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**The traditional epistemology and the modern Geography**

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**ABSTRACT**

A review of the treatment given to the notion of scientific method by the post-empiricist philosophers of the twentieth century, as also of the foundation of human sciences, according to Foucault and the notion of positivism, according to the critics of the School of Frankfurt, led us to the debate over the scientific character of geography especially in the last two hundred years. From the analysis of the texts of the main theorists of geography, it is argued that the modern geographical discourses are in general on the fringes of the debates held in the scope of the history and the philosophy of science during the twentieth century. The concern about the definition of method and objects of study specific to this discipline lends itself as evidence that the traditional methodology also serves as the foundation of modern geography.

**PALAVRAS CHAVE:**

Geografia Moderna  
Epistemologia  
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**RESUMO** – Epistemologia tradicional e a Geografia moderna. Uma revisão a respeito do tratamento dado à noção de método científico pelos filósofos pós-empiristas do século XX, como também dos fundamentos das ciências humanas, segundo Michel Foucault, e da noção de positivismo, de

acordo com os críticos da Escola de Frankfurt, introduziu-nos no debate a respeito do caráter científico da Geografia, considerando-se, especialmente, os últimos 200 anos. A partir da análise de textos de alguns dos principais teóricos da Geografia, argumenta-se que os discursos geográficos modernos colocam-se, em geral, à margem dos debates promovidos no âmbito da história e da filosofia da ciência, durante o século XX. A preocupação com a definição de método e objetos de estudos específicos para esta disciplina presta-se como evidência de que a concepção tradicional de metodologia serve ainda como fundamento para a Geografia Moderna.

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## 1. Introduction

The publication of *Anthropogeographie*, in 1882, by Friedrich Ratzel, marked the beginning of the process of reflection of a new central theme emerging from the fields of knowledge constituted until then. This comprehension is supported by the affirmation of Horacio Capel (1983), when he explained that the definition of Geography given by geographers at the end of the twentieth century, corresponding to the integration of physical and human phenomena on Earth's surface, meant an authentic innovation.

Initially, the theme man/environment and interface society / nature drew the attention of many scholars, such as Friedrich Ratzel and Paul Vidal de La Blache, among others with the same thoughts.

In the need of elaborating the theoretical foundation of geographical science, the thinkers of this course traveled several theoretical paths, during the last 200 years, in search of solid ground to implant the foundation of their knowledge. We dare to argue in this article that the development achieved in this direction is aligned with the conception of epistemology and traditional methodology and because of this geography was unsuccessful in breaking the cocoon of positivism where it was engendered.

Although the constitution of certain geographical societies has occurred in the early decades of the nineteenth century concomitant with the process of institutionalization of the teaching of geography in some European universities, the geographers, since the beginning, have encountered difficulties in the attempt to explain the object of studying, the research procedures applied, as well as the concept of categories and fundamental notions applied to their analyses.

The explanation of the method and the delimitation of the object were procedures required of all knowledge that was intended to be scientific in that period, according to traditional criteria. Therefore, the proposition of modern and scientific geography required the design of methods and objects compatible with a supposed systematization. This requirement might have never been met. And this is the reason for the continuation of this debate until the present day.

If the theorists sought to make geography a recognized discipline academically speaking and give it a scientific character, during the last two centuries, they wanted it as systematic knowledge, seeking to conform it to the methodological standard suggested and making it the object of study. Antonio Carlos Robert Moraes (1989) proposed that the necessary conditions for an achievement of geography, such as the transition from feudalism to capitalism, the constitution of the world space of links, the knowledge of the total extension of the earth, the improvement of the cartographic language, etc would have been effected in periods that ranged from Renaissance to the nineteenth century (MORAES, 1989). The belief in this supposed process of systematization of Geography, widespread in the academic community, has been vehemently defended by the most eloquent theorists. Even after the discussions promoted by post-empiricist philosophers of the twentieth century, the reality has not been changed in the scope of geography.

If nowadays some geographers are delighted to assure that a supposed process of systematization of geography has occurred, it is necessary to show that such positioning is on the fringes of the debate about the theory of the method.

The argument presented by Moraes suggests that the expression “systemized geography” has the same meaning as “modern geography”, when he warns that systematic geography has not emerged from the referred process of systematization, but from “[...] a systemized geography that, despite assuming itself as an autonomous field of scientific knowledge, does not formulate a proposal of a systematic study, isolating an object specifically as its own” (MORAES, 1989, p.15). Except for the election of a new theme and also for the addition of a characteristic discourse, we have not found any distinct elements of the new discipline and because of this we think that is not clear what Moraes (1989) wanted to say when he mentioned the emergence of a systemized geography.

## **2. The debate on the theory of method and on the object of research**

Several points of view were constituted on the foundations of rationalism and empiricism and they were also identified as a group by the great title of modern science, whose development became outstanding from the scientific revolution of the sixteenth and seventeenth centuries. From the success and failure of these perspectives of research (one which supposedly sought to stick to the thought and one that in principle prioritized data) the modern flow of knowledge, practice and technology has emerged.

The constitution of science has been confused with the birth of modernity, so it is impossible to mention one without referring to the other. This is one of the conclusions reached by Paulo Cesar da Costa Gomes (1996). For him “the modern scientific thought is

the essence of modernity, being its most eloquent witness” (GOMES, 1996, p.66).

Tuned in to this view, Boaventura de Sousa Santos (2006) affirms that all the theoretical and methodological orientation elaborated, at least in the two last centuries, was conceived in a dominant pattern of science and elaborated and practiced in our time. From the two strands of thoughts referred above were derived both the positivism and a critical Marxist approach as well (SANTOS, 2003). The predominance of the interpretative current admittedly hegemonic should not be taken as the only one, since there are variations within it.

The theoretical assumptions in the philosophic and scientific periods of the seventeenth and eighteenth centuries recommended an investigation of the supposed method that, in principle, enabled the discovery and the identification of the alleged natural laws. The proposed scientific method, first to be applied to problems of physics, was later praised as a methodological pattern for research in other fields of studies that emerged in a sequence during the eighteenth and nineteenth centuries.

The supposition of the existence of such a method that could lead to a scientific discovery and that could also be applied to all fields of knowledge has been taken as an indicative of a positivist approach. In social science, all the elements that are often related as features of this case are: aversion to various forms of historicism, an investigation exempted from interest of the transformation of the social, economic and political order and the proposition of methodological ways that are somehow similar to induction and experimentation.

According to Phil Slater, the term “positivism” was applied by the theorists of the School of Frankfurt to designate not only those who knowingly accepted the label of positivist, as also any theorists that fitted into the broad category of “traditional theory”.

Based on the argumentation of Max Horkheimer and Herbert Marcuse, Slater (1978, p. 68) referred to positivism as a theoretical stance that “[...] performed a progressive role in the revolutionary ascent of capitalism”, but failed in trying to restrict the scientific activity to the record, classification and generalization and also assuming technological advancement as a model of all rational activity.

A positivist mentality, according to Massimo Quaini (1983), corresponds to a vision of the world that is more characteristic of capitalism and it refers to the treatment of social facts as natural facts. Some authors propose a simplified comprehension of positivism, relating it to the application of the natural science method (in principle, the inductive method) to social sciences.

The search of certainty of knowledge is often identified as a key issue to the field of philosophy of science. Put it in another way: How can we make sure that the knowledge we have is true? If such possibility exists it is up to us inquire about the requirements that should be met so that the knowledge gained can be reputed as a true fact. Is there any legitimate criteria of scientificity capable of guaranteeing a certainty of knowledge?

The establishment of criteria of scientificity, in principle capable of validating the knowledge produced for centuries has been a reason for concern among several researchers and philosophers. The traditional methodology proposes that such criteria must be gained from the proposition of a scientific method and also from the definition of the object of research. This procedure has been widely questioned during the last decades.

The definition of methods and the delimitation of the object of research, a procedure that has become standard to all modern disciplines, means implicitly the alignment to the traditional methodology that is, for its part, predominantly an inheritance from empiricism and rationalism related to the logic of the modern thought.

Despite the difference that can be verified between Popper's conception (1972), Lakatos (1979), Kuhn (2000 and 2006) and Feyerabend (1989) and despite their frictions and incomprehension, we observe that there are several identified regularities in their philosophical discourses regarding the question of the method. Clarification stood out as exceedingly useful for the elucidation of certain recurring problems involving academic discipline and this is also true when it refers to geography.

The consciousness that, despite all the rigor applied to researches, the knowledge obtained is still nuanced by uncertainty and error and that "the old scientific ideal of episteme - of knowledge absolutely correct and demonstrable - showed itself to be nothing but an idol", as Popper wrote (1972, p. 30), it is one of main consequences of this reflection. The perception that we can not justify our theories rationally also falls between the main results of post-empirical authors' reasoning. If we think that we have learned after extensive field research, analyses and discussions cannot be taken as reliable knowledge, because they also result from speculative assumptions and personal opinions, a reference to an epistemology as an investigation of procedures of production of scientific knowledge needs to be revised.

If we disclaim the belief in methodology and if we admit that there are no rational legitimate criteria of scientificity (also with regard to natural science), if there are no rules that enable the obtention of safe knowledge, why still make use of the expression "scientific methodology"?

Another consequence is the fact that advances promoted by Kuhn, Popper and their supporters, in the comprehension of the question of the method, alter our comprehension of positivism that in our point of view can not be taken only with the application of the method of natural science in the studies conducted in the scope of social science. If an induction cannot

be mentioned as the method of natural science, and still more, there is not a method or a logic of discovery, clearly defined, how can we say that the application of this alleged method in the social sciences corresponds to positivism? Maybe it is more appropriate to say that the positivism relates to an erroneous application of theoretical premise, with which the research in the field of Physics and Chemistry, Biology etc is practiced, to the human and social studies (in the corresponding domain of sociology, economy and geography, etc). Thus put the posture of positivism closer to those authors who believe in the existence of a logic of a discovery of a way assigned to reach the fundamental knowledge, the epistheme.

From the debates between the philosophers of the post-empiricist science in the twentieth century, we can still find another verification related to the difficulty of characterization of scientific activity, broadly speaking, that is able to cover all the fields of knowledge. On the impossibility of establishing an authentic scientific method, it means, the clarification of typical procedures that lead to a scientific discovery, we can ask the following question: is a definition of a general and unique science possible?

Attempts to define the term science are abundant and they are conducted by those who reduce the scope of this question. Thus they offer responses based on general terms. In general these responses are insufficient, once they return the question with a circular reasoning, as an example of “activities that make use of the scientific method”. Because of the lack of criteria of scientificity that can be applied to the various fields of research, each scientific field needs to be characterized in what it has of scientific. Because of this the supporters of the additional methodology claim the requirement of the combination of object and method in its characterization of science, an option that leads us back to the previous question. However, if we admit that the lack of a characteristic method calls for the delimitation of object,



another problem is posed. This problem is related to the difficulty of evaluating what is said regarding the same object. This comes from the fact that the objects and phenomena are often intricate, constituting an impediment to the exact definition of the field of study. If it is not possible to delimit the frontiers precisely, how can we define specific scientific fields?

The research undertaken by Chalmers (1993), in order to understand what can characterize a science, as a general category, with respect to the areas of knowledge that can be classified as scientific or not, was unsuccessful. His conclusion makes us believe that “the philosophers do not have resources that enable them to legislate about the criteria that need to be met in order to make an area of knowledge acceptable or scientific” (CHALMERS, 1993, p. 211). The lack of an objective criteria, besides disabling the classification of the discipline, makes it impossible to label the researches, articles, dissertation, theses and books of varied contents, as scientific or not. We do not know strictly what science means, because this term is excessively full of meaning and, at the same time, empty. However, we suspect that an ideological load weighs on it and it is the cause of much of our incomprehension.

Due to the difficulty of characterizing as scientific or not each discipline or any field of knowledge we came upon the possibility of understanding them all just as knowledge. Written this way, this statement does not appear in Michel Foucault's texts. However, an approximation of his work to the works of Popper, Kuhn, Lakatos and Feyerabend suggests this hypothesis.

Foucault (1999 and 2005) refused to deal with the epistemology of human sciences and he did it in the belief that some epistemology is possible to determine the fields of knowledge. In fact in his book “The Words and the things”, Foucault does not dispute epistemology. Instead he is concerned with an archaeology of knowledge. The task of doing the criticism of the epistemology was the responsibility of the school of thought that

beginning with Physics, accepted as standard for the other academic disciplines, eroded the notion of science inside. The philosophy of science seen by Popper, Kuhn and Feyerabend dealt with this.

If we interpret the perspective of Karl Popper (1972 and 1978) carefully and also some post-empiricist of the twentieth century like Imre Lakatos (1979), Thomas Kuhn (2000 and 2006) and Paul Feyerabend (1989) geographical knowledge does not constitute “knowledge” according to the standard of classic epistheme. Most of the time it is knowledge, interpretative and speculative, although presented, several times as obvious, observable and verifiable.

Side by side, the philosophy of science of Popper, Lakatos, Kuhn and Feyerabend, seen as a denial of the methodology of natural sciences and the historical archaeology of knowledge of Michel Foucault, also seen as a way of denial of epistemology of human sciences offer in terms of their consciences and complementarities subsidies for major deconstruction of the idea that a scientific method presides over the various fields of knowledge.

### **3. The modern geographical thought**

In the last decades, some of the reputed theorists who tried to make progress in the knowledge of the base theme of geography, apparently, did not become aware of the corollary of the critic evaluation offered by the group of post-empiricist philosophers of the twentieth century. This criticism made the characterization of a geographical science, from the establishment of criteria that imposes a standard of a scientific method, meaningless.

Thus one can explain why Yves Lacoste complained about the lack of epistemological debate among the geographers, believing that the geologists, the climatologists, the botanists, the

economists and the sociologists, “[...] of whose works geography makes partial use, developed a method of a conceptual instrumental that is specific for a particular science, whose aims are not those of geography” (LACOSTE, 1981, p 227). Lacoste (1981) foresaw that such disciplines have sophisticated methods and conceptual tools, that does not constitute truth, and he does not take into consideration the doubts questioned by Popper (1972) about the classic epistheme and safe knowledge.

The revision made by R.J. Johnson (1986) is an example of the difficulties faced by geographers when they tried to apply in their studies the practices suggested and announced by the logical positivist that were well known right after the second world war (1939-1945). The pre-supposition that the adoption of such procedures of investigation, according to a scientific method (well accepted in the decades of 1950 and 1960 in the United States and Great Britain) would enable the development of alleged geographical laws, did not correspond with the facts.

Despite the fact that “in developing their analyses, the human geographers increasingly sought a clear identity for themselves within the social sciences”, as Johnson affirmed (1986, p. 132), we did not face a consensual method adopted as the research instrument driver.

The theory of science of Popper, Kuhn and especially Feyerabend was more effective than the argumentation of Michel Foucault`s criticism on the ideology of scientificism. Popper specially because he attacked the belief in the induction as a characteristic method of “scientific” activity. Kuhn suggested that criteria that were not objective guide the choice of their alleged paradigm. Feyerabend (1989 and 1996) made us believe that all the elaborated methodologies up to now have limits and the supposed truths announced by the scientists showed their own opinions. Foucault (1999 and 2005) therefore was the first to suggest that the analyses of discourse and the historical

archaeology are instruments of comprehension of knowledge, especially in the domain of humanities.

The accomplishment of critical investigation about the method proceeded by Popper, Kuhn, Lakatos and Feyerabend, that revealed the lack of legitimate criteria of scientificity, made us give up questioning the scientific method adequate for geography. The existence of a method capable of conducting scientific discoveries proved to be an illusion. So it is not advisable to proceed with, according to Massimo Quaini's suggestion (1983, p. 15) an accomplishment of a [...] history of scientific methods in the field of geography”.

The affirmation of theoretical foundation of geography is based on a traditional theory that is still valid even if we consider that, in the second half of the twentieth century, several critical geographers have made efforts to try to elaborate an approach more aligned to the principles of Marxism, trying to approximate the geographical themes to practical problems of the real world – specially those experienced by social classes excluded from the political and economical circles of power. Even if this movement of innovation has been responsible for a recognized effort of equation of theoretical-methodological<sup>1</sup>, we will only find the foundations of this discipline in the common matrix to other disciplines, which in turn rest on the false idea of the existence of the scientific method.

There is a heated discussion around this issue because, for several authors the originality of Marx's propositions is unprecedented in modern time. However, in the analysis undertaken by Cornelius Castoriadis (1995), the theoretical matrix Hegelian dialectic may be found in the intellectual atmosphere of the second half of the twentieth century, characterized by scientificity, evolutionism and positivism. So

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<sup>1</sup> Among the critics of different thoughts we can mention Pierre George, Yves Lacoste, David Harvey, Milton Santos, Edward Soja, R. J. Johnston, José William Vesentini, and others.

there is no denying the rationalist empiricist inheritance of Marx's philosophy and history.

As Jurgen Habermas (1982) understood, Marx had in mind a natural science of mankind, established in a critical form, but constituted according to the model of the sciences of nature, comprising a historical process, as well as the economical dynamic of society regulated by laws. "To patent the scientificity of his analyses, Marx has always pointed out the analogy with the science of nature" (HABERMAS, 1982, p.62).

An effort made in order to constitute an archaeology of geography, the same undertaken by Foucault (1999) to the group of human sciences apparently can not be accomplished independently without considering the other disciplines that work with the social, economical and political framework of nature.

On the framework established by Foucault (1999), the positivism of knowledge is not directly related to geography neither to any other "natural sciences". These can only be found in the study of life, language and work, or in other words, in the empiricist sciences. The domain of human sciences was not previously shown. Foucault, however, (1999, p. 486) suggests that the human sciences are found positioned in the neighbourhood, in the frontiers and "[...] in the whole extension of science that works with life, work and language".

What was implied by the criticism made by Foucault (1999 and 2005) related to human sciences, what the positivist geographers (often unconscious) avoid commenting, is related to what Habermas (2000) called the "exposure of human sciences". It means that there is no possibility of establishment of a typical epistemological statute of geography and it is also true that we do not have enough elements to characterize it as science. This position, however, does not refer only to geography, but to the framework of knowledge related to humanity.

When Foucault (1999) said an epistemological analysis does not fit humanity, but an archaeological analysis does, due to the lack

of criteria of scientificity that could make an investigation on the procedures of production of knowledge possible, only the character as knowledge resulted from this. If Foucault is right, geography corresponds to a knowledge or collection of knowledge.

Purified by the philosophy of science of the twentieth century and by historical archaeology of Foucault's knowledge, geography exists as a collection of knowledge with other knowledge about human beings, so that we have not innovated if, instead of the expression "geographical science", we use the expression "geographical discourses".

Under the perspective that we adopted, we see no possibility of distinguishing, or at least characterizing, knowledge about geography from the verification of knowledge. At the most we succeeded in observing at certain times the pre-eminence of one or another kind of interpretation, under the influence of several philosophical currents and the political movements. As an example, we can mention the fact that in recent decades, at least among Brazilian geographers, predominated (although there is disagreement) the acceptance of space as an object of the study of its discipline, mostly because of the influence of Milton Santos. We verified that to a certain extent in certain periods of history, some geographers agreed on the theme of studying and also on problems accepted as priority subjects even without consensus of procedures of research and of the object of studying.

If the elucidation of methodological procedures eminently scientific and adopted in the academic disciplines have become impracticable for Kuhn (2000 and 2006) and Feyerabend (1989), it is even more difficult for us the definition of sciences from the choice of the object. Furthermore the philosophers of post-empiricist sciences have not done that either.

Apparently, Milton Santos did not understand the post-empiricist thought on the questions of method and object. This can be seen in *For a New Geography: from the Criticism of Geography to a Critical Geography* (2002), when the author

endeavours to define space as an object of the study of geography. His conception of object to geography involves the notion of a social space, or human space, as a social instance allocated together with other instances: economic, political, social and judicial etc. Even without losing sight of the need for the apprehension of totality (inheritance of dialectal authors?) we can refuse to admit an economic determination on space, because its approach tacitly recognizes the impossibility of delimitation of a scientific field to its discipline by the definition of its methods.

If Yves Lacoste was concerned with the shortage of methods adequate to geography, Milton refused to deal with this question. Milton Santos did not make the same mistake that Lacoste did. Instead of questioning the method, Santos (2002) proposed the discussion of the object of the study of geography, developing an argumentation that admits the existence of laws for each social instance and also the relative autonomy of the disciplines: “and as in the other disciplines, space, although submitted to the law of totality, has a certain autonomy that manifests itself through its own laws, specific to its own evolution” (SANTOS, 2002, p. 181). Each discipline, from his point of view, corresponds to a part of reality and each one with its own object: “taking into consideration this aspect of social life that comes to be the object of each particular discipline” (SANTOS, 2002, p. 147). That explains his struggles to define space as an object of the study of geography.

The choice of terrestrial space or geographical space as an object of the study of geography provokes numerous difficulties, both from the theoretical point of view and the practical side. The delimitation of an object of the study of an excessively ample nature does not show any utility, provided that there are no restrictions. Dealing with space, we can not speak exactly of delimitation, because the notions of geographical space and terrestrial space, under no circumstances, concentrate the research in certain limits. On the contrary, it extends it.

If the phenomena that we observe are not clear, if the reality that we perceive does not make it possible to see the distinction of immediate causes, unless through an analytical and reducible effort, we can risk isolating the object of study. Considering that investigating social relations means, at the same time, to study their economic and political relations, according to history, at a given moment, from which criteria can a community of researchers choose only one of these instances and make it an object of their discipline?

The development of the academic practice in the scope of social science has revealed that the definition of the object of the study of the disciplines can not be respected as exercise of research. In view of this the nomination of a specific object for the domain of geography, more than simply a thankless task, reveals itself as unnecessary. If we have not succeeded in distinguishing and characterizing geographical knowledge by the verification of the methods applied we have not succeeded in distinguishing it from the delimitation of its object.

Assuming that the identification of an object of specific study has become a thankless task, when we ask about the constitution of modern geography and the fact that this group of knowledge is not characterized by the application of a method supposedly scientific, what does “systemized geography” mean?<sup>2</sup> What can be said about the convenience of its use if we still consider the present verification that geography presents a theoretically uncertain reality? This evaluation is necessary if we take into consideration that is not clear what Moraes (1989) wanted to say when he pointed out the emergence of a systemized geography, which means the same as questioning the constitution of modern geography.

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<sup>2</sup> A discussion about the categories of the geographical analyse, as well geography, as a field of knowledge and discipline can be found in Pelegrini (2008).



#### **4. Last words**

Even recognizing the importance of what was written by Foucault, geographers still mention a supposed geographical science. We accept that this is a posture compatible with the traditional conception of science and it also does not consider all the discussions undertaken by Popper and by those that followed him in the field of the philosophy of science.

Broadly speaking, the positions supported by many geographers are still ruled by a positivist view that teaches the application of the scientific method, even if it does not have any foundation, and that proposes an object of study that defines the scope of the discipline, even though there is no consensus about the objects, or that these objects are objects of other disciplines. The traditional methodology, the positive prescription, has proved inefficient. However, some authors have not noticed this and they are still using the old discourse.

Although the history of geographical thought had its roots planted in the reference of classical epistemology, this history does not correspond to the theory of geography, contradicting many others who believe this. Geographical thought has a long history. However the work of construction of the theory of geography is still to be done.

#### **References**

CASTORIADIS, Cornelius. A instituição imaginária da sociedade. Translated by Guy Reynold. 3. Ed., Rio de Janeiro: Paz e Terra, 1995.

CHALMERS, Alan F. O que é ciência afinal? Translated by Raul Fiker. São Paulo: Brasiliense, 1993.

CAPEL, Horacio. Filosofia y ciência em la geografia contemporânea. 2. ed. Barcelona: Barcanova, 1983.

FEYERABEND, Paul K. Contra o método. Translated by Octanny S. da Mota e Leônidas Hegenberg. 3. ed., Rio de Janeiro: Francisco Alves, 1989.

FOUCAULT, Michel. As palavras e as coisas: uma arqueologia das ciências humanas. Translated by Salma Tannus Muchail. 8. Ed. São Paulo: Martins Fontes, 1999.

GOMES, Paulo Cesar da Costa. Geografia e modernidade. Rio de Janeiro: Bertrand Brasil, 1996.

HABERMAS, Jürgen. O discurso filosófico da modernidade: doze lições. Translated by Luiz Sergio Repa e Rodnei Nascimento. São Paulo: 2000.

JOHNSTON, R.J. Geografia e geógrafo: a geografia humana anglo-americana desde 1945. Translated by Oswaldo Bueno Amorim Filho. São Paulo: DIFEL, 1986.

KUHN, Thomas S. A Estrutura das Revoluções Científicas. Translated by Beatriz Vianna Boeira e Nelso Boeira. 5 ed. São Paulo: Perspectiva, 2000.

KUHN, Thomas S. O Caminho desde a Estrutura: ensaios filosóficos, 1970-1993, com uma entrevista autobiográfica. Translated by Cesar Mortari. São Paulo: Editora UNESP, 2006.

LACOSTE, Yves. A Geografia, In: CHATELET, François. A filosofia das ciências sociais. Translated by Hilton Ferreira Japiassu. Rio de Janeiro: Zahar Editores, 1981.

LAKATOS, Imre. O falseamento e a metodologia de pesquisa científica. In: LAKATOS, Imre and MUSGRAVE, Alan. A crítica e o desenvolvimento do conhecimento. Translated by Octavio Mendes Cajado. São Paulo: Cultrix: Editora da Universidade de São Paulo, 1979. pp. 109-243.

MORAES, Antonio Carlos Robert. A gênese da geografia moderna. São Paulo: HUCITEC, 1989.

PELEGRINI, Djalma Ferreira. Geografia e Saberes Modernos: a inserção da complexidade nos discursos geográficos. Thesis (PhD in Geography). Universidade Federal de Uberlândia (UFU). Uberlândia, 2008.

POPPER, Karl Raymund. A lógica da pesquisa científica. Tradução de Leônidas Hegenberg e Octanny Silveira da Mota. 2. ed., São Paulo: Cultrix, 1972.

POPPER, Karl. Lógica das ciências sociais. Translated by Estevão de Rezende Martins, Apio Claudio Muniz Acquarone Filho, Vilma de iliveira Moraes e Silva. Rio de Janeiro: Tempo Brasileiro; Brasília: Ed. Universidade de Brasília, 1978.

QUANI, Massimo. A Construção da Geografia Humana. Translated by Liliana Lagana Fernandes. Rio de Janeiro: Paz e Terra, 1983.

RATZEL, Friedrich. Geografia Dell`Uomo (antropogeografia). Tradotta da Ugo Cavallero. Torino: Fratelli Bocca, 1914.

SANTOS, Milton. Por Uma Geografia Nova: da critica da geografia a uma geografia critica. São Paulo: EDUSP, 2002.

SANTOS, Boaventura de Sousa. Um discurso sobre as ciências. 4. ed. São Paulo: Cortez, 2006.

SLATER, Phil. Origem e Significado da Escola de Frankfurt. Translated by Alberto Oliva. Rio de Janeiro: Zahar Editores, 1978.