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The environmental question: Challenges for constructing a transdisciplinary perspective

A questão do meio ambiente: desafios para a construção de uma perspectiva transdisciplinar

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INTRODUCTION

The theme proposed for debate immediately challenges us to reflect on two controversial issues that today concern scientific communities: The problem of interdisciplinarity and the environmental question.

The major development of the different particular sciences during this century contributed to great scientific and technological advances, but it also led to an extreme specialization of knowledge, the consequence of which is often the impairment of our very understanding of the world. The possibility that older forms of knowledge may succumb to new ones means that those confined to an immobilist view run the risk of being left adrift when faced with the task of interpreting the present.

The so-called environmental crisis that we are witnessing today suffers from this situation and should prompt a revision of the theories and practices of the various disciplines, insofar as it demands a comprehensive, totalizing analysis: an analysis in which people from different horizons, working with present reality, can bring their steps into alignment across the world through genuinely interdisciplinary work. We also agree with Paulo Vieira (1992, p. 103) when he states that “the problems involved in the environmental crisis are characterized by the fact that, if they are to be effectively confronted, they require new patterns of organization within scientific communities.”

How can we provide the foundations for an epistemology of the environmental question that contributes to this interdisciplinary approach? But what is this

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interdisciplinary work? The disputes maintained since the last century “over the monopoly of the object of study” (Iglesias, Alicia, 1994, p. 5), and the resulting isolation of disciplines, have lost their meaning in view of the complexity of the present day. To achieve valid interdisciplinarity, we must begin from metadisciplines, which obliges us to bow before contemporary history. Otherwise, we would arrive at a crippled interdisciplinarity, founded on a zeal for extreme specialization, with all the dangers of mechanical analogy.

Failing to take into account the multiplicity of perspectives through which the same reality presents itself to our eyes may lead to the theoretical construction of a blind and confused totality. Yet the need to begin from metadisciplines that lead to a systematic view of the totality does not exclude specializations, since these remain necessary. For this reason, another essential requirement is to define the object of study precisely. We understand that an object of study presupposes a view of reality, which denotes a system of thought: from the same object, different views may arise. The entire question of the objectivity of the object and the objectivity of the subject is continually posed anew.

The terms of the problem are not given a priori when interdisciplinarity is to be defined. Nor can we forget that each period and each object has its own interdisciplinarity. This question is not abstract, because what is at stake is not, strictly speaking, disciplines, but aspects of total reality made autonomous and demanding specific treatment. We insist that the historical process changes the meaning of the object, and the necessary truth also changes as time passes. This is inevitable and even entails changes in the very range of disciplines or fields of knowledge concerned.

Historical evolution gives rise to new forms of knowledge, renewed forms of knowledge, or forms of knowledge undergoing transformation and therefore difficult to define. Recognizing this historical evolution is essential. It is always risky to work exclusively with the present and only from the present. It is more appropriate to seek to understand its formative process. When we content ourselves with the present and take it as our point of departure, we run the risk of establishing an inadequate causal chain that may direct reasoning in an undesirable direction. It is equally problematic to take a planning intention as a point of departure, since its premises will likewise influence the sequence of facts and ideas.

Hence our proposal to reconsider the historical construction of the object itself, so as to recognize its formative elements, assessed not in isolation but according to their respective context. To this end, we believe that an approach based on the technical phenomenon is the most appropriate, since nature and space are redefined through technical evolution, whose periodization can serve as the basis for recognizing a periodization in territorial history, until we reach the current phase, in which the problematic of the “environment” imposes itself.

BASIC PREMISES

An indispensable basic premise is that there is no environment distinct from the milieu. Both geography and sociology, since the end of the last century, have based a substantial part of their propositions on this idea of milieu, which remains valid today. Thinkers such as Humboldt, Ritter, Vidal de La Blache, Durkheim, among others, sought to reflect on the society-nature relationship, considering the surroundings of societies as an essential datum of human life.

What today are called harms to the environment are, in reality, nothing other than harms to the human milieu of life, that is, to the milieu viewed in its entirety. These harms to the milieu must be considered within the evolutionary process through which the dynamics of history confront the life of the planet.

The history of humankind on Earth is the history of a progressive rupture between human beings and their surroundings. This process accelerates when, practically at the same time, human beings discover themselves as individuals and begin the mechanization of the planet, equipping themselves with new instruments in an attempt to dominate it. Artificialized nature marks a major change in the human history of nature. Now, with technoscience, we have reached the supreme stage of this evolution (Santos, 1994, p. 16).

Faced with the consequences arising from the mistreatment of the milieu, which threaten life on the planet, we immediately pose a question: is the locus of these problems the place or the world?

In the current phase, when the economy has become globalized and adopted a single technical model, nature has become unified. Its various fractions are placed within the reach of the most diverse forms of capital, which individualize and

hierarchize them according to logics operating at different scales. A global scale corresponds to a global logic that, at this level, guides investment, the circulation of wealth, and the distribution of commodities. Yet each place is the meeting point of logics operating at different scales, revealing different levels, sometimes contrasting, in the pursuit of efficiency and profit and in the use of technologies, capital, and labor (Santos, 1994, p. 19). It is a nature unified by history in the service of hegemonic actors, in which technique has become the fundamental mediation between human beings and their surroundings.

When we speak of the environment, therefore, we must first understand the formation of this technical milieu, which today can be apprehended in the relationship between place and world, since technique is the basis for the realization of worldliness as an empirical totality (Santos, 1985), and this is achieved only through places, insofar as places express the functionalization of the world.

Technique is the great banality and the great enigma, and it is as an enigma that it commands our lives, imposes relations upon us, shapes our surroundings, and administers our relations with those surroundings. If yesterday human beings communicated with their portion of nature practically without mediation, today the very definition of what these surroundings are - near or distant, local or global - is full of mysteries. It is in this sense that, as early as 1949, Georges Friedmann advised us to consider this technical milieu as a "reality with which we are confronted," proposing, for that reason, "to study it with all the resources of knowledge and to attempt to master and humanize it."

THE CONSTRUCTION OF THE OBJECT: THE IMPORTANCE OF TECHNIQUE

We believe that a historical analysis of the so-called "environmental question," viewed from the standpoint of technique, can provide a sound point of departure for a periodization of the problem and for understanding the present situation. Technique would thus appear, in each period, as a kind of pivot or reference point in the constitution of interdisciplinary knowledge.

Our point of view begins from a premise now adopted by numerous historians of science and philosophers of technique (B. Latour, A. Gras, J. Ellul, among others), according to which one cannot think about technique, or more explicitly about the

technical object, without thinking simultaneously about the society that animates it. This can be stated more directly: no technique is merely materiality; technique is also social. And especially today, in this technical-scientific period of history, nothing is purely social; it is also, equally, technical. In short, everything is hybrid, mixed.

This notion of hybridity and mixture constitutes a fundamental element in the equation with which we intend to work. This equation consists of three terms: (1) the first is given by the technical systems added to Nature, in a given place and at a given historical moment - a second nature, already technicized; (2) the second is given by the motivations for using this second nature. These motivations are local and extra-local, increasingly extra-local; (3) the third is the degree of "indifference" of the technical systems employed toward the milieu that receives them, in other words, the degree of respect shown by technical systems for the structures encountered: the structure of the milieu, viewed as materiality (in its so-called natural equilibria) and as society (in its so-called social equilibria).

There would thus be, in a rough delimitation, three major periods:

(1) the pre-technical period;

(2) the technical period; and

(3) the scientific-technical-informational period.

Even before attempting to characterize each of these periods, it is necessary to emphasize that this periodization, arbitrary as always and, as always, governed by the purposes of the theme and the author, is susceptible to subperiodization. Until recently, situations were difficult to compare, since the unity of evolution of the technical phenomenon is itself recent. Yet, in each area, differences in evolution allow the respective historical time to be treated specifically.

1) What we are calling the pre-technical period entails a restrictive definition. From the emergence of social humanity onward, natural objects themselves - that is, things themselves - acquired social content through human use. The transformations imposed on natural things were already technical, among which the domestication of plants and animals appears as a decisive moment: human beings changing Nature and imposing laws upon it. This, too, is called technique. Here, however, we reserve the designation technical period for the phase following the invention and use of

machines, since machines, joined to the soil, give an entirely new dimension to the corresponding geography.

In this pre-technical period, technical systems had no autonomous existence. Their symbiosis with the resulting nature was total, and we may perhaps say that the possibilism of creation was immersed in the determinism of functioning. Motivations for use were above all local, although the role of exchange in social determinations could be growing. Thus, local society was at once the creator of the techniques used and the authority governing the times and limits of their use. The socio-spatial harmony thus established was respectful of inherited nature in the process of creating a new nature. By producing it, territorial society also produced a series of territorial norms concerned with preserving the milieu of life so as to safeguard the continuity of the process. Examples include fallowing, land rotation, and shifting cultivation, which are at once social and territorial rules aimed at reconciling the use and “conservation” of nature so that it may be used again. These technical systems without technical objects were therefore not aggressive, because they were inseparable from Nature, which they helped to reconstitute through their operation.

2) The technical period witnesses the emergence of technical objects and mechanized space. The objects that constitute the milieu are no longer merely cultural objects; they are cultural and technical at the same time. As for space, its material component is increasingly formed by the “natural” and the machine. Within the total population of objects in an area, the number and quality of technical objects vary. Areas and spaces - that is, regions and countries - come to be distinguished according to the extent and density with which things and cultural objects are replaced by technical objects.

Technical, machinic objects add their own reason to natural reason, an instrumental logic that challenges natural logics and creates, in the places they reach, conflicting mixtures or hybrids.

Technical objects and mechanized space are loci of “superior” actions, in the sense of their triumphant superimposition upon natural forces - actions deemed superior because of the belief that they confer new powers upon human beings, the greatest of which, in this sense, is the ability to confront natural Nature, or the Nature already socialized in the preceding period.

In this period, the body is surpassed through the transgression of limits imposed by the resistance of materials or by distance; human beings begin to manufacture a new time in work, exchange, and the home. Social times tend to overlap with and oppose natural times.

The international component of the division of labor tends to increase exponentially. Thus, the motivations for using technical systems become increasingly alien to local and even national logics, while the importance of exchange to the group's survival also grows. Since success in this process of trade depends largely on the presence of effective technical systems, these seek to become ever more present and ever more effective. The reason of commerce, rather than the reason of nature, governs their installation. In other words, their installation becomes increasingly indifferent to pre-existing conditions. Pollution and other environmental offenses did not yet bear these names, but they were already widely observed - and castigated - in the nineteenth century in the great English and continental cities. Even the arrival of railways in the countryside did not fail to provoke protest. The anti-machine reaction represented by the various forms of Luddism anticipated the present battle of environmentalists. This was the social side of urban miasmas.

The phenomenon, however, was limited. There were few countries and regions in which technical progress could take hold. And even in those few, the prevailing technical systems were geographically circumscribed, so that their effects were far from generalized, just as the perception of those effects was equally limited.

3) The third period begins practically after the Second World War, and its consolidation, including in Third World countries, truly occurs in the 1970s. This is the phase that R. Richta (1968) called the technical-scientific period, distinguished from the preceding ones by the two-way interaction between science and technique, to such an extent that some authors prefer to speak of technoscience in order to emphasize the present inseparability of the two concepts and the two practices.

This union between science and technique, and between technique and science, takes place under the aegis of the market. And the market, precisely because of science and technique, becomes a global market. In this case, the idea of science, the idea of technology, and the idea of the global market must appear together, offering a new interpretation of the present, since the changes occurring in nature are also subordinated to this logic.

In this period, technical objects tend to be at once technical and informational because, owing to the extreme intentionality of their production and location, they already emerge as information; indeed, the principal energy of their functioning is information.

As in every period, the new is not diffused in a generalized and total manner. Technical-informational objects, however, undergo a more generalized and rapid diffusion than preceding families of objects. On the other hand, their presence, even when punctual, marks the totality of space. This is why we designate the geographical space of the contemporary world as a technical-scientific-informational milieu (Santos, 1985 and 1994).

The more “technically” contemporary objects are, the more they are subordinated to global logics. The association between modern objects and hegemonic actors now becomes clearer. In reality, both are the principal agents responsible for the process of globalization.

These modern - or postmodern - objects range from the infinitely small to the extremely large, such as large hydroelectric plants and large cities, two enormous objects whose presence accelerates society-nature relations, imposing radical changes on nature. The hunger for energy is an essential feature of the functioning of the current economic system, of which megalopolises are both a datum and a consequence. Both large hydroelectric plants and large cities emerge as central elements in the production of what has conventionally been called the ecological crisis, whose interpretation, we insist, cannot be undertaken without once again taking into account the typology of objects and the motivations for their use in the present historical period.

Technical progress, especially the development of information, allows changes in the level of competition within capitalism, leading to the imposition of what has also conventionally been called competitiveness, which appears as a single equation to which all countries must submit. The use of the word in this sense is recent, but the phenomenon itself dates back several decades.

The pursuit of surplus value at the global level means that the primary seat of the productive impulse (which is also destructive, to use an expression of J. Brunhes) is stateless, extraterritorial, indifferent to local realities or, as we might say, to environmental realities.

Perhaps for this reason the so-called environmental crisis is produced in this historical period, when the power of the forces unleashed exceeds the capacity to control them under the current conditions of worldliness and their national and local repercussions.

CURRENT PROBLEMS OF AN EPISTEMOLOGY OF THE ENVIRONMENT

When we speak of the environment instead of the milieu, certain contemporary approaches may appear reductionist insofar as they are concerned with only one aspect of a complex problematic: For example, a purely ideological view of the question, a purely economic view, or an exclusively topical concern.

In the case of the environmental question, these reductions renew the already stated danger that we may be led to construct a causal chain which, in the case of topical planning, can reach the absurd point of making the effect appear before the cause in the production of knowledge.

Large campaigns involving funding from international agencies seek to preserve the Amazon, restore the Tietê and Guanabara, save Indigenous nations and golden lion tamarins from extermination. But what is to be done about the poor who continue to arrive in the great cities, and about abandoned children?

Seen through this restricted prism, environmentalism would be a reduction, although it assumes an air of scientificity in the name of safeguarding the planet. To what extent might these global campaigns be annihilating the force of concepts and imposing new forms of control over intellectual work? In the words of Bertha Becker and Paulo Gomes (1993, p. 162), “ecological influence as a new parameter of current world geopolitics [appears] in various forms: the media; the violent contraction of credit for projects; the impositions of the international agenda, which defines what will be discussed and excludes essential themes; the proposal for debt-for-nature conversion, which corresponds to the creation of new territorial divisions, veritable experimental paradises for biotechnology - analogous to tax havens - and which signifies the withdrawal of portions of national territories from the productive circuit.”

Before us today lies the possibility (and frequency), through the falsification of the event, of the triumph of presentation over meaning, even while demanding an anchor. In the environmental question, which reveals this facet of contemporary

history, this anchor is called the ozone hole, the greenhouse effect, and acid rain; and ideology takes concrete form in the immense territory of the Amazon (Santos, 1994, p. 21). The force of images thus tends to annihilate concepts, emptying them of their corresponding meanings. Some scholars have also addressed these questions. Eduardo Yázigi (1994, p. 92), for example, points out that in contemporary society "the fate of the planet has become inseparable from that of those who inhabit it," and that it is precisely the human factor that must be recovered in environmental movements, whose principal motivation should not be "emotion." Likewise, according to Ana Fani A. Carlos (1994, p. 77), "ecological discourse has replaced the concrete space of lived social practice, that of inhabiting in the broad sense (routes, encounters, gestures, symbols, signs, conflicts), with abstract space... One moves from the lived to the abstract in order to project that abstraction onto the level of the lived. In this sense, nature becomes a sign, and becomes strategic and political."

The media have become the great vehicle of this process that threatens human integrity. Although perception could, in principle, be enhanced through the appropriate use of so many sophisticated technical resources, it is mutilated when the media deem it necessary to capture attention through sensationalism and fear. Many ecological movements, carried along by the media, destroy, mutilate, or repress Nature... When the "environment," as "Nature-as-spectacle," replaces Historical Nature, the place of work of all human beings, and when "cybernetic" or "synthetic" nature replaces the analytical nature of the past, the process of concealing the meaning of history reaches its peak. In this way, too, a painful confusion is established among technical systems, nature, societies, culture, and morality (Santos, 1994, p. 24).

In the current process of globalization, discourse assumes a fundamental role in constructing the "new order," or rather, the order of things, in this technical-scientific-informational period. Today, objects are created and then disciplines are commissioned to be created. How can we refuse the confusion of minds in a University whose thematic agenda is guided by fashion and the media! (in Vattimo's words, 1992).

Through the choice of themes and the seriousness of reflection in dealing with concepts - as, in this case, with the necessary care regarding the term environment - we may perhaps find possibilities for action. Contextualizing the environmental crisis, avoiding topical studies and the seduction of global campaigns, becomes an urgent necessity if we wish to apprehend and propose solutions for the environment, which,

as we have already said and it bears repeating, is nothing other than the human milieu of life, constituted in contemporary society as a technical-scientific-informational milieu.

Here again, it is the history of labor that helps us delimit the problem, since it includes the history of techniques and social systems, viewed as a historical combination. This is the same proposal that served as the basis for suggesting a periodization. We therefore reconsider the production of technical objects in relation to the motivations for their use and the degrees of indifference of objects and their use toward the milieu.

Technique (or technical systems), as possibilities that are used, but also and above all as possibilities not yet used, allows us to look toward the present and the future and may perhaps enable us to overcome the fable that, in a globalized world, permeates the various motivations for use, with the consequent degrees of indifference toward the structures - material and social - of the milieu. The elaboration of a technical culture, that is, a view of technique that includes all aspects of life and all actors, should allow us to uncover what lies behind the “savage exploitation of nature” and the very rationalization of existence grounded in current relations between technique and societies.

Since technique defines the present and, in many respects, limits or opens the doors of the future, we must explore this phenomenon in all its dimensions - from the properly technical and operational to the cultural and political references that govern its incorporation into the history of the world and of places. Relations among human beings, relations between human beings and their surroundings, so-called international and interlocal relations, the use of capital, the nature of labor, life in the home, and even intersubjectivities are today subordinated, actively or passively, to the conditions offered by technique in its various manifestations. These are so many fields of knowledge that arise and are renewed, and whose methodical exploration through this unifying term permits the construction of metadisciplines that establish, on adequate foundations, the indispensable interdisciplinary work.

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