Hacettepe University Graduate School Of Social Sciences

Political Science and Public Adminstration Department

Political Science Programme

METABOLISM IN CAPITALISM: METABOLIC RIFT DEBATES

Yakup Atamer AYKAÇ

Masters Thesis

Ankara, 2023

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ACCEPTANCE AND APPROVAL

The jury finds that Yakup Atamer Aykaç has on the date of 16.01.2023, successfully passed the defense examination and approves his Masters Thesis] titled Metabolism in Capitalism: Metabolic Rift Debates.

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i

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ETİK BEYAN

Bu çalışmadaki bütün bilgi ve belgeleri akademik kurallar çerçevesinde elde ettiğimi, görsel, işitsel ve yazılı tüm bilgi ve sonuçları bilimsel ahlak kurallarına uygun olarak sunduğumu, kullandığım verilerde herhangi bir tahrifat yapmadığımı, yararlandığım kaynaklara bilimsel normlara uygun olarak atıfta bulunduğumu, tezimin kaynak gösterilen durumlar dışında özgün olduğunu, **Prof. Dr. Örsan Öcal Akbulut** danışmanlığında tarafımdan üretildiğini ve Hacettepe Üniversitesi Sosyal Bilimler Enstitüsü Tez Yazım Yönergesine göre yazıldığını beyan ederim.

Ar. Gör. Yakup Atamer Aykaç

ACKNOWLEDGEMENTS

First of all I would like to acknowledge and give my warmest thanks to my supervisor, Prof. Dr. Örsan Öcal AKBULUT, who made this work possible not by simply supervising it but also by inspiring my academic interests in all of the courses I have taken from him. I would also like to thank my commitee members, Assoc. Prof. Mustafa Kemal BAYIRBAĞ and Dr. Onur ÜNLÜ, for letting my defense be both an enjoyable and challenging moment which has definitely been unforgettable for me. I have learnt so much during the process and their contribituions were immensely large.

I would also like to thank my family; my mother, my father and my big brother. All of the minor and major achievements I have made and will be making in the future would not be possible without your support that never ceases to exist in ups and downs. I would like to present my most sincere thanks to them, especially my mother who constantly supports me without any expectations.

I would also like to acknowledge and give my thanks to Ali Rıza TAŞKALE and Ruhtan YALÇINER for making me interested in the academia. Without your courses and the chats we have made during my undergraduate years, my interest in academia would never have been formed. I will never forget your courses which were both enjoyable and challenging at the same time.

Lastly, I would like to give my thanks to many friends and asscociates, including ones who are no longer in my life as well for the friendship and academic advices you provided that helped me to find the necessary strength to continue. I would especially like to thank Esin, since even simply by being there, you have elevated my will to continue and made the emotional turbulances of life during the process of writing this thesis bearable. Especially in the most stressful moments, the joy and support you have provided knowingly or not can never be forgotten. Thank you from the bottom of my heart.

ABSTRACT

AYKAÇ, Yakup Atamer. *Metabolism in Capitalism: Metabolic Rift Debates]*, Masters Thesis, Ankara, 2023

In our contemporary context, capitalist mode of production has expanded itself almost entire corners of the earth both in economic and political planes and became a notion in which functions in a sense that knows no limits. This mode of production which functions on a global level is primarily an economic and therefore a political notion. This notion has positioned its own frontiers on to the limits of cycles of natural life and continues to effect these cycles in inconceivable manners. The subject of this thesis is being able to make sense of the political and economic outcomes of the relationship between capitalist mode of production and nature in the contemporary context. It will be touched upon the meanings of the concept of *metabolism (stoffweschel*) which was coined by chemist Justus von Liebig in the 19th Century and given its political and economic context by Marx in order to both be able to achieve this purpose and to set a contextual limit on the discussion.

Keywords: Capitalism, Metabolism, Metabolic Rift, Climate Crisis, Historical Materialism

TURKISH ABSTRACT

[AYKAÇ, Yakup Atamer]. *Kapitalizmde Metabolizma: Metabolik Kopuş Tartışmaları* Yüksek Lisans Tezi, Ankara, 2023

Kapitalist üretim biçimi bugün hem siyasal hem de ekonomik düzlemde neredeyse dünya sınırlarının tamamına yayılmış ve sınır tanımayan bir şekilde etkisini gösterir hale gelmiştir. Aslen ekonomik ve dolayısıyla siyasal bir olgu olarak küresel düzeyde işleyen bu üretim biçimi, kendi sınırlarını doğal yaşam döngülerinin sınırlarına da dayamış ve bahsi geçen döngüyü akıl almaz seviyelerde etkilemeyi senelerdir sürdürmektedir. Bu tezin konusu ise, kapitalist üretim biçimi doğanın çağdaş dünyada nasıl etkileştiğini ve bu etkileşimin siyasal ve ekonomik sonuçlarını anlamlandırabilmektir. Bu tezde bahsi geçen anlamlandırmayı hem kotarabilmek hem de bağlamsal bir sınır atfedebilmek adına 19. YY'da Justus von Liebig tarafından ortaya atılan ve Marx tarafından siyasal ve ekonomik bağlamına oturtulan *metabolizma (stoffweschel)* kavramının hem tarihsel ortaya çıkışı hem de bugünkü material düzlemde ifade ettiklerine değinilecektir. Bu bağlamın ortaya çıkardığı çağdaş çalışmaların tarihsel materialist bir düzlemde eleştirel değerlendirmesinin ardından dört farklı ama birbiri ile ilişkili maddede kavramın çağdaş bağlamda tarihsel materyalist perspektiften bugün ne anlama geldiği ve gelecek çalışmalar için nasıl işlevselleştirilebileceği tartışılacaktır. Bunu yapabilmek için tezin ilk bölümünde *metabolizma* kavramının tarihçesine odaklanılacak, hem metinsel hem sosyal bağlamda ne anlama geldiği özellikle Marx'ta incelenecektir. Ardından ikinci bölümde ise kavramın günümüze yaklaşırken geçirdiği değişimlere eleştirel bir literatür taraması ile değinilecek ve sonunda John B. Foster ile Jason W. Moore'un kavrama ilişkin ayrışmaları detaylıca serimlenecektir. Bu ayrışmadan kendi tarihsel ve teorik orjinal bağlamını üreten tez, son bölümde dört ana başlık altında çağdaş kapitalist üretim biçimi altında metabolizma kavramının insan ile doğa arasındaki ilişkiyi açıklarken nasıl isabetlice işleveselleştirilebileceğini ortaya koyacaktır. Sonuç kısmında ise bu bütünlüğü kendine kaynak alan ileride çalışmalar yapılmasının ve politikalar üretilmesinin kapitalizmde çelişkili olarak kendini gösteren insan-doğa ilişkisinin onarılmasına dair kritik olduğunun altını çizecektir.

Anahtar Sözcükler: Kapitalizm, Metabolizma, Metabolik Kopuş, İklim Krizi, Tarihsel Materyalizm

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INTRODUCTION

Climate crisis is a major yet not so new problem for innumerable number of species on earth including humanity. Almost all the scientific research regarding the matter starts out with the climate science data related with the matter. Therefore, it would be in vain anymore to mention these data again and again. These data and how urgent the problem is can already be observed in the latest IPCC report (2022). In short, the climate crisis and its consequences are not in a distant future anymore. If we take the notion of future in the form of catastrophes to come due to climate crisis, William Gibson's famous words *"The future is already here – it's just not evenly distributed"* (2003) is the perfect phrase that explains the global situation. Disasters have already started in numerous parts of the world and continues to rise day by day unevenly.

From all sorts of disciplines in social sciences to all sorts of natural science fields, climate crisis has been a popular object of analysis. From natural science (such as (Mitchel, Frisbie & Sarkar, 2011)) to its reflections on literature (such as Kim Stanley Robinson (2017) or solarpunk movement (Reina-Rozo, 2021)) its entire impact on science, art and literature is immensely large. How the discipline of political science should approach to it, this thesis claims that, should have its unique perspective. It should be a unique approach for it must be a political economic approach which should include certain interdisciplinary features that is not eclectic to cover it in its totality.

The exact purpose of this thesis is going through the relationship between humanity and nature specifically in capitalist relations of production, formulating a precise materialist approach in how it should be analyzed and discussed in accordance with the real existing world. Only by then, the contemporary problem of the climate crisis can be answered politically. Yet, such a purpose is too wide to cover if we were to review and critique all the social and natural scientific literature regarding the matter to arrive at such a 'formula'. So, it is accepted as given in this thesis that for an accurate analysis, Marxian historical materialist methodology is the only possible methodology. This allows the

thesis to let go all the scientific discussions which is related with “which -cene to choose” and concentrates only on the historical materialist tradition and its approach.

The task at hand is a difficult one for the problematique at hand is anything but one dimensional. It has its historical, philosophical, economic and natural scientific aspects linked to it inseparably. Therefore, roaming in between all these areas without getting lost within the vast data and knowledge is challenging. Yet, this thesis claims that it achieves the matter at hand, which being formulating a coherent relationship between the human and extra-human natures (also causing the climate crisis) in capitalist mode of production by a political economic approach. This accuracy, this thesis claims, can only be achieved when the conceptualizations of the ‘metabolism and metabolic rift’ within Marx’s framework is taken at the center of the discussions that will be built. The ongoing scientific discussions centered around the concept of metabolism and criticisms towards them will allow this thesis to form a historical materialist approach that is coherent with the real existing world for both contemporary and possible future political scenarios. As will be seen at the end of the thesis, the matter at hand will continuously be about the relationship between humanity-nature and more in specifically, capitalist mode of production-nature. Right within this section, the main claim of this thesis is constructed. The main concern of this thesis is the relationship between humanity and the nature under capitalist mode of production as said before. It is claimed that with capitalist mode of production, a significant that is both qualitative and quantitative change occurs within this relationship. Humanity which has a transhistorical relationship with its own surroundings (nature) that is mediated with his/her own labor goes through certain historical changes under capitalist mode of production which presents itself now as climate crisis in general. An accurate historical materialist analysis of this relationship that is based upon its historical and social features is a must have if the correct political solutions were to be produced in dealing with the problems that is caused by this unequal and contradictory relationship between humanity and nature under capitalist mode of production. For this thesis, the concept of ‘metabolism’ (*stoffweschel)*, which was appropriated by Marx, functions as the main mediator in understanding the relationship mentioned above. By examining the real existing world and the scientific literature at hand, it is seen that if it is desired to have a coherent understanding of the relationship mentioned above, a critical

approach to the two pioneering Marxist scholars within the field, John B. Foster and Jason W. Moore, and a new historical materialist synthesis that is born out of this critical review is an indispensability. The reason why, is not merely textual. Right before presenting such synthesis, it will also be shown why a synthesis is a necessity for scientific research that is conducted on the real existing world through examples. Their perspectives alone without a synthesis of them together, falls short in giving meaning to the real existing events that occurs between humanity and nature, both in our contemporary world and also historically under capitalist mode of production. Metabolism between humanity and nature that is mediated by the labor of humanity, needs to be theoretically intervened and made more in accordance with the real existing world outside and the main purpose of this thesis resides within this necessity. If such a synthesis is not provided and the reasons for the climate crisis are not presented correctly through such analysis, both the billions of working class' lives and also many species different from humanity face the danger of becoming extinct and this thesis' purpose is providing a scientific contribution for producing correct political solutions in preventing such a set catastrophic scenarios.

This thesis is constructed in three main sections and a conclusion section. The first section contains first and foremost a methodology discussion. The appropriated perspective is the historical materialist perspective and therefore within this perspective, a certain methodological explanation is a necessity. This explanation is not presented simply for the sake of didactical purposes. An historical materialist methodology in which coherent with the real existing capitalism is a necessity to realize why the contemporary theoretical investigations that is self-acclaimed historical materialist is forming a contradictive relationship with the real existing world which will be criticized later in the thesis. Another reason why a certain methodological discussion is made is to become acquainted and familiar with Marxist methodology which the thesis follows. The last reason that can be stated is that it will be seen that Marx's materialist conception of history and materialist conception of nature becomes one with another through historical materialist methodology and what the concept of metabolism signifies in the real existing world. This 'becoming one' of the two cannot be made sense of if the appropriate methodological discussion is not made properly. After briefly explaining the fundamental notions of the historical materialist methodology that is set by Marx and Engels, the birth and evolution

of the concept of metabolism in Marx's works were traced back. Where it appeared first, from which fields it was borrowed first and how the concept itself evolved as Marx's his own works which allowed the notion of nature to become integrated with his general project evolved. In this literature review, John Bellamy Foster and Kohei Saito's works have been major sources to apply since these thinkers were quiet exquisite already in the related research. This historical investigation of the birth and evolution of the concept is not made merely from a textual and abstract perspective. The social materialist historical approach is at the center of the thesis. The social context of the era that contains the developments in agricultural chemistry and the imperatives of the capitalist mode of production are considered in their effects in the birth and evolution of the concept of metabolism in Marx's historical materialist context. Also, certain examples are given upon the misunderstandings and the misusages of the concept in the first half of the 20th Century. The reason for it is presenting how if the historical materialist conception of history is misunderstood, the concept of metabolism and the relationship between humanity and nature is analyzed in contradiction with the real existing world within Marxist framework. The review of the literature within Marx's studies and certain examples of how they were misconsturcted is crucial for it allows the critically made literature review in the second section meaningful within our context. Without the social history and the theoretical framework of the concept of metabolism given in the first section is not given properly, the second and the third section would lack the necessary foundation to function as required.

At its very core, the concept of metabolism relates itself with both the human and the capital's relationship with the earth. Therefore, before proceeding towards the contemporary discussion regarding the concept of metabolism in capitalist mode of production which constitutes the third part of the thesis, the ecosocialist literature review centered around the concept of metabolism is indispensable and carried on in the second part of the thesis. For a critical review of the mentioned literature, the periodization of the ecosocialist thought by John Bellamy Foster is instrumentalized. Here, the literature is reviewed critically since his historicization carries him to finally towards mistaken notions regarding the concept of metabolic rift. Right where he mistakenly historicizes is where the original contribution of this thesis is given that constitutes the third part of the

thesis. The notion of ‘mistaken’ here refers to Foster’s analysis of Jason W. Moore. When analyzed in accordance with the historicity of capitalist mode of production, Foster is in contradiction with his own mode of thought when labeling Moore’s analysis as postmodernist since even though it has its own shortcomings, Moore’s analysis is Marxist and therefore historical materialist, which will become observable within the thesis. The disagreements between John Bellamy Foster and Jason W. Moore regarding the discussion of metabolic rift and metabolism within capitalist mode of production, opens a possibility for the correction of the approach of historical materialist methodology to intervene to the discussion at hand. By criticizing two distinct scholars in four fundamental principles which will be based upon certain Marxist notions such as alienation and other notions in which historical materialism consists of, a precise methodological framework and set of tools is constructed for the future practical and policy making research. It is this thesis’ claim that only with an accurate appropriation of historical materialist method which is constructed by a critical synthesis between these two scholar’s modes of thought in this study, is the path to make future accurate scientific research. However, it is obvious that a synthesis without presenting why such a synthesis is a necessity can merely function as a hermeneutic study, not a historical materialist one. Therefore, before presenting such a synthesis between these two scholars, by certain examples from the scientific studies that is conducted by following these two scholars, the reason why such a synthesis is an absolute necessity will also be presented.

The conclusion section is a minor attempt for such future research. Framing future political projections that is based on historical materialist method is an important form of political research. By borrowing the future projections from Peter Frase’s study but instrumentalizing them in this thesis’ unqiue context, the importance of the methodological contribution of this thesis has been tried to emphasize. Therefore, the conclusion section will not merely summarize the thesis, but will try to function as a catalyst to other future studies within the field.

So in short, the main concern of this thesis is to make a political scientific sense of the relationship between humanity and the nature under capitalist relations of production through the concept of metabolism. The reason for such concern was appropriated first

of all personally for me was to make sense of the causes of the climate crisis and its catastrophic outcomes from a scientific standpoint. In such concern, certain limitations had to be set to be able to make a coherent intervention to the already existing literature. The limitations are set as the following; the historical materialist approach as the framework of the study and the concept of metabolism as a conceptual limitation to maintain the integrity of the thesis. These limitations are not set merely for arbitrary reasons. The methodological limitation was set for the historical materialist approach provides the necessary tools to be able to apprehend such a notion without falling into a 'particularity fetishism' and make sense of the notion in its own totality. The conceptual limitation is set for the literature at hand is immensely large and a certain conceptual tool needs to be chosen for the coherency of the study at hand. With such a purpose and the limitations set as stated, it is arrived at the conclusion that a theoretical and historical intervention needs to be made in order to analyze the relationship between humanity and nature in the real existing world-capitalism, with obeying to its rules for scientific purposes. This intervention has one main purpose; it is not a simple hermeneutic attempt but making the theoretical approach in accordance and in harmony with the real existing world that is mediated by capitalist relations of production for both contemporary times and historical causes. This main purpose is achieved by forming a syhnthesis between the modes of thought of John B. Foster and Jason W. Moore in four different principles.

CHAPTER 1: METHODOLOGICAL DISCUSSION AND METABOLISM IN MARX

Since the beginning of life on earth, all creatures that have lived upon this planet have had to interact with their environment, transform it in one way or another to survive and reproduce their own species. For a long time within the academic framework, in order to be able to make sense of this interaction, the concept of 'metabolism' has been instrumentalized. Especially within the 19th Century, the concept itself became quite common to connote the relationship mentioned above. However, when the concept is understood merely as the relationship conducted by the living with the non-living within the nature, a certain contextuality and historicity remains absent and the concept can merely function as an "empty-signifier"[1]. To be able to understand the relationship between the capitalist mode of production and what the concept of metabolism refer to within its relations of production, we must return to Marx and his instrumentalization of the concept of metabolism within his grand theory of the critique of capitalist political economy in his own historical conditions. Yet, before diving deeply into the usage of the concept of metabolism within the Marx's critique of political economy, we must first briefly explain the revolutionary method of Marxist analysis, which is historical materialism. If the methodology of Marx, historical materialism, is not comprehended clearly, not only the concept of metabolism but whole of his grand project would be at risk of not being interpreted correctly. After outlining the methodology of Marx, only then we can proceed to the usage of the concept of metabolism in Marx and only after that by instrumentalizing the same method to the Marxist scholars who lived after Marx and to our contemporary situation, we can begin to make sense of and interpret the relation between human and non-human nature in capitalist relations of production. If we want to understand his adoption of the concept thoroughly and correctly, we must also examine certain examples of misunderstandings of the theory of metabolic rift of Marx regarding the relationship between human and nature. The notion of 'misunderstanding' requires an explanation. This misunderstanding derives not from the fact that they are

[1] The meaning of empty-signifier in semiotics can be summarized as the word, notion or the *concept to represent an undetermined quantity of signification, in itself void of meaning and thus apt to receive any meaning* (Levi-Strauss, 2013, p. 64). For more information look for (Levi Strauss, 2013).

merely in contradiction with Marx's writings but they are incompatible with the real existing world and its analysis in accordance with the metabolism and capitals relation with the earth

1.1 METHODOLOGICAL DISCUSSION

To begin with, we can first state easily that historical materialism is not a method which resembles a toolbox that you can implement to every stage of history with the same guidelines to follow. In order to understand historical materialism of Marx and Engels, one book that a researcher must examine is *German Ideology*[2] (1970). Written in 1846 but not being published until 1932, at its very core, text itself is a polemical and critical work against young Hegelians, particularly Bauer, Stirner and Feuerbach. Their study begins with the problematique of what distinguishes humanity from the rest of the living creatures. This is a precise starting point for our thesis as well since the object of this thesis is based on the humanities' relationship with the earth under capitalist mode of production. The over-simplified answer which they present is that humans have "history" unlike any other species. By history what they refer is the ongoing developments or rather differentiations within the modes of production in a given society in any space and time. The dialectical relationship between social needs and the mode of production in which a society inherits and the ever-ongoing relationship between the two is quite crucial for what they refer to as the history. Their main and primary criticism against the young Hegelians begins within this very notion and continues with how the history moves, develops. For Marx and Engels, young Hegelians were totally mistaken when they assumed that it was consciousness of humanity as a whole or the abstract ideas within

[2] When the original texts of Marx and Engels is appropriated in the form of 'Orthodox Marxism' as labeled by some, especially one certain study must be addressed here before proceeding to the book itself; Comninel's *Alienation and Emancipation in the Work of Karl Marx* (2019). The main thesis of the study is that the book *German Ideology* was never meant to be a coherent and integrated one single study. In the time that it was published, for the sake of certain ideological imperatives of the ones who published, the texts of Marx and Engels were disrupted, became contradictiory with the rest of the works of Marx and Engels. It became blended with certain liberal framework that makes the book incapable to be studied as the 'manual guide of historical materialist method'. Comninel's study is effective and it is hard to disagree with his claims which were supported by historical facts. However, the four main themes which this thesis appropriates from the *German Ideology*, is not in contradiction with Comninel's claims, therefore it becomes possible to both agree with his claims and also see the book as the guide to historical materialist methodology in analysing the relationship between humanity and nature through historical materialist lens.

them is the primary motor that ensures and catalyzes the development or movement of history.

> "We do not set out from what men say, imagine, conceive, nor from men as narrated, thought of, imagined, conceived, in order to arrive at men in the flesh. We set out from real, active men, and on the basis of their real life-process we demonstrate the development of the ideological reflexes and echoes of this life-process. The phantoms formed in the human brain are also, necessarily, sublimates of their material life-process, which is empirically verifiable and bound to material premises. Morality, religion, metaphysics, all the rest of ideology and their corresponding forms of consciousness, thus no longer retain the semblance of independence." (1970, p. 47)

The quote given above is a perfect exemplification on how they were critical of the young Hegelians. What Marx and Engels continuously tried to underline was that it was our relationship with the nature or in their words "inorganic body of man" (1992, p. 36), that constitutes the basis of our abstract thoughts, ideals, imaginations, ideologies and so forth.

If we were to inspect the work of Marx and Engels more in depth in relation with the methodology of historical materialism, in the very first section we observe how immediately they start a set of criticisms both with irony and absolute scientific seriousness towards young Hegelians. Their criticism evolves around this very dichotomy; idealist conception of history versus "materialist conception of history" (Marx, 2019). For them, young Hegelians were almost deserving to be mocked, along with the lines that qualifies them such as "industrialists of history" (Marx, & Engels, p. 39). The main claim in which they inherit is that history cannot be analyzed as the mere debates on philosophical ideas but through concrete and materialist analysis of the actual historical events. This method of analyzing history and the events that occurred within, can again, be observed perfectly in an another work of Marx;

> Men make their own history, but they do not make it just as they please; they do not make it under circumstances chosen by themselves, but under circumstances directly encountered, given and transmitted from the past. The tradition of all the dead generations weighs like a nightmare on the brain of the living. (Marx, & Paul, 1978, p. 10)

Again, in the quotation above, we see what moves or develops history is not mere abstract thoughts evolving around a Hegelian Notion of "World Spirit" (Weltgeist) (Martin, 1971, p. 155) for Marx and Engels but a material dialectical relationship between the human (together with its organic and inorganic body) and the history in which they inherited as

the “tradition of all the dead generations”. This pre-acceptence is crucial for our thesis as well, since theoretically there are multiple ways of formulating the relationship between humanity and nature. However, with such pre-acceptence, it is given that for this thesis as well, it is the primacy of the material relations that is crucial for in the relevant discussion.

With underlining such dialectical relationship, it is crucial to remind us here at the very beginning, Marx and Engels were not totally negligent of the movement of abstraction within their train of thought. Such utter and vulgar criticism against abstraction belonged to a mechanical understanding of materialism in which they continue to critique later on. What they wanted to imply was that abstractions were necessary and useful only insofar that they were abstracted form material sources such as the historical events’ themselves and continued to be useful on the material level back again. Again, in one of their satirical analogies, they resemble “descending from heaven” if one tries to grasp the world and history beginning from the realm of the abstract ideas. Rather if one wants to achieve precise and true knowledge about nature and history altogether, one must “ascend from earth to heaven” (Marx, & Engels, 1970, p. 154), meaning begin from the realm of the material world all around us to the level of abstraction that belongs to them.

Yet, for them, an analysis based on history cannot be the only precondition to outline their methodology of historical materialism. Since only drawn within this frame, they cannot exactly differentiate themselves from the materialist analysis of Feuerbach. Therefore, they dive deeper into the concept of ‘nature’, both of human and history itself. From their perspective, Feuerbachian analysis constantly signifies an ‘essence’ or nature of humanity that is constant, in some sense almost transhistorical. For Feuerbach, transformation of consciousness in accordance with the material world is essential. In his own words, goal of his entire project of thought is producing “a correct consciousness about an existing fact” (Marx & Engels, 1970, p. 64). Marx and Engels were dedicated to the reversal of such a line of thought. For them, it was the outside world, particularly the mode of production and the social and political body it brings forth is the producer of the consciousness of humanity. Since the humanity and its consciousness is ever changeable, depending on the history and its mode of production, human nature and human essence

cannot be comprehended transhistorically. Again, "tradition of all dead generations" is a constant force in determining the nature of humanity. Yet it is not the only force in act. Their dialectical approach shines out exactly within this sphere. If we were to keep the analogy ongoing, traditions of the dead generations can be altered, revolutionized yet only within certain limits since humans cannot make their own history with their transformable consciousness or mere imagination as Feuerbach would have suggested, but only with differentiations throughout the material world. The primary force of the ability of humans to make differentiations within the material outside world was for Marx and Engels, were their very own labor. Humanity from "*homo habilis* to *homo sapiens"* (Önal, 2022, p. 89) that is from its very beginning, depended on its own labor to create, transform and disrupt its own surroundings. In their book *German Ideology*, they differentiate such moments of labor to four different categories. According to their in-depth approach, the primary historical act of humanity is the production of life through securing basic needs. If the labor to provide basic needs was the primary act, what follows right after is the beginning of other needs as the secondary act. Humanity does not merely produce its own basic needs but changes and develops itself through production of these needs. Third moment they refer to is reproduction of life as a biological process. These three moments combined, forms the fourth moment which they call as "the co-operation of several individuals" (Marx, & Engels, 1970, p. 157)**.** Each mode of production corresponds to a certain way of cooperation which mediates the social life itself. Therefore, by altering, developing and disrupting its own surroundings within these moments, the humanity as a whole was able to transform itself together with its own surrouindings. This transformation of course did not occur the same within different societies in a given certain time and space but just because they differed from one another in certain ways does not mean that they cannot be analyzed within such methodology since the methodology itself is the primary key to comprehend the differentiations among them.

After these four basic moments that explains the emergence of societies from the methodology of historical materialism, Marx and Engels make this method function within the book in four different themes. In these four different themes, what we can observe is that both by explanation of the method itself and also arriving conclusions out of them, Marx and Engels outline and present what they mean by historical materialism

blatantly. First theme we encounter which is also foundational to the method of historical materialism is the notion of totality. In their analysis which can easily be linked with their Hegelian roots they constantly remind the reader that their perspective does not merely inspect one aspect of society such as economy, philosophy, state or religion. Their analysis which takes the mode of production at its basis allows them to both disintegrate and totalize different parts of society into a whole. In the book under the title "Summary of the Materialist Conception of History", Marx and Engels underline this importance with these words;

> "This conception of history thus relies on expounding the real process of production — starting from the material production of life itself — and comprehending the form of intercourse connected with and created by this mode of production, i.e., civil society in its various stages, as the basis of all history; describing it in its action as the state, and also explaining how all the different theoretical products and forms of consciousness, religion, philosophy, morality, etc., etc., arise from it, and tracing the process of their formation from that basis; thus the whole thing can, of course, be depicted in its totality (and therefore, too, the reciprocal action of these various sides on one another)."(Marx, & Engels, 1970, p. 61)

As we have seen in their historical materialism, thought itself is in a constant movement, decompartmentalizing and totalizing in abstraction continuously following into one another. This emphasis on totality will be crucial especially in the third part of the thesis when the notion of metabolism within capitalism will be discussed in contemporary political paradigm for it will allow us to grasp it in its totality. Without the notion of totality, the relationship between humanity and nature through the concept of metabolism that is mediated by labor, cannot be made sense of, since the realities of the real material world outside, especially in our context that is multidimensional, can never be made sense of in its entirety. In order to make sense of the relationship between humanity and nature under capitalist mode of production through the concept of metabolism, the principle of totality is indispensable.

The second theme which we encounter that carries primary importance within their methodological approach is a concept that has been at the center of the many debates even long after Marx himself by Marxists; the concept of ideology. From Terry Eagleton (2007) to Jan Rehmann (2013), concept itself has become a major problematique within Marxist tradition. However, for our purposes of this part which is primarily explaining the methodology of Marx and also this thesis, here, concept is crucial not for the ongoing

debates that circulates around it but for its primary attributes which were outlined by Marx and Engels. For Marx and Engels, the concept of ideology denotes to a force which creates a consciousness for humanity that is false, an invisible veil-like force which obscures and hides the truth, makes truth unable to function. Once again in their words;

> "Consciousness [das Bewusstsein] can never be anything else than conscious being [das bewusste Sein], and the being of men is their actual life-process. If in all ideology men and their relations appear upside-down as in a camera obscura, this phenomenon arises just as much from their historical life process as the inversion of objects on the retina does from their physical life-process." (1970, p. 42).

In this passage which underlies their materialist understanding before by claiming how it is the material world that shapes and forms the consciousness of humanity as a whole, ideology is referred to as a force that conceals such truth of our material lives. It makes the relations within a society which is determined by the relations of production seem as not it is but only as upside down. It disrupts the conception of social life of a human, making he or she see the relations within society in a "false consciousness" (Eyerman, 1981, p. 48) and causes them to live their lives within the phrase of *"*they do not know it, but they do it*"* (Marx, Fowkes & Mandel, p. 126). After explaining what ideology is, Marx and Engels make one more important contribution that is related to both the concept of ideology and materialist conception of history. They clearly underline how the ruling ideas within a society, which is ideological in the sense that is discussed before, are the ideas of the ruling class. In our related text once again, they claim that;

> "The ideas of the ruling class are in every epoch the ruling ideas: i.e., the class which is the ruling material force of society is at the same time its ruling intellectual force. The class which has the means of material production at its disposal, consequently, also controls the means of mental production, so that the ideas of those who lack the means of mental production are on the whole subject to it" (1970, p. 64).

Here once again manifested through Marxian analysis of class and ideology, we can observe one of the fundamental aspects of the method of historical materialism. In its totalizing analysis all forces that have an effect within a given human society has its roots in the material basis' of life: i.e, modes of production and the way in which we relate ourselves with nature through our labor. Thus, together with the notion of totality we observe one another crucial aspect of historical materialist method which will carry a great deal of importance for this thesis while explaining Marx's formulation of the

concept of metabolism and also for contemporary debates and their political consequences regarding this concept. The notions of primacy of the material relations and ideology is critical in the context of this thesis. Primacy of the material relations is crucial since at its very basis, the relationship between humanity and its surroundings, no matter through which concept we make sense of is a material, corporeal relationship. Even though it seems as a simple premise at first, without such a premise, all of the claims of the thesis and all the limitations it set to itself at the very beginning becomes an empty-signifier. Ideology and its signifiers are also crucial when the two scholars that is mentioned is taken as objects of criticism with the help of the concept of "capitalist realism" (Fisher, 2009) to present how they are in contradiction from certain ways with the real existing world. Capitalist relations of production through its 'ideas of the ruling class', do intervene in every aspect of life, including the work of the scholars that will be criticized later on.

To turn back to the line of thought of the methodology at hand, third theme that needs to be visited within the book is in general historical change and its agency; particularly revolution and the proletariat. Since historical materialism presupposes historicity and constantly emphasizes the fact that if history is ever one thing it is that it changes, Marx and Engels are well aware that capitalist mode of production and its relations of production will vanish one day and a new mode and relations of production will take its place. For their analysis it is the proletariat who owns nothing but its own labor is the historical agent which will carry on this change (Blackburn, 1976, p. 6). As Ellen M. Wood has shown in her study (1998, p. 13), this claim of Marx and Engels has been one of the most critiqued aspects of their theory. Even those who claim to be Marxist themselves have approached quite critical to the idea that the agency of the revolution will be carried on by the proletariat. However, this notion both in *German Ideology* and in the grand general theory of Marx and Engels, derives from the necessities of historical materialist method and Marx and Engels were merely following where their methodology carried them to. It is one thing to critique this aspect of their theory which their methodology carried them towards and another thing denying that their methodological approach arrives at this outcome. As have been tried to outline here, it can be summarized as the primary feature of historical materialism is that it concentrates on the changes

within the organization of material life through social production and reproduction. It is from this premise that proletariat is the agency which 'will the change' will be carried on. The logic behind this is that proletariat is the main medium in which the change in the organization of material life and social production occurs. Thus, if a radical change will occur in these spheres of life, it is only the class that maintains their production can be the agent which will carry the change in the mode of production. Therefore, historical agency analysis of Marx and Engels becomes quite crucial for their methodological approach as well. The notions of class and proletariat as the historical agent, will have importance for our thesis as the following; the notion of class will become critical when the synthesis between the two scholars is built, one of the main features will be the problematique of the class from the standpoint of the questions of 'who is responsible for the contradictory relationship between humanity and nature that is formed under capitalist mode of production and on whom the climate crisis which is the fruit of this relationship will have most of its consequences on?'. The discussion around these questions will be made around the notion of class and class politics.

If we were to sum up, in *German Ideology* Marx and Engels give the outlines of the methodology that they will follow for the future works that they will conduct. This methodology explains history with its continuities and discontinuities focusing on the organization and production of material life in each mode of production. When Marx stated that a society and its meaning "…does not consist of individuals, but expresses the sum of interrelations, the relations within which these individuals stand." (2005, p. 265), relations and interrelations he refers to were not mere discursive relations that are based upon incorporeal forces but on the very materialness of the production and reproduction of daily life based upon a given mode of production. The notion of totality enters the picture with the Hegelian notion of dialectics, which can be seen as a line of thought that does not forsake both compartmentalizing and totalizing forces when inspecting societies and their histories within. This refers to both being able to see the ideological, religion or production aspects of a society both distinct from one another by abstraction and also in totality with one another since in material life in a given society these notions are experienced in their totality.

After the notion of totality comes another important concept for the methodology, ideology and the material conditions. Even though the notion of the primacy of material conditions is often misinterpreted willingly or not as a reduction of all aspects of life to crude economism, the importance of material conditions for historical materialism is essential and can't be forsaken. Without falling into the trap of mere economism or technological determinism, importance and primacy of material conditions and their production and organization is absolutely critical from historical materialist approach. Last theme we encountered while we were analyzing *German Ideology* and historical materialist method first unraveled in there is proletariat as the agent of the revolution. This notion of the 'subject of the historical change' will become especially crucial in the 'Anthropocene or Capitalocene' discussion that will be hold in the last section.

Explained as a consequence of the theme explained before itself, primacy of material conditions, proletariat as the agent of the historical change is also crucial for it reveals that historical materialist method is not about mere economism or technological determinism but within totalizing perspective, does not forsake the political aspect of human societies. As we have seen in a short summary here, comprehending and explaining this method in its specificity will carry great importance for the entirety of thesis for it will be the historical materialist method that will allow this thesis to form its original contribution. However, for the rest of the first section which will explain the usage of the concept of metabolism in Marx's studies, this methodological discussion will be enough. Before going towards the unfolding of the concept of metabolism in Karl Marx in his contemporary social historical context, one must also remember that methodology of historical materialism continuously unfolds itself especially in *Grundrisse* and *Capital* as well. As the usage of the concept of metabolism is explained within these works as well, it will be clearer on how the methodology itself continuously expands itself within his and also this work.

1.2 METABOLISM IN MARX AND EXAMPLES OF MISUSAGES OF IT

In 19th century, the concept of metabolism became popular to be able to make sense of the transactions between organic and the inorganic spheres of earth. Not only for Marx

but also for different philosophical and scientific theories, concept itself became almost pejoratively common to denote to the relations of energy which entails production, consumption and digestion between the living and the inorganic. To be able to fully comprehend the concept of metabolism in Marx and Engels, it is this thesis' claim that the situation at hand needs to be apprehended from three intersecting perspectives. First one can be summarized as the usage of concept in Marx before *Capital*, second one can be seen as the function of the concept in *Capital* and the third one which can only make sense when thought together with the other two, is the social material history of the era in which the texts were written.

Let us begin with the social material history of the era for the theoretical conceptualizations mean nothing if the social material context is not given. Generally, environmental historians refer to an only single agricultural revolution occurred in Britain which happened in a long span of time, from 17th to 18th Century onwards. However, agricultural historians like Thompson (1968) splits this long era of agricultural revolution into three different revolutions. First one is "associated with the enclosures and the growing centrality of market relations; technical changes included improved techniques of crop rotation, manuring, drainage, and livestock management." (Foster, 1999, p. 373) Second one which occurred in a much shorter span of time (for Thompson occurred between 1815-1880 and for Foster 1830-1880 (Foster, 1999, p. 373)) was marked by the expansion of fertilizer usage and radical scientific breakthroughs in soil chemistry. Third one occurred in 20th century which for some still continues (Foster, 1999, p. 374), was associated with machine traction, genetic alteration of plants, birth of monocultures and intensification of fertilizers more than ever before. However, it would be falling to the trap of technological determinism to only think of these revolutions in terms of advancements in technology. Historical materialist approach is aware of the importance of the productive forces in terms of technology and do not forsake them in the process of analysis. However, it cannot also see them as the center mediator of the analysis since it would be, as stated above, a feature of technological determinism. All these revolutions were wrapped up in capitalist social relations of production. It was during the second agricultural revolution which Marx began to use the concept of metabolism (*Stoffweschel*) in a text of his called *Reflection* which was a part of the *London Notebooks* (Musto, 2010).

What this proves first is that as Saito demonstrated, Marx did not learn the concept merely from Justus von Liebig, the famous agricultural chemist (Saito, 2017). Even though Marx was very much influenced by Liebig especially in his usage of the concept in *Capital*, he started insturmentalizing the concept even before reading Liebig. In fact, the concept had become almost pejorative in the agriculture and chemistry scientific circles. To return to Marx, in *London Notebooks,* Marx stated that;

> "Unlike ancient society where only the privileged could exchange this or that [item], everything can be possessed by everybody [in capitalist society]. Every metabolic interaction can be conducted by everyone, depending on the amount of money of one's income that can be transformed into anything: prostitute, science, protection, medals, servants, cringer everything [becomes a] product for exchange, just like coffee, sugar, and herring. In the case of rank [society], the enjoyment of an individual, his or her metabolic interaction is dependent on a certain division of labor, under which he or she is subsumed.." (Saito, 2017, p. 71).

In this long quotation which resonates semiotically with "all that is solid melts into air" (Marx, & Emgels, 1967, p. 83), another words from Marx, he instrumentalizes the concept of metabolism in the service of a comparison between capitalist mode of production which exchange of goods were no longer becoming related with direct personal or political privileges and pre-capitalist modes of production. We can clearly see that in his earlier usages of the concept metabolism and metabolic interaction, simply refers to the material exchange between humanity and non-human nature which existed transhistorically. With capitalism, this exchange was starting to have a different character unlike ever before. One must not forget that the historical context of especially Britain that is mentioned before. As the profit maximizing motive of capitalist mode of production its engine, there were happening major changes within the agricultural production technologies. These major technological shifts and their impacts on the soil were becoming more and more a problematique for the scientific circles of agriculture and chemistry and also the field of political economy. However, as one can observe here, Marx's usage of the concept is not really an in-depth conceptualization with all its limits and possibilities but almost pejorative. The physiological meaning of the concept that is related with the human body is merely taken as an analogy to refer to a broader context. This broader context as revealed in a recent study of Saito, is being that it is learnt from the Ronald Daniels, whom Marx dedicated his book *Poverty of Philosophy* (1920) to. A man of science Daniels, wrote *"Mikrokosmos: Entwurf einer physiologischen Anthropologie."* (Daniels, & Elsner, & Blecker) and sent a copy of it to Marx asking for

a “sharp and candid” critique from his friend. It was here first that Marx learnt about the concept of metabolism (*Stoffweschel*) and started functionalizing it in his own analysis. So, it was not a direct implementation of the concept in the way Daniels used it. To sum it up, Marx as we can see did not use the concept to refer to the enjoyment of the individual in the sense of consumption and digestion but instrumentalized it in a broader social scale, referring to production of the goods and services that makes reproduction of a society possible. Therefore, from this early usage of the concept what we can infer is that Marx’s interest to the concept began way earlier than *Capital*, before him being influenced from Liebig’s *Agricultural Chemistry* (1855) and as will be observed it is going to become more in depth and become a major indispensable part of his whole critique of political economy as Saito claims (2017, p. 14). However, one notion must be stated for the integritiy of the thesis here. The birth of the concept of metabolism in Marx is not crucial for this thesis for simply the sake of it. It is crucial for it was Marx who has appropriated the concept and applied to the material relations of capitalist mode of production. Therefore, the purpose here is not to merely following the story of the concept hermeneutically but to set the foundations of how the concept will be instrumentalized in our contemporary context through Marx and Engels and their revolutionary methodology.

Before his magnum opus *Capital*, Marx applied the concept of metabolism to his critique of political economy in *Grundrisse* with more detailed conceptualization compared to *London Notebooks* which the concept first appears. It is especially within this text where Marx’s methodological differentiation through historical materialism that is discussed above seems significant in the context of metabolism in general.

What we observe in *Grundrisse* related with our context is how the concept of alienation which appears much earlier in the Marx (1992), starting to have a much more political economic notion rather than being merely a repetition of Hegelian philosophy with minor alterations. In here Marx outlines how it is the separation between humanity and non-human nature one must concentrate in the capitalist mode of production and not an abstract unity between them;

> “It is not the unity of living and active humanity with the natural, inorganic conditions of their metabolic interaction with nature, and hence their appropriation of nature, which

> requires explanation or is the result of a historic process, but rather the separation between these inorganic conditions of human existence and this active existence, a separation which is completely posited only in the relation of wage labor and capital."(2005, p. 489).

Here as we can observe, alienation of human from rest of the nature starts to become a notion that can be regarded within the limits of historical materialism and through the prism of metabolism. Unlike Feuerbachian crude materialism which is discussed above in the methodology discussion, here the concept of alienation starts to distance itself from a notion of a transhistorical human nature which is being alienated from, towards material conditions of producers and production which is what is truly being alienated from. This evolution of the concept is quite crucial for the usage of the it within the relevant text since all modes in which concepts takes form of will be dependent upon this separation between human and non-human nature under capitalist mode of production. First appearance of the concept is related with the conditions of labor, to refer to the process of laboring as the "metabolic interaction with nature" (Marx, 2005, p. 320). For Marx this process has been existent since the dawn of humanity for it would be impossible to survive in nature without laboring through nature. Therefore, as of here, Marx does not only point out the capitalist mode of production but also discusses a process that is existent since the dawn of humanity. Labor, as our metabolic interaction with nature which involves both producing means of production but also laying out the waste which is given birth due to this process is a transhistorical material process in order to continue our existence. Here we are at the same field of thought when Marx referred again to the same process as what makes human different from other animals, which is this process being carried out consciously, planned (1975, p. 276). If one expected Marx to only think in terms of transhistorical features of production regarding human reproduction through history, that one person would be terribly wrong. After mentioning this process, he then starts to talk about "valorization process of capital" (Saito, 2017, p. 75) to refer to how the conditions of labor and therefore metabolic interaction with nature starts to become altered, disrupted under capitalist mode of production. Yet, it is not specifically this line of thought that concerns us right here and now. What we are merely concerned is the usage of the concept of metabolism within *Grundrisse*, thus we will keep following it only to return to this line of thought of Marx which will be crucial later on.

The other usage of concept of metabolism is constructed in a much more specific sense. When the whole text of *Grundrisse* is taken at hand as a draft to what will become the volumes of Capital, this one usage is resonating quite a lot with what Marx refers to as the differences between "use-value" and "exchange-value" in Capital (Marx, & Fowkes, & Monkel, 1992, p. 126). Here in Grundrisse Marx creates a juxtaposition between metabolism (*stoffwechsel*) as "changes of material" and "changes of form" (*formwechsel*) (1983, p. 326). With the latter what he refers to is simply the commodity and money within the circulation process of capital which will later be regarded as "C-M-C and M-C-M" (Marx, & Fowkes, & Mankel, 1992, p. 240-248). With the metabolism however, what is meant is the differentiations which occur in use values under capitalist mode of production in time. Especially in here we see the concept of metabolism being adopted as a notion to refer to the aspect of capitalist mode of production which is related with the nature around humanity in *formwechsel* referring to the social aspect of the capitalist mode of production, specifically to the exchange value aspect. What we see is a glimpse of the start of a discussion in Marxist historical methodology that will be carried here at the beginning of the second and third sections of the thesis; specifically, the misinterpretation of it in terms of base-superstructure conceptualizations. If we were to follow this line of thought here for the sake of argument – which will be critiqued later on – only to make it understood better, both metabolism and formweschel is within base sphere of capitalist mode of production, the last one is related with the human constructed aspect of capitalism and the first one is its relationship with nature.

The last given meaning to the concept of metabolism by Marx in Grundrisse is related with the notion of "natural metabolism (*natürlicher stoffwechsel*)," (Marx, & Fowkes, & Mandel, 1992, p. 289). With it, what Marx points out is that the nature which is thought outside of humanity also has its own energy circulation, entirely independent of human intervention. Use values, for Marx, "are dissolved by the simple metabolism of nature if they are not actually used" (2005, p. 272). So therefore, what Marx means is that natural metabolism is the force of nature that effects both human constructed and natural features related with the energy circulation within nature.

Another mention of the concept of metabolism related with this differentiation that at the same time corresponds with it is the "universal metabolism of nature" and "social metabolism" (Foster, 2013, p. 5). These conceptualizations that is made before the *Grundrisse* do not contradict with the conceptualizations of metabolism that is made in *Grundrisse*. With universal metabolism of nature what Marx refers to is the "specific cycles and processes within the broader biophysical world that produce and regenerate ecological conditions" (Clark, & Foster, & Longo, 2018, p. 652). Universal metabolism of nature subsumes both human and non-human ecological activities that consists in itself social metabolism as well. Social metabolism is interrelated with the universal metabolism of nature, underlines more and more the social production of humanity in order to reproduce itself.

To summarize, Marx refers to the concept of metabolism in Grundrisse in three-dimensional perspective. First one refers to the exchange and relationship between humans and non-human nature regarding the energy flows between one another. Second one refers to the metabolic interaction within society itself which is composed in two parts; being *stoffweschsel* and *formweschsel*. The last one is the "metabolism of nature" which existed before the birth of human race and will continue to do so even after humanity as a species extinct. Before analyzing *Capital* in depth from the perspective of the concept of metabolism, the way in which historical materialist methodology apprehended when analyzing the concept of metabolism so far needs to be explained more in detail since without it, these attempts at taking the object of analysis within a notion of totality (totality of social and natural sciences) would make the scientific analysis in contradiction with the real existing world outside. The other reason why the form of the usage of the concept of metabolism in *Grundrisse* is that by this, it is observed how the concept evolves in Marx's thought and how it will arrive to its final meaning. With such an observation, the link to the literature after Marx will be built so that the way this thesis makes its intervention will be placed in its context properly.

As Saito demonstrated with precision, if one does not internalize the method of historical materialism in all its dimensions, each and every concept within Marx's works becomes transhistorical, non-contextual and eventually non-materialist. Concept of metabolism is

not an exception here. If Marx is taken at hand as if he was a Feuerbachian vulgar materialist then the the frame of the concept of metabolism becomes entirely distorted, referring to the essentialist meanings of alienation which it has nothing to do with. To begin with, we can clearly cite some of the thinkers and scholars who have studied the relationship between Marx's thought and nature (Schmidt, 2014, p. 133), which claims Marx's main influence was Jacob Moleschott, a natural scientist of 19th Century and not Justus Von Liebig or Carl Fraas. One of these studies cite that what Marx was influenced by in forming the concept of metabolism was heavily from the sphere of philosophy (as if pure philosophy was ever Marx's main interest). Moleschott's definition of metabolism is entirely incorporeal and speculative for he defines it only abstractly as the mere energy exchanges between human, plants, air and animals. It can easily be proven that Moleschott is a vulgar materialist in the sense that he defended a very simplistic sense of materialism in a materialism debate he initiated with Liebig, claiming that thought is what is to brain as the same as urine is to the kidneys (Saito, 2017, p. 80). In synchronization with the same line of thought, for him, thought itself was even nothing more than mere material movement within the brain (Saito, 2017, p. 80). He did not even hesitate to reach social and political consequences again with his crude materialist line of thought, claiming that the reason why a worker from the Mediterranean area is lazier than the English worker is due to each one of their diets (Saito, 2017, p. 80). Parallels between him and Feuerbachian crude materialism is also stated by himself as well, him claiming that Feuerbach's line of thought and anthropology specifically is his life's main task as well. For him and Feuerbach alike their entire philosophical and natural scientific aim was to concentrate on transhistorical never-changing 'essence' of things, whether a thing like nature which is material or thought itself which is an absolute abstraction. Therefore, Moleschott's conceptualization of metabolism is entirely incompatible with Marx unlike what Schmidt claims for Schmidt's understanding of so-called ecology that is based on materialism primarily see the transformation of consciousness on its absolute abstractness, to see nature and society as whole and a unity in the first place. But as we have seen clearly in *German Ideology* that is discussed above, Marx's approach was entirely critical towards this position.

Two more examples can be given before going towards the infamous *Capital* and the presentation and construction of the concept of metabolism in it. Next one, as Saito presents (2017, p. 85), is another study which claims that Marx is a "natural scientific materialist". The one we have analyzed before was claiming that it was Moleschott who inspired Marx mainly in his construction of the concept of metabolism in particular and understanding of nature in general. In this study (Wendling, 2009), it is Lüdwig Büchner (1864) that is claimed to have general effect on Karl Marx in constructing the relevant concept. With certain analogies between how capital functions, circulates and human physiology, this study claims a similar rupture in Marx as we have seen in Althusser's "epistemological rupture" (2005, p. 13), claiming that the concepts of labor and nature goes through fundamental differentiations in meaning in Marx after 1840's, being philosophical and ontological before and becoming scientific later. The main notion that marks this differentiation, according to this study is the notion of thermodynamics. Thermodynamics, being;

> "…science of the relationship between heat, work, temperature, and energy. In broad terms, thermodynamics deals with the transfer of energy from one place to another and from one form to another. The key concept is that heat is a form of energy corresponding to a definite amount of mechanical work" (Drake, 2022)

As a branch of chemistry, study claims that Marx, beginning with the *Grundrisse* becomes more and more a thermodynamics scientist, analyzing the energy and value flow between capitalist mode of production and nature from this mere materialist natural scientific sense. Forming analogies between bones and fixed capital and also between organs and floating capital (Wendling, 2009, p. 54), it is claimed that Marx starts to analyze the circulation of capital in and out of human and non-human nature, in accordance with the laws of thermodynamics. However, as we have seen above within the methodology discussion centered around historical materialism, it does not surrender itself to any sort of 'laws of natural sciences' to explain the emergence and functioning of any mode of production. According to a main principle of it which we have seen above that is totality being, "social relations which are born together with a linked certain mode of production" (Wood, 2011, p. 3), are material forces in themselves which must be taken into consideration just as laws and principles of natural sciences in order to understand and give meaning to social relations of a certain society at any given time in history.

A discussion regarding the concept of thermodynamics and its first and second law is also carried on by Friedrich Engels in the *Dialectics of Nature* (1987). There, Engels in three different long paragraphs, deals with the problem of energy conversation and law of entropy and forms. These studies of Engels were misinterpreted in certain studies as shown in detail by Foster & Burkett (2008, p. 8). However, it can clearly be observed that what Engels aimed was a quite similar to the description stated here above. Historical materialist analysis can neither be understood merely in terms of natural sciences of thermodynamics nor it can be seen as a mere social sciences issue. In his study, Engels presents how these two cannot be thought separately and presents this unity in terms of laws of thermodynamics, especially first and the second laws (Marx & Engels, 1987, p. 561).

Two examples presented above which are explained much more in detail in Saito's study can be understood within our context through the evolution of the concept of alienation in Karl Marx. Therefore, before the analysis of *Capital* from the lens' of the concept of metabolism, it is crucial to explain this evolution in the relevant context. As a concept which is misinterpreted quite often, alienation when interpreted in accordance with principles of historical materialism and not through the vast literature of Hegelian alienation (Hegel, 1991, p. 96), becomes a quite significant marker for a historical materialist understanding of the concept of metabolism marking a crucial space in the grand critique of the political economy within Marx.

Disagreements and debates regarding the concept of alienation in Marx's works is quite rich within Marxist tradition. The main reason for the emergence of this debate is related with the lessening appearance of the concept in Marx as he became older and his studies started to differ. In his earlier works, especially *The Economic and Philosophic Manuscripts of 1844* (1992), it can be observed that there is a heavy dependence on the concept of alienation. Later on, when we arrive and analyze *German Ideology*, concept seems to disappear only to reappear in *Grundrisse*. In *Capital* it starts to appear less and less again and in later notebooks and works such as *The Critique of Gotha Programme* (2008), it disappears again almost entirely. Due to this appearance of the concept in his

works which are full of ups and downs, certain Marxists tend to believe that the concept has no use after he left being a left Hegelian and certain ones believe that the concept kept being resourceful to him but only changed its form, becoming more and more in accordance with the principles of historical materialist methodology. After brief examination of the ones that disregard the importance of concept, it will be shown here that concept kept being useful for Marx, but not in an essentialist sense which could be seen as Feuerbachian analysis but in a more historical materialist method. This thesis claims that importance of the concept of alienation that is carried on within Marx's studies is quite crucial for the main purpose of this thesis, which is explaining the relationship between human and non-human nature in the contemporary human societies that is mediated through capitalist mode of production.

In *The Economic and Philosophic Manuscripts of 1844* the concept functions as a prominent dynamic notion for Marx in explaining human nature and the psyche of the worker under capitalist mode of production. In short, he explains that there are four types of alienation which Marx analyzes in clarity; first one being the worker being alienated from the product or creation which is the consequence of his or her labor. The purpose and the shape of the existence of the product which is being produced by the laborer is not determined by the laborer, who is the true producer of the product according to Marx, but by the capitalist who own the means of production. Therefore, production of a certain product which is also a production of a certain use-value, is detached from the use-value and determined fundamentally by its exchange-value. Second one is directly related with the first one. When the worker is repetitively being alienated to his or her product which is the outcome of his or her labor, then labor of the worker becomes "external to the worker" (Marx, 1992, p. 143) himself/herself. Therefore, worker is no longer merely alien to the material or incorporeal product as the outcome, but also becomes alienated to himself/herself through the process of labor itself. Third one is called in its native language *Gattungswesen* (Marx, 1992, 140) which is commonly translated as "species-essence" or "species-being". For Karl Marx, humans are different from animals for they can plan the future of their actions as the subject of those actions which was already outlined here before (Marx, 1975, p. 276). Things around themselves functioning as objects becoming tools for the humans, subjects of the deed or labor being carried. This

feature for Marx is decisive in defining human nature, which is also determined within social relations. For Marx, capitalist mode of production takes away from the worker this ability to act as the subjects of their deed. Therefore, becoming alienated to their *Gattungswesen*. The fourth and the last one is worker being alienated from other workers themselves. Workers becoming objects of an imperative to compete with one another for the profit maximization drive of the capital, delivering more labor in less wage, workers become alienated to their common interests, which the notion of false consciousness appears as the outcome. Henceforth, as it is shown there are four fundamental types of alienation in Marx's early studies. The subject of alienation will appear later on within this thesis especially in the third section regarding the debates on metabolic rift and metabolism under capitalist mode of production. However, what one needs to realize here is that the two examples of reading of Marx which are inaccurately regarding him and his understanding of nature can be made crystal clear through how one should and should not be looking at his conceptualization of alienation.

One must always keep in mind that Marx's studies will always be misunderstood if the notion of historical materialism and its critique towards Feurbachian essence is overlooked. The second type which is mentioned above, alienation from *Gattungswesen*, is tended to be understood in Feurbachian sense. It is true that if we take his analysis in bits and pieces, there are certain 'aphorisms' which would make us think as if Marx indeed refers to transhistorical essence which humans possess and therefore which capitalism alienates us from. However, for Marx, human nature is always dependent on the social relations of the existing mode of production which is always dynamic and subject to change. Therefore, for Marx, even the essence of a certain thing is alterable and changeable within time, more specifically within history. Therefore, what we are being alienated from whether it is our labor or our conscious and unconscious being which related with labor is ever changing dependent on the social relations of capitalist mode of production. When it is this insight that one keeps in mind, two misexamples given above becomes much clearer on why they are 'mis'examples. If an essentialist understanding whether technological determinist or directly Feuerbachian is attached to Marx, Marx becomes the very thing he critiqued in his works. All of these were critical for the following part of the thesis which is related with the how the concept of metabolism takes

shape in *Capital* and his notebooks after 1868, for if his methodology and the evolution of the concept is not understood properly, Marx appears as Promethean, an epistemological trap even some those who proclaim themselves as Marxists tend to fall from time to time.

The first author which revolutionized the Marxist ecology by underlining the importance of the concept of metabolism and Metabolic rift is John Bellamy Foster and his in-depth studies of Marx and ecology and the political and economic outcomes which can be derived from them. As can be seen in Bellamy's work as well, when Marx started to actualize his grand project of the critique of political economy through *Capital*, his criticisms towards political economists such as Ricardo and Malthus were also quite powerful in terms of capitalist agriculture and exhaustion of the land. Now that it was more about political economy than mere philosophy itself, Marx realized that it was mainly through agriculture, specifically capitalist agriculture that relationship between humanity and nature can be made sense of. He wrote that;

> "The actual causes of the exhaustion of the land… were unknown to any of the economists who wrote about differential rent, on account of the state of agricultural chemistry in their time." (1981, p. 915)

In this specific passage, "any of the economists" were referring to such political economists mentioned above. The main reason for such harsh critique was centered around one crucial notion; the notion that these political economists, almost all of them, has taken the productivity of the soil as infinite into their abstract economic equations. If we were to take Ricardo's own words for it, it was indestructible power that soil possessed which caused infinite source for the production itself. This line of thought, which attributes infinity to the potential productivity of the agricultural soil, can be said has roots in a much deeper philosophical thought. Known as "the father of liberal thought" (Wood, 2012, p. 273), John Locke and his argument on property which centered around the idea of "improvement" (Wood, 1984, p. 57). In its etymological roots meaning "turning into profit", Locke's argument on property solely rested upon the idea that it was those who improved to its utmost capability, whether land or another, was the owner of that specific mean of production. When read together, Ricardo's argument on infinitely productive soil with Lockeian improvement, makes sense since if the land is intinitely productive, those

who carried to its utmost limit is the winner of the capitalist competition. However, if we return to the Marxist understanding of nature in *Capital* and after 1868, we must first again realize the social context in which these studies on agriculture and relationship between humanity and nature arose from.

In the 19th century, soil depletion and exhaustion and therefore loss of nutrients regarding soil fertility had become a major issue, making Malthusian notion of overpopulation in comparison to agricultural food stuck ever more worrisome and popular (O'Connor, 1998). Since the capitalist urge to relentlessly maximize profit has become determinant in much of the Europe by now, demand for fertilizers which were continuously on the rise, had to be met. The demand was met by Peruvian guano (dung of sea birds which were gathered to be used as fertilizers (Ernle, & Hall, 1937, p. 369)) and it was ever so increasing that the difference between the first Cargo which arrived in England and the one which arrived seven years after that was measured as 218,300 tons (Hillel, 1992, p. 132). As Hillel shows, the demand was so high that European farmers wandered around the battlefields to extract human bones and skeletons or any type of such thing to be able to use it as fertilizers (1992, 132). What is called as second agricultural revolution, which was explained before, occurred in a social context such as this. In year 1837, a pioneer science organization in England asked from Justus Von Liebig, a chemist which was interested in agriculture, to write about the relationship between agriculture and chemistry. Again, what we observe here is an example of the social context as the driving engine of the scientific discoveries within the era; the drive for capital to maximize its profits and accumulate infinitely. In 1840, after three years, Liebig wrote the "*Organic Chemistry in Its Applications to Agriculture and Physiology"* (1841), which was a groundbreaking study revealing for the first time the role of elements such as phosphorus, nitrogen and potassium in the agricultural production. This study allowed many big farmers of the time to develop productivity within their land. Henceforth to achieve it, farmers in large scale, especially in England and United States looked around the world for fertilizers that are rich in potassium, phosphorus etc., from Peruvian guano to Chilean nitrates (Foster, 1999, p. 377). As one can immediately realize, this became a beginning mark for "ecological imperialism" (Foster, & Clark, 2004). Later in 1850's an economist named Henry Carey, wrote within the context of the U.S.A that the ongoing path of the

capitalist agriculture which was also marked by the separation of town and countryside, will only worsen the situation of the continuing loss of soil nitruents (Foster, 1999, p. 377). Liebig, effected by Carey's writings, even though did not exactly use the concept unsustainable, pointed out that the ongoing production cannot increase in the way that it is and let alone increasing, it cannot even maintain its current productive power (von Liebig, 1859, p. 178).

When Marx was studying for the *Capital*, he was deeply interested in his own time's latest scientific discoveries and particularly upon the subject of ground rent, these discoveries made primarily by Liebig became a main interest for him. In 1866 he wrote to his friend Engels that:

> "I had to plough through the new agricultural chemistry in Germany, in particular Liebig and Schonbein, which is more important for this matter than all the economists put together" (Marx & Engels, 1975, p. 114).

Then later on in Capital, Marx was going to mention Liebig saying that it was him to first outline the destructive aspects of the capitalist agriculture (Foster, 1999, p. 378). In all three volumes of the *Capital*, there are two passages spesifically where the concept of metabolism in terms of "metabolic rift" makes itself visible significantly. First one, from the volume III under the section "The Genesis of Capitalist Ground Rent", being;

> "Large landed property reduces the agricultural population to an ever de- creasing minimum and confronts it with an ever growing industrial population crammed together in large towns; in this way it produces conditions that provoke an irreparable rift in the interdependent process of the social metabolism, a metabolism prescribed by the natural laws of life itself. The result of this is a squandering of the vitality of the soil, which is carried by trade far beyond the bounds of a single country. (Liebig.) . . . Large-scale industry and industrially pursued large-scale agriculture have the same effect. If they are originally distinguished by the fact that the former lays waste and ruins the labour-power and thus the natural power of man, whereas the latter does the same to the natural power of the soil, they link up in the later course of development, since the industrial system applied to agriculture also enervates the workers there, while industry and trade for their part provide agriculture with the means of exhausting the soil." (1981, p. 949-50).

And the second one in in the first volume under the section "Large Scale Industry and Agriculture" being;

> "Capitalist production collects the population together in great centres and causes the urban population to achieve an ever-growing preponderance. This has two results. On the one hand

> it concentrates the historical motive force of society; on the other hand, it disturbs the metabolic interaction between man and the earth, i.e. it prevents the return to the soil of its constituent elements consumed by man in the form of food and clothing; hence it hinders the operation of the eternal natural condition for the lasting fertility of the soil... But by destroying the circumstances surrounding that metabolism . . . it compels its systematic restoration as a regulative law of social production, and in a form adequate to the full development of the human race… All progress in capitalist agriculture is a progress in the art, not only of robbing the worker, but of robbing the soil; all progress in increasing the fertility of the soil for a given time is a progress toward ruining the more long-lasting sources of that fertility… Capitalist production, therefore, only develops the techniques and the degree of combination of the social process of production by simultaneously undermining the original sources of all wealth—the soil and the worker. (1992, p. 937).

In these long-quoted passages, Marx now starts to instrumentalize the concept of metabolism not just to refer to the relationship between humanity and nature from an abstract philosophical point of view but instrumentalizes it in terms of a historically based notion of "rift", between human and nature. In these critical insights regarding industry and agriculture and their transformation under capitalist mode of production, Marx seems to instrumentalize the concept of metabolism to claim that there has been an "irreparable rift" between man and nature caused by capitalist mode of production. Marx in line with Liebig, claims that this rift does not simply manifests itself on the production level but also deepens itself within logistics of capitalism. Long-distance trade of especially agricultural commodities constantly deepens this rift by depriving the soil of its natural circulation including wastes of certain agricultural production. However, Marx also appropriated the concept to describe in certain sentences which he described the communist society, which we all know there are not many numbers of such sentences. He claims that;

> "Freedom, in this sphere can consist only in this, that socialized man, the associated producers, govern the human metabolism with nature in a rational way, bringing it under their own collective control rather than being dominated by itas a blind power; accomplishing it with the least expenditure of energy and in conditions most worthy and appropriate for their human nature" (1981, p. 959).

As can be seen, it is the repairment of this irreparable rift under capitalism as an important precondition of the communist society unlike under a mode of production which is based upon the blind drive for profit.

Henceforth, we can be certain that with the completion of *Capital* and Marx's thoughts regarding the critique of political economy, Marx refers to a rift, a separation between

humanity and nature in which humanity lives within. This concept of the "rift" will become terribly crucial for the rest of the thesis, since debates regarding the Marxist theory of nature and metabolism will be centered around this notion, whether the questioning of its existence or its function both historically, politically, economically and philosophically. Questionings regarding how the Marxist methodology explained above can be applied to this abstraction of differentiation between human and nature (philosophically), what are the historical developments that are occurred which gave rise to such a theoretical differentiation among Marxist scholars (historical), what do the economic data regarding the inputs and outputs of bourgeois economy in relation with nature tell us about the "rift" between humanity and nature (economic) and finally how is the right appropriation of this notion of rift is crucial in regarding producing a correct political program is necessary (political) will be discussed throughout the second and third chapters of the thesis.

Before getting to the second part of the thesis, an in-depth summary of what is explained so far and how they are connected to the second part of the thesis are indispensable theoretical bridges in order to build this thesis coherently. At first, it is explained within the thesis that to understand the meaning of the concept of metabolism within the context of capitalist mode of production, Marx and Engels' methodology of historical materialism must be comprehended. This methodology discussion is useful and necessary for this thesis for two purposes; first it is important to understand their methodology in order to make sense of the concept in which Marx has used. If the methodology is not comprehended properly, then the risk of making sense of Marx within the related concept as if he is one of the bourgeois economists and young Hegelians in which he himself criticized. Therefore, not only for the concept of metabolism but to make sense of any of the concepts that Marx has applied in his studies, his methodology carries great importance. Second reason why it is important to understand this methodology is that it also functions to understand the methodology in which thesis applies in his research. As it will be clearer in the second part of the thesis in which the debate that is carried around the concept of metabolic rift in capitalist mode of production will be discussed, one of the main reasons which this concept is taken at hand in contradiction with the real existing world has its roots in not being able to comprehend and instrumentalize the methodology

of historical materialism properly. To summarize the methodology of historical materialism, we can underline three important concepts which will continue to be meaningful throughout the thesis.

First concept is the concept of totality. Even though its roots in Marx can be traced back to Hegelian philosophy, it would be inaccurate to claim that they both understand the concept entirely same. For Marx, in order to understand the evolution of a given society and its mode of production, the forces in which are effect cannot be analyzed separate from one another. Social bodies differ and evolve with complex relations in which without the movement of abstraction cannot be understood. This complexity in which the totality brings forth however does not mean that a social body cannot be analyzed entirely since it is too complex to analyze. The movement of abstraction in thought comes to play its part here. Marx abstracts and analyzes a specific notion of a given society whether religion, forces of production or state just in order to build in its totality again. Therefore, for the historical materialist methodology, compartmentalizing and abstracting is a must if at the end the totality of it is aimed to be understood. This notion of compartmentalizing for the sake of totality will be quite crucial for the rest of the thesis, since contemporary uses and abuses of the concept of metabolism carries quiet significant problems regarding the notion of totality.

Second concept in which is important is the material conditions of social life. Since the beginning of the debate regarding Marxist methodology, the primacy of material conditions and sometimes "economy" has been at the very center of almost all discussions. Certain traditions critiqued Marx for being a crude materialist for they assumed it was economic determinism in which Marx has applied to all of his studies. However as explained above this is definitely not the case and a very common abuse of Marx's thought which should have been resolved by now. As Engels stated in a letter to Bloch that was sent to him;

> "According to the materialist conception of history, the ultimately determining element in history is the production and reproduction of real life. Other than this neither Marx nor I have ever asserted. Hence if somebody twists this into saying that the economic element is the *only* determining one, he transforms that proposition into a meaningless, abstract, senseless phrase. The economic situation is the basis, but the various elements of the superstructure — political forms of the class struggle and its results, to wit: constitutions

> established by the victorious class after a successful battle, etc., juridical forms, and even the reflexes of all these actual struggles in the brains of the participants, political, juristic, philosophical theories, religious views and their further development into systems of dogmas — also exercise their influence upon the course of the historical struggles and in many cases preponderate in determining their *form*. There is an interaction of all these elements in which, amid all the endless host of accidents (that is, of things and events whose inner interconnection is so remote or so impossible of proof that we can regard it as non-existent, as negligible), the economic movement finally asserts itself as necessary. Otherwise the application of the theory to any period of history would be easier than the solution of a simple equation of the first degree." (Lenin, & Engels, & Marx, 1984, p. 295).

The primacy of real (material) life in determining the change in history does not refer to economism. Examples that are explaining this notion from Marx and Engels can be given even more than just the one given above but this quotation is, I believe, already enough to prove this point. This notion is crucial for the remaining of the thesis for first of all metabolism refers to a notion in production and reproduction in life to a very crucial aspect. Since it refers to the direct interaction between humanity and the rest of the nature through its labor is extremely fundamental. Its importance does not derive from this mere connection but also for how such a principle is still crucial in examining contemporary relationship between humanity and nature through concept of metabolism in a globalized world mediated by capitalist mode of production.

The last important notion which needs to be summarized within the methodology section is how Marx through the primary principles of his methodology comes to conclusion that in capitalist mode of production, it is the proletariat that can assume the role of agency in which the history develops and evolves. This notion which underlines the importance of class and class politics and agency in history will continue to be crucial for within the metabolism debate in contemporary capitalist mode of production, agency and the political aspect will be quite critical in the following chapters, especially the last one, since it underlines the fact that history is not a teleological movement in Marx but a dynamic process. Again unlike many criticisms towards Marx which blames him of being a teleological thinker regarding the movement of history, Marxist methodology cannot be labeled as teleological. However, it also cannot mean that the movement of history is impossible to analyze like the postmodernist history claims (Blackledge, 2013, p.3) but it is also not a teleological notion in him.

In the thesis, after the methodological debate that is outlined, how the concept of metabolism was instrumentalized in Marx is presented. In order to do that, three different branches are analyzed separately but interconnected with one another. First one is the social material history of the era that the concept started to become important within Marx. As the methodology forces us, we know by now that if a concept is analyzed in a given period within history only textually and in a complete abstract sense, it would be impossible to understand what that concept signifies in material life and therefore what is achieved is not a scientific conclusion but mere speculation. In line with this notion, first what has been analyzed were how the capitalist mode of production interacts with the earth and soil in the given time and more specifically, how the transition to capitalist mode of production altered agriculture and human relation with the earth. Here what becomes crucial in our context is how the need to maximize the profit that is gained from agriculture is imposed by capitalism how the way in which fertilizers are being used and produced in the capitalist countries of the era. What we observe here is that since the need to maximize the profit through agriculture became an absolute law in order to compete in capitalist mode of production, certain problems that were unknown before occur and the capitalist class of the era funds the certain scientific circles to solve the problems that starts to emerge. Right at this very moment, the concept of metabolism emerges pejoratively to simply mean the transaction between human production and the state of the soil. Marx learns the concept from the agricultural chemists of his time and starts to instrumentalize it. However, concept does not signify the same meaning in Marx in all of his texts.

Concept first appears in Marx in the *London Notebooks*. Here it is merely used pejoratively, to refer to the exchange between humanity and non-human nature regarding human production through labor. As it is said above, the concept is merely borrowed by Marx and cannot even be associated with him uniquely since it is only using it the way other scientific circles use.

After *London Notebooks*, the concept reappears in *Grundrisse* however this time, the concept has evolved more in line with the purpose of the *Grundrisse*, being a draft to his project of critique of bourgeois political economy. In *Grundrisse,* he compartmentalizes

the concept into three parts only again to understand and instrumentalize it in its totality. This compartmentalization of the concept into three parts is arranged in regarding the topology which is related with ‘where the metabolism happens’. First part is as we know of it, simply referring to the energy exchange between humanity and the non-human nature during human production with labor. Second one is related more with the circulation of value within capitalist society, abstracted from the nature related only with humanity itself. Here Marx as he does many elsewhere, actually refers to the what the bourgeois economists only think the ‘science’ of economy is, abstracted from the outside of humanity. Also he splits this sphere of metabolism into two different aspects, creating parallels with his “use-value” and “Exchange value” differentiation. Use-value corresponds to what he calls “stoffweschel” which is related with the use-value of commodities that circulates within economy. “Formweschel” corresponds to Exchange value. The third and the last section of the compertmentalized concept is the notion that is called “metabolism of nature” (natürlicher Stoffwechsel). With such notion what Marx tried to refer to was the transhistorical energy Exchange within nature that is this time unlike the first abstracted from human societies. With such a reference, we can once again observe the profound materialism of Marx’s methodology, acknowledging the existence of a transhistorical nature existing before and also outside of human intervention. These three differentiations along with the evolution of the concept in Capital will be quite crucial fort he contemporary debate regarding the concept of metabolism in trying to understand the relationship between human and non human nature seems to forsake or do not see these conceptualizations of Marx carefully and mistakens in certain parts due to such incapability to understanding.

In the thesis, before going onwards towards the usage of concept in *Capital*, certain examples of the misuages of the concept in the early 20th century is presented. There are mainly two reasons for it. Before going towards the second part of the thesis in which the contemporary literature will be reviewed more in depth, presenting these examples function as the correction of how the methodology is misunderstood and therefore the importance of methodology. I will not summarize them here again but only claim that it is important to see the misugaes as much as the correct usages and interpretation of Marx regarding the concept to analyze the contemporary situation more precisely. What is more

crucial for this thesis is the literature review that will be held in the second section for in there literature review will not be merely "who has studied what" but also will function as a tool to understand the contemporary situation between human and non-human nature. Another aspect that is explained shortly before the Capital is the concept of alienation in Marx which caused too many debates after him as well. It is not presented in detail in this first section because the concept of alienation will be much more crucial in the second part of the thesis since it plays a quite critical role when inspecting the relationship between humanity and non-human nature and also the debate that occurs centered around the concept of metabolism and metabolic rift in capitalist mode of production.

When we finally arrive to the magnum opus, *Capital*, we now realize that the concept takes its final form. As presented with the quotes above, with *Capital*, Marx now formulates the concept of metabolism together with the notion of "an irreparable rift" in metabolism. Now in the Capital, the concept becomes more and more an economic notion as much as it was philosophical before. This rift between humanity and the rest of the nature is not merely philosophical anymore but now, materialized with the analysis of the soil, rent and also separation between town and country. A rift between the social metabolism and the universal metabolism of nature is the primary difference in which capitalist mode of production brings forth. With the motive of maximizing the profit in capitalist mode of production, now the human production is not for the sake of the use-value of things but for the Exchange value. This change fundamentally disrupts the relationship between humanity and rest of the nature and starts an irreparable rift between them which will be analyzed much more in depth after Marx. In Marx's time, this separation is materialized mostly in the situation of agriculture and separation between town and country but since then, this separation has manifested itself in much more different and complex dimensions that will be analyzed in the second section of the thesis.

CHAPTER 2. CONTEMPORARY DEBATES ON THE CONCEPT OF METABOLISM UNDER CAPITALISM

To comprehend the contemporary situation regarding metabolism and metabolic rift that is produced by capitalist mode of production, first of all, it is needed to review what has Marxian thought produced regarding the conceptual development. It is crucial to keep in mind that the new studies regarding the concept of metabolism after Marx were not conducted for mere hermeneutic reasons. Just as stated in the introduction section, as the capitalist mode of production enlarged itself globallt after Marx, relationship between humanity and nature under capitalist mode of production evolved and this evolution which manifested itself as climate crisis, formed the basis of the social historical context for the development of these studies.

In order to achieve the related literature review that has been conducted Marx, it would be the correct choice to borrow John Bellamy Foster's periodization of Marxist tradition on ecosocialism. After such periodization, how Foster and Moore conceptualize the concept of metabolism historically and theoretically will be inspected so that at the end of the thesis, the synthesis which will be constructed will be comprehensible and meaningful.

2.1 ECOSOCIALAIST PERIODIZATION AND THE CONCEPT OF METABOLISM

It can be claimed that ecosocialism according to Foster can be divided into three main stages. First stage ecosocialists in short are the ones who claim that Marxist methodology and Marxist thought in itself is incompatible with ecological thought and perceives the nature as mere economic source that can be extracted infinitely. For Foster, the main reason for the existence of this line of thought is the massive impact of Adorno and Horkheimer's *Dialectic of Enlightenment* (1997) and a book that is mentioned in this thesis before, Alfred Schmidt's *The Concept of Nature in Marx* (2014). When Horkheimer and Adorno claimed that the absolute "control of nature" (1997, p. 27) was essential in Marxist thought, the thinkers that followed them who are also focused on

ecological thought and Marxian tradition, analyzed the relationship between Marx's works and nature in an apologetic sense, claiming that Marx was mistaken regarding the issues of nature in terms of sustainability and therefore needed to be corrected. His mistakes, for these thinkers, were fundamentally rooted in his methodology which prioritizes production over nature and is ready to sacrifice the latter for the sake of the first. Schmidt as well, analyzing Marx as a product of the enlightenment tradition and claimed that "domination of nature" (2014, p. 154) is essential to his thought.

Yet, it would be wrong to claim that such a tradition was born simply because a book was written by some philosopher. No text in itself has a weight that can be effective enough only by itself to be able to create a tradition of thought that can become mainstream. If we follow the Marxist methodology that is explained here before, we must also look for material reasons that exist in everyday life as reasons for such a tradition become effective as it is. Material reasons can be found in the social history of the era in which the *Dialectics of Enlightenment* was written. After the collective traumatic experiences caused by the Second World War, any of the claims that existed before it was being started to blame for their totality in trying to understand the world and history. This collective trauma only found its political and philosophical background in Adorno and Horkheimer. This political drive is primarily what made such a tradition gained weight, not a mere text that was written.

This line of thought which assess Marx and ecological tradition in a negative sense had found its roots also in the rejection of dialectics of nature (Lukacs, 1972, p. 207). Even though Lukacs was not entirely sure about such rejection and made alterations in his claims in the future editions of his book, this notion become extremely critical for especially Western Marxism. Blaming Engels and his *Dialectics of Nature* (1987), certain thinkers have claimed that it was Engels who furthered the reach of the movement of dialectics from social medium to nature itself and claimed that dialectical thinking could not be applied to natural sciences and cycles. So in order to summarize, the school of thought that Foster labels as "first stage ecosocialism", the thinkers that can be said that belong to this school of thought believes that fundamentally Marxist thought and green

thought are not compatible in themselves, green theory and Marxism is not naturally in harmony among themselves but can merely be grafted eclectically into one another.
Of course, it would be falling short to simply refer to this school of thought but not exemplifying them in relation with the notions of metabolism and metabolic rift. Therefore four different examples will be presented to be able to present scientifically how this first stage ecosocialism presents itself in relation with our metabolic rift notion.

First example is Eckersley's book, *Environmentalism and Political Theory; Toward an Ecocentric Approach* (1992). In her book, Eckerley's primary goal is to formulate an accurate ethico-political normative theory that can be raised from a solid critique of the already existing certain radical political movements and theories. Marx's or maybe for her, Marxist approach, carries a great amount of weight in these. In her book's first section she reviews certain green political theories with the aim of differentiating what is ecocentric and what is anthropocentric. She achieves this goal by both normative and critique of the already existing certain theories (1992, p. 27). In the second section she reviews and almost borrows the useful aspects from theories such as ecosocialism to ecoanarchism. In this second aspect we can see that Eckerley accepts the Frankfurt School's perspective towards 'orthodox' Marxism and blames it for being a product of enlightenment that only seeks the domination of nature. In her book Eckerley claims that;

> "Orthodox eco-Marxists simply seek to replace the private and socially inequitable mastery of nature under capitalism with the public and socially equitable mastery of nature under communism." (1992, p. 85).

After accusing Marxist thought from an obvious Frankfurt Schoolian perspective, she claims that this is 'orthodox' Marxism (1992, p. 25) and after such orthodoxy she believes that there are certain other Marxisms (such as humanist Marxism) which apologizes for Marx originally being promethean and tries to correct it (e.g Gorz, 1994).

In the specificity of our context, the concept of metabolism only appears once in the section which she explains the theoretical roots of Marx. However, those theoretical roots are coming from Schmidt's book which was critiqued here before in this thesis. Therefore, the interpretation of Marx's methodology that derives from Schmidt's interpretation is mistaken as well. This misinterpretation led her to claim that "Conquering nature in this

way was welcomed as the means of human self-aggrandizement, for Marx*"* (2021, p. 231).

The other example is Joel Kovel's book *The Enemy of Nature: The End of Capitalism or the End of the World* (2021). In his book Kovel's primary claim is actually simple but quite effective: Capitalism is all that is to blame for the ecological problems of the earth and if we do not get rid of capitalist mode of production, the world as we know of it will end towards a much worse future. Even though this statement can be accepted as it, the problematique part of his thesis starts when he starts to analyze Marxist thought and methodology regarding the matter.

When he starts to analyze how Marx approached the question of nature, he sets up an antagonistic dualism between two approaches to Marxist questioning of nature. First one is the one who accuses of him of being promethean, implying that all that was ever important for Marx was the maximization of production, nature and earth carried no value for him (2021, p. 171). The other end of the antagonistic dualism is Foster's and Burkett's approach which is centered around the concept of metabolic rift, which will be analyzed here later on but to simply put it now, claims that Marxist thought and ecological thinking do not need to be articulated with an outside intervention, but they are already subsuming one another and do not contradict with one another. After setting out this antagonism between two readings of Marx, Kovel suddenly hesitates to dive deeper into this discussion and claims that both school of thought is inaccurate (2021, p. 231). For his set of ideas, a close reading of Marx clearly shows that he is definitely not a promethean (Kovel, 2019). However he also critiques the Foster and Burkett's idea that Marx's ideas and methodology is already enough for the analysis of the current ecological crisis. For Kovel what is missing in Marx is the "intrinsic value of nature" (2021, p. 232). He admits that except a few passages from *Manuscripts of 1844*, nature only functions as use-value in his analysis. So, in short, nature has no value in-itself in Marx's critique of political economy.

This inaccurate critique of Marx is the reason why he can be labeled under first stage of ecosocialism. Such critique is inaccurate for two reasons; first one is by separating certain

part of his thought (which is the manuscripts) and analyzing Marx's studies distinct from one another would make us fall into the Althusserian trap of "epistemological break" that was mentioned here before which divides Marx's work dramatically. However, if his historical materialist method is understood accurately, it could also be seen that concepts and notions may appear and disappear throughout Marx's works when you analyze them chronologically, but appearance and disappearance are merely transformations of the concepts which only functions as the presentations of phenomena of the existing world, into one another. Another mistakes is a theoretical mistake which also puts him under the category of first stage ecosocialists. This theoretical mistake derives from his negligence on assuming that metabolic rift school does not take the intrinsic value of nature notion into consideration.

Where Kovel is mistaken is while trying to discredit the labour theory of value of Marx, he shows how he is not really familiar with his political economy therefore;

> "…confuse concepts of energy use, use value, intrinsic value, and normative value with the economic system of commodity value based on abstract labour under capitalism" (2021, p. 6).

When in Grundrisse Marx claimed that; "the purely natural material in so far as no human labor is objectified in it…has no [economic] value under capitalism" *(*2005, p. 344) what is crucial in this aspect is it has no economic value under capitalism. Therefore, claiming that Marx did not value nature intrinsically is inaccurate for he critiques capitalist mode of production as such and accusing him of such thing would be accusing him of being the defender of the very thing he critiques himself.

To summarize, it is clear that Kovel sees Marxism as insufficient in itself to understand the relationship between humanity and the rest of the nature and certain modifications have to be made. Added on top of that, he never develops a sufficient critique of the metabolism and metabolic rift therefore falls short of implementing Marxist methodology on the related matter properly.

The third example is James O'Connor's *Natural Causes: Essays in Ecological Marxism* (1998). In his book which is compiled of twenty-one essays that are written in a long

period of time, he categorizes these essays in three different parts; first one being History and Nature, second is Capitalism and Nature and the third is Socialism and Nature. Just as the previous examples, book starts with claiming that the ecological crises' which the earth is going through has only one notion to blame; capitalist mode of production and the imperialism it brings forth (1998, p. 193). However, later on, just as the previous examples, book claims that Marx did not value nature in itself. To quote directlyfrom his words;

> "Marx did have a vision of society in which humankind ceases to be alienated from nature, one in which the appropriation of nature is not based on the logic of capitalist accumulation but rather on direct individual and social need, on the one hand, and what we would today call "ecologically rational" production, on the other. This vision, however, did not include an ecological society in which nature is not merely a productive force but also is valued as an end in and of itself." (1998, p. 11).

To be fair, he does acknowledge that Marx aimed a society that is alienation from the nature is ceased, however, also critiques Marx for being insensitive towards the value of nature in itself. One must never forget that the notion of totality in which Marx applies to his own methodology has to be applied to Marxist sum of ideas as well. Marx was never only a philosopher or economist or a sociologist but all of them at once and more then they are combined. As Foster presented, when his political economist aspect is not known as much as it needed to be known, these philosophical critiques towards him becomes a non-signifier for those who critique him from such perspective do not know the meanings of and the differentiations between *"*energy use, use value, intrinsic value, and normative value*"* (2021, p. 6) and accuses Marx of the very thing he critiques. This results in an abstract critique of Marx in which claims that nature is invaluable in Marx and only valuable as it is useful for the sake of production and labor. Metabolic rift school has overcome such criticisms of Marx by showing how Marx's goal with the construction of communism is the associated producers living not by and for the domination of nature, but by abiding its rules.

The last example will be given before going towards the second stage ecosocialists is Daniel Tanuro's *Green Capitalism: Why It Can't Work* (Tanuro, & Ennis, 2013). In his book that is primarily a critique of the capitalism, specifically 'green capitalism' which can be defined as the theory or practice of a free-market economy in which natural

resources are regarded as capital and profits are partially dependent on environmental protection and sustainability cannot work and it is inherently non-coexistable and contradictory with the primary motives of capitalist mode of production. In order to do it, he starts to critique the claims of green capitalism such as how free market can be turned into a medium of change towards more ecological energy resources (Anderson, 2019) or by writing that;

> "The cause is therefore not 'human agency', nor humanity in general, but a particular type of historically and socially determined human activity. Earlier societies are not responsible for global warming, and neither are those who continue with alternative modes of production in the present day." (Tanuro, & Ennis, 2013, p. 42).

And claiming it is the capitalist mode of production that is to blame instead of an abstract contextless agency such as humanity, Tanuro is efficent at his endeavor of forming a critique of capitalism and especially green capitalism regarding nature and the relationship between humanity and the rest of the nature under capitalism. However, just as we see in the examples above, he fails to avoid the fetishism of being an original thinker and also claims that Marxist thought and methodology is not ecological entirely and needs to be re-assessed, modified and sort of greenized if we want to build political programs that can ensure the sustainable co-existence of humanity and nature in a possible post-capitalist future. In Danuro's part, such criticism towards Marx derives from the point of view of energy resources. It is striking that in their analysis of the Industrial Revolution, Marx and;

> "Engels have simply failed to grasp the enormous ecological and economic potential of the transition from a renewable source of energy, produced by photosynthesis of solar radiation — wood — to a fossil fuel source, produced by the fossilisation of solar radiation and thus exhaustible in a historical time period — coal. Let us make no mistake: in the eyes of Marx, technology is not neutral. He makes a clear distinction between pre¬ industrial and industrial technologies, 'specifically capitalist' according to his definition." (Tanuro, & Ennis, 2013, p. 143).

In this long quotation we can observe that Tanuro critiques Marx (though not being too harsh on him since Marx was allowed to be wrong for during his time, thinks Tanuro, technological advancements were not developed enough) for being unable to comprehend the ecological consequences of steam engine shifting its own energy source; from wood to fuel. However, this criticism derives from the very reason that resembles why the other pervious examples were mistaken in their analysis of Marx; not being able to comprehend

his methodology in its totality. When read carefully, it can clearly be observed that Marx's analysis is about social relations of capital or to put it more specifically class relations that derive from the fact that how capital functions as a social relation, including the matters of technology: "Capital also is a social relation of production. It is a bourgeois relation of production, a relation of production of bourgeois society." (Marx, 2006, para. 5)

It is in this sense that Danuro is incorrect since Marx's analysis of capital as a social relation of production allows him to be precise and accurate even if he were not able to predict the outcomes of the usage of coal, in Danuro's terms. Since capital as a social relation of production forces to maximize the profit as much as possible, whether the capitalist mode of production built its global domination with coal or with wood would not have made much of a difference since the 'production for production' principle was going to cause ecological problems in one way or another (e.g Jevons Paradox (Foster, Clark & York, 2010, p. 1)). It might not have been the global climate crisis as we know of it, but a different set of ecological crises would have been inevitable.

Another reason why this critique requires an "anti-critique" (Foster, & Burkett, 2016) is that its negligence and misunderstanding of the metabolic rift analysis which is also interrelated with the first "anti-critique" in the last paragraph. Marx and Engels's metabolic rift analysis is so simple yet definitive that when it is considered in the energy resource context, it still provides with the enough tool to realize that the real reason that an irreparable rift occurred between social metabolism and universal metabolism of nature is not which energy resource that the capitalist mode of production instrumentalized but the capitalist mode of production, its social relations and its imperatives that imposes themselves on every aspect of production from labor to machinery.

With the four examples above, we can clearly see why it is correct that Foster categorized such thinkers as the first stage ecosocialists (there can be other examples of course such as (Löwy, 2015)). These thinkers were harsh critiques of capitalist mode of production and its effects on environment and nature. However, they were also critical towards

Marx's conceptualization of nature and relationship between humanity and nature for certain similar and also different reasons yet inaccurate entirely. The reasons for such a paradigm of false criticisms towards Marxian methodology and thought of course cannot be understood merely textually and conceptually. Certain social historical events such as the fall of USSR and how USSR's economy effected nature (even though this is a notion that is still ambiguous and for an in depth reading look for (Richter, 1997), (Foster, 2015), (Chattopadhyayi 2014)), how the end of the second world war formed an ideological wall regarding all the totalizing ideologies of the past, including Marxism, were to blame for the tragedies that occurred can be named as few. This social contextuality of the era must never be forgotten.

This stage is especially crucial in our context for since the original contribution of this thesis will be born out of the theoretical and methodological debate within Marxist thought that is centered around the notion of relationship between capitalist mode of production and nature, showing why and how some of the early studies regarding the subject is mistaken will pave way for the contemporary situation centered around the notions of metabolic rift and metabolism under capitalist mode of production. However, what needs to be carried out before that contribution is the preliminary review of the second stage socialism.

When the second stage ecosocialism is the matter of subject, beginning of the new millennia and John Bellamy Foster's groundbreaking studies should be the center of attention. However, Foster is not alone in his endeavors. John Bellamy Foster's insights will be quite crucial for this thesis and they will need to be studied in depth, however before him and other exemplifications of the second stage socialism, a certain definition has to be given of this period of ecosocialist thought. As Foster defines it blatantly open and briefly, second stage socialism;

> "…sought to go back to Marx and uncover his materialist conception of nature as an essential counterpart to his materialist conception of history. The object was to transcend first stage eco socialism, as well as the limitations of existing green theory, with its overly spiritualistic, idealistic and moralistic emphases, as a first step on the development of a more throughgoing ecological Marxism." (Foster, 2014, p. 43).

As can be observed, second stage ecosocialism emerged in some sense as a "return to Marx". By the thinkers that belong to this stage, Marxist methodology and thought did not need to be altered or modified in order to be a set of ideas and tools that are compatible with the green theory and in more general, ecology. Rid itself from the dominant paradigm of "USSR is no more, therefore no more Marx" and also from the academic fetishism of being theoretically original, these thinkers turned back to Marx's writings and his materialist conception of history and claimed that, "metabolism and metabolic rift" are as crucial as concepts such as labor and class in Marx's project and therefore, it is in itself already at the very heart of ecological thought. For the first stage ecosocialists, the reason behind their appropriation of the concept of eco socialism is that socialism was either dead (fall of USSR) or outdated and not useful anymore, either pragmatically or substance-wise. For the second stage however, ecosocialism is intertwined with socialism, not against it but as an adjective to it. Another reason for the rise of the 'return to Marx' paradigm in social contextual terms in ecosocialist thought is the 2008 economic crisis and how a certain paradigm of return to Marx himself became dominant in all social scientific fields. Since the return to Marx as a paradigm in Marxist ecological studies is defined, what is needed now is the in-depth analysis of certain examples to comprehend the studies ever more clearly.

First example we will take into consideration is Paul Burkett's *Marx and Nature: Red and Green Perspective* (1999). To be blatantly clear, the book is the first study that shows how in detail that Marxian analysis of value is positioned against the dominant views of green theory to its day. Study achieves it in fourteen different sections under three main parts. These three main parts are Nature and Historical Materialism, Nature and Capitalism and the last is Nature and Communism. In the first part, it can be claimed that the study, by underlining certain fundamental principles of historical materialist method, claims that Marxist methodology is the right tool for the analysis for nature, history, capitalism and communism; one by one and in a dialectical totality (1999, p. 17). With the help of quotations from Marx such as below;

Burkett first underlines that in Marx the process of production in human societies, since the beginning of its dawn, has always been both a natural and a social process. He

carefully presents how in Marx, this principle is never forsaken. He does this in order to emphasize how Marxian thought in itself does not forsake nature in favor of the reproduction of the social body neither in his analysis of capitalist mode and relations of production but also while formulating a sustainable condition under communism. The concept of labor plays a crucial role in formulating such a basis for him since the labor theory of value is the most criticized theory of Marx from green theory cycles up until its day.

In the second part, Burkett develops his analysis. First, his aim is to present how the function of capital under capitalist relations of production is the subjugation of both labor and nature to capital is the determinant factor of how humans relate with the nature around themselves (1999, p. 67). This "dual subjection" is not entirely a new process that is brought by capitalist mode of production of course. However, Burkett shows how in Marx, this subjection occurs quiet different from the previous modes of production (such as how capitalism is much less dependent to "particular ecosystems and other localized natural conditions (e.g., mineral deposits)" *(*1999, p. 67*)*). After such claim, he presents that how one of the primary contradictions which Marx formulates in Capital, contradiction between use-value which is wealth that is produced by labor and nature and exchange value which is wealth manifests as the abstract labor time is in fact a quiet ecological analysis and its implications and outcomes are a matter of nature at least as much as a matter of the social reproduction of a given society. Such ecological insights and analysis' of Marx finally takes him to the point where he starts to present these contradictions and the ecological disasters they brought cannot be solved under capitalist mode of production since it needs them to make its continuity ever infinite.

In the last part, Burkett is more interested in the normative outcomes of such critiques against capitalist mode of production by Marx and more specifically, ecological implications of such normative analysis. So far, he is clear that he has shown that Marx is falsely critiqued for the list that he has presented at the beginning of its book;

> "1. Marx fell prey to a "productivist" or "Promethean" vision under which (a) capitalist development of the productive forces allows human production to completely overcome natural constraints; (b) communism is projected as extending and rationalizing capitalism's

> drive toward complete human domination over nature; and (c) both capitalism and communism demonstrate an inevitable antagonism between humanity and nature.
> 2. Marx's analysis of capitalism excludes or downgrades the contribution of nature to production; this applies especially to Marx's labor theory of value.
> 3. Marx's critique of the contradictions of capitalism has nothing to do with nature or with the natural conditions of production." (1999, p. 1).

And since these criticisms are answered, it is time to present how the communist society in Marx is also an ecological matter especially around the concept of "association" that is built between the workers and also between social metabolism and universal metabolism of nature.

> "For Marx and Engels, the maintenance and growth of working-class combinations represents a triumph of association over competition as a mode of organizing human production. As such, it prefigures the transition to communism, in which capital and its competition are replaced by cooperative-democratic control of production "(1999, p. 209).

In the quotations given above, it can be seen that how the notion of association that is built historically among workers even under and because of capitalist relations of production (such as trades) is a notion that is forceful enough to become something entirely different but at the same time same under communism, also determining the relations between humanity and nature under communism.

Here we can clearly see how the second stage ecosocialism differs itself from the first stage ecosocialism. Unlike the first, Marxist methodology and Marxian thought, especially much refuted labor theory of value does not need to be modified or altered to become ecological but the notion of nature and the wellbeing of soil and earth is already at the center of the labor theory of value and more generally Marxist theoretical framework. From the perspective of metabolic rift, what we can state so far considering only the framework of Burkett's study is that it starts to become more and more clear that considering the major ecological crises' which is faced globally, it becomes slowly clear that Marx's conceptual framework and methodological precision is accurate and sufficient to analyze the nature of what is faced in its entirety. This will become more and more clear as we move forward the second stage socialism and the fierce debate that is grown around it.

Second example is an extraordinary researcher, Andreas Malm and his study on the fossil fuels, *Fossil Capital* ((Malm, 2016), and also (Malm, 2013)). In his analysis of the roots of the current climate crisis from a Marxist point of view, he chooses his subject of research as the transition from water as energy source to the steam power energized by the coal. His insights on the fossil fuel and fossil economy are crucial, worth and necessary to mention here. For Malm, fossil economy is an economy which is in a dynamic of self-sustainment that is also "predicated on the growing consumption of fossil fuels, and therefore generating a sustained growth in emission in carbon dioxide" (Malm, 2016, p. 11). After defining what is fossil fuel then the book starts to ask the question which can be said that resides at the very center of the book and allows Malm to make a provocative claim: How did it occur that the steam engine entered the market and claimed victory over the water as an energy source? When it is thought preliminary, even most of the Marxist scholars would not hesitate to guess that steam engine was victorious at the end due to however any commodity becomes triumphant over any commodity; it is cheaper and easier to produce and use it also as a capital. However, Malm has a different claim which he historically puts forward evidence one by one. At the emergence of the patent of the steam engine and even four decades after it, cotton manufacturers continued to instrumentalize water wheel as their energy source. The reasons for this are that as Malm claimed, water as the energy source continued to "being abundant, cheaper and at least as powerful, even and efficient*"* (Malm, 2016, p. 93) as the steam engine. Even though he puts forth many historical evidence regarding this comparison, probably the one that is most intriguing is certain quotes from the mill owners of the era that is taken from the Factory inquiry, confessing that how the fact that water power is cheaper than steam (Malm, 2016, p. 89). If this was really the situation between the steam engine and water mill, then Malm asks, how did the steam engine become the victorious and became monopoly of the market which became crucial in the emergence of the global ecological crises?

For Malm, this occurred due to two reasons. First being the inability of the water mill owners to organize. As we are aware from Marx, competition as a force that "subordinates every individual capitalist to the immanent laws of capitalist production, as external, coercive laws" (Marx, & Fowkes, & Mandel, 1992, p. 725) is a major factor within the

capitalist relations of production. It was the inability to collectively organize and plan among the mill owners to lose the competition with steam factory owners (Malm, 2016, p. 115) Here in Malm's analysis one of the reasons why water mill owners were defeated in the market was this which is an internal capitalist class politics issue.

Second one again is another matter of class politics. However, this one is not related with the inner competition among the capitalist class but about between worker class and the capitalist steam factory owners class. As a follower of the Marxist methodology, Malm describes how the "control and containment" (Malm, 2016, p. 154) of the working class as a process of proletarianization was easier in the town rather than every water mill which would span all over the countries' riversides, in the form of colonies. In the riversides of the country, for Malm, control over the worker was naturally lesser than the compressed cities. Therefore, productivity was lessening and the production was interrupted from time to time. Another reason which in Malm which can be thought entirely interrelated with the second one is the labor struggle. Due to labor struggle, Factory Act of 1833 was legislated within the parliament and this act limited the working hours. Limitation of the working hours effected water mills in a much worse sense than the steam factories. Reason for this was entirely technical. When the working hours are restricted, steam factory owners were able to intensify the labor per minute of the worker and the loss of productivity was compensated much or less but the water mill could not have done the same since the pace of the river flow is a natural force and could not have been hastened.

So, when Malm's analysis on the regarding matter is analyzed, it can be claimed that the importance of it derives from the fact that he centers class politics on the determinacy of an economic problematique which can be seen purely economic from many perspectives. Just as how Marx has primarily shown in his analysis of "primitive accumulation" (Marx, & Fowkes, & Mandel, 1992, p. 873) in Capital, it is important in this sense that how Malm also show those two fields who are thought entirely separate by liberal bourgeoise theorists are not entirely separate at all. After the market analysis that is entirely ecological, Malm continues to his analysis on regarding how to think of alternatives to capitalist mode of production from a Marxist standpoint. However, for our contextuality, the rest carries no importance.

In our context, the study is crucial for its methodology. Malm's entire analysis of the fossil capital does not force any corrections to Marx in order to make it ecological. The situation between the water mill and the steam engine which an ecological problem at its basis is analyzed within Marxist methodology. Therefore, considering him as an important scholar which belongs to the second stage ecosocialists would be quite accurate since his analysis is both methodologically in the second stage but also analysis of fossil fuel as fossil capital within Marxist methodology without forsaking its ecological basis is terribly important.

The third example before the last one (which will be John Bellamy Foster that will continue to carry great importance for the original contribution of this thesis) is again a very important author that is instrumentalized in this thesis' first part as well; Kohei Saito and his book *Karl Marx's Ecosocialism: Capital, Nature, and the Unfinished Critique of Political Economy*. As we have mentioned before in Introduction and as the headline of the thesis suggests, debate ongoing around the metabolic rift concept is at the very heart of this thesis. Therefore, studies of John Bellamy Foster and Jason W. Moore and how they interact with each other will be the very center of the thesis. This "comparison" will not merely be a textual or phenomenological analysis but as is being built by now it will be historical, economic and very much embedded in the social material historical analysis of the contemporary situation between the capitalist mode of production and the earth. However, Saito's study one might claim that takes the "second stage ecosocialist" claim even further than Bellamy himself. As he states in the very beginning of his study;

> "Although Foster and Burkett have carefully examined various texts by Marx for the purpose of demonstrating the power of his ecological theory, their analyses sometimes give a false impression that Marx did not deal with the topic in a systematic but only in a sporadic and marginal way." (2017, p. 12).

The adjectives that shine out in this paragraph are "sporadic" and "marginal" way. Due to them, it can be said that Saito critiques Foster and Burkett almost as same as the way Foster and Burkett criticize first stage ecosocialists. The reason why he is bringing forth such a critique derives from the fact that he was the first Marxist eco socialist scholar that have studied certain texts and notebooks of Marx which was not studied before; *Marx-*

Engels-Gesamtausgabe, known as *MEGA* (Musto, 2010) which for him these allow researchers to;

> "…allow to trace the emergence and development of Marx's ecological critique of capitalism in a more vivid and lively manner, unraveling various unknown aspects of his astonishingly encompassing project of Capital" (2017, p. 13-14).

These newly studies and drafts of Karl Marx, for Saito, allows researchers who are interested in Marx's historical materialist methodology to see how ecology and totality between societies and nature are at the center of his project even more than Foster and Burkett claimed. For Saito, Foster and Burkett's analysis remains on the "form" terrain but Saito's analysis *"*deals with the interrelation between economic forms and the concrete material world, which is closely related to the ecological dimensions*."* (2017, p. 16).

It is unnecessary here to in depth review how Saito differentiates his own study from Burkett and Foster's for even though critical towards one another from certain aspects, we would not be mistaken to consider both from the same school, second stage eco socialism. Saito in his own claim simply deepens this analysis with the previously unknown texts and studies of Marx that is uncovered recently.

In our context what is crucial is that in Saito's analysis, metabolic rift and Marxist methodology forms the very fundamental principles in general. In his own words:

> "Modern discussions of ecology owe a great debt to Marx's deep insight into the fundamental nature of a society of generalized commodity production. He shows that value as the mediator of the transhistorical metabolism between humans and nature cannot generate the material conditions for sustainable production. Rather, it causes rifts in the process of material reproduction. When value becomes the dominant subject of social production as capital, it only strengthens the disturbances and disruptions of that metabolism, so that both humanity and nature suffer from various disharmonies." (Saito, 2017, p. 258).

So far, we have outlined the contemporary historical materialist studies regarding the concept of metabolism in the capitalist mode of production as the mediator of the relationship between humanity and nature. Reviewing critically these studies were important in order to set the frame for the upcoming section in which the historical materialist approach will be unfolded as the original contribution of this thesis together

with the studies of John B. Foster and Jason W. Moore combined with the historical-economic data. Certain studies of Moore and Foster will be analyzed more in detail than the studies analyzed above. The reason for this is that their contribution to this thesis is not merely in the form of critical literature review but their modes of thought sets the framework of the original contribution of this thesis.

2.2 MOORE AND FOSTER ON THE METABOLISM DISCUSSION

It is John Bellamy Foster's work as the next object of analysis since he can be regarded together with Paul Burkett as the pioneer of the second stage eco socialism. In his article "*Marx's Theory of Metabolic Rift: Classical Foundations for Environmental Sociology"* (1999) and shortly after that in his more in-depth book *Marx's Ecology: Materialism and Nature* (2000) revives the concepts of metabolism and metabolic rift of Marx. In short, metabolic rift is the "*irreparable rift in the interdependent process of social metabolism*" (1981, p. 949) in Marx's conceptualization. Foster revives this and aims to achieve to position this conceptualization in its rightful place among the grand project of critique of bourgeois political economy. According to Foster, Marx after reading the natural sciences of his own day, took the concept of metabolism from Justus Von Liebig and integrated it to the analysis of the relationship between capitalist mode of production and soil it effects. By such analysis, Marx was able to theorize the relationship between capitalist mode of production and earth.

However, before diving deeper into Foster's analysis, we must first situate the 'stages of ecosocialism' in our context to not de-route from the purpose of our thesis. Only by following this periodization of Foster to a certain point, the necessary theoretical-historical intervention that is required to formulate regarding the relationship between humanity and nature within capitalist mode of production centered around the concept of metabolism can be achieved. For Foster, after the second stage eco-socialism, the way in which society-nature relationship is theorized departed in two different routes. First one is the third stage eco socialism which takes the theoretical framework of the second stage eco socialism and applies "it into the realm of ecosocialist praxis through the investigation of the developing ecological rift in the Earth system." (Foster, 2016, p. 396) (e.g Clausen & Clark, 2005). These studies will be of critical importance later within this thesis as well. The second route is the "hyper-

social-constructionist monism now developing in Marxian, post-Marxian and postmodernist circles" (Foster, 2016, p. 396) that for Foster is entirely contradictive with the second stage eco socialism. This theoretical route for Foster, analyzed the relationship between nature and humanity with concepts such as "Gaia" (Latour, 2017), "Cthulucene" (Haraway, 2015) or with the "production of nature" (Smith, 2010: Castree, 2015) which focuses on urban and urbanization either idealistically, monist or entirely textually. What they have in common is that they are entirely not materialist and therefore idle academic fetishistic theorizations. This thesis is entirely in agreement with such buildup of the theoretical mapping of the situation. However, there is one thinker which has gotten himself into a fierce debate between John Bellamy Foster regarding matters of methodology, history, economy and philosophy. It is this thesis' claim that, in our contemporary economic and political global situation which has led to the birth of global climate crises', it is in this debate which has given fierce critique after critique towards one another, one can reach to precise and accurate theoretical framework and tools to analyze the contemporary relationship between capitalist mode of production and earth. Therefore, from this point forward, after reviewing both thinkers' perspectives regarding the matters of capitalist mode of production, its history and their contemporary framework a Marxist synthesis of the two will be reached and presented as the original contribution. This synthesis will not be achieved by simply textual comparison as underlined before time and time again but by economic data, material analysis of the history of transition from feudal mode of production to capitalist mode of production and finally the political implications of such synthesis will be discussed.

First and foremost, John Bellamy Foster's studies regarding metabolism and metabolic rift will be reviewed and analyzed, especially one particular study of his. Following his research, Jason W. Moore's groundbreaking study of capitolecene will be the subject of research. After such, their criticisms towards one another will be discussed and then they will be both put to "ruthless criticism of all that exists" (Marx, 2000, p. 200) of historical materialist tradition will be applied to both thinkers to achieve a historical materialist analysis of the contemporary relationship between capitalist mode of production and nature. After achieving a semi-normative ground through such a criticism, what can this normative ground present to us politically will be discussed.

To begin, Foster's groundbreaking book needs to be analyzed in depth; *Marx's Ecology*. At the very beginning, Foster makes the claim of the book quite clear:

> "The argument of this book is based on a very simple premise: that in order to understand the origins of ecology, it is necessary to comprehend the new views of nature that arose with the development of materialism and science from the seventeenth through nineteenth centuries." (2000, p. 1).

For Foster, if such a goal is to be achieved, two prominent thinkers were going to be eminent. These thinkers were Marx and Darwin. However, even though Darwin plays an important role in the book as well, it is Marx that is much more at the center of it since one of the primary goals of the book is also to show how Marx's thought considers the evolutionary process' of human societies and the rest of the nature under the principle of totality, therefore criticisms towards him for being un-ecological are mistaken and product of a certain ideological paradigm. When Foster sets on the path with such purpose, he also realizes that Epicurus, whom Marx wrote his doctoral thesis on is as crucial for Marx as any other thinker.

In the first chapter, John Bellamy Foster takes on an eye-opening, bold task. How can one analyze the notion and more in general philosophy of materialism beginning with the Ancient Greece? In order to achieve this, first he sets out three branches of materialism which function together but separately. These are;

> "(1) ontological materialism, asserting the unilateral dependence of social upon biological (and more generally physical) being and the emergence of the former from the latter;
> (2) epistemological materialism, asserting the independent existence and transfactual [that is, causal and lawlike] activity of at least some of the objects of scientific thought;
> (3) practical materialism, asserting the constitutive role of human transformative agency in the reproduction and transformation of social forms." (2000, p. 1).

These three branches together, for Foster, allows one to understand and functionalize what can be called "materialist conception of history". In the first chapter, through this lens of materialist conception of history, Foster tries to analyze how the ecological thought evolved since Ancient Greece. In this task of building a line of thought from Ancient Greece until Marx, first thinker he encounters is Epicurus. The reason why he chooses Epicurus is the reason that in Marx's understanding of the history of philosophy,

the materialist line of thought, separated from sensualism or empiricism owes its existence first and foremost to Epicurus.

> "Philosophy, as long as a drop of blood shall pulse in its world-subduing and absolutely free heart," Marx declared, "will never grow tired of answering its adversaries with the cry of Epicurus: 'Not the man who denies the gods worshipped by the multitude, but he who affirms of the gods what the multitude believes about them, is truly impious.'" Impiety here consists in the denial both of human self-determination and freedom, and of the mortal, material basis of life" (2000, p. 5).

In order to link the materialist traditions of the Marxist philosophy and Epicurean primitive materialism, first notion that Foster attacks to is the premise that Marx's doctoral thesis that is centered around Epicurus is a parenthesis in his grand philosophical framework. Foster reads it as an earlier attempt to link Epicurean materialism with the Hegelian aspects of Marx (2000, p. 33) To form such link, Foster instrumentalizes the atom hypothesis of Epicurus and through this link he first mentions Thomas Hariot as the second ring of the chain. In one of his letters which he explains the dynamics of how optics works Thomas Hariot, an important actor of the English Scientific Revolution, wrote that;

> "I have now led you to the doors of nature's house, wherein lie its mysteries. If you cannot enter because the doors are too narrow, then abstract and contract yourself into an atom, and you will enter easily. And when you later come out again, tell me what wonders you saw." (2000, p. 40).

His ideas were regarded as heresy and crime and was arrested for being a follower of Guy Fawkes which was plotting to blow up the English Parliament, famously known as The Gunpowder Plot. From Hariot, the next chain of the ring in this Epicurean line of thought for Foster was Francis Bacon and his emphasis on Ancient Greek atomism. In his own words which he compares Epicurean atomism with Aristotle;

> "For it is a thousand times more credible, that four mutable elements, and one immutable fifth essence, duly and eternally placed, need no God, than that an army of infinite small portions or seeds unplaced, should have produced this order and beauty without a divine marshall." (2000, p. 41).

In Bacon what Foster appropriates with the quote above and through the rest of Bacon is the materialist, evolutionary with the connotation of "transmutation of species" a "beacon

of enlightenment" (2000, p. 44) which can form the third ring of the materialist line of thought.

The other thinker which is linked to the chain before Marx is Isaac Newton. Foster claims that Isaac Newton whom his weight on the scientific revolution with his publication of the *Phiilosophiae Natnralis Principia Mathetnatica* (2009) is indisputable, built his line of thought especially in his earlier ages found the roots for his own thought in Epicurean atomism. However, in his later works, Foster believes that this atomism became less and less due to being Epicurean became more and more religiously problematic and therefore dangerous.

In his most famous work *Principia (*1999*)*, Newton was "offering a particulate, or atomic, view of matter, did so only after this was widely accepted within science, which had been inoculated against the worst heresies of the Epicureans" (2000, p. 45). Therefore, Epicurus, even under regulations against his thought, continued to be a basis for the materialist and enlightenment beacon for the many of whom revolutionized the scientific method, especially in British Scientific Revolution.

For Foster, the most critical aspect in forming his theoretical framework is in detail explanation between Marx and Epicurus since *"*for Marx, Epicurus was "the greatest representative of the Greek Enlightenment, and he deserves the praise of Lucretius.*"* (2000, p. 51) Other than many different aspects, for Marx, what was mainly distinctive and crucial in Epicurus' philosophy was that "it was opposed both to the determinism of Democritus' physics and to the ideological principles of religion" (2000, p. 56). Even though its quiet materialist vein, one must not forget that at the time Marx wrote his doctoral thesis on Epicurus, he was still much like the young Hegelians such as Bruno Bauer, therefore the doctoral thesis has many aspects which can be regarded as Hegelian especially in its conceptualizations (Though for Foster, it was not entirely Hegelian, it was in "substance" (2000, p. 60) a pathway for the future studies and methodologies of Karl Marx).

The first chapter of the book was crucial for our context since Marx's methodological roots were never before Foster was analyzed in his relationship with Epicurus within this depth. Foster, thanks to this perspective, was able to find the foundation for not just this book but the many of the books that will follow. Reason for this is that Epicurean root and the line of thought which touched upon Francis Bacon and Isaac Newton, allowed Foster to analyze Marx within relation to natural sciences unlike anyone before (Unlike Kohei Saito perhaps and his fundamental analysis which includes MEGA that was mentioned before). Henceforth, it can be stated that the discussion of this thesis owes very much to the study of John B. Foster and what allowed Foster to arrive the conclusion he arrived which is also critical for this thesis was his study of ecology and Marx in this book therefore making the detailed analysis of this book crucial for the context of this thesis as well.

Following three chapters onwards[3], Marx's evolution of thought, how he became interested with political economy and therefore not a young Hegelian anymore is revealed. The Really Earthly Question starts with mentioning Marx's article, *Debates on Law of Thefts of Wood* (2017) and marks it as the point where Marx became more and more interested in political economy. The Parson Naturalists section is related with how not just Marx but also Charles Darwin's entire framework could be thought against "parsonic naturalism of Thomas Malthus and Thomas Chalmers, and of the entire attempt to insert ideological principles into nature—and was to celebrate Darwin principally for his triumph over the ideological view of nature." (2000, p. 82). For Foster's project, the critique of Malthus was not merely about his unsupportable "arithmetical food ratios" (Kovats-Bernat, 2001) hypothesis. It was more of a methodological theoretical warfare. His main aim for his book on how showing Marxist understanding of nature and society is not teleological but a dynamic materialist process. For Foster, when such an understanding of Christian teleological theology met with Malthusian political economic views, an enmity towards both nature and society was inevitable to be born. Therefore, a radical and direct criticism of such a perspective was crucial in Marx's formulation of his point of view.

[3] The Really Earthly Question, Parson Naturalists and The Materialist Conception of History

The next chapter titled, The Materialist Conception of History, defined by its name presents how the materialist conception of history is formulated in Marx. For Foster, this methodology which is also explained before in this thesis is formulated by;

> "…critique of Malthus with respect to land and of Pierre Joseph Proudhon in relation to industry—along with the break with the contemplative materialism of Feuerbach—become defining moments in the development of both Marx's materialist conception of history" (2000, p. 82).

This materialist conception of history, throughout the chapter, is finally linked to the separation of town and country and alienation from nature notions. With these notions, Foster presents how materialist conception of nature and materialist conception of history with a radical critique towards parsonic teleological naturalists cannot be thought without the notion of totality and separately from one another in Marx. However, all the chapters before chapter five and six were merely transitional chapters towards them which is also entirely related with the context of this thesis as well. Therefore, the next two chapters will be analyzed in much more detail unlike the chapters before so that Foster's original analysis on metabolic rift and metabolism under capitalist mode of production that gave birth to second stage eco socialism can be better understood since without in detailed analysis of the relevant aspects, metabolism between the human production and nature under capitalist of production in the contemporary text cannot be apprehended appropriately.

The fifth chapter is titled The Metabolism of Nature and Society. Chapter starts with the analysis of Capital and Foster claims that, the analysis' of Marx until Capital were fragments of his materialist conception of history and materialist conception of nature which could be traced back to his Epicurean PhD thesis. However, he also claims that such a claim is already achieved in some sense by Paul Burkett's book, *Marx and Nature: A Red and Green Perspective*. Marx's economic value analysis is already tied to his materialist conception of nature by Paul Burkett (2000, p. 282). However, Foster's original perspective derives from linking Marx's ecological and political economic view with to his Epicurean Phd thesis. On his unique perspective, Foster focuses on the concept of metabolism (stoffwechel) and in his own words:

> “It was in Capital that Marx's materialist conception of nature became fully integrated with his materialist conception of history.1 In his developed political economy, as presented in Capital, Marx employed the concept of "metabolism" (Stojfwechsel) to define the labor process as "a process between man and nature, a process by which man, through his own actions, mediates, regulates and controls the metabolism between himself and nature." Yet an "irreparable rift" had emerged in this metabolism as a result of capitalist relations of production and the antagonistic separation of town and country. Hence under the society of associated producers it would be necessary to "govern the human metabolism with nature in a rational way," completely beyond the capabilities of bourgeois society.” (2000, p. 83).

In short, Foster defines metabolism and metabolic rift in Marx as the prime mediator between humanity and nature which can only be understood if it is apprehended with the concept of labor together. With such conceptual framework, Marx was no longer after merely contemplative or philosophical answer regarding the relationship between human nature and nature itself but he was now onto certain political economic questions: These questions can be named as following; how the capitalist ground rent should be analyzed regarding metabolic rift? How can we understand the extraction of surplus from the producers in relation with the metabolic rift? And the how can the Malthusian theory of population might be regarded again in relation with metabolic rift? All these questions have one certain phenomenon at their center: the ecological question therefore the problematique of metabolic rift in relation with capitalist mode of production. It can easily be observed that Marx is not only related with abstract philosophical questions but concrete, real-world- political economic matters that Marx regards himself from now on.

His first target is the Malthus and his population-overpopulation problematique. As usual, Marx realizes a form of critique towards Malthus as his methodology requires him to do so, this criticism in one word is: historicization. Marx claims rightfully that Malthus fixates a certain numerical data and hypothesis in which while population is expanding geometrically, food source is only rising arithmetically (Malthus, 2015, p. 79) Marx cleverly asks the question; even if Malthus were right, in which mode of social production and reproduction does this dynamic function? This formula would find different consequences if it is occurring in capitalist mode of production or in feudal mode of production. He does not merely stop his mode of thought there and continues to materialize his criticism and shows how in capitalist mode of production, a surplus of population is not merely related with a surplus of grain stocks like the previous mode of productions but the phenomena is also related with “the fundamentally by the relations of

production that made the continual existence of such a relative surplus population necessary for the system." *(*2000, p. 143*).* However, for Marx, a criticism of Malthusian theory of overpopulation cannot be merely produced from such perspective. Marx knows that Malthusian overpopulation theory finds its roots on the classical theories of differential rent which belongs to Ricardo and James Anderson. Without a concrete and materialist critique of the classical theories of differential rent, Malthus and his parsonic naturalism cannot be criticized, disrupt, and answered.

However, many of the studies that focus on Marx's critique of classical theories of differential rent, they tend to focus on his critique of Ricardo. Foster, with his academic integrity and precision, knows that Marx's critique is more of a critique of James Anderson compared to Ricardo since he was at the time in a much more advanced position than Ricardo himself.

James Anderson, in his book, in "*An Enquiry into the Nature of the Corn"* (1777), defines rent as;

> "(Rent) was a charge for the use of the more fertile soils. The least fertile soils in cultivation generate an income that simply covers the costs of production, while the more fertile soils receive a "certain premium for an exclusive right to cultivate them; which will be greater or smaller according to the more or less fertility of the soil" (2000, p. 143).

Here as we can see, rent is a notion especially in agriculture that is related with "differential fertility" of the soil. What needs to be focused on this analysis of rent is its changeablity attribute, that it's not a fixed concept here. This adjective will be crucial since it will be of great importance when compared with Ricardo's theory of rent.

Ricardo's theory of rent, in his own words defined as "that portion of the produce of the earth, which is paid to the landlord for the use of the original and indestructible powers of the soil." (2000, p. 145). Therefore, Anderson's analysis resembles a primary feature of the Marxian methodology, that not only the structures of the societies were historical, meant that they were capable of change but also the improvement or the degradation of agricultural soil is also historical, therefore changeable. In Marx's analysis of the productivity of the soil and differential rent related with it, contemporary natural sciences

were crucial as can be observed. However, with Liebig, as Foster shows, Marx had learnt about the soil that was not known to him before by any economist up until then. As he presents in his own words that, prior to Liebig;

"the actual natural causes for the exhaustion of land ... were unknown to any of the economists who wrote about differential rent, on account of the state of agricultural chemistry in their time." (1999, p. 373).

As underlined in this thesis before, the social historical context of the scientific discoveries of Liebig was parallel to the process called as "second agricultural revolution" which can be defined as "…occurred over a shorter period (compared to the first one) (1830–80) and was characterized by the growth of a fertilizer industry and a revolution in soil chemistry…" (1999, p. 374). This process was the main ecological issue, both for the earth and also for the capital itself since it undermined the agricultural production in the 19th century. The need to meet the demand of the fertilizers over Europe and Americas was insatiable and under-provided. Such an interruption in the capitalist valorization cycle of the agriculture, caused tremendous amount of panic for the capitalist class which in the end led to the plundering of *"*Napoleonic battlefields of Waterloo and Austerlitz and reportedly dug up catacombs, so desperate were they for bones to spread over their fields. The value of bone imports (to use as fertilizers) to Britain skyrocketed from £14,400 in 1823 to £254,600 in 1837. The first boat carrying Peruvian guano (accumulated dung of sea birds) arrived in Liverpool in 1835; by 1841 1,700 tons were imported, and by 1847 220,000." (Ernle & Hall, 1937)

The statistics show the amount of the rise in the demand for the fertilizers around Europe and North America. Therefore, after Marx read Liebig and his studies on the regarding subject, he realized that capitalist mode of production was not unsustainable only for the social class relations and the class politics it gives birth to, it was also unsustainable for the way in which it interacts with earth and soil through agriculture especially in Marx's time. Foster presents two examples on why Marx started to believe and prove capitalist mode of production and its unsustainability:

> "1) the widening sense of crisis in both European and North American agriculture associated with the depletion of the natural fertility of the soil—a sense of crisis which was in no way alleviated, but rather given added impetus, by the breakthroughs in soil science; and (2) a shift in Liebig's own work in the late 1850's and 1860's toward a strong ecological critique of capitalist development." (2000, p. 151).

With the economic statistics provided above and the Liebig's theoretical framework, Marx concludes that the rift that is occurred between social and natural metabolism, was not going to be repaired under capitalist mode of production but only was going to deepen within time. The rift though, was not merely related with the fertilizer demand and its degradation of the soil for Liebig. Another phenomenon which was also crucial was how the situation ongoing in the agriculture was deepening the separation between town and country.

> "In his influential Letters on the Subject of the Utilization of the Municipal Sewage Liebig himself insisted—relying on an analysis of the condition of the Thames—that organic recycling that would return to the soil the nutrients contained in sewage was an indispensable part of a rational urban-agricultural system." (2000, p. 154).

Reading and studying such illuminating insights of Liebig, Marx was able to formulate the situation of the agricultural soil in particular, human-nature relationship in general and Foster summarizes it as;

> "Under the influence of Liebig, whom he studied attentively—making extensive extracts from Liebigs work in his scientific notebooks—Marx was to develop a systematic critique of capitalist "exploitation" (in the sense of robbery, that is, failing to maintain the means of reproduction) of the soil. Hence, both of Marx's two main discussions of capitalist agriculture ended with explanations of how large-scale industry and large-scale agriculture combined to impoverish the soil and the worker" (2000, p. 154).

As it is known, Marx is widely known with his analysis of the exploitation of the labor under capitalist mode of production with the purpose of the production of surplus value. As we can see in Marx through Foster, this exploitation was not separable from the robbery and exploitation of the soil and therefore earth itself. It can be stated that just as the capitalist mode of production forms a rift within the subject of humanity as capitalists and workers, it also separates humanity as a general subject from the nature itself.

The key feature in Marx's both texts that were cited before were theoretically and methodologically is its emphasis in notion of "rift" between social and natural metabolism

under capitalist relations of production. By examining concrete relations of production within agriculture in the capitalist mode of production, Marx formulates a rift which can be instrumentalized for the entire relationship between humanity and nature under capitalism. Marx himself, furthers this analysis of rift beyond agriculture, claiming that logistics of capitalist mode of production is also a manifestation of such a rift since commodities such as food and fiber and their waste when they are carried in long routes and stripped from the soil in which they were produced, therefore leaving their waste in an entirely different towns or cities, also furthers such an irreparable rift as well (2000, p. 156). Technological developments were not going to be enough to repair this rift as well for Marx, since the root of the rift is positioned in the social relations of production.

The reason why in Foster's claim that the concept of metabolism is so critical in Marx is that it is interrelated with the concept of labor which is one of the critical concepts of Marx. Metabolism (stoffweschel), in German meant "material exchange", which referred to the way humanity forms the nature around her and her nature as well through her labor. In Grundrisse, the philosophical aspect of this formula was stated much clearer compared to Capital;

> "Labour is, first of all, a process between man and nature, a process by which man, through his own actions, mediates, regulates and controls the metabolism between himself and nature. He confronts the materials of nature as a force of nature. He sets in motion the natural forces which belong to his own body, his arms, legs, head and hands, in order to appropriate the materials of nature in a form adapted to his own needs. Through this movement he acts upon external nature and changes it, and in this way he simultaneously changes his own nature It [the labor process] is the universal condition for the metabolic interaction [Sloffwechsel\ between man and nature, the everlasting nature-imposed condition of human existence." (2005, p. 527).

Foster, does not forget to mention how the concept is not utilized only in the critique of the capitalist mode of production but also in his future communist society (2000, p. 159) Onwards, Foster analyses the birth of the concept of metabolism even before Marx. However, it will not be repeated here since the emergence of the concept was analyzed through Kohei Saito's groundbreaking work, even more in-depth since Saito was able to analyze *MEGA*.

In the related chapter of the book, Foster connects his analysis of metabolic rift in Marx with the notion of a more contemporary concept; sustainability. It can be said that the reason for him opening such an argument is exactly same as why he and Burkett alongside him are the pioneers of the second stage of ecosocialism; That in Marxian analysis of nature-society, Marx has given the enough theoretical tools for us to analyze the contemporary ecological crises' as well since the concept of ecological crises is entirely linked with the notion of sustainability of earth.

He opens the discussion of sustainability with emphasizing a sentence which Marx has written before; For Marx, human existence on earth was on its basis depended on one critical notion. That notion is the obedience and harmony that is created by humanity to the "everlasting nature-imposed conditions*"* (Foster, 2000, p. 163). Foster claims that such a critical emphasis of Marx, allowed him to make an analysis of the human condition and reproduction of its own conditions to be in harmony with the conditions of nature that is truly superior to the first one. He visits the notion of "separation between town and country" and Marx's insights regarding the situation to prove that what we call as sustainability today was already essential to Marx when quoting Engels and his *The Housing Question* (1935) with the related context in which he says:

> "…in London alone a greater quantity of manure than is produced by the whole kingdom of Saxony is poured away every day into the sea with an expenditure of enormous sums." (1935, p. 133).

To be fair to his search of sustainability in Marx regarding the separation between town and country, he quotes another sentence from *Capital Vol III*, which now the notion of the separation between town and country is directly linked with the notion of metabolism. For Foster;

> "Marx was adamant in insisting that the "excrement produced by man's natural metabolism," along with the waste of industrial production and consumption, needed to be returned to the soil, as part of a complete metabolic cycle." (2000, p. 163).

First of all, about the separation between town and country regarding the notion of sustainability, Marx shows how his analysis of a certain feature of capitalism is entirely sustainable. However, Foster puts it front of the reader an even more substantial claim of

Marx regarding the notion of sustainability. It can easily be claimed that our contemporary definition of sustainability can be as organization of production and consumption of human civilizations that care for both present and the future generations. The emphasis in this definition for Foster is the critical notion of "future generations". Foster shows how the importance of the healthy reproduction of the future generations was also crucial in Marx, in the same contextuality even. As Foster quotes once again;

> "The way that the cultivation of particular crops depends on fluctuations in market prices and the constant changes in cultivation with these price fluctuations—the entire spirit of capitalist production, which is oriented towards the most immediate monetary profits—stands in contradiction to agriculture, which has to concern itself with the whole gamut of permanent conditions of life required by the chain of human generations." (Marx, 1981, p. 754).

The healthy reproduction of the future generations of humankind is as essential as the healthy reproduction of all life on earth from the perspective of sustainability and as we can see from Foster that Marx was very well aware of it. The central contradiction of capitalist mode of production which Marx formulated, the contradiction between the use value and exchange value, allows Marx to formulate a precise definition of sustainability which can be applied to even our contemporary context.

Yet, For Foster, it is not simply enough to point out these notions to prove that Marx in its essence was a thinker that formulated a methodology that allowed him to be a thinker that values sustainability. He is very aware that certain thinkers after Marx, critiqued him of being inconsiderate to the notions of sustainability and these criticisms will have to be answered (which he wrote an entire new book later on with Burkett (Foster & Burkett, 2016) to answer these claims even more in-depth).

First criticism he answers in shortly is that Marx was blind to the scientific developments regarding the matter of entropy law and its consequences regarding the energy exchange between human societies and nature. This criticism towards Marx was mainly produced and developed by Juan Martinez Allier (Alier & Naredo, 1982). These critique toward Marx were based upon the two letters of Engels to Marx (Marx, 2006), which were critical of the work of Sergei Podolinsky, a pioneer in the scientific study of the entropy law. However, in these letters Engels was not in total rejection of the work of Podolinsky but

merely critical for his inability to acknowledge the importance of fossil fuels and agriculture: Foster writes that Engels;

> "…criticized the shortcomings of his (Podolinsky) analysis of energy transfers, which failed to take into account energy transferred by fertilizers in agriculture and the importance of fossil fuels. In general, Engels believed that the obstacles to calculating accurately the energy transfers involved in economic transactions were so enormous as to make them impractical. This was far from constituting a rejection of the entropy law." (2000, p. 166).

Marx's lifespan was not long enough to reply to this letter of Engels. Therefore, Allier's critique is not substantial since its basis cannot prove that neither Marx nor Engels were in denial of the work of Podolinsky, which he himself was also a follower of the Marxist methodology.

Another notion in which Foster defends Marx against false criticisms of being a thinker that neglects the sustainability of earth is Marx being allegedly a thinker that saw and perceived nature as a mere infinite gift to the humankind. This criticism of Marx can only be made sense with Sartre's words:

> "I have often remarked on the fact that an "anti-Marxist" argument is only the apparent rejuvenation of a pre-Marxist idea. A so-called "going beyond" Marxism will be at worst only a return to pre-Marxism; at best, only the rediscovery of a thought already contained in the philosophy which one believes he has gone beyond." (2004, p. 14).

When we take aside the Sartre's general framework and its contradictions with Marxism in general, Sartre's diagnosis is a prime example in our context here as well. The classical political and economic theorists in which Marx critiques often stated that nature is a free gift and Marx only diagnosed that in capitalist mode of production, capital sees earth as a free gift. It was not a notion in which Marx defends but only a diagnosis of the capitalist mode of production formulated by Marx himself in which he critiques in his entire lifespan. As Foster shows as well;

> "To be sure, Marx agreed with classical liberal political economy that under the law of value of capitalism nature was accorded no value. "The earth," he wrote,"...is active as an agent of production in the production of a use-value, a material product, say wheat. But it has nothing to do with producing the value of the wheat"1 " The value of the wheat, as with any commodity under capitalism, arose from labor. For Marx, however, this merely pointed to the very narrow, limited conception of wealth associated with capitalist commodity relations and a system built around exchange value. Genuine wealth, he argued, consisted of use values—the characteristic of production in general, transcending its specifically capitalist

> form. Indeed, it was the contradiction between use value and exchange value engendered by capitalism that Marx considered to be one of the foremost contradictions of the entire dialectic of capital." (2000, p. 167-8).

As Foster presents in detail, Marx was not a thinker who saw the earth and soil as free gift to the producers in his analysis but only diagnosed a criticism within capitalist mode of production that for capital, soil functions as such and his criticisms towards capitalist agriculture and a theoretical framework explained by the metabolic rift can prove that this notion of free gift is an object of critique rather than a position to defend. In his own words, it would be either a scientific disintegrity or laziness to claim that a thinker who puts forward an allegory such as "labour is the father of material wealth, the earth is its mother." (Dooley, 2005) sees the earth as a free infinite gift to produce capitalist wealth.

The last criticism made towards Marx which Foster answers is that Marx believed that all the crises produced by capitalist mode of production whether social or natural will be solved by the notion of abundance in all levels in the post-capitalist society to come, namely communism. However, once again this is a critique towards Marx which is formulated through a superficial study of his works. It is true that the notion of abundance in the communist society to come plays a significant role (for a further reading of a study related with it look for (Bastani, 2019), but in the field of agricultural production which plays the central role in volumes of Capital it is not the concept of abundance in expenditure of the degradation of the soil that is determinant factor in Marx but;

> "Agriculture in general, Marx argued, "when it progresses spontaneously and is not consciously controlled ... leaves deserts behind it—Persia, Mesopotamia, etc., Greece." (Foster, 2000, p. 169).

The notion of "consciously controlled" is critical here for the context of this thesis. What Marx aims in his future vision of communist society is not the unplanned abundance of agricultural products in favor of the human luxury but a harmony between humanity and nature, in particular soil, that can be the only path towards the healthy reproduction of the future generations and earth itself.

The notion of sustainability is crucial in Foster's analysis of Marx as one can see. Even though the notion of sustainability is not directly the focus of our thesis, it is a notion

which is crucial for the environmental politics and it is also indirectly related with this study since the relationship between humanity and nature is either sustainable or not. Therefore, the notion of sustainability will not be discussed more in detail but its emphasis on Foster and Marx had to be shown even as a short discussion.

Before ending this chapter, Foster does not forget to mention a concept which is critical in this metabolic rift framework, the concept of alienation. In our comparison with the Jason W. Moore, this notion will carry a much greater importance as well but it is also crucial that Foster does not end the chapter without mentioning it by*;* "In all of this, however, Marx continually insists that the alienation from the earth is sine qua non of the capitalist system." (2000, p.175). The notion of alienation from the earth is essential when considered the notion of metabolic rift. It is this thesis' claim that also the notion of metabolic rift allows the alienation from the earth notion that belongs to Marx to have a scientific basis which functions both as a philosophical and also an economic notion. This matter will be touched upon once again.

Right before ending the book, Foster briefly mentions the important contributions of Engels to the ecological aspects of historical materialist method and the importance of *Dialectics of Nature* and his works which are considered by many to evolutionary biology through the prism of the methodology that is mentioned here again and again (e.g., Engels, 1950). Later on, after briefly mentioning the ecological Marxist thought after both Marx and Engels, Foster summarizes the surroundings of the Marxist thought that led him to form the ecological aspects of his own grand project; that is the critique of bourgeois political economy. In Foster's words;

> "Marx was deeply influenced by the non-deterministic materialism that he thought he had found in Epicurus (but couldn't quite prove given the sources then available). He transformed this view while absorbing it within his larger dialectical synthesis, which also included Hegel, political economy, French socialism, and nineteenth-century evolutionary science. Epicurus, according to Marx, had discovered alienation from nature; but Hegel revealed the alienation of human beings from their own labor, and hence from both society and the specifically human relation to nature. Marx forged these insights, together with the critical knowledge obtained from Ricardo's economics, Liebig's chemistry, and Darwin's evolutionary theory, into a revolutionary philosophy that aimed at nothing less than the transcendence of alienation in all of its aspects: a world of rational ecology and human freedom with an earthly basis—the society of associated producers." (2000, p. 256).

As we can observe in this brilliantly built summary of his study, we can once again observe the importance of the concept of alienation for all the metabolic rift theory within Marx which will be put to subject in here in detail as well.

Foster's analysis of the metabolic rift that is caused by capitalist relations of production does not end with this study. It actually merely starts with this comprehensive book. After this book however, Foster does not modify his theoretical framework but only intensifies and furthers it in analyzing the ecological catastrophes in the globalized in the form of *Empire of Capital* (Wood, 2005) world that we live in. He goes on to search what is the meaning of this metabolic rift which manifests itself philosophically as the alienation from nature, economically as the robbery of the agricultural soil from its nutrients in Marx's time and as politically, consequences and outcomes of it. His main study however can be said as the first one which is how economic and ecological manifestations of the metabolic rift manifest themselves economic and ecologically. Four fundamental studies can be mentioned regarding this tradition: *The Ecological Rift: Capitalism's War on Earth* (Foster, Clark & York, 2011), *Capitalism and Ecological Rift: The Robbery of Nature* (Foster & Clark, 2020), *Socialism and Ecology: The Return of Nature* (Foster, 2020) and finally *Capitalism in the Anthropocene: Ecological Ruin or Ecological Revolution* (Foster, 2022). Yet, it would be entirely meaningless to review and go through all these studies as detailed as we have done for *Marx's Ecology*. The reason for this is that what Foster and his colleagues aim in these studies is furthering the research that they put forward in *Marx's Ecology*. Theoretical additions and modifications are not qualitatively different enough to go through in as detailed as that is done for *Marx's Ecology*. He takes Marx's theoretical framework of metabolic rift and conducts historical and economic research on how this rift kept functioning until our contemporary context. However, we cannot entirely forsake these studies and they are needed to be looked upon. Each of the analysis of these studies which will be given below has to be read with what is given above in *Marx's Ecology* regarding the notion of metabolic rift under capitalist mode of production in order to comprehend the meaning of the notion and what it signifies. Its meaning which will construct a contradiction with Mooreian 'metabolic shifts and one singular metabolism' and what their contradiction means for the context of our thesis can only be made sense if it is kept in mind. Therefore, the reviews of these

books will function in some sense as a book review, but its purpose is not a mere book review with didactical purposes but only to be able to make sense at the end the claim of this thesis. Without a certain understanding of how the concept was instrumentalized especially in Foster and Moore in their studies, the criticism and the synthesis which is produced thanks to them cannot be understood.

For instance, in *The Ecological Rift: Capitalism's War on Earth*, Foster modifies a quantitative aspect of the theory of metabolic rift. It is a simple modification however the consequences of such a modification opens up new terrains of research for Foster, Clark and York which they undertake brilliantly and precisely. Let us analyze the modification that they do:

> "Three processes have already crossed their planetary boundaries: climate change, the nitrogen cycle, and biodiversity loss. Each of these can therefore be seen, in our terminology, as constituting an extreme "rift" in the planetary system. Stratospheric ozone depletion was an emerging rift in the 1990s, but is now stabilizing, even subsiding. Ocean acidification, the phosphorus cycle, global freshwater use, and land system change are all rapidly emerging global rifts, though not yet extreme. Our knowledge of these rifts can be refined, and more planetary rifts may perhaps be discovered in the future. (2011, p. 14-5).

As we can observe, in close interaction with our contemporary climate natural science, Foster turns his gaze to the "ecological tipping points" (Lenton & Röckstorm, 2019, para. 1) as planetary boundaries just as Marx formulated his analysis of metabolic rift by turning his gaze to the developments in the latest research on agricultural chemistry. Foster looks further upon and sets the boundary in the rift planetary. He now claims that the rift is entirely global anymore and there have been formed multiple rifts. He mentions in the quote above only three rifts that is already crossed by now however there are even more rifts in which he does not forget to count (2011, p. 11-14). With such an advancement, the theoretical framework of Foster remains loyal to the Marx himself however its global political economic outcomes from the ecological perspectives became more clear areas for future research. Foster, with such modifications, in his own claim, presents us with the necessary tools to analyze the ecological catastrophes in which we live in today thanks to capitalist mode of production, in its totality which does not forsake natural science, political outcomes and economic foundations. This totality is also one of the terrains in which he remains loyal to Marxist methodology of historical materialism.

In the rest of the book, Foster and his colleagues looks upon how capitalist mode of production deepens these rifts (2011, p. 51), how do certain ecological economic paradoxes function under these rifts (2011, p. 167) and finally how can these global rifts be mended and what is the alternative way out of these planetary rifts (2011, p. 375).

In *Capitalism and Ecological Rift: The Robbery of Nature*, Foster and Clark again develops a notion that is originally formulated in Marx's Ecology, being, what are the consequences of nature being appropriated as "free gift" that causes "robbery" and "expropriation" of nature. While in search of such consequences, they discuss certain notions such as Marxist food theories (2020, p. 103) and criticism towards Marxist political economy and especially the labor theory of value from ecological perspectives (2020, p. 211).

Next book, *Capitalism in the Anthropocene: Ecological Ruin or Ecological Revolution,* carries one great importance in our own context. Foster utilizes the concept of Anthropocene in almost all his studies. This one book is the one that he sets forth his approach to the concept Anthropocene in detail (2022, p. 327). The reason why this is crucial in our text is that the debate between the "Anthropocene and Capitolocene" will be of great importance in the comparison between Foster and Moore's line of thought in the context of metabolism under capitalist mode of production.

In the last book to be mentioned, *Socialism and Ecology: The Return of Nature,* Foster once again develops a line of thought that resembles the one he formed in Marx's Ecology. As discussed above, in Marx's Ecology Foster forms a line of thought from Epicurus to Marx. In this study, he enriches this line of thought and analyzes other socialist thinkers which are quiet rich in the ecological thought.

All of these studies, as I have stated in the very beginning, find their roots in the Marxist analysis of the dialectical union between earth and labor for the sake of the reproduction of humankind. For Foster, what Marx have observed with transition to capitalist mode of production is that a rift that is irreparable under capitalist mode of production has been opened between nature and humanity. The existence of this rift is accepted as given in the

entirety of his works. It is this metabolic rift and the methodological consequences of this rift that is at the center of this thesis. In order to achieve our aim which is a comprehensible historical framework of the relationship between capitalist mode of production and nature under contemporary capitalist relations of production in Marxist methodology, an alternative to Foster's methodological and historical framework but at the same time also claims itself to be Marxist but in an entirely contradiction with Foster's framework needs to be examined as well. Without Jason W. Moore's critiques towards Foster and in turn Foster's critique towards Moore, our aim cannot be achieved. After such a comparison, it can be seen that what Foster labels as "third stage ecosocialism" which can be defined as "took this new theoretical perspective (second stage ecosocialism) into the realm of ecosocialist praxis through the investigation of the developing ecological rift in the Earth system" (2016, p. 396) is entirely dependent on the differentiation between Foster and Moore. The scientific researches' accuracy and sharpness within this Marxist line of thought that has been made until now and will be made later will be dependent on how a certain theoretical synthesis among Foster and Moore produced truthfully. Therefore, an equally dive into the Moore's line of thought is a must have.

Jason W Moore is an environmental historian and historical geographer. As the titles environmental historian and historical geographer signifies, his studies are mainly about the relationship between what is natural and what is social throughout the history of civilizations. His pioneering work within the field was published under the name "*Capitalism in The Web of Life: Ecology and the Accumulation of Capital"* (2015). In this fundamental research which goes through philosophy and history of the relationship between the birth of capitalist mode of production and the reproduction of it and what is mainly called as Nature (the reason why "N" is a capital letter will be revealed) is groundbreaking research which has led to many other research within the field and functioned as a methodological tool to analysis of the relationship between society and nature. However, if he himself were to read these, he would already have several objections on our usages of the concepts of "society" and "nature". His groundbreaking theoretical framework is a perspective that constantly reminds us of the "violent abstractions" (Sayer, 1987) while we are analyzing the history of nature and capitalist

relations of production. Let us dive deeply into his pioneering study and try to understand and comprehend the differences between him and Foster, since they both claim to be the precise and accurate follower of the Marxist historical materialism on the fields of ecology and nature.

Right at the Introduction section of his book, Moore tries to distinguish himself from Metabolic Rift theory and John Bellamy Foster. In his own words:

> "I ask the reader to consider capitalism as a world-ecology, joining the accumulation of capital, the pursuit of power, and the co-production of nature in dialectical unity. Far from asserting the unfettered primacy of capitalism's capacity to remake planetary natures, capitalism as world-ecology opens up a way of understanding capitalism as already co-produced by manifold species, extending even to our planet's geo-biological shifts, relations, and cycles." (2015, p. 15).

As can be observed within his words, he starts by claiming that capitalist mode of production cannot be comprehended in accuracy if it is seen as an object of study that is external to nature. Rather than externality, he goes further enough to claim that capitalist mode of production is continuously reproduced not by merely capitalist class structure but by "manifold species". With such a claim, Moore paves the way for himself to construct a theoretical and historical framework which will allow him to criticize the metabolic rift theory of Foster.

His main claim is that a conceptual framework which can study the relations and interrelations between capitalist mode of production that is outside of the Cartesian binary mode of thought could not have been constructed until him, even though have been tried many times.

> "a new language—one that comprehends the irreducibly dialectical relation between human and extra-human natures in the web of life—has yet to emerge. Not for want of trying, I know: cyborgs, assemblages, networks, hybrids, and many more have been offered as a way forward. They have pointed the way forward. They have not, however, directly challenged the dualist framing of world history. For those concerned about the earth, its people, and the web of life, the great patterns and processes of modern world history have remained firmly encaged within the prison house of the Cartesian binary." (2015, p. 16).

When one critically examines these sentences of Moore, that one person realizes the prospects of concepts that he exemplifies for the modes of thought that have tried to

overcome the binary thought of Cartesian dualism towards society/nature: “cyborgs, assemblages, networks, hybrids…” These concepts for him were attempts at overcoming the binary mode of thought towards society/nature yet they were not able to overcome it. Another notion that we must not forget is that an academic enmity towards the Cartesian binary scheme is a notion that continuously repeats in his line of thought.

In order to overcome this supposed Cartesian binary way of looking towards the abstract relationship and to build a true dialectic mode of thought between society and nature, Moore invents the concepts of “society-in-nature” and “nature-in-society” (2015, p. 22-3) so that within our conceptual framework as we abstract these forces of life, we will not be limited by such binary modes of thought. Moore calls this conceptualization of his as “double internality”. Considering his first movement was the denial of the externality of nature, appropriating the notion of internality should have been no surprise:

> “Taking the double internality of human organization as our guiding thread, we can begin to reconstruct narratives of two simultaneous movements. the first is capitalism’s internalization of planetary life and processes, through which new life activity is continually brought into the orbit of capital and capitalist power. The second is the biosphere’s internalization of capitalism, through which human-initiated projects and processes influence and shape the web of life. This guiding thread—framed as a double internality—allows us to move beyond a kind of “soft” dualism that re-presents the dialectic of human and extra-human natures as an alternative to Nature/Society.” (2015, p. 23).

Here what we should focus on is that Moore analyzes the forces and drives of capitalist mode of production and also physical forces of the biosphere as two equal forces which in the contemporary mode of life that is brought by capitalist mode of production internalized one another, functions within one another. However, he does not stop there and furthers this theoretical thesis to its very end by claiming that;

> “My focus in this book is capitalism as project and process: the logic of capital and the history of capitalism. This capitalism is not, as we have seen, a narrow set of economic or social relations, since these categories are part of the problem. Capitalism is, rather, best understood as a world-ecology of capital, power, and re/production in the web of life”. (2015, p. 24).

As we can see, this appropriation of an internality finally makes him define capitalism as something more than a certain set of social relations that is brought by capitalist mode of production. Moreover, for him, capitalism is a driving force of nature itself which can only be seen as an “nature-creating” power. Slowly we begin to see how Moore is

differentiating himself from the metabolic rift. His real issue is with the notion of rift rather than metabolism. Yet let us not be hasty and continue to dig deeper into his line of thought.

He claims that another one of his conceptualizations which corresponds with socially necessary labor time (abstract social labor) of Marx under capitalist mode of production but subsumes it and means even more, concept of work/energy (2015, p. 24), allows him to emphasize that what need to be analyzed are not metabolic rifts that occur on planetary level as Foster did but metabolic shifts;

> "White's sketch is focused on the geophysical work/energy implied in the historical geography of a river (the Columbia, in this instance). But work/energy is also about organic life: from photosynthesis to hunting prey to bearing children. What bears emphasis is how the work/energy of the web of life is incorporated into the relations of power and re/production. Food—in capitalism as for all civilizations—is a crucial nexus of all these The work/energy concept allows us to transcend the metabolic fetish of Green materialism, in which living flows are narrowly biophysical, can be disrupted, and can be subsequently repaired to some Edenic, pristine state. The work/energy alternative sees metabolism through the double internality: flows of power and capital in nature, flows of nature in capital and power. In this, the issue is not "metabolic rift" but metabolic shift." (2015, p. 28).

This notion of the book is the most crucial aspect of the study of Moore for our thesis. Moore claims that if we were to follow the Marxist methodology regarding the relationship between capitalist mode of production and society, an assumption of a rift between one another is trapped within the Cartesian binary line of thought. A historical materialist method requires discussing shifts, not rifts. The chapter that is related especially with the metabolic shift will be made of an object of critique even more. Yet for now, in order to comprehend the necessity of the metabolic shift, his line of thought needs to be reviewed more in total.

Another notion that is crucial for Moore is that nature is first and foremost an historical notion. It can never be stated as static, it is a continually ever-changing process. As Moore states;

> "The web of life itself evolves historically. In this, "nature" (and its cognates) is a way of conceptualizing not merely the objects of capitalist activity. For the web of life is more than "taps" and "sinks." It is the field upon which capitalism unfolds. And we can go still further. Nature is no static field, but is itself renewing and evolving in cyclical and cumulative fashion. Nature is, above all, historical." (2015, p. 28).

This historicalness of the nature allows Moore to bring forth another criticism towards Foster and the thinkers of the metabolic rift. For Moore, it is because these thinkers cannot conceive a notion of nature that is historical first and foremost that they cannot be useful for the analysis' of the ecological crises to come but can only function as harbingers of ecological doom. In Moore's framework;

> "For the concept of "nature in general" (by nature in general, he means a notion that is not historical) has made it easy for many scholars and activists to embrace the apocalyptic imaginaries of catastrophe and collapse. Absent the specification of historical natures that encompass humanity, nature-in-general has driven Green politics into an "either/or" position: sustainability or collapse." (2015, p. 28).

Therefore, as can be observed, Moore's criticism towards Metabolic Rift school does not only consist within the analysis of the capitalist mode of production and the relations it brings forth but also related with inventing or discovering possible alternative ways out of it. "Sustainability or collapse" mode of thought which even though Moore has not stated explicitly can be regarded as Cartesian binary mode of thinking, blinds Metabolic Rift school from being able to plan realistic alternative paths to exit the capitalist mode of production and form a mode of life that is sustainable.

Another notion which needs to be mentioned before summarizing Moore's line of thought in order to be able to put it into the desk of criticism is his approach regarding the "transition debate". Transition debate in general is a debate that occurred over many years regarding the disagreements among Marxist and non-Marxist scholars over the questions of how the transition from feudalism to capitalism has occurred (for certain remarks look for (Brenner, 1976; Hilton, 1976; Sweezy & Maurice, 1950). This debate will be of great importance later when these two lines of thought are put under scrutiny). Even though Moore has a whole different study that he discusses (2021) in which he tries to shift the main focus of debate to "how class politics and modern state formation – including modern empires – cohere relations of production, reproduction, and accumulation" (2021, p. 1), at its basis it would not be wrong that he has a Wallersteinan perspective regarding the matter. In his own words;

> "Descartes hardly stands alone; he represents a broader historical movement towards the dualisms at the core of bourgeois thought. The emergence of Nature—the environment—was a symbolic-material process that began at least a century before Descartes, and continues to

> this day. One can quibble about names, but Descartes' biography is instructive: he wrote most of his major works between 1629 and 1649 while living in the Dutch Republic, the "model capitalist nation of the seventeenth century," and the epicenter of a world-ecological revolution that stretched from Southeast Asia to the north Atlantic" (2021, p. 29).

Along these lines in which he analyzes Descartes as the prominent thinker of the capitalist appropriation of earth for his society/nature and mind/body binarism, he clearly states that the Dutch Republic of 17th Century is a model capitalist nation which finds its roots in the Wallersteinian perspective. The matter of transition will be of great importance when Foster and Moore will be critiqued from historical perspective. Yet, it is crucial here to not forsake this matter and touch upon it.

One of the final debates in which needs to be assessed before proceeding a more relational approach in between Foster and Moore in order to achieve an historical and theoretical synthesis for achieving the precise and useful Marxist approach to the relationship between capitalist mode of production and nature, is the conceptual contradiction between Anthropocene and Capitalocene. The paradigm of Anthropocene for Moore functions as an ideological vale for the bourgeois ends:

> "The Anthropocene makes for an easy story. Easy, because it does not challenge the naturalized inequalities, alienation, and violence inscribed in modernity's strategic relations of power and production. It is an easy story to tell because it does not ask us to think about these relations at all. The mosaic of human activity in the web of life is reduced to an abstract Humanity: a homogeneous acting unit." (2021, p. 173).

The primary criticism of Moore against the narrative of Anthropocene among others is the subjectivity it infers: When trapped inside the Anthropocene paradigm, the ecological crises and disasters have one responsible agent being the entire humanity. To be able to summarize, we must first read Moore's own sentences below;

> "The choice is between a Cartesian paradigm that locates capitalism outside of nature, acting upon it, and a way of seeing capitalism as project and process within the web of life. If the destructive character of capitalism's world-ecological revolutions has widely registered—the "what" and the "why" of capitalism-in-nature—there has been far too little investigation of how humans have made modernity through successive, radical reconfigurations of all nature. How capitalism has worked through, rather than upon nature, makes all the difference. We have, I believe, arrived at a powerful educative moment. It is one that allows us to erase old boundaries and open new vistas, one where we can reconstitute each of these processes on the basis of the historically evolving oikeios. It allows for an understanding of modernity's historically specific natures as webs of liberation and limitation for the accumulation of capital, itself a way of organizing nature. The point can scarcely be overemphasized if we are

> to take seriously the idea that all limits to capital emerge historically, out of the relations of humans with the rest of nature. And in equal measure, so do all projects for the liberation of humanity and our neighbors on planet earth." (2021, p. 38).

In the long quotation above, we can infer the academic intention of Moore as he undertakes the duty of correcting a Marxist tradition of thought. According to Moore, until him, almost all the Marxist tradition which had interest in the ecology were primarily wrong within their methodological approach. Their approaches even though different from another in some respects have only consisted of "violent abstractions" (Sayer, 1987, p. 114) of the duality of the Cartesian binarism. This methodological flaw not just have been made them wrong in their historical and theoretical diagnosis of the history of the relationship between capitalist mode of production and nature but also helped enhancing its effects, since Cartesian binary mode of thought is the mode of thought that enabled capitalist mode of production to dominate and exploit nature within history. Yet, the insights of Moore that have been given above are not entirely enough to analyze the relationship between metabolic rift and metabolic shift's relationship with one another.

As we have seen in Foster, in the metabolic rift analysis, a certain dialectical unity/separation between nature and society is accepted as given and by now we now know that one of Moore's primary premises is that this dialectical unity/separation is mistaken in Foster just because these two notions, nature and society, are mentioned different from one another in the conceptual arsenal. So therefore, he develops an another notion to replace this "duality", which he calls oeikos;

> "I propose that we begin with the oikeios Oikeios is a way of naming the creative, historical, and dialectical relation between,and also always within, human and extra-human natures. The oikeios is shorthand: for oikeios topos, or "favorable place," a term coined by the Greek philosopher-botanist Theophrastus. For Theophrastus, the oikeios topos indicated "the relationship between a plant species and the environment." Properly speaking, oikeios is an adjective. But in the long journey towards a vocabulary that transcends the Two Cultures (the physical and human sciences), I hope the reader might excuse a few liberties with the language. (2015, p. 45).

The concept of *oeikos* which he takes as the primary tool for changing the paradigm of "Cartesian binary of society/nature" finds its etymological roots in the Ancient Greece as can be seen. The function of the concept can be summarized as the one holistic inclusive

concept that allows the reader to analyze matrix of social, cultural and natural forces under the same totality. As Moore states;

> "Through the oikeios form and re-form the relations and conditions that create and destroy humanity's mosaic of cooperation and conflict: what is typically called "social" organization. Nature as- oikeios is, then, not offered as an additional factor, to be placed alongside culture or society or economy. Nature, instead, becomes the matrix within which human activity unfolds, and the field upon which historical agency operates. From such a vantage point, the problems of food, water, oil (and so much more!) become relational problems first, and object problems second; through the relations of specific civilizations, food, water, and oil become real historical actors." (2015, p. 45).

In the paradigm of oeikos, the problems of the civilizations such as food, water, oil or even cultural uprisings for instance are nothing other than different manifestations of a certain holistic notion, being oeikos. With such conceptualization Moore once again paves the way for himself to see all social phenomena and natural phenomena melted in one basket altogether. He does not hesitate to follow his argument to its very end and arrive to the conclusion that even Wall Street is a formation of oekios, equally a part of social and natural mediums of capitalist civilization:

> "To see "Wall Street as a way of organizing nature," for instance, opens up questions that are prematurely—and unnecessarily—foreclosed by the dualisms of contemporary economic and ecological thought." (2015, p. 35).

The narrative of metabolic shift in Moore is also related with what he calls "singular metabolism". (2015, p. 84). The ontological material reality within "nature-in-humanity" and "humanity-in-nature" for Moore is that it exists as a singular metabolism. The only rift that exists for Moore is not in the material world outside, but in the epistemological field of both the researchers that takes this material world as their object of study and also within the minds of the early thinkers such as Descartes that allowed capitalist relations of production to separate the ontological singular metabolism into an epistemological rift:

> "If metabolism is not an exchange between quasi-independent objects— Nature/Society— but instead a process of life-making within the biosphere and its human-initiated processes, new possibilities emerge. The epistemic rift might be transcended. A singular metabolism of humanity-in-nature might allow us to chart a course beyond dualism." (2015, p. 85).

For Moore, both the research methodology and the real material world is consisted of a singular metabolism and thinkers such as Foster who analyzes the material world in terms of a metabolic rift is not only wrong in his methodology but also contributes to the capitalist "accumulation by appropriation" (2018) and plundering of the earth ideologically. As a consequence of such a mode of thought, Moore does not hesitate to see as all of the ability of human subject to create environments is qualitatively equal to the forces of nature itself in the capitolecene. In his own words;

> "The production of nature is therefore always the co-production of nature—a coproduction not of two ontologically independent units (Humanity plus Nature) but of an evolving mosaic of interdependent flows, forces, conditions, and relations. (Humans are surely distinctive in this mosaic, a point to which we will return.) This means that the accumulation of capital and the pursuit of power in the modern world-system do not have an ecological dimension. They are, rather, ways of human organization moving, representing, channeling, and reworking a singular metabolism: the web of life." (2015, p. 85).

When this line of thought is appropriated, it is not of course a surprise that a critique towards Foster and his metabolic rift under the name of 'left ecology' is constructed by Moore. Moore writes that for this Marxist ecology, society and nature is summed arithmetically, not dialectically. He claims that in this line of thought the boundaries between one another are not historicized but merely set as transhistorical limits (2015, p. 86). Since this is for him a "fetishization of natural limits" a mistake is being continuously made. It prevents the correct questions regarding history and theory to be asked. The correct question in which needs to be an analysis of object is that: "How are distinctive metabolisms of capital, power, and production unified, however unevenly, across the long arc of capitalist history?" (2015, p. 87-8) From this analysis, he returns to the matter of natural/social limits, or on his words naturally constructed limits. Right at this moment, he puts forth his analysis of "cheap natures" which he constructed out of his historical reading of capitalist mode or production from the perspective of natural limits as historical limits. Moore claims that:

> "Nature is finite. Capital is premised on the infinite. And both are historical in a very specific sense: what worked at one historical juncture will not necessarily work at the next. Thus the centrality of the Great Frontier in the history of capitalism, and the centrality of the end of the last frontiers—Cheap oil in the Middle East, Cheap laborpower in China, Cheap food everywhere—in the present conjuncture. It was this Great Frontier that inaugurated a civilizational metabolism in which most nature, including most humans, was sacrificed in service to the productivity of wage-labor. These frontiers of appropriation were the major

> way of making others, outside the circuit of capital but within reach of capitalist power, foot the bill for endless accumulation" (2015, p. 90).

For Moore, each historical limit that capital is confronted or "frontiers" in his own conceptualization have had their own newly invented cheap natures. In each era of crisis that capitalist mode of production has encountered so far, it always had to invent or discover new natural limits in which it can appropriate "free". So, for Moore, the meaning of natural limits for capitalist mode of production being historical, means that it has had different limits set upon for itself throughout history and capitalist mode of production violated these limits only in order to encounter new limits. This reading of the history of capitalism can be understood in parallel with David Harvey's reading of the capitalist crises' throughout its history. For Harvey, crises' of capitalist mode of production are never resolved by capitalism even when it seems so, they are merely shifted in time and space towards another market to commodify or plunder (2014, p. 255). Just as Harvey theorizes the crises' of capitalism (whether production or under-production) as ever changing only in time and space, Moore theorizes the frontiers of capitalist mode of production as that it confronts with new "cheap natures" as a way to shift the cheap nature that is no longer cheap to a new cheap one. This notion of limit will be of great importance when Moore's and Fosters line of thought are compared economically, historically, politically and philosophically.

The last notion before proceeding to the criticisms of Moore and Foster towards one another is the concept of capitalocene which Moore puts against the concept of Anthropocene. As I have stated before, for Moore, the concept of Anthropocene is not only inaccurate for scientific purposes but also has a political function which being blaming the entire human race for the blaming of the ecological crises. For Moore, the paradigm of Anthropocene functions as a bourgeois ideological force. This force allows capitalist class to take the blame out of themselves to the entire human race. However, this is not the only critique of Moore towards the concept of Anthropocene. For him, the concept of Anthropocene also serves the cartesian binarism that paved the way for capitalist mode of production to find cheap natures and plunder earth throughout history. As Moore states;

> "The two principal framing devices—consequences determine periodization, the Anthropos as the driver of these consequences—stem from a philosophical position that we may call Cartesian dualism. As with Descartes, the separation of humans from the rest of nature—"Are humans overwhelming the great forces of nature?"11—appears as self-evident reality. In its simplest form, this philosophy locates Human activity in one box; Nature, in another. To be sure, these two acting units interact and influence each other. But the differences between and within each acting unit are not mutually constitutive, such that changes in one imply changes in the other. This dualism leads Anthropocene advocates to construct the historical period since 1800 on an arithmetic basis: "human activity plus significant biospheric change equals the Anthropocene." In this, too, the Anthropocene perspective incorporates the common sense of Green Arithmetic: "Society plus Nature equals environmental studies."" (2015, p. 174-75).

As we have seen the mode of thought within Moore in its primary thesis and claims (which will be even more in depth analyzed later), what needs to be made before forming a political, theoretical and historical synthesis between one another, how Foster and Moore critiqued one another also needs to be mentioned. First what needs to be reviewed is Foster's critique of Moore.

Foster, first of all methodologically claims that what Moore assumes to be "dialectical historical materialist methodology" as his own methodology is merely "Latourian Marxism and neutral monism" (Foster, 2016, p. 404). After mentioning Moore's claim that metabolic rift theory posits two metabolisms, social and nature and this is a result of the Cartesian binary, he answers it as Moore is incapable of thinking in terms of dialectical abstraction:

> "Here he (Jason W. Moore) seems to think that one cannot speak abstractly, as Marx did, of a metabolic relation of humanity to the earth through production, i.e. a social metabolism, while also recognizing the universal metabolism of nature within which this social metabolism necessarily exists." (2016, p. 404).

For Foster, Moore is suffering from what Mark Fisher calls "capitalist realism" (2009) in the most violent sense possible:

> "In this (Moore's double internality) abstract conception, in which capitalism is more real than nature, there is no longer an ontology of nature (or an ontology of being); there is only the ontology of the market. The environment, following the bourgeois view, is thus reduced to little more than a set of inputs or "cheaps" (food, labor, raw materials, and energy) to the economy" (2016, p. 405).

For Foster as can be observed, Moore's ontology of the material world is consisting only capitalist relations of production. Foster critiques Moore for being unable to acknowledge

an ontology of the material world that is independent of the capitalist mode of production. In short, Foster agrees with Mckenzie Wark in criticizing Moore for the only analysis he is capable of is production of a certain number of social reductionisms (2015). For Foster, he is "an idealistic monist" (2016, p. 405) who traps his entire analysis of the relationship between nature and capitalisms into social constructivisms unlike what he claims to be, a Marxist historical materialist.

Another methodological notion in which Foster critiques Moore is his understanding of Marxist dialectics. Basing his views on Roy Bhaskar (2008), Foster underlines the importance of the movement of separation within abstraction in the dialectic method and right after that critiques Moore for not being able to comprehend the importance of it and confusing it with Cartesian society/nature binary.

For Foster, Moore does not practice Marxist historical materialist method but is only a follower of the Bruno Latourian line of thought regarding the relationship between humanity and nature. Moore's "bundles" (2015, p. 404) which are consisted of "double internalities of humanity-in-nature and nature-in-humanity" are only different manifestations of the postmodernist monism between humanity and nature.

Just as Moore was criticizing Foster for "being a follower of the Cartesian binary mode of thought" was not only inaccurate scientifically but also served the furtherization of the capitalist agenda for the accumulation by appropriation, Foster inverts the same critique and points it towards Moore as well;

> "In the Marxian view updated for our time, capitalism has not only inverted the world, it threatens to drive a stake through its heart. The world is not moving under capitalism toward the unity of humanity and nature but toward a dangerous separation: one, though, that represents, in the alienated context of class society, an "unconscious socialist tendency," in that it gives rise to the necessity of revolutionary human intervention." (2016, p. 406).

Or in another even more radical words of Foster, he critiques Moore of being a follower of capitalist eco-modernist thought; "In this respect he has been influenced by radical… and by constructionists like Bruno Latour, now a Senior Fellow at the Breakthrough Institute, a leading center for capitalist "ecomodernism." (2016, p. 3).

As stated above, Foster is also very well decisive when he claims that Moore has no clue about the meaning of dialectical method. After explaining dialectics in a brief manner by writing those dialectics is about "appearance and essence, identity in difference, the interpenetration of opposites, and the negation of the negation" (2016, p. 4) Foster believes that Moore appropriates the material history of earth and society in a crude binary, falling into his own trap, crude dualism and monism. Foster is also very critical of the notion of "cheap nature" of Moore. Foster claims that for Moore;

> "…the central ecological problem is not the disruption of the Earth System, but the fact that natural resources have become more expensive, creating problems for the capitalist economy. He says that this view is "more hopeful" than the "usual narratives of impending catastrophe and collapse" – apparently because it offers hope that capitalism can escape from the crises it has caused." (2016, p. 5).

As can be inferred from the last sentence, Foster believes that the theoretical framework of Moore provides capitalist relations of production a chance to escape and reproduce its own relations again and again.

Jason W. Moore answers these critiques fundamentally from the methodological perspective, even though this theoretical and methodological debate is also entirely historical since for Moore; "Dialectical abstractions, in contrast, begin with historical movement and decisions about strategic historical relations – something conspicuously absent from Nature/Society." (2016,). He claims that, the abstractions which are not dialectical such as Nature/Society binary of Foster, are violent since these violent abstractions "remove essential relations from each node in the interests of narrative and theoretical coherence." (2016). He does not claim that the entire reason why there is a Nature/Society binary is the Rift School or even capitalist relations of production. He claims that the existence of such a binary "antedates capitalism by millennia" (2016), referencing to Arnold's *Death of Nature* (272). However, he claims, from a Wallersteinian perspective that becoming the fundamental principle of this binarism in forming civilizations have not occurred until the "long" 16th Century (Wallerstein, 1974). Until the very end of the paragraph of his answer to the Foster's criticisms, from "Columbian rupture of 1492 as discovery of Americas" functioning at the same time as the "discovery of mankind" (he refers that historically, certain indigenous people and also in many cases women were labeled under Nature in nature/society violent abstraction) to

the "1700's England agrarian class struggle, Moore continues to exhibit how this binary of Nature/society functions in a cartesian binary, giving positive effect to the plundering of the earth and discoveries of "cheap natures" (Moore & Patel). At the very end of his answer to Foster's criticisms, after writing "Nature/Society can only be a dialectic – as opposed to a relation – through a specification of its laws of motion, its developing tendencies." (2016) Moore states that;

> "Rift arguments, however, deploy Nature/Society very differently, as basic units rather than interpenetrating relations. Nature as a general abstraction – like population or production in general (Marx 1973) – dominates. As if to move from the frying pan into the fire, Rift analysts dismiss as idealist efforts to historicize the capitalism-nature relation (e.g. through integrating accounts of science and culture in successively dominant understandings of the web of life)The result is a twofold conception of history shaped by a declensionist Fall from Eden and the inexorable drive towards catastrophe in which capital accumulation will proceed until "the last tree has been cut" No one disputes the reality of socio-ecological disaster, planetary change, and limits – notwithstanding Foster's insistence to the contrary (2016, forthcoming). Rather, the crux of the present argument highlights how the life and times of metabolism has resisted the tendency of dialectical praxis to dissolve its analytical objects (e.g., capital/labor), and to create new categories suitable to comprehending the historically successive interpenetrations of humans with the rest of nature." (2016, para. 12)).

As we can see from the ending paragraph of his article, Moore answers critiques of Foster by repeating his critiques that he constructed in his *magnum opus, Capitalism in The Web of Life: Ecology and the Accumulation of Capital.* Foster according to Moore at the very last instance, is suffering from a methodological blindness regarding the history of the capitalist mode of production and dialectical method related with researching it.

It is now the time to present the original scientific contribution of this thesis; which being constructing a historical materialist synthesis between John Bellamy Foster's version of Marxian ecology and Jason W. Moore's version of "world-historical" Marxist history of the relationship between society and nature or in his own words, the bundles of humanity-in-nature and nature-in-humanity. However, before the details of such a synthesis, why such a synthesis is needed must be repeated. It is claimed in this thesis that these two pioneering scholars that studies the relationship between humanity and nature within the Marxist historical materialist perspective is either inadequate compared to the real material existing world or in contradiction with it, therefore unable to instrumentalize in the scientific research conducted with following them. Yet, it is not enough to simply

state this, certain examples of these research must be given and present why they are either inadequate or in contradiction with the real material existing world. Only by presenting this, the synthesis which will be formed in this thesis will have a justified scientific reason. Henceforth, one example for each of these perspectives will be given and shown why these two scholars need a historical materialist synthesis before giving a detailed synthesis between one another.

Such a synthesis, as I have stated before, cannot be merely formed if the questions that are attempted to answer are questions such as 'Which one is the True (with a capital T) Marxist?' or 'What will a textual comparison between one another will unfold? The intention here is not to underrate these questions or the possible answers towards them. Certain features of these questions and possible answers still do carry great importance but these questions on their own will block our path to a historical materialist synthesis. A historical materialist synthesis in between these two lines of thought cannot forsake the notion of totality, which is a critical feature of the historical materialist method. This totality at stake drives us towards a synthesis in which being formed as a coming together of historical, economic, political and philosophical all at once. If a synthesis between two self-acclaimed Marxist line of thought does not consist of such totality in its analysis, what is produced is not a scientific discussion but merely an academic gossip.

The first examples for why these two thinkers and their theoretical framework alone is insufficient when analyzed through in comparison with the real existing world will be Jason W. Moore and his analysis of the Wall Street and 2008 economic crisis and also an analysis that takes Mexico as its case which follows Moore's line of thought in context with finance capital and nature. These exemplifications will allow us to go further than merely a theoretical and methodological criticism of Jason W. Moore's mode of thought and will show us why analyzing real world events through his line of thought regarding the relationship between humanity and nature is insufficient for an adequate diagnosis of the events and therefore insufficient to produce precise political solutions for the ongoing crisis within the relationship of our context. Same will apply to the John B. Foster's line of thought for different reasons entirely.

In one of his interviews, Jason W. Moore was asked about what the 2008 crisis would signify in his perspective which sees the history of capitalist mode of production as *oeikos*, that is being one monist metabolic regime. In his answer he states that:

> "My view can be stated simply: Wall Street is a way of organizing nature, differently but no less directly than a farm, a managed forest, or a factory. The financial speculation that reinforced underlying contradictions in the production of food, energy, and metals between 2003 and 2008 – the longest, most volatile, and wide-ranging commodity boom of the 20th century – was a decisive moment of world-ecological crisis. The point is crucial, because there is so much confusion over the nature of capitalism. Capitalism is commonly understood as the sphere of commodity production and exchange; but this ignores the even more expansive relations of reproduction necessary to sustain commodification. Capitalism as world-ecology is therefore a dialectic of plunder and productivity – appropriating nature's free gifts outside the commodity system in order to maximize labour productivity inside. Plunder, or appropriation, exhausts the non-commodified relationships that allow capital accumulation to proceed. Financialization, allied in the closest possible fashion with the military capacities of imperial states, has accelerated this process." (2011, p. 43)

His perspective is crystal clear here. For his theoretical perspective, there are no different crises' from one another in the form of 'financial crisis' and 'ecological crisis'. Crises' that occur under capitalist mode of production are singular and the fall of the financial markets and the Wall Street is only a different manifestation of the capitalist crisis which also can manifest and manifests itself as a crisis in agriculture.

At first sight, Moore's analysis seems valid both theoretically and applying that theoretical aspect into real life social events under capitalist relations of production. However, when the theoretical aspect is taken to its very end, its implementation into real life events such as 2008 financial crisis becomes both contradictory with itself. When what is social, economic or ecological is not separated from one another even only on the plane of abstraction as Moore tries to achieve with his conceptualizations such as singular metabolism and *oeikos*, the possible outcomes of a certain crisis that manifests itself on all these terrains can be seen qualitatively same as well and this analysis of sameness would be an analysis that is contradictory with historical materialst methodology. Let us take the example of 2008 financial crisis at hand. The main form that the capitalist crisis manifested itself was the burst of the housing bubble in U.S.A with the non-repayable mortgage payments. This process as known by now, caused a major recession which caused millions of losses in jobs, houses and savings (for the case of job loss look for Davis & Wachter, 2011, p. 5). Yet, as stated by Moore as well,

such a short circuit in the flow of capital, had its outcomes on the agriculture and the production of 'cheap food' as well (Moore, 2011, p. 53). Moore is certainly in sync with the reality of capitalist mode of production when he analyzes the reason for these two sorts of crisis'. However, the part that he neglects is the possible outcomes out of these crisis'. Even though caused by the same process of the capitalist mode of production, financial part of the crisis would cause losses in houses, savings and jobs etc. Devastating social and economic effects of such houses cannot be underestimated for the working class. However, the agricultural crisis' consequence is far more different especially qualitatively for the working class and the other species. In the long term, it disrupts the natural surroundings of the working class and other species and causes far more immense dangers. Moore's methodological standpoint however, neglects such difference and neglecting such a major difference would make the policy creators regarding the related issues to come up with solutions that is in contradiction with the crisis' themselves. Therefore, claiming that Wall Street is a part of nature under capitalist mode of production carries the risk of falling into the trap of capitalist realism. Henceforth, Moore's mode of thought in its own when applied to the real-world events, falls short in developing a historical materialist analysis of human-nature relationship under capitalist mode of production. If the notion of nature and society is not separated from another in the plane of abstraction, the scientific study cannot be historical materialist.

An even more concrete example derives from a study that takes Mexico as its case. Reis claims that in the Mexico case, "water and finance are thus joined in the 'web of life'" (Reis, 2017, p. 2). As stated by himself, his analysis follows Moore's mode of thought in analysing the relationship between nature and humanity under capitalist mode of production which allows him to perceive water and finance under same category when analysed in the relevant context. Through his analysis of commodification of water rights and housing problems in Central Mexico, Reis reaches three conclusions. The first conclusion that is drawn is how the housing policies are implemented not for the sake of the citizens but for the redistribution of wealth for the certain social actors such as "real estate agents, municipal and state officials, and actors controlling the necessary material resources for homebuilding" (2017, p. 10). However, the author also states that

in his actor-oriented analysis, those actors are the same actors who also controls the water rights thanks to their privileges in housing market (2017, p. 11). It is first of all this link that allows him to analyse the relationship between capital and earth through Mooreian line of thought. Second conclusion is the role of the state in regulating the housing and water rights issues in favor of these actors in correleation. Therefore, state also makes sure that the capital functions as finance as 'socio-ecological force' in Mooreian sense. Third is that how finance capital functions on ecology is not merely "water grabbing" (2017, p. 11) but through more indirect and complex routes, making finance capital and water the different elements of the same process of capital accumulation. Just as how Moore analysed the 2008 crisis, Reis applies the same mode of thought to the questions of housing and water rights in context of Central Mexico, especially for years 2012 and 2013 (2017, p. 7). As stated in Moore's analysis of 2008 crisis, same danger applies in the context of Mexico. Even though it is the same actors that functions together in the housing and water rights process' and it is indeed precise where he claims that capital penetrates these fields in same mindset, the possible consequences in the long term differs from one another so deeply that, these two elements need to be separated from one another both in policy making process and in the level of abstraction. The housing policies in favor of capital which disrupts the everyday lives of the citizens of Mexico can be fixed with appropriate policies in the short term with a simple political intervention and the effects of finance capital can be reversed easily in compared to water rights. However, water and its rights as the 'universal metabolism of nature' as Marx would have called, cannot be easily reversed in the long term. Even with a hypothetical political intervention which reverses the effects of financial capital on water rights, the effects it causes to universal metabolism of nature and reversing them would take much longer compared to the housing problems. Therefore, Moore's mode of thought which incorporates these fields under the same umbrella of capital, would lead us to wrong policies in reversing them and therefore must be abandoned or one shall say, made more compatible with the real-world events of capitalism which will be attempted below in the synthesis between Foster's and Moore's modes of thought.

Foster's methodology falls short just as Moore's methodology when it is on its own. In a quiet important study on the climate crisis' impact on the oceans of the earth (Clausen & Clark, 2005), Foster's metabolic rift line of thought is appropriated. One crucial aspect can be seen why the methodology of Foster alone is insufficient in analyzing the real-world human-nature relationship under capitalist mode of production. For the authors, by applying Foster's metabolic rift perspective to human-ocean relationship through fishing production and waste management, four different purposes are aimed to achieve. One of these, as the authors claim is, "examining the anthropogenic (human-generated) causes offish stock depletion*"* (2005, p. 1). As will be revealed in the below in more detail, the notion of 'anthropogenic' mystifies more than it reveals and gives birth to more questions than answers it produces regarding the responsible subject of the climate crisis under capitalist mode of production. The subject of 'anthropos' that represents humanity as a whole is in contradiction with the real-world relationship between humanity and nature under capitalist mode of production since it is the capital and the capitalist class who is responsible for the uneven relationship between humanity and nature under capitalist mode of production. The authors even present the relevant data regarding the anthropogenic effect on fishery. After claiming that it was in Marx's time the soil chemistry that was the frontier field in human-nature relationship, in the contemporary context ocean functions as the same frontier (2005, p. 427), with a relevant graphic they present how with the mass production became a major feature of fishery, the anthropogenic effect on oceans in context of the capturing of wild fisheries have raised since 1950's (2005, p. 431). If such qualitative and quantitative change regarding the capture of wild fishery is in fact the effect of the 'anthropogenic force', then the rate of increase should not have been drastically different under capitalist mode of production and the technological possibilities it brought forth as seen in the relevant graphic. The data in which they present do not end with the capture of wild fishery. By now, we have presented how the intensification of production, so the maximization of profit is a law for capitalist mode of production. With the emergence of aquaculture, this law applies to the fishery field. As stated in the relevant study, it is the anthropogenic force and causes that elevated the effect of aquaculture in fish production "from 3.9% of total worldwide production by weight in 1970 to 27.3% in 2000" (2005, p. 436). Such raise in aquaculture causes major threats to food security in long term, therefore causing the metabolic rift to

deepen even further. However, even though all this data is extremely relevant, calling the reason for this qualitative and quantitave change as anthropogenic, mystifies more than it reveals politically. As will be detailed below, it is the capitalogenic force that caused the drastic qualitative and quantitative change in the relationship between humanity and ocean not the anthropogenic.

Even though Foster's analysis does not make the same mistake of Moore in abstracting humanity and nature different from one another, it is not entirely in touch with the concrete material relationship. As will be seen below, the notion of the subject of the uneven relationship between humanity and nature under capitalist mode of production will be critically held below on the anthropocene and capitalocene discussion and will be seen in more detail why it carries problems for future policy creating research. Therefore, just as Moore's mode of thought, Foster's mode of thought in itself is not on the same level with the real-world events under capitalist mode of production regarding the relationship between humanity and nature as presented in the context of fishery and oceanography.

These two criticisms alone is sufficient to realize that a historical materialist synthesis between two scholars is a must if analyzing the relationship between humanity and nature under capitalist mode of production from a historical materialist standpoint is aimed to achieve. In the below, such an attempt is made through four different nodes of thought.

CHAPTER 3: A SYNTHESIS: METABOLIC INTERACTION IN CONTEMPORARY CONTEXT

This thesis' synthesis between these two modes of thought will be made of four interrelated subparts;

1. Metabolic Rift or Metabolic Shift?
2. The Limits of Capital and Nature
3. Where Catastrophe Leads
4. Anthropocene or Capitalocene

The criticisms which will be brought to both scholars regarding these four parts that are linked to each other, will allow us to construct an analysis that can capture the contemporary material reality of the relationship between capital and nature through the prism of the concept of metabolism.

3.1 METABOLIC RIFT OR METABOLIC SHIFT?

The first question is the most crucial one since it functions as a key as well as a passage to the other ones. Answer for this question is also compiled in three sections. First section is the philosophical feature of the question. In this section the Marxist concept of alienation will help to clarify. The second one is about empirical data of the contemporary economy and climate science. This section can be labeled as the economy part of the total synthesis. Third one is the historical part. By analyzing the position of Moore in the "transition debates" from feudalist mode of production to capitalist mode of production, the reason why they are differentiated in the given manner and also which one is inaccurate and why will be made clear. These four parts together will give us the precise and accurate perspective that is in parallel with the material world outside.

The first and the most critical question in which we must discuss in order to find a coherent historical materialist synthesis between Foster's and Moore's modes of thought is the question of "Metabolic Rift or Metabolic Shift?". In order to be plain from the very

beginning, Foster's line of thought is closer to the material concrete world outside in the context of capitalist mode of production and nature. However, simply claiming that one of these thinkers is more accurate than the other is not a scientific claim but merely a speculative and intuitive claim. Henceforth, why Foster is more accurate than the other needs to be explained and to discuss it, two notions that are critical which are related with philosophy, economy and history will be put on the table of discussion. The first notion that is mostly related with methodology, therefore philosophy, is the notion of Marxist dialectics. These both thinkers without a doubt insist that their methodology and line of thought is in parallel with Marxist dialectics and the other is either "a postmodernist monism" or "a cartesian binarism". One must be honest that which one is closer to the Marxist line of thought and which one is not not entirely important since the goal in here is not elaborating which one is loyal to Marx and which one is a deviation from it. Closer and being in parallel with Marx is only important since that this thesis accepts as given that Marxist methodology of historical materialism is the only methodology regarding political science in particular and social sciences in general that can capture the ever-changing concrete world outside without forsaking its reality in totality and also in significant particularities.

In order to achieve the meaning of the dialectical movement of thought and putting it into work in comparison between these two prominent thinkers, both Marx's own writings and also Ollman's study on the subject, *Dance of The Dialectic: Steps in Marx's Method*, will be put to use[4]. Before proceeding further one notion must be cleared out. It is

[4] For the sake of not conducting a one dimensional analysis, it should be stated here that Ollman's study is dependent on Hegelian philosophy of internal relations (for a more detailed information about it see Sayers, 2015). The movement of the dialectical thought is briefly explained within Ollman's thought through certain principles. A different approach which again explains the dialectical method in principles is Carchedi's *Behind The Crisis*: *Marx's Dialectics of Value and Knowledge* (2010). Carchedi, instead of Hegelian internal relations philosophy, only focuses on the Marx's methodology and forsakes its Hegelian roots or implications (2010, p. 2). Therefore, when it is considered that the main interest of this thesis is Marxian thought and not Hegelian one or its Hegelian roots, the question of why the Ollman's study is apprehended and not Carchedi's can be raised. However, in Carchedi's book we can observe that there is a certain notion which makes its analysis unsuable here that is being that his own claim that his analysis cannot be applied to the nature and thought in terms of dialectics of nature (2010, p. 37). This thesis as discussed above and continued to be discussed below appropriates the notion of dialectics without disintegrating nature and society different from one another, claimig that dialectical thought can and should be applied to both. Therefore, it would be methodologically mistaken to insturmentalize Carchedi's study here. Yet Carchedi's formulation of dialectics, is an important study which needed to be mentioned here in any case.

common in claiming that it was Hegel, not Marx who first constructed the dialectical method and all that Marx has ever done was to invert it and made it a materialist perspective, putting matter before thought. In Marx's words, with Hegel dialectics are; "…standing on its head. It must be turned right side up again, if you would discover the rational kernel within the mystical shell." (Marx, Fowkes & Mandel, 1992, p. 25)

Whether Marx's dialectics is merely a reversement of the Hegelian dialectic or is it something entirely new is a major debate in which does not carry a great amount of importance here. What is critical for our discussion is the philosophical, historical and economic comparison between the two thinkers and where the concept of Marxist dialectics fall upon within this subject.

Ollman sees Marx's dialectics primarily as a philosophy of internal relations in certain conditions. With Marx's historical materialist method, what was important is no more the static nature of things but the internal and external relations between them. These internal and external relations are the tools in which these things find meaning in it. Ollman starts with an allegory in reference to Charles Dickens' *A Tale of Two Cities*, the one city as capitalism and the other is communism. With such allegory, where Ollman tries to underline is that it is not one or the other that Marx was interested but the "internal relations" between one another. In Ollman's words;

> "There is a lot in Marxism, of course, that cannot be captured by this tale of two cities, but it does help to bring out the singular nature of Marx's subject matter: it is not capitalism, it is not communism, it is not history. Rather, it is the internal relations between all of these. It is how communism evolves as a still unrealized potential within capitalism and the history of this evolution stretching from earliest times to a future that is still far in front of us." (2003, p. 1-2).

Henceforth, what Marx first and foremost altered in the classical materialism (such as Feuerbachian crude materialism) is the vanishing of transhistorical notions and underlining that each and every notion is historical in one form and another, therefore an object of change. In the totality of his book Ollman does not only explain the movement of dialectic in tis philosophical and abstract sense but also exemplifies it and puts it to work. Yet, what is most crucial for our discussion is the first and fifth chapter in which

Ollman explains the primary movements and steps of the Marxian dialectical methodology.

In the first chapter, an introductive explanation of the dialectical movement of thought is given. Here, what needs to be underlined is that it's a method of movement against the statisticness of things, these things are objects of research, whether societies or anything else. Henceforth for Ollman, Marxist dialectics;

> "…restructures our thinking about reality by replacing the commonsense notion of "thing" (as something that has a history and has external relations with other things) with notions of "process" (which contains its history and possible futures) and "relation" (which contains as part of what it is its ties with other relations)." (2003, p. 13).

What one needs to remember first therefore is Marxist dialectics as "process" and "relation" and not as a thing. This notion in which emphasizes an anti-transhistoricalness, allows Marx to think of social relations in terms of time, actualities and potentialities and henceforth capable of change and more likely not just capable but must change. This notion, dialectics as process and relation, will be always important in all the other methodological steps of Marx.

After presenting how dialectical movement of thought is a methodological approach in which first proceeds from whole to the part and to the whole again with its approach that is embedded in process' and relations, Ollman states that there are four major relations in this movement thought. Dialectical movement;

> "…is primarily directed to finding and tracing four kinds of relations: identity/difference, interpenetration of opposites, quantity/ quality, and contradiction. Rooted in his dialectical conception of reality, these relations enable Marx to attain his double aim of discovering how something works or happened while simultaneously developing his understanding of the system in which such things could work or happen in just this way." (2003, p. 15).

After explaining these four moments of dialectical mode of thought within Marx, we will be able to comprehend the notions of unity/separation which is most critical in our context. In the dialectical approach which are not merely about appearances but also essences that are historical, hinges compared to one another are not either identical or different. When process' and notions are taken at hand as historical, in time and space, a

certain relation is both identical and different. When we think in our context, we can infer that the process' that occur between nature and capitalist mode of production appear and function as both identical and different. A Marxist dialectical approach can never forsake this simultaneity but also can never forsake the primacy of the material world, in this case being nature. When Moore perceives the "Wall Street as a formation of nature", where he is right is that it is true that organizations of capitalist mode of production and nature are intertwined in the contemporary capitalist world and in some sense they are identical. However, they are also different and separated from one another by certain features which will be exemplified later. If we were to continue, dialectical approach towards this notion of identity/different allows Marx "to arrive at detailed descriptions of specific phenomena without getting lost in one-sidedness." (2003, p. 15). The interpretation of the opposites in the dialectical methodology of Marx;

> "…is based on the recognition that to a very large degree how anything appears and functions is due to its surrounding conditions. These conditioning factors apply to both objects and the persons perceiving them. As regards the former, for example, it is only because a machine is owned by capitalists that it is used to exploit workers. In the hands of a consumer or of a self-employed operator, that is, conditioned by another set of factors, operating under different imperatives, it would not function in this way. As regards the latter, when people conditioned as capitalists look at a machine, they see a commodity they have bought on the market, perhaps even the price they paid for it, and something that is going to make them a profit. When people conditioned as workers, however, look at the same machine, they only see an instrument that will determine their movements in the production process." (2003, p. 16).

Therefore, interpretation of the opposites in our context function as; nature as an abstract category is merely the features of the earth around us. For a capitalist, the forest appears and functions only as "free gifts" of the earth which lies there for its own appropriation and the production of surplus-value. For worker, it can function and appear as multiple things; a space for the reproduction of the worker thanks to resting in there or a place in which consists of wood branches for the worker to collect in order to heat its own house. And again, in our context, what appears as rift may in any other time and space be a unity and what appears as unity between two notions vice versa. This is a quiet critical perspective that Marxist dialectics provide us.

The notion of quality/quantity is another important aspect of the Marxist dialectical methodology. In short, a phenomenon that is whether qualitative or quantitative, can

transform into one another in certain specific historical conditions. In the example that is provided by Marx and Engels;

> "Only when money reaches a certain amount, Marx says, does it become capital, that is, can it function to buy labor-power and produce value). Likewise the cooperation of many people becomes a new productive power that is not only more but qualitatively different than the sum of individual powers that compose it" (2003, p. 17).

To interpret such relation in our context, for instance a rift caused by the wastes of cities not being returned to the countryside, is a form of metabolic rift. However, this certain rift between production and the nature, thought in terms of globally and ecological crises, becomes an ecological rift, that is being more than simply the sum of certain metabolic rifts but quantitatively different from it, causing ecological crises that are unprecedented which is labeled under climate change contemporarily.

The last relation in which Marx inspects as he applies the dialectical method on the concrete material world that is also a sum of the ones before it, is contradictions. As a follower of the Marxist methodology, David Harvey consisted of his study of capitalism in terms of its seventeen contradictions (2014). The reason for he did what he did is that Marx explicitly states that "in capitalism everything seems and in fact is contradictory" (286). Contradiction, in Ollman's words is "understood here as the incompatible development of different elements within the same relation, which is to say between elements that are also dependent on one another". *(*2003, p. 17*)* For Marx, unlike commonsensical nondialectical thinkers that claim an X cannot also be X', which means the opposite of X, a process or a notion that is in movement can carry features that are entirely contradictory with one another. This situation of being contradictory does not stop it from functioning, on the opposite in the example of capitalist mode of production, it functions as it is because it is contradictory. As an example from Ollman's words is that*;* "Capitalism's extraordinary success in increasing production, for example, stands in contradiction to the decreasing ability of the workers to consume these goods." (2003, p. 17) Henceforth, the contradictory characteristic, especially in the context of capitalist mode of production, is central to dialectical methodology. Analyzing a relation with its contradictory aspects and finding the nodes historical change within these contradictions is a must if we were to follow the dialectical method.

Taken in our context, what are the ecological contradictions of capitalist mode of production in which it cannot stop but to reproduce? Added on top of that, needs these ecological contradictions to reproduce itself. The primary contradiction in here is the matter of "natural limits" which will be a matter of discussion as we continue.

The question arises then; what do these four moments of dialectical thought can tell us about the "unity/separation" between social metabolism and natural metabolism in Foster's claim or within the singular metabolism of Moore? The identity and difference discussion regarding the abstractions of society and nature within capitalist mode of production in the dialectical methodology of Marx should make us believe that these two abstractions are both identical and also different from another. The production of nature school (Ouma, Johnson & Bigger, 2018; Dempsey, 2017) gives more emphasis to the identicalness aspect, claiming that nature is a notion that the contemporary capitalist mode of production can produce and reproduce itself. Foster's line of thought emphasizes the differences between one another since its emphasis is in the natural limits to capital imposed by earth itself. A dialectical methodology unlike commonsensical thought or positivist science, should understand both these notions can in fact be true regarding the historicity of the certain moment that is chosen. Wall Street for instance, was an organization of nature for Moore. Let us inspect this notion from this standpoint. Here what we observe is the over emphasizing of the identicalness between social and natural organisms. We must accept that Wall Street is so interrelated with almost all economic notions of earth that in certain moments it resembles a natural force just as Marx claimed that money is only capital in certain social relations. However, when differentiality of the dialectical methodology is forsaken and this identicalness between one another is over emphasized, the dialectical methodology is forsaken in favor of an either idealist or materialist monism which blocks our analysis to be precise. Since it is historical materialism that defines Marx's methodology, primacy of what is material is essential and, in our context, especially the primacy of the material world commands us not to forsake the differential aspects of the two under capitalist mode of production. Therefore, in capitalist mode of production, nature and society is both identical to one another and also entirely different from another that needs not to be forsaken. The over-emphasizing

of the identicalness as Moore does, would make us fall into a monist notion that is undialectical.

The interpretation of opposites in terms of nature and society would give us certain insights whether it is a separated metabolism we live under contemporary capitalism or in a singular metabolism in which crises' shifts but not separates. As it is stated above, interpretation of the opposites is more about the surroundings off the notions and relations between one another. In the "empire of capital" that we live today, there are very few soils left on earth that is not directly touched by capital. Henceforth, it would not entirely be wrong that there is nothing outside the nature and society and the surroundings of these two notions are nothing but one another. This notion leads us into realizing that both nature and capital as abstract concepts, are determined by their relations towards one another. However, when the subject at hand is not merely social but also related with the earth and soil which historical materialist methodology claims primacy upon it, saves us from becoming absolute relativist to both of them. Their conditions and features are indeed determined in their relations with one another however, one must not forget that nature has its own limits and rules outside of the society as the historical materialist tradition has proven and this primacy can never be forsaken.

The quality and quantity discussion is once again critical for our context. One must never forget that there were major ecological issues that is caused by the modes of productions that were prior to the capitalist mode of production (look for Papanastasisa, Arianoutsouç & Papanastasisn, 2010). However, the qualitativeness and systematisms of the capitalist mode of production regarding its contradictions with capitalist mode of production transforms these contradictions into one single contradiction which is more than the sum of all the ecological contradictions preceded it: Climate crisis. The notion of the climate crisis is a crucial notion regarding the rift or shift discussion. In Moore's conceptualization what we are faced is the shifts of crises within a singular metabolism of humanity-in-nature and nature-in-humanity. This notion of unity blocks us from the possible disasters that can be caused by the ecological crises, since the ecological crises are nothing but shiftable forces that can shift its time and space within a singular metabolism by discovering new cheap natures. Foster's rift, in this sense is a better tool

in giving meaning to ecological crises' and their consequences since a rift is what causes the unsustainability.

The metabolic rift vs metabolic shift debate from the standpoint of dialectical methodology of Marx makes us realize that under capitalist mode of production nature and society are both separate from one another and also in unity with another just as certain other contradictions under capitalism. What is crucial and exceptional when contemplating between such two notions under capitalism is that we must equally emphasize both their separate being and also being in unity and from there we must start analysis' of when they manifest themselves as separated notions and when they are manifested as a single unity. However, when the subject at hand is the relationship between nature and society, materialness aspect of the historical materialism forces us to remind the primacy of the material relations of both nature and society but especially nature since for Marx, a materialist understanding since Epicurus has to prioritize the material natural world that is outside. If such primacy is not given to nature and nature is taken both as a subject and object that is equal to socially determined other forces such as capital or labor time in order to reproduce social mediums, the socially objectively constructed forces and the forces of nature are seen as equal inputs and outputs. This equality would be a violation of materialism of Marx. In order to avoid this, the emphasis of "metabolic rift" makes much more sense and allows us to further our research accurately compared to the analysis of "metabolic shifts under one singular metabolism". This does not mean that inputs of nature and society do not appear as elements of one singular metabolism from time to time. However, their differences and therefore the rift between one another is precise both academically and pragmatically. The crucialness of the rift is beautifully summarized in Marx's own words:

> "It is not the unity of living and active humanity with the natural, inorganic conditions of their metabolic exchange with nature, and hence their appropriation of nature, which requires explanation or is the result of a historic process, but rather the separation between these inorganic conditions of human existence and this active existence, a separation which is completely posited only in the relation of wage labour and capital." (2005, p. 239).

The discussion between metabolic rift vs metabolic shift cannot be resolved merely by situating which one is more compatible with dialectical method since what is really crucial in our analysis is the notion of totality and their compatibility with the real existing

world and history. Another concept of Marx however enables us to both philosophically and economically allows us to realize why it is a rift that should be at the center of our scientific attention and not a shift. This concept is alienation.

The concept of alienation has given birth to too many debates within Marxist scholars since Marx (the most important being Althusser's rejection of it by in his own words, separating 'young and old' Karl Marx with "epistemological break" (Althusser, 2005) and rejections towards him (e.g., Mandel, 1969)). It is this thesis' claim that Marx's concept of alienation still existed in Marx even though it was not mentioned explicitly in his later works. The reason why this thesis claims as such is the Marx's dialectical method itself. In Marx, certain concepts may seem like they have vanished however it is not vanishing that occurs but merely manifestation of the concept in a different time and context within different forms. Alienation is a concept as such. It contains a fragment of the so-called young Karl Marx and clear Hegelian influences on him and also later on in the political economist Karl Marx in which is entirely against Feuerbachian crude materialism and its transhistorical philosophy of essences. Yet, in order to explain this concept of alienation that is coherent with 'all of the Marxs' and how it helps to the discussion of metabolic rift and metabolic shift, one must briefly analyze the history of the concept within Marx.

The concepts history independent from Marx roots all the way back to the Old Testament and Christian theology. From there, it appeared again in many of the philosophers of the past such as Rousseau, Hegel and Feuerbach (Khan, 1995; Mezsaros, 2006; Sayers, 2011). In the early writings of Marx, Hegel's and Feuerbach's influence is crucial. The entire development of the concept is impossible to cover here and it is not necessary as well. What is needed here is a coherent theorization of the concept of alienation regarding the detachment of humanity from rest of the nature in the form of metabolic rift.

Here, we can apply to the Ollman's study (1976) and David Harvey's article on alienation (2018). If one claims that the concept of alienation remained entirely same within Marx's entire framework throughout his life, he/she would be terribly mistaken. However, the transformations the concept has been through made it coherent with his historical

materialist methodology. In his earlier before *Philosophical Manuscripts* especially with the concept of *Gattungswesen (species-essence),* the influences of the Feuerbach's crude materialist philosophy that is centered around transhistorical essences can easily be observed. In Harvey's account:

> "In the early Marx the universality is rooted in the supposed inherent qualities of our species being. The potentiality for realizing those qualities is frustrated by capital. The labourers who produce capital are denied the fruits of their labour (they stand in a relation of alienation to their product, the value they produce and to the labour process in which they engage). The individual potential to achieve self-perfection (in social relations, in the relation to nature and in the experience of the labour process) is denied". (2018, p. 138).

Therefore, in short, we can state that what is being estranged and detached within the concept of alienation in early Marx is the almost transhistorical "species-essence" of humanity, that is being the will to self-realize and perfectualize itself of the humankind. This notion has certain resemblances with Feuerbachian analysis of human nature;

> "What, then, is the nature of man, of which he is conscious, or what constitutes the specific distinction, the proper humanity of man? Reason, Will and Affection ... To will, to love, to think are the highest powers, are the absolute nature of man as man, and the basis of his existence. Man exists to think, to love, to will" (Feuerbach, 1957, p. 3).

For Marx's earlier writings, what is being alienated from as the nature of man through work, therefore, is not compatible with the historical materialist methodology of him and is indeed abandoned as we reach upon *Grundrisse*. In here, what primarily starts to differ in the concept of alienation is not the alienator, that is, capitalist mode of production. What is alienated from however transforms and leaves its transhistorical characters outside and brings a notion that is entirely historical;

> "In the Grundrisse, the universality of alienation arises out of the historical tendency within capital to create the world market, to establish its social (class) and metabolic relations everywhere and to inscribe certain identifiable laws of motion into human history under the rule of the coercive laws of competition. The 'universality' is specific to capitalism's historical evolution. The problem from the Grundrisse onwards into Capital is to identify the laws of motion of capital and to understand how these laws govern the conditions of daily life and labour for the mass of the working population. The political project is to liberate ourselves, in thought as well as in political and economic practices, from the constraints imposed by these laws of value and of motion." (Harvey, 2018, p. 139).

What we are alienated anymore, is the laboring process and the labor itself which is determined historically with relation to the given mode of production. When the worker is alienated to his such features;

> "The theory of alienation is the mental construct in which Marx displays the devastating effect of capitalist production on human beings, on their physical and mental states and on the social processes of which they are a part." (Ollman, 1976, p. 129).

This being alienated in the individual sense that is primarily the detachment of the worker from his own labour and product of his labor takes a more collective notion in the context of society and nature. Since metabolic rift was derived from the fact that worker's labor was no longer his/her own and the ecological consequences out of it, the process of alienation which occurred within the process of labor had also its impact on the relationship between humanity and nature;

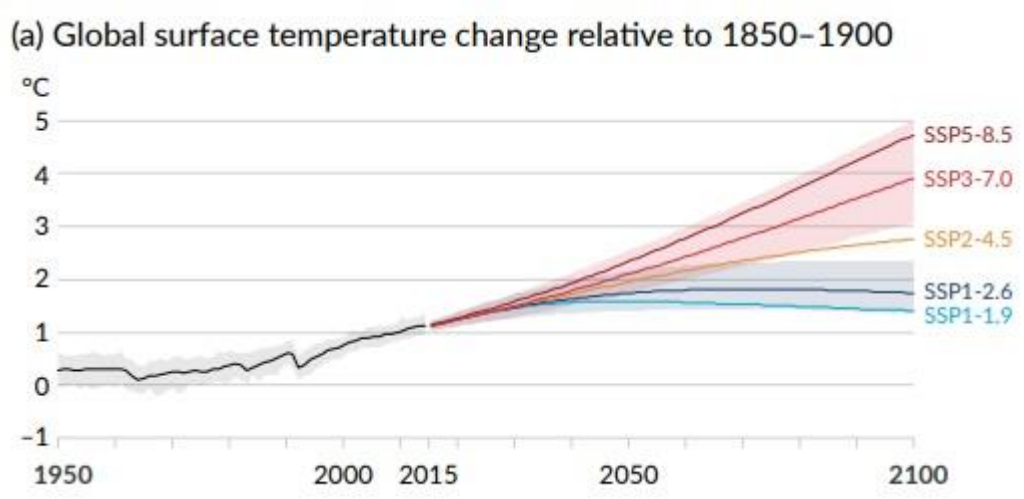
> "Marx's notion of the alienation of nature, which he saw arising out of human practical life, was no more abstract at its core than his notion of the alienation of labor. Both were grounded in his understanding of the political-economic thrust of capitalist society. The alienation of labor was a reflection of the fact that labor (power) had become reduced virtually to the status of a commodity, governed by the laws of supply and demand. This proletarianization of labor, though, was dependent, as the classical political economists Smith, Malthus, Ricardo, and James Mill had insisted, on the transformation of the human relation to the land.." (Foster, 2000, p. 73).

Thus, the concept of alienation in time leaves its transhistorical tendencies and becomes a notion that is entirely dependent on the historicity and material notions of life. In conclusion, if we were to appropriate the meaning of alienation as in the literal meanings of detachment and estrangement in Marx's vocabulary, what these concepts refer to is not a unity within a singular metabolism but a separation and a rift between the worker and the nature that surrounds it within the capitalist mode of production. This rift caused by the disruptions within the labor process under capitalist mode of production, is the primary theoretical framework in which we must appropriate in order to be able to historical materialist, since it gives us the proper tools in understanding the historical process' within capitalist mode of production that has led us to the ecological crises' of contemporary conditions.

So far, what we observe is that both dialectical materialist method and also the concept of alienation in which Marx emphasizes reminds us is that both the notion of separation

and unity are crucial tools in conceptualizing the materialist relationship between humanity and the rest of the nature. However, the primacy of the material conditions of everyday life also commands us that the independent existence of the material world that is outside of humanity requires us to underline the notion of rift and particularly metabolic rift more than metabolic shifts within a singular metabolism under capitalist mode of production and the relations of production it gives birth to. However, only philosophical and textual discussion is not enough in determining the accurate position in the given discussion and natural scientific data is also required. How the natural science's data corresponds with the economic data of the contemporary capitalist mode of production? To understand such relation, we must dig deeper.

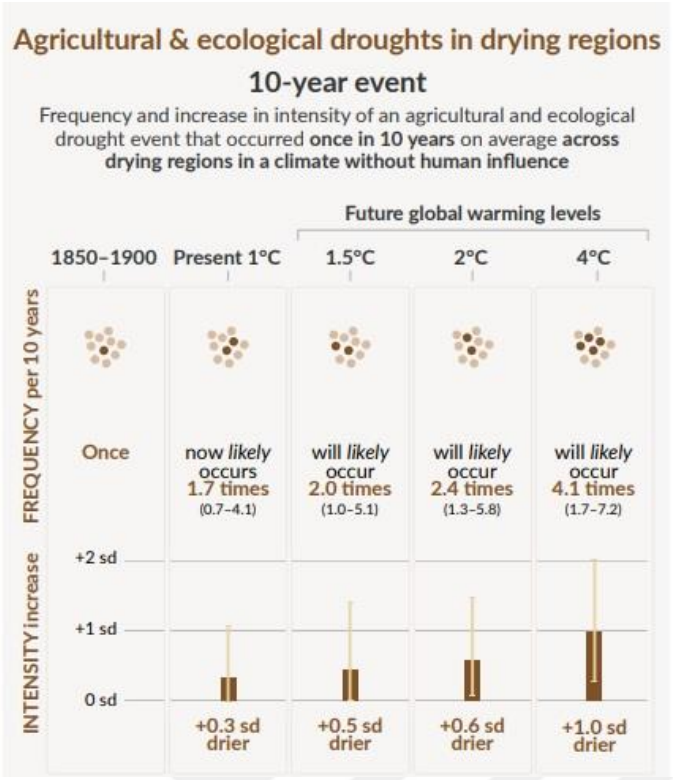
The most accurate and scientific data regarding the climate science and climate change can be found in the IPCC (The Intergovernmental Report on Climate Change) reports. In 2022, the UN organization published their sixth report (fifth one was in 2014). The set of reports are consisted of four reports (AR6 Synthesis Report: Climate Change 2022, AR6 Climate Change 2022: Impacts, Adaptation and Vulnerability, AR6 Climate Change 2022: Mitigation of Climate Change, AR6 Climate Change 2021: The Physical Science Basis) that covers the situation of the climate change from diverse focal points (IPCC, 2022). From suggestions to policy makers to technical scientific data, scientists within the organization publishes in detail reports. Even though the political suggestions are quite controversial (305), the scientific basis is extremely trustworthy. Yet, it is both impossible and unnecessary to cover the entire scientific data that is presented by IPCC to prove the point of metabolic rift against the metabolic shift. There are two certain graphics that is enough to present the existence of a rift between capitalist mode of production and the rest of the humanity, proletariat in particular. First one is related with the historical change in the the global surface temperature;



Graph 1. The Illustration of the Change in Global Surface Temperature (IPCC, 2022, p. 22)

The graph given above is a historical graph that also contains certain historical future projections dependent on the carbon emissions that the capitalist mode of production will apprehend or not. Here, projected surface changes from SSP2-4.5 and above simply means the death of many species and a terrifying environment for the proletariat to survive. If we instrumentalize the notion of singular metabolism and metabolic shifts in analyzing the given situation, such worsening conditions related with the relationship between humanity and the nature would become impossible for the social scientists to analyze since theoretically, a unity does not consist of features that is in destroying one another. As will be seen later on, these limits are not the same with “historical cheap natures”.

Graph 2 is related with the ecological droughts given below;



Graph 2. How the droughts are projected to continue dependent on the future global warming levels (IPCC, 2022, p. 28)

The graph 2 given above is related with the agricultural and ecological droughts and both their intensities and frequencies again with certain future projections dependent on the possible temperature changes. Again it is this thesis' claim that in overall totality, the theoretical framework of singular metabolism, metabolic shifts and analysis of the history of capitalism through "cheap natures" (which will be explained later on) is inadequate in realizing the urgency of the situation and the natural limits that is being imposed upon the capitalist mode of production year by year. A rift that between the social metabolism (which consists of the relations of production within social sphere) and the natural metabolism (climate change and its possible consequences) is the framework that is both pragmatically needed and also scientifically accurate since the historical materialist method always claims the existence of the nature that is independent of humanity. In considering the metabolic rift as ecological rift as Foster, Clark and York did as stated below;

> "The ecological rift referred to in the title of this book is the rift between humanity and nature. The world is really one indivisible whole. The rift that threatens today to tear apart and

> destroy that whole is a product of artificial divisions within humanity, alienating us from the material-natural conditions of our existence and from succeeding generations. Our argument, in brief, is that a deep chasm has opened up in the metabolic relation between human beings and nature—a metabolism that is the basis of life itself. The source of this unparalleled crisis is the capitalist society in which we live." (2011, p. 7).

Such a chasm between the capitalist mode of production and rest of the nature can only be comprehended with the notions of chasm, rift and separation. However, a historical notion is also required in addition to philosophical and natural scientific/economic notions in understanding why the conceptualization of singular metabolism and metabolic shift is mistaken. This historical notion can be found in the discussions regarding the transition to capitalist mode of production from feudalism. This discussion is deep and very detailed in the Marxist history literature. Here the primary notion in which we are interested is Jason W. Moore's position regarding the matter since it is this thesis' claim that his historical misunderstandings regarding the transition to capitalist mode of production leads him to not be able to see the rift that is caused. It is not the only theoretical and philosophical misunderstandings of him that causes him to mistakenly not be able to see the rift between social metabolism and natural metabolism. Added on top of these, his understanding of the history of capitalist mode of production unables him to see the rift. The reason for this is that his inability to pinpoint the beginning of the capitalist mode of production from a Wallerstenian perspective. If one theoretically cannot pinpoint the beginning of the capitalist mode pf production precisely then he/she cannot see the rifts that are caused by it since it almost exists from innumerable dates for that person. His analysis of the transition to capitalism will be confronted and critiqued from Ellen Meiksins Wood's perspective and will be shown also why not only philosophically and methodologically is Moore inaccurate but also his inaccuracy derives from his misunderstandings of the transition to capitalism.

Before criticizing Mooreian and Wallersteinian transition to capitalism theories, we must first explain Wood's theoretical framework in which she explained in her pioneering study, *The Origin of Capitalism: A Longer View* (2022). In her book, after constructing certain criticisms against Marxist and non-Marxist frameworks regarding the transition to capitalism; Wood, mostly in line with Brenner, explains her framework:

> "The most salutary corrective to the naturalization of capitalism and to question-begging assumptions about its origin is the recognition that capitalism, with all its very specific drives of accumulation and profit-maximization, was born not in the city but in the countryside, in a very specific place, and very late in human history. It required not a simple extension or expansion of barter and exchange but a complete transformation in the most basic human relations and practices, a rupture in age-old patterns of human interaction with nature." (2002, p. 95-96).

Here in this paragraph, we can observe one of the main motives of Wood other than historical precision, the criticism of any understanding of capitalism that does not naturalize it or sees it as the "inevitable outcome of the human development throughout history". Before explaining her theory, Wood writes in her book, criticizing other theories of transition from these notions.

For her, appropriation of the surplus value from the workers must be by economic means, not extra economic means. With such differentiation she remains loyal to Marx. With extra economic means what she refers to is "by means of direct coercion, exercised by landlords or states employing their superior force, their privileged access to military, judicial, and political power." (2002, p. 96)

Yet, existence of extra-economic means for the appropriation of the surplus value alone is not sufficient for the existence of capitalist mode of production. The "legally free" direct producer also needs to be dispossessed of his/her properties and this dispossession makes the only way possible for producers to access to the means of production by selling of their labor to the capitalist. Legally free aspect is crucial in here since it is a major differentiation from the previous modes of production and their serfs or slaves (2002, p. 96).

A certain medium of course is needed for the laborer to sell his/her own labor to the capitalist class and that medium is the market. However, Wood is well aware of the fact that the dynamic market predates capitalist mode of production. It is in her claim however, that capitalist market is significantly different from the previous ones:

> "Virtually, everything in capitalist society is a commodity produced for the market. And even more fundamentally, both capital and labour are utterly dependent on the market for the most basic conditions of their own reproduction. Just as workers depend on the market to sell their labour-power as a commodity, capitalists depend on it to buy labour-power, as well as the

> means of production, and to realize their profits by selling the goods or services produced by the workers. This market dependence gives the market an unprecedented role in capitalist societies, as not only a simple mechanism of exchange or distribution but the principal determinant and regulator of social reproduction." (2002, p. 97).

After stating the necessity of a certain kind of market is a must if one needs to talk about the existence of the capitalist mode of production, she also states that certain economic imperatives are also a must have within these markets for the existence of the capitalist mode of production: these imperatives are "competition, accumulation, and profit-maximization, and hence a constant systemic need to develop the productive forces." (2002, p. 97).

In her historical analysis, she states that one minor exception which has changed everything for the course of history that contains all these imperatives and market dependence like never before, existed in the context of the birth of capitalism. This was rural England, 16th Century (2002, p. 98).

Unlike parcellized sovereignties of other European countries, England, thanks to its historical developments that dates back to 11th Century and Normans, political centralization occurred before any other country (316). The reason for this political centralization was not merely due to historical difference of the England but also due to material and geographical aspects;

> "Already in the sixteenth century, England had an impressive network of roads and water transport that unified the nation to a degree unusual for the period. London, becoming disproportionately large in relation to other English towns and to the total population of England (and eventually the largest city in Europe), was also becoming the hub of a developing national market." (2002, p. 99).

Under such conditions, capitalist mode of production became existent in the rural area of England. In England, centralization of the state power when you inspect it, must have had made the landlords upset since in the other European countries, landlords had certain political powers as well. However, alienating the political rights to central state have granted the landlord with certain positive aspects as well. With giving up on their extra-economic powers, they were granted with increasing economic powers (2002, p. 99). The landlords had huge areas to farm and this range of areas compelled them to the work of

the land not by “peasant-proprietors but by tenants (the word 'farmer', incidentally, literally means 'tenant' - a usage suggested by phrases familiar today, such as 'fanning out')” (2002, p. 99) Since the landlords were deprived of political coercive power, they had to force the tenants to reduce the costs and increase productivity. The only possible way to make more money was this force towards tenants (2002, p. 100). These tenants were not only subject to such coercion from landlords but also exposed to the imperatives of an already integrated market and therefore what this system gave birth to was:

> “Many agricultural producers (including prosperous 'yeomen') became market-dependent in their access to land itself, to the means of production. Increasingly, as more land came under this economic regime, advantage in access to the land itself would go to those who could produce competitively and pay good rents by increasing their own productivity. This meant that success would breed success, and competitive farmers would have increasing access to even more land, while others lost access altogether” (2002, p. 100-101).

Wood continues this narrative by providing more historical insights and how the Lockeian theory of “improvement” was the true mediator of the capitalist mode of production (2002, p. 109). The birth of capitalism from Wood’s perspective is not merely historically accurate but by underlining the certainty and remarkably clear situation of the birth of capitalism within history, this analysis also allows us to realize one of the key notions of Marxism; that is being that capitalism is also historical and subject to change. Or as Ursula Le Guin has summarized; “We live in capitalism. Its power seems inescapable. So did the divine right of kings.” (Arons, 2014)

Then the question rises; how does Moore’s theorization of the transition to capitalist mode of production differs from Wood’s and why is this differentiation a cause for him to inaccurately theorize metabolic relation under capitalist mode of production?

In his own words; transition to capitalism from feudalism for Moore meant two certain notions. Risking with giving a long quotation, Moore states that first of all, relationship between transition to capitalism and ecology is that ecological degradation became global with transition to capitalism. It would be impossible to disagree with this. However, his second claim is quiet problematique;

> “…the environmental history of early modern Europe supports the idea that there was one and not many transitions to capitalism. (Even as we acknowledge that capitalism has become

> more "capitalist" over time in the sense that social life and its material substrate has become progressively commodified.) Capitalism emerged over the course of the "long" sixteenth century (1450-1640) as a "vast but weak" world-economy that stretched from Poland to the Americas. The subsequent history of global conquest bore witness not only to the ascendancy of capital to the commanding heights of this vast but weak world-economy, but equally to the new system's explosive socioecological contradictions." (2003, p. 99).

In his own words; Moore is a follower of Immanuel Wallerstein and his "commercialization model" (2002, p. 18) regarding the discussion of transition to capitalist mode of production. This "world-systems" model claimed that;

> "…economic development in a 'world' economy is largely determined by an unequal exchange between regions, between 'core' and 'periphery', and especially the exploitation of the colonial (and post-colonial) world by imperial powers. ~ According to some applications of this theory, capitalism originated in the context of such a 'world' economy, which emerged in the early modern period, if not before, when vast trading networks covered the globe." (Anievas & Nişancıoğlu, p. 14-22).

There can be named number of criticisms towards this approach (for a detailed and precise one, look for (2002, p. 16)). One criticism that allow us to position this debate in our context is that;

> "There was, in fact, no need in the commercialization model to explain the emergence of capitalism at all. It assumed that capitalism had existed, at least in embryo, from the dawn of history, if not in the very core of human nature and human rationality. People, it assumed, given the chance, have always behaved according to the rules of capitalist rationality, pursuing profit and in its pursuit seeking ways to improve labour-productivity. So history in effect had proceeded by the laws of capitalist development, in a process of economic growth sustained by developing productive forces, albeit with some major interruptions. If the emergence of a mature capitalist economy required any explanation, it was to identify the barriers that have stood in the way of its natural development, and the process by which those barriers were lifted." (2002, p. 54).

This criticism that blames this model for granting teleological forces to the capitalist mode of production that as if the duty of history was to make sure that humanity finally invented capitalism causes us to be unable to give an actual definition of capitalist mode of production. If we were to brain-storm, I believe it would not be wrong to assume that if an environmental historian of capitalist mode of production (Moore), is analyzing the history of capitalist mode of production as if it was something that lied in the veins of society since the dawn of humanity waiting to be discovered not invented, how can this historian be able realize how capitalist mode of production cracks a rift between humanity

and the earth? In order to realize such a rift, a definitive explanation of the birth of capitalism in terms of history and economics is a must. If capitalism was always then and there waiting to be discovered, then it cannot have been separated anything since the start of such separation would be entirely blur, henceforth non-existent. This causality is the historical reason why Moore is mistaken regarding his theory of metabolic shifts within singular metabolism.

Therefore, from a Marxist philosophical, natural scientific/economic and historical perspectives, Jason W. Moore and his conceptualization of singular metabolism fails us to analyze the nature of capitalist mode of production and its relationship with earth both historically and contemporary-wise. This failure to grasp the humanity-nature relationship under capitalist mode of production in terms of the concept of metabolism, to summarize, derives from three codependent perspectives. The philosophical notion is the concept of alienation. This thesis, with its claim that the notion of alienation has always been crucial for Marx and his historical materialist method, presents why there is a metabolic rift and not metabolic shifts under singular metabolism. The human as producer when appropriated transhistorically, can indeed be analyzed as one with the nature under a singular metabolism which flows his/her productive energy (labor) to its surroundings (nature) and receives from it just as same, therefore constructing an even an sustainable relationship. Under capitalist mode of production, the human producer as a universal subject, becomes alienated to itself since the fruit of his/her own labor is no longer his/her. This dispossession of a notion that is within him/her from his/her birth (labor) causes such alienation and such alienation signifies a rift between the alienated and what is being alienated from. The second reason why is the economic data under capitalist mode of production. The imperetaives of capitalism (Akbulut, 2009, p. 178) forces capitalist mode of production to construct a relationship between humanity and nature that becomes more and more unsustainable for the working class and many other species to survive. This unsustainability and death of the conditions to survive can only be made sense conceptually with a notion of rift rather than a notion of a monist singularity. Third one is the historical reason which explains why Moore has to conceptualize a singular metabolism instead of a rift between humanity and nature. The theoretical mindset here is as follows; when the beginning of capitalist mode of

production is set as a vague and going much back than it should have been, it produces the tendency to think of capitalist mode of production as more and more a part of 'human nature'. This naturalization of capitalist mode of production through history, intentionally or unintentionally forces the author to forsake capitalism's specific historicity, therefore being unable to to think of it in terms of its feature of subject to being change which is a prime feature of historical materialism as discussed in the beginning of the thesis.

The discussion of metabolic rift vs. metabolic shift carries us onwards to another conceptual and historical discussion between two modes of thought. If a separation and rift in their abstraction between metabolisms is a necessity, where is the threshold or the limit between these two notions that are separated from one another? Where does the rift(s) begin and where does the rift(s) end?

3.2 THE LIMITS OF CAPITALISM AND NATURE

One of the primary differentiations between two scholars is the notion of limits between capitalist mode of production and the earth which is primarily a question of the geography of capital. Questions such as "What are the material limits of these notions when they are thought in between themselves?" or "What is the threshold, the limit in between these notions?" Two scholars seem to underline quite the opposite perspectives from one another.

Jason W. Moore has written an entire book related this question with Raj Patel called *A History of The World in Seven Cheap Things: A Guide To Capitalism, Nature and The Future of The Planet* (2017). In their book two scholars form a reading of the history of capitalism through six cheap natures in which capitalism has both constructed and consumed (Money, Work, Care, Food, Energy, Lives). From their perspective, capitalist mode of production did not solely depend on the appropriation of the surplus value from labor of the worker in order to survive but also plundered nature and every notion in which it put under the basket of nature (for instance how slaves were seen as a part of nature and not human (2017, p. 33)) by accumulation by appropriation. What they mean by cheapness is that;

> "… it's a set of strategies to manage relations between capitalism and the web of life by temporarily fixing capitalism's crises. Cheap is not the same as low cost-though that's part of it. Cheap is a strategy, a practice, a violence that mobilizes all kinds of work-human and animal, botanical and geological with as little compensation as possible. We use cheap to talk about the process through which capitalism transmutes these undenominated relationships of life making into circuits of production and consumption, in which these relations come to have as low a price as possible." (2017, p. 191-92).

Henceforth, capitalist mode of production has to invent new cheap natures continuously in order to survive each time it confronts a crises of especially underproduction or a limit against the earth. It is from this notion that they infer first and foremost nature and its limits confronted with capitalist mode of production is historical, as it is mentioned here before. Throughout its history, whenever capitalist mode of production has come across a crisis, it was capable of delaying it by finding new cheap natures instead of the old one that is no longer cheap. The book is full of historical and accurate examples from their perspective of history which contains the production of cheap money within Genoese Banking (2017, p. 83) to the appropriation of free labor within household from women as cheap domestic labor (2017, p. 124) if we accept the commercialization model for the transition to capitalism. As we can see, the limit of the nature that is continuously confronted by capitalist mode of production and also overcome by it is historical and therefore subject to change. Moore does not define a "biological" static limit of nature but defines certain series of limits of nature throughout the history of capitalist mode of production. Moore does acknowledge a certain amount of externality within this notion of limits;

> "The limits of production, consumption, and reproduction are fixed only by the system in which we find ourselves. Such limits are neither outside nor inside but both, knitted together by capitalism's ecology of power, production, and nature." (2017, p. 210).

Yet he does not underline such externality any further throughout the book, they continuously underline how the limits between capitalist mode of production and nature is continuously determined by the capitalism's ability to overcome and set new limits.

However as presented before, Foster critiques this notion by claiming it as a denial of the climate science and denial of the ecological tipping points that was mentioned here before. In the book *Ecological Rift*, Foster, by applying to certain climate scientists

constantly remind us of certain static limits of nature that should not have been crossed transhistorically:

> It is common today to see this ecological rift simply in terms of climate change, which given the dangers it poses and the intractable problems for capitalism it presents has grabbed all the headlines. But recently scientists—in a project led by Johan Rockström at the Stockholm Resilience Centre, and including Crutzen and the leading U.S. climatologist, James Hansen—have developed an analysis of nine "planetary boundaries" that are crucial to maintaining an earth-system environment in which humanity can exist safely. Climate change is only one of these, and the others are ocean acidification, stratospheric ozone depletion, the nitrogen and the phosphorus cycles, global freshwater use, change in land use, biodiversity loss, atmospheric aerosol loading, and chemical pollution. (2011, p. 14).

These planetary boundaries from all sorts of ecological fields are not the same as "historical limits" of Moore. For Foster, these are not limits in which capitalist mode of production simply confronts and overcomes in the process. These are limits in which when crossed, will turn life on earth irreversibly inhabitable.

Therefore, when inspected in comparison what we have at one hand is a thinker, being Moore, that continually emphasizes from a social constructionist perspective the changeability and overcomingness, in Moore's understanding "historicalness" of the natural limits that is imposed on capitalist mode of production. On the other hand, other thinker, Foster, over emphasizes the natural limits under the concept of "planetary" boundaries, that is imposed upon capitalist mode of production. The historical materialist method and dialectical mode of thought however, both allows and compels us to realize that both authors are correct and wrong at the same time.

Moore is accurate in analyzing the history of capitalist mode of production in terms of its ability to overcome the crises' it confronts (except the birth of it as stated above). Even more examples can be stated than the ones given in his book. One of the examples can be given as David Harvey's analysis of how capitalist mode of production has economically overcome the financial crisis of 2008. Harvey believes that "…capitalism, in general, was rescued in 2007/2008 by an expansion of the Chinese economy." (2019, para. 7) Faced with crisis of real estate;

> "China was consuming (cement) at an astonishing rate, and they were building new cities, they were building new roads and highways, & they built a high-speed rail network-- they

> had zero miles of high-speed rail in 2008. By the time you get to 2014, they've got around 15,000 [miles] maybe. Now they've got around 20,000 miles high-speed rail. All of this takes a lot of materials, so China boomed in terms of its infrastructure and investment." (Harvey, 2019, para. 24).

This is only one of the examples in which how capitalist mode of production is able to overcome the accumulation crises' it confronts. This ability to overcome of the crisis' in capitalism is also appliable to the ecological crisis it occurs. Therefore, Moore is right in emphasizing the ability to overcome of capitalism faced with crises'. However, the primacy of the material aspects in historical materialism puts us in a different situation regarding the data of climate science. The crises of climate urgency have put us against such crisis' that are not as simple as the previous crises' of capitalist mode of production. Overcoming of the each of the crisis' of capitalist mode of production had certain price for the proletariat throughout history. The price of overcoming the planetary boundaries that Foster mentions, however, can be considered impayable for the reproduction of the proletariat and maybe even for capitalist mode of production itself.

Henceforth, in terms of the limit between capitalist mode of production and nature, the limits are both historical in Moore's terms yet however, deriving from what Marx coins as "universal metabolism of nature" they are also transhistorical static limits in which when crossed, life as we know of it both for the proletariat and capitalist class will change according to the scientific data (IPCC, 2022). Therefore, materialist principles within historical materialism compels us to methodologically analyze the limits between nature and capitalist mode of production both historically and also trans-historically. This setting the balance right in between these two thinkers regarding the limits carries us towards another node in constructing the synthesis between one another. The question arises: If there are both historical and trans-historical limits, what do these thinkers project as the outcome of the crossing of this limit? This question is critical since their historical methodological difference causes both of them to give different answers to it.

3.3 WHERE CATASTROPHE LEADS

The narrative of the "biogeochemical limits" (Moore, 2015, p. 88) of earth that is set against capitalist mode of production for Moore means that;

> "Ignoring the "normal" operation of capitalism's world-ecological reorganizations, a dual systems approach to metabolism gives us only one flavor of crisis—the apocalypse. In the absence of a rigorous historical approach to the bundling of human and extra-human natures in the accumulation process, arguments for an epochal crisis today will tend to fall back on arithmetic rather than dialectical reason." (2015, p. 93).

For Moore, forsaking the language of catastrophe and apocalypse in the case of trespassing the external limits of nature, will provide us with the more hopeful perspective since crises' are "full of danger, to be sure. But they are also, as the Chinese would remind us, full of opportunity. (2015, p. 99) For him, whether it is the limits of cheap money or food that is set entirely historical or the limits that we are discussing are Foster's "planetary boundaries", discussing them in terms of catastrophes or apocalypses is politically false since they pave way for nothing but despair for the future policy making process'.

Yet for Foster, the situation signifies an entirely opposite consequence. The emergency of the situation as the "greatest historical challenge" that human civilizations have ever faced, even the concept of catastrophe would seem insufficient. The future projections that the IPCC reports have shown in the case of deepening the ecological rift, will not cause one singular catastrophe but a set of catastrophes that will mean the end or even worse for the lives on earth.

The question at hand here is a tricky one. Since their differentiation depends on which conceptualization will provide us with the better tools for the future policy making process', it is impossible to know exactly which one is right. Any claim further than this is merely a guess, which would not be scientific at all. However, one modification to the question in which they differ from one another will provide us a set of answers that might let us come closer to the ultimate end of this line of thought. In order to answer it, we must first apply to somewhere else.

The question of democracy regarding with critical, empirical and normative aspects of it has been a topic that is discussed within political science discipline for too long and too much. One example to this discussion will allow us to make more sense of the question of catastrophe within ecological rift. Vladimir Ilyich Lenin, in formulating the historical

and practical meaning of the concept of dictatorship of the proletariat; sets out four primary principles;

> "(A) The dictatorship of the proletariat as new forms of the class struggle of the proletariat (in other words: its new stage and new tasks).
> (B) The dictatorship of the proletariat as the destruction of bourgeois democracy and the creation of proletarian democracy.
> (C) The dictatorship of the proletariat and the distinguishing features of imperialism (or the imperialist stage of capitalism).
> (D) The dictatorship of the proletariat and Soviet power. Plan for the elaboration of these 4 sections" (1965, p. 99).

In the B section, Lenin asks a very simple yet quiet powerful question in terms of the political aspect of the historical materialist methodology which was discussed in the methodology section in the first part. Democracy is the collective desire of the masses, he accepts, however the crucial question is "For whom?" (1965, p. 101). This simple question disrupts the abstract meanings of the concepts of democracy and dictatorship in such a precise manner that their abstract idealist approach vanishes and concepts become critical notions of the historical materialist method and socialist politics. A similar question is a necessity; Catastrophe for whom? Asking such a simple yet effective question will allow us to realize the notions of whether hope or pessimism is what awaits beyond the climate catastrophe.

Remembering the discussion of historical limits, it would not be mistaken that even planetary boundaries of Foster is a sort of historical limit for the capitalist class. Art, especially science fiction and their dystopian products can be named as great examples for such a debate. Therefore, trespassing the planetary boundaries might not function as a total catastrophe for the capitalist class while the proletariat suffers under unimaginable consequences of the climate change. Catastrophe, then one can say, is a notion in which arrives for different classes in different times. Facing the question of "catastrophe or opportunity" in face of trespassing the planetary boundaries, whether one needs to be hopeful for the future policy making process or any other notion, the question must always be followed by another question in which Lenin has asked in 1919: For whom? Only then any related research can become more and more meaningful. This question is critical since the relationship between humanity and nature under capitalist mode of production, as stated above, caused certain irreversible ecological catastrophes in which we

conceptualize now as climate crisis. One of the main fields which is studied regarding the climate crisis both within climate science but also policies adopted internationally is the question of who is responsible for it and how this notion of responsibility is a major part of how to reverse the effects of climate crisis (e.g Barbier, 2010: Bloomfield & Steward, 2020). Henceforth the question of 'whom' is also a critical academic question even only for providing a historical materialist approach to the such studies and debates that are ongoing in worldwide scientific and political circles.

This differentiation links us to the final discussion related here. The question of "for whom" and the class politics perspective it brings is followed inevitably by another question. That question is "By whom?"

3.4 ANTHROPOCENE OR CAPITALOECENE

The meaning and the connotations of the concept of Anthropocene has now become widely known among both natural and social scientific circles and even popular culture. In short, with Crutzen's coining the term in a speech he gave in International Geosphere-Biosphere Program in Cuernavaca, Mexico, in his claim, the geological age of Holocene came at an end and the geological age in which the agency of humanity function as the primary agent of change, Anthropocene has arrived (Crutzen, 2006). Yet one must not forget that the concept has existed before, first invented in the Soviet Union, though not in the entirely same meaning. Official acceptance of the concept by the International Commission on Stratigraphy of the International Union of Geological Sciences which would make it indisputable in natural sciences has not yet occurred, but it is expected to be real soon. Even though the concept is widely accepted by the natural scientific circles, in literature, philosophy and social sciences the concept has also become quite controversial. Unlike the natural sciences in which it is more related with the required empirical change within certain metrics than "what should we name this era" question, social sciences have given birth to many debates regarding the question of whether we should call this era the Anthropocene. Foster, until very recently instrumentalized the concept and appropriated it indisputably in his environmental research. However, unlike

the other posthuman and postmodernist criticisms of the concept in which Foster ignores already (e.g Stiegler, 2018; Haraway, 2015) criticisms that is made by Andreas Malm and Jason W. Moore in the form of 'eras name should be 'capitalocene' not Anthropocene' is quite important in which he had to answer. They are important because they do not derive from idealist monist perspectives but from Marxist historical materialist perspectives.

The question in which Jason W. Moore forms his critique of the concept of Anthropocene is: "Is humanity as a whole responsible for the climate crisis?". His answer is as follows;

> "Well, yes and no. It turns out that saying "Humans did it!" may obscure as much as it clarifies. A world of political difference lies between saying "Humans did it!" – and saying "Some humans did it!" Radical thinkers and climate justice activists have begun to question a starkly egalitarian distribution of historical responsibility for climate change in a system committed to a sharply unequal distribution of wealth and power. From this standpoint, the phrase anthropogenic climate change is a special brand of blaming the victims of exploitation, violence, and poverty. A more nearly accurate alternative? Ours is an era of capitalogenic climate crisis." (2019, para. 2).

As we have seen and will continue to see, the thesis' of the natural scientific circles are extremely crucial for Bellamy Foster. Social sciences, for him must learn and appropriate natural science's findings. However, for Moore, the concept of capitalogenic and capitalocene is not a direct alternative for the definition of Anthropocene made by the science of geology. For Moore, capitalocene functions at the intersection of these two fields:

> "Let me begin by saying what the Capitalocene is not. It is not a substitute for geology. And it is not an argument that says an economic system drives planetary crisis – although economics are crucial. It is a way of understanding capitalism as a connective geographical and patterned historical system. In this view, the Capitalocene is a geopoetics for making sense of capitalism as a world-ecology of power and re/production in the web of life." (2019, para. 4).

For Moore, there are two anthropocenes. One is as the geological Anthropocene in which "primary concern is golden spikes: key markers in the stratigraphic layer that identify geological eras" (2019, para. 5). The other one is the popular and cultural Anthropocene in which forms its narrative of "Man and Nature" throughout history in the name of domination and exploitation of earth. It is historically ideological in the sense that it paves the way for the capitalist mode of production to exploit cheap natures within *longue durée* (Wallerstein, 2015). Concept of capitalocene functions right at the intersection between

these two areas, even claiming to blur the distinct limit that they pose to one another. In line with his mode of thought that compels him to see two distinctions between different scientific fields not so different from one another, he instrumentalizes the concept of capitalocene from the same perspective as well. Yet, the greatest reason why he believes it is the concept of capitalocene in which must be used and not Anthropocene is not the melting of two fields into one another but ideological notions in which it signifies. For Moore;

> "…the Anthropocene discourse is distinctive only for its subtlety. Among its great accomplishments is an audacious form of doublespeak, mobilizing the power of Good Science to sustain capitalism under cover of a surficially radical critique. Johan Rockström, the planetary boundaries superstar and scientific director at the Potsdam Institute, is a perfect example. Trading ideologically on Good Science, Rockström tell us that "our current economic logic no longer works"18 – while refusing to name that logic" (2021, p. 10).

Johan Rockström, in which he critiques as contributing to the capitalist ideology was a preliminary focal point for Foster in line with "planetary boundaries". For Moore, with the instrumentalization of the concept of Anthropocene, this narrative blinds the audience from being able to see what the true agent behind climate crisis is. Anthropocene, with the notion of Anthropos, blames entire humanity for the production of climate crisis and functions as the generator of a model of "original sin" (Britannica, 2022) for the entire humanity; a debt that is unpayable for the entire humanity no matter what. This ideological notion must be defied and the most precise tool to defy it is Capitalocene which signifies; "…are we living in the Capitalocene – the 'age of capital' – the historical era shaped by the endless accumulation of capital?" (2017). If the historically determined geological and social era is shaped by the endless accumulation of capital, with the help of the concept of capitalocene, one can realize that the agent behind the climate change is not an abstract notion of humanity but capital and its endless accumulation process'.

The other thinker who claims that the concept of Capitalocene is the correct concept to name the era for quiet similar reasons with Jason W. Moore is Andreas Malm. Malm argues that the concept of Anthropocene "…entails the attribution of fossil fuel combustion to properties acquired during human evolution, notably the ability to manipulate fire. But the fossil economy was not created nor is it upheld by humankind in general." (Malm & Hornborg, p. 34). For Malm just as Moore, the concept of

Anthropocene shadows the true economic and political relations behind climate change and as an "indefensible abstraction" (Foster & Clark, 2021, para. 12) must be abandoned. Different from Moore, the notion that Malm underlines constantly is the fossil fuel and the distinct relations of production that it produces.

Foster does not ignore these criticisms and applies to natural sciences once again to continue to defend the concept of Anthropocene. He applies to the differentiation between epochs and ages in geological time scale of the science of geology and claim that epochs subsume ages and an age within Anthropocene should be called Capitalinian For Foster, we are contemporarily inside Capitilinian age which is inside of the Anthropocene epoch. In his own words;

> "Adopting the standard nomenclature for the naming of geological ages, we propose, in our role as professional environmental sociologists, the term Capitalinian as the most appropriate name for the new geological age, based on the stratigraphic record, and conforming to the historical period that environmental historians see as commencing around 1950, in the wake of the Second World War, the rise of multinational corporations, and the unleashing of the process of decolonization and global development." (Foster & Clark, 2021, para. 2).

After putting forth the term of Capitilinian, what needs to be done for Foster is without a doubt, constructing how the concept differs from the concept of Capitalocene. For Foster, there are two crucial reasons why the concept of Capitalocene should not replace Anthropocene. First one is;

> "…Anthropocene is already deeply embedded in natural science, and it represents the recognition of a fundamental change in human and geological history that is critical to understanding our period of planetary ecological crisis." (Foster & Clark, 2021, para. 13).

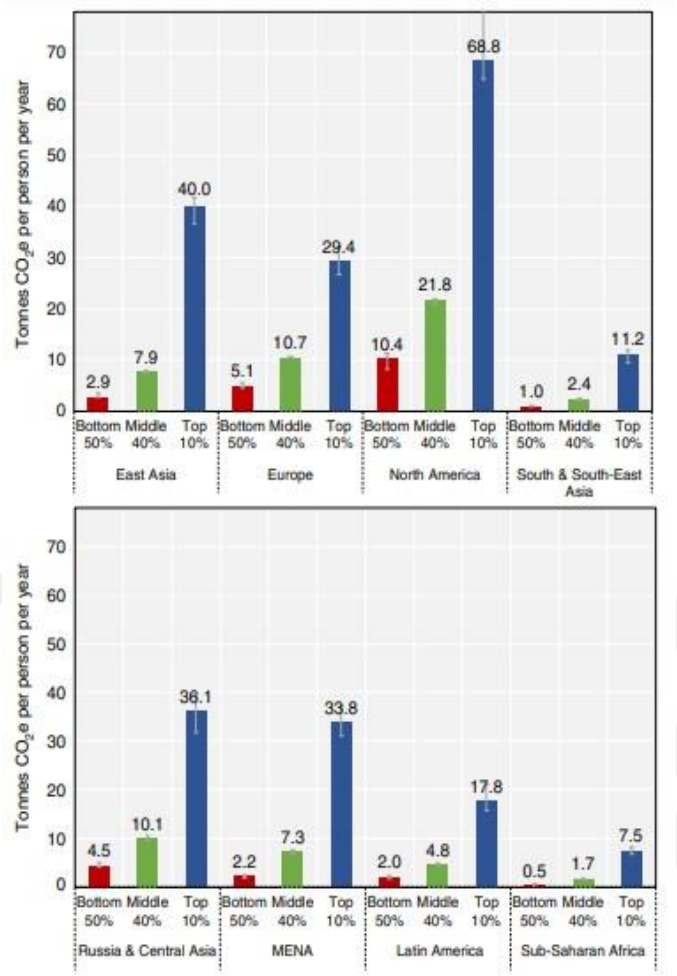
First reason is the concept has become too enormous for the natural sciences to abandon in the first place. The acceptance that social sciences must be in harmony with natural sciences is a powerful notion in Foster, in certain cases this goes far enough that social sciences must *obey* to natural sciences. This reason can be a primary example to this obedience and therefore is not a fundamental and substantial critique. His second reason, however, is more challenging to answer. In his own words;

> "…even if capitalism is surmounted, through a "Great Climacteric," representing the transition to a more sustainable world order, this fundamental boundary will remain.18

> Humanity will continue to operate on a level in which the scale of human production rivals the biogeochemical cycles of the planet, and hence the choice is between unsustainable human development and sustainable human development. There is no going back (except through a civilizational crash and a massive die-down) to a time in which human history had little or no effect on the Earth System." (Foster & Clark, 2021, para. 13).

Even if the capitalism is surmounted and a post-capitalist global civilization is built, human civilizations will never go back to the times that the humanity was an agent that could not alter the geological climacteric features of the earth. Born out of this criticism, the final question in forming the historical materialist synthesis between these two schools of thought rises: How will the era in which we are in will be named in relation with the capitalist mode of production and its relationship with the earth?

If we do ignore the notion of Capitalinian for a second, the criticism that is brought with the notion of capitalocene is entirely accurate. As the consequences of the deepening of ecological rifts in Fosterian sense or the "end of cheap nature" in Mooreian sense (2014), however one might call it, the abstract notion of "humanity" cannot be held responsible for the making of climate crisis. Certain countries and certain classes have much more impact on the deepening of the crises at hand. In the graph 3 below;



Graph 3. How the greenhouse gas emission is distributed dependent on certain variables (Chancel, 2022, p. 2)

From the data in which asks the question of "by who?" that is stated above as a historical materialist question, within the context of greenhouse gas emissions, it can easily be inferred that the contribution to climate crisis is not made wholly by humanity. By "Bottom, Middle and Top" the economic income is stated. In another data that is collected in England, top %1 in income causes greenhouse emissions in one year more than the %20 poorest of the country does in 20 years (Garcia & Stronge, 2022, p. 14) Therefore, the capitalist class both in the production and consumption nodes of the capitalist value realization, deepens the ecological rift and fastens the end of cheap nature process incomparably higher to the working class. As we have stated above, it does not just deepen it but also was the first to gave cause to it by certain imperatives of the capitalist

market relations (see above Wood). Therefore, Malm is quiet right when he claims that Anthropocene (without Capitalinian) is “indefensibly abstract” and shadows the real relations pf production within the capitalist mode of production.

However, it can be claimed that Foster overcomes such critique by placing the role of capital within Anthropocene with the concept of Capitalinian. As he overcomes one criticism however, he starts to deserve another one. Historical materialist methodology cannot be related with a teleological notion of history. It is dialectical in the sense that it does not surrender itself to the postmodernist notion of history which sees the history of object of analysis too chaotic to study but also reifies itself from a teleological and mechanic notion of history which claims that the future is entirely knowable (Blackledge, 2013, p. 162). Claiming that once capitalist mode of production is over, all the possible future post-capitalist societies cannot be “un-Anthropocentric” is a teleological view of history. As will be discussed in the conclusion chapter, certain future possibilities can be ‘a return’ within history.

To summarize, in order to form a historical materialist synthesis in between two Marxist-historical materialist analysis of the relationship between capitalist mode of production and the earth, two thinkers that must be applied are John Bellamy Foster and Jason W. Moore. These two prominent thinkers, being loyal to the historical materialist methodology, have conceptualized this relationship further than any other scholars (except Paul Burkett, Andreas Malm and certain colleagues of Foster in which he writes most of his books together with). These two scholars represent the primary differentiation within historical materialist tradition. Here, an attempt at forming a synthesis between one another is made under four headlines. First one is the most crucial one which entails history, methodology, natural science and political economy. The discussion of whether metabolic rift or metabolic shift carries us onwards to the where the limits can be discerned and acknowledged between the capitalist mode of production and nature. Again this discussion forces us to look within the principle of totality within historical materialism which leads us to investigations that are historical, philosophical and also political economic to form an accurate historical materialist synthesis. If a question of limit is at hand between capital and nature, the next question that is imposed upon us has

to be related with the scenarios of trespassing that limit in our context. Here, the political choices that is in front of the humanity as a subject is discussed and looked upon with a fundamental Leninist question: “for whom?”. This question at the very end carried us towards the agency matter at hand and the question of capitalocene or Anthropocene. In between these thinkers, a synthesis has been tried to form for the further studies that will appropriate the historical materialist perspective. In order the future studies to be accurate in historical materialist perspective, an intervention between these two modes of thought had to be made and this thesis aimed at achieving it.

CONCLUSION

After constructing a historical materialist synthesis which can be applied to the future both theoretical studies and also political praxis, a discussion needs to be carried on within the meaning of this synthesis and the possible political outcomes which can derive from the futures that is set within. When the climate crisis is considered in context of the capitalist mode of production and its relationship with earth, the possible futures and which one will we get closer to is entirely a situation that is dependent on the global policy making process. As presented above, even though very in-depth and useful theoretical framework they are, both Moore's and Foster's frameworks alone are insufficent when they are applied to real world events in "empire of capital" (Wood, 2005) Therefore, it is this thesis' claim that whether we analyze the metabolic relation between social metabolism and natural metabolism of earth correctly or not and form political decisions that is set around this synthesis is crucial for if not apprehended accurately, many lives on earth, especially the working class humans and non-human species are in great danger thanks to the imperative of capitalist mode of production which is to infinitely accumulate. Henceforth, certain future scenarios can be constructed theoretically in dependence with our understanding of the metabolic rift.

In order to construct such certain possible futures, a study made by Peter Frase can set a good example for us. In his book, *Four Futures: Life After Capitalism* (2016), Frase is after a similar purpose. After accepting that there can be multiple matrices of scenarios for the future in relation with the climate crisis that is caused by capitalist mode of production, he constructs four possible futures. These four possible futures are determined by the variants of equality and hierarchy on the y axis and abundance and scarcity on the x axis. A graphic is given below;

	Abundance	**Scarcity**
Equality	Communism	Socialism
Hierarchy	Rentism	Exterminism

Table 1. Frase's formulation of future political scenarios in accordance with climate crisis scenarios (2016, p. 26)

In his book he continues to formulate certain features that belong to each and every future with rich social and cultural encounters such as films, music but also from economic notions and data. However, entire story of how the book theorizes and formulates his versions of future is not entirely crucial for the implications of this thesis. What can be inferred for our context from this political theory study is that what possible futures would await the earth and its inhabitants globally if the political actions that will be taken won't be for mending the ecological rifts that deepen day by day?

The line of thought that is carried within this thesis proves that if the metabolic rift that is opened between humanity and nature is not mended properly by abandoning the capitalist mode of production with forming an associate of producers, the only future that awaits us is a sort of future that awaits us is a version of exterminism of Frase (2016, p. 89) This exterminism (which also points out why Foster is wrong in assuming that in every a post-capitalist civilization, Anthropocene will continue to exist), is not a "catastrophe for entire humanity" situation as Moore underlines time and time again. A future where a large proportion of the working-class people are no longer needed due to capitalist development of A.I (2016, p. 89) and this situation of no longer needing the working class is given the right opportunity it needed by the climate catastrophes that will come.

In order to avoid such a future of post-capitalism, one of the primary policy creating process should be centered around the mending of the ecological rifts that is created and deepened by capitalist mode of production. It is this thesis' claim that, by instrumentalizing Frase's political theoretical study, if theoretical interventions such as this thesis and practical particular studies that follow these interventions are continued to be made, the forces of equality and abundance in Frase's framework, which does not forsake the material realities of the nature of the earth can be built in time which will allow the humanity to overcome the catastrophes of climate disasters. It is the purpose of this thesis to contribute to this matter by formulating a historical materialist synthesis

between metabolic rift and the metabolic shift under one singular metabolism modes of thought and further the literature even more.

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SOSYAL BİLİMLER ENSTİTÜSÜ
SİYASET VE SOSYAL BİLİMLER ANABİLİM DALI BAŞKANLIĞI'NA

Tarih: 08/12/2022

Tez Başlığı: Kapitalizmde Metabolizma : Metabolik Kopuş Tartışmaları

Yukarıda başlığı gösterilen tez çalışmam:

1. İnsan ve hayvan üzerinde deney niteliği taşımamaktadır,
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08.12.2022

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Tez Başlığı : KAPİTALİZMDE METABOLİZMA: METABOLİK KOPUŞ TARTIŞMALARI

Yukarıda başlığı gösterilen tez çalışmamın a) Kapak sayfası, b) Giriş, c) Ana bölümler ve d) Sonuç kısımlarından oluşan toplam 123 sayfalık kısmına ilişkin, 05/12/2022 tarihinde şahsım tarafından Turnitin adlı intihal tespit programından aşağıda işaretlenmiş filtrelemeler uygulanarak alınmış olan orijinallik raporuna göre, tezimin benzerlik oranı % 7 'dir.

Uygulanan filtrelemeler:

1- ■ Kabul/Onay ve Bildirim sayfaları hariç
2- ■ Kaynakça hariç
3- ■ Alıntılar hariç
4- □ Alıntılar dâhil
5- ■ 5 kelimeden daha az örtüşme içeren metin kısımları hariç

Hacettepe Üniversitesi Sosyal Bilimler Enstitüsü Tez Çalışması Orijinallik Raporu Alınması ve Kullanılması Uygulama Esasları'nı inceledim ve bu Uygulama Esasları'nda belirtilen azami benzerlik oranlarına göre tez çalışmamın herhangi bir intihal içermediğini; aksinin tespit edileceği muhtemel durumda doğabilecek her türlü hukuki sorumluluğu kabul ettiğimi ve yukarıda vermiş olduğum bilgilerin doğru olduğunu beyan ederim.

Gereğini saygılarımla arz ederim.

Tarih ve İmza

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