of each era, often linked to metaphysical, non-dialectical and, therefore, essentially non-scientific.

As knowledge corresponds to the development of productive forces, of objective material reality, she is constantly developing and renovating. But, as "the new denies the old and the old denies the new," This process does not occur in a straight line, with flows and inflows.

That explains why sometimes we have the feeling of a historical setback when, in truth, we are facing an influx in the march of historical materialism. It´s common, for example, observe characters with reasonable knowledge formal academic exercising predatory practices, at odds with the fundamentals of science and, social groups without any academic training in the strict sense of the word, giving examples of high rationality in its mode of production.

The facts to validate this claim of historical materialism are abundant, as illustrated by the story of most naturalists and chroniclers who visited the Amazon in the seventeenth, eighteenth and nineteenth centuries. They made severe criticism of the "Indians" for using the floodplains and not the mainland mainland for agricultural production, when today it´s known that this represented an

extremely rational choice, both because of the high fertility of the floodplain lands, as for the convenience of planting, harvesting and reducing the environmental impact.

And the denial of traditional science by the academy will be more or less according to the perception that scientists have if the main thing is the idea or the matter, what is the role of the state in social relations and the understanding of the finitude or infinity of resources that, in the last analysis, he will determine the option for the method of sanctuary, productivist or sostenibilist.

Currently, facing the obscurantist offensive that goes from the "earthplanismo" (theory of the flat earth) until the pure and simple denial of science, the reaffirmation of science and technology as an essential tool for the sustainable development process assumes special relevance, both because of the limitations inherent in the academy as for the recognition that if everything is moving, transformation and evolution, science and technology, equally, they must be in constant development and improvement.

2. Methodology

Through an extensive literary review, try to establish the counterpoint between the dialectical and metaphysical conception, that between conceptions that, in the final analysis, affirm or deny science and historical materialism.

Especially those formulated by Thomas Hobbes (1979), in the play "The Leviathan" of 1651; Montesquieu (1995), in The Spirit of the Laws of 1748; and Marx and Engels in The Origin of the Family, Private Property and the State of 1884, whose correct interpretation will help us to understand the different manifestations of society and governments in social relations.

Similarly, it is necessary to analyze and understand the main currents that polemicize the environmental issue, in particular the conceptions defined by Bezerra (2010, 2019); Bezerra and Fraxe (2012, 2019) as productivists, santuaristas and sustainable.

The correct understanding of these fundamentals as well as its proper application in production relations, is what will enable science and, technology, therefore, is guided by historical materialism and not by metaphysics; that there is a proper interpretation if the main thing is the idea or the subject, as well as if natural resources are finite or infinite and what is the class character of the state that, Ultimately, it will define its role in social relations of production.

3. Discussion & Results

Ultimately, it will define its role in social relations of production. the content of their political manifestations and the conception they defend in the form of production, it´s necessary to take into account the fundamentals of historical materialism (dialectic versus metaphysical); the theory of the state (from the defense of the authoritarian and repressive state until the end of the state, defended by the Marxist theory); and the basic conception of environmental currents (productivists, sanctuaries and sustainable), rom what will be easier to understand how these theoretical conceptions condition Science and Technology and interfere in the development of societies.

4. Historical materialism: dialectic versus metaphysics

The essential theoretical foundation of sustainability is the dialectic, historical materialism, based on the principle that in nature, as in society, all phenomena are interlinked, interconnected and interdependent, of what is inferred, as a result, that everything is in constant movement, transformation and evolution. By the same logic it is also possible to conclude that if nothing is eternal, everything will be finite.

Epicuro de Samos (2005) sais that "nothing can originate from nothing" and Fausto de Goethe (1956) proclaimed that "everything that is born must die" making clear the interdependence and finitude of any natural resource. From dispersed records of Democritus of Abdera, Epicurus of Samos, Goethe; Empirical observations and dense scientific treatises, Marx and Engels (1979b) conclude, in introduction to the dialectic of nature, that "in nature, as in society, everything is interlinked, interconnected and interdependent ", which suggests the finite nature of natural resources and the need for permanent renewal.

Marx and Engels relied on what was most advanced at the time, in terms of science and technology, with emphasis on two classics: Ancient Society, by Lewis Henry Morgan (2009), and The Origin of Species, by Charles Darwin (2009).

In Ancient Society, Morgan maintains that humanity, in its trajectory, He developed seven great ideas and went through three distinct stages in his development process. The seven ideas were means of architecture and property developed in the first stage (savagery), they continue to improve until now. The three stages: the wild, barbarism and civilization, each of them marked by certain

peculiarities, hey also continue to develop and, coexisting in the same society, an indisputable evidence of historical materialism.

In the On the Origin of Species, Darwin demonstrates that all existing organic nature, plants and animals, and logical, the man, is the product of a million-year development process, that, according to Marx, he took the most severe blow in the metaphysical conception of nature.

In the classic Utopian Socialism of Scientific Socialism, Marx and Engels (1979c) emphasize that "nature is the touchstone of the dialectic and modern natural sciences offer us for this problem a collection of extraordinarily copious data and enriched every day. "They demonstrate that "nature moves, ultimately, through dialectical paths and not through metaphysical paths, that doesn't move in the eternal monotony of a constantly repeated cycle, but it goes through a real story", but warn that "until today naturalists who knew how to think dialectically can be counted on the fingers.

At the same time, documents from other scientists converge in need of science as an essential resource for sustainable development, some being Bursztyn (1993), Moran (1994), Leff (2000), Morin (2002), Sachs (2002), Capra (2006), Abramovay (2010) and Bezerra (2010, 2019), for those who say "no development without sustainability in sustainability", demystifying the false contradiction between production and conservation and demonstrating that food selfsufficiency can succeed with the use of extremely modest areas on a global scale, national and regional.

As we emphasize, the knowledge it's not the primacy of the academy.

If it derives from the broad and the exhausting process of human development and its achievements, through different social groups, Many already extinct.

The natives who lived here, when the Europeans arrived, they mastered silage techniques and they practiced regular agriculture in the floodplains, now recognized as the most appropriate place, but at that time they were severely criticized by most of the naturalists who passed through here, who saw no technical and scientific rationality in this gesture, but rather the expression of laziness and indolence of the Indians, who, according to La Condamine (2000), differed little from beasts and depended on Europeans "transform them into people, it would not be a small task according to Agassiz (2000), for whom nature would have favored the laziness of the Indians by storing hundreds of turtles in artificial lakes, that formed after the flood, and saved them efforts.

Despite the solid foundations of historical materialism to demonstrate the interdependence of natural and social phenomena and, therefore, its finitude, science has not always been taken into account in the use of natural resources and in social relations, being, repeatedly, replaced by metaphysics.

5. Theory of the state: absolutist, tripartite, instrument of the ruling class

And these manifestations of scorn of science, prejudice against traditional knowledge and intolerance against society they are aggravated depending on which conception of state will be decisive in each historical period.

That is why it is essential to understand, also to these theoretical foundations, what is the conception of the state of the different social groups, to the extent that they will determine the type of relationship that the state apparatus will maintain with society as a whole. In summary, there are 03 basic concepts of state: absolutist, tripartite and instrument of the ruling class.

Thomas Hobbes (1979), in The Leviathan of 1651, He argued that humanity, being extremely mean and selfish, could never live in society without their self-destruction, unless he was under the command of an emperor with absolute powers. Therefore, he defended an authoritarian state, based on an absolutist monarchy. It was the extreme denial of any democratic precept. Subsequently, Montesquieu (1995), in From the Spiritist of the Laws of 1748, recognizes that society was hopelessly divided into classes. His diagnosis was perfect, but not the solution to deal with an antagonized society. He suggested the tripartite state, structured around the legislative, executive and judicial power, with the hope that society could harmonize. Forgot the trivial: if there were classes, one of them would be the dominant one and, All structures of the state apparatus would be subordinated to it and at its service.

And it is exactly to that conclusion that Marx and Engels (1979 a)) they will reach the classic The origin of the family, private property and the State, 1884. They show that in fact society was divided into classes and that the State was nothing more than an instrument of domination of the ruling class, which determines all and any form of social relationship in the present, in the past and in the future. The state is an instrument of oppression of the ruling class, Marx and Engels sentence. These conceptions will determine social relationships. The state coups, either in the classic sense of military barracks or of the false legislative / judicial, example, They are based exactly on Hobbes' authoritarian assumption.

4. The historical relationship with the environment and environmental currents: productivists, sanctuaries and sustainable.

the development of agronomic sciences overcame the challenge of food shortages, but it helped strengthen the conception that natural resources were infinite, like the horns of the mythological goat from which food came out profusely, this stimulated the followers of productivist theory, also essentially metaphysical. That is why Marx and Engels (1979 d) always sought to put in evidence the destructive violence of capitalism. In The condition of the working class in England, Engels mentions the devastating effects of the expansion of the industry on the natural environment, highlighting both the predatory character and the irrationality of the capitalist mode of production hat didn't even properly dispose of waste. Marx (2011) emphasizes that "the more the development of a country is supported in modern industry, as in the United States, faster is that destruction process, " concluding that "capitalist production, only develops the technique and the combination of the social production process, "Exhausting the original sources of all wealth: the land and the worker."

And Kautsky (1998), in The Agrarian Question of 1898, analyzing the reality of the countryside in Germany, concludes that the depletion of forests and rivers, which previously served as a source of food for the peasants, It was one of the causes of the peasants' misery.

In the third book of Capital Marx he continues: "From the point of view of greater socioeconomic training, this is socialism, individual private ownership of land will seem in such bad taste as the property of one human being for another" and suggests "not even an entire society, or all contemporary societies taken together, they are absolute owners of the land; they are just their occupants, their beneficiaries and, as a good father, it must be left in better conditions for the next generations "(Bottomore, 1988).

But, resorting to the dialectical principle, Marx argues that it is possible to solve these problems using rational productive methods. It fuels special expectations with the development of agronomic science. And he was right. The development of the productive forces has buried catastrophic theories, like that of Malthus, and has ensured high food productivity in smaller and smaller areas. This controversy has accompanied the development of the society and was structured from it, according to Bezerra (2010, 2019) and Bezerra & Fraxe (2012, 2019), The three main environmental currents: productivists, santuaristas and sustainable, throughout the ages, determined the relationship of the productive forces based on predatory practices, blocking of natural resources and / or sustainable management. For productivists, natural resources are infinite or t hey can be replaced by similar or synthetic resources. Under the argument that "homo" is everything and the environment is nothing, ended up raising a false dichotomy produção x conservação, Sem understand that these phenomena are indissociáveis. also condemned as cornocupians, as well as the mythological goat Where did food abound in abundance. They are against any rule of conservation or preservation and, debit their productive inefficiency and "excess of environmental rule"

For their part, the Santuaristas absolutize nature to the detriment of the "homo."They argue that natural resources are at their limit and no longer support any potential new use.

They try to recover the Malthus theory, which is why they are also known as "neomalthusians." They are as metaphysical and non-scientific as the productivists. Although they support a different rhetoric, the practical consequence of their actions is the dichotomy between production and preservation.

While for the drivers of sustainability, it is perfectly possible to reconcile production, conservation and even preservation, to the extent that "homo" and nature integrate the same environment.

They start from the premise that resources are finite and that there is no anthropic or natural action that does not have impact.

That is the essence of nature and society, since everything is interlinked, interconnected and interdependent, as well as in constant movement, transformation and evolution.

They claim that the challenge posed is how to reduce this impact and reconcile productive action with popular interest, taking into account the need to raise the material and spiritual standard of humanity and at the same time, extend the use of natural resources.

The understanding, as well as the acceptance or denial of these theoretical assumptions, it´s in the last analysis that guides and determines our relationship with the environment, as the facts and history records show

6. Conclusion

The principle of historical materialism, systematized by Marx and Engels (1979 b), based on the premise that practice is the criterion of truth. The dialectic was systematized from valuable

and informed contributions of scientists and thinkers, as well as by careful observation of the development process of the different social groups and ethnic groups, many of which unfortunately no longer exist.

Science is based on the development of productive forces and the way in which they are related and the environmental conception to which they are affiliated. The launch of the US atomic bombs in Hiroshima and Nagasaki, represents one of the greatest environmental aggressions already registered and it is inserted in the productive and authoritarian logic. The tragedies of Mariana and Brumadinho, forest fires and increasing deforestation in the Amazon they are also an expression of productivism and authoritarianism, and a demonstration that the state and all its power (legislative, executive and judicial) are nothing more than instruments at the service of the ruling class, which explains the lassitude with which the subject is treated.

And because they are repeated so often without major consequences for offenders.

These aberrations can be contained, or reduced, by the pressure of the social movement, the progressive forces and the academic world for that to happen, there must be freedom of manifestation.

That is why the lack of democracy favors the emergence of obscurantist ideas and hinders the development of science.

On the other hand, the more authoritarian the regime is, the greater the aggressiveness against natural resources, science and social actors. that advocate the use of resources in a sustainable way. in these regimes, the environment and science are the biggest victims.

But it is necessary to keep in mind that in a society divided into classes, with antagonistic interests, the solutions presented reflect the level of knowledge and the interests of the social classes in dispute. Reason why so much controversy. This theme has always been present in the entire trajectory of humanity, as the facts show.

In Travels through the Amazon and Río Negro, Alfred Russel Wallace (2004), He visited the Upper Rio Negro in 1848 and recorded, among many other precious observations, such as the Indians of the region made plantations to produce flour in the following terms (Figure 1):

> *I imagined the trees of a virgin forest, all felled, but in such a way that their trunks fall on the others, in all conceivable directions. After drying for time, they are immediately burned. Nevertheless, the fire, on the occasion of burning, sometimes it's not enough and consume only the smallest leaves and branches. The rest remains whole, only blackened and Charred. under these conditions, cassava is sown, without any other soil preparation (p. 278).*

The photo below is from a current crop in Amazonas. As can be seen, the similarities between the two "scenes" are incredible, although they are set aside for no less than 171 years, in unquestionable evidence of the need for the use of science and technology as a resource to reduce environmental impacts and optimize production and productivity.

Figure 1: Cultivation in Amazonas

Wallace criticizing local production saying that "here, we prefer to make rubber, harvest cocoa and collect chestnuts, instead of regular soil cultivation. "showed that he was not aware of economic rationality and the technological limitations of the time, among which. the fact that the production of rubber or the collection of cocoa and chestnut, with its subsequent commercialization, it was extremely more profitable, also to not requiring without ever moving towards sustainability. Such assumptions will be mere rhetoric while workers do not have access to scientific technological resources and technology, to science and technology organizational changes that allow them to put that theory into practice. That is the debate that has been put on the different environmental currents.

Therefore, the maintenance of the human species on the planet tierra it´s conditioned to our ability to develop science and technology to manage natural resources, within the logic that "There is no development without sustainability and there is no sustainability without development" and considering that the search for sustainability is not an option but a requirement for any economic or social process.

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