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# Can Environmental Problems Be Subject to Economic Calculations?

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**Summary.** — Environmental critiques of unsustainable development are not novel formulations, but rediscoveries of traditional socialist critiques of the capitalist economic system. While the necessity for economic calculations is not in doubt, these should not be undertaken within a capitalist system that divorces the economic from the social, but in a framework that identifies needs prior to production, recognizes the multidimensional nature of humankind, and operates on a global scale.

## 1. INTRODUCTION

Over the past 20 years, a series of problems characterized as "environmental" have occupied pride of place in political awareness (and occasionally in political action), particularly in the industrial countries of the East and West. The problems grouped under the term "environment" are extremely diverse: products of behavior and mechanisms operating at different levels, and at varying degrees of severity (localized noise pollution, insufficient regeneration of renewable resources, danger of depletion of nonrenewable resources, irreversible negative effects on the biosphere and the future of the planet, etc.).

The political and ideological reactions to these phenomena are themselves very diverse, even within organized movements — the Greens — especially if one considers the full range of opinions and interventions.

A distinction is proposed here between "technocentric" and "ecocentric" schools of thought. The technocentric approach identifies in the "environment" a series of concrete and distinct problems whose solutions are found in scientific and individual measures that do not involve calling into question the whole cultural, political and economic order of the modern world. By contrast, the ecocentrics reject the philosophic basis of the human-ecology relationship upon which modern civilization is (according to them) founded.

All major schools of thought concerned with the environment and ecological development share two views. The first holds that their discoveries, formulations of problems and proposed solutions, whether radical or reformist, are novel. I do not agree with this judgment, and will show that an acute awareness of these problems is present at the roots of the socialist critique of capitalist industrialization. The second is that the environmental critique is more radical than the socialist critique with respect to the capitalist mode of production. The environmental critique is in fact of modernity in all its forms, capitalist or socialist, based on the argument that socialist countries have treated the environment as badly as (and sometimes worse than) capitalist countries. It consists, therefore, of taking self-proclaimed socialist countries at face value without examining their social structure, and from this simplification, creating an amalgam of Marxism, socialism, and the experiences of Eastern bloc countries. Such an amalgam leads to confusion and should not be permitted in an analysis that is anything more than superficial.

In any case, environmental issues have currently assumed enough importance to merit a systematic effort to integrate them into conventional economic analysis. The dominant neoclassical economic paradigm has been chosen as the target for this integration of the environment in the economic calculus. There are two distinct issues relating to this effort. The first is how to integrate the environment in economic calculations; and the second is the construction of decision systems capable of implementing the logic of this calculus in the practical management of economic and social life. My reply to these issues is therefore twofold: (a) that economic

calculus itself, the necessity of which is not in doubt, has only limited applicability, and that the limits of this applicability should be precisely defined; and (b) that a decision system capable of responding to the challenges of the environment implies modifications of property laws, of the organization of markets, and of the nature of government intervention to such an extent that it would necessitate an abandonment of the rationales that define capitalism.

The modern economy in which we live is incomparably more complex than that of previous epochs. Whatever the organizational principles of societies in the near or distant future, this complexity will inevitably become more pronounced. This fact itself imposes, and will continue to impose, the requirement that all economic agents — individuals, simple decision-making units, firms (whatever their ownership), collectives, communities, villages, the world — make economic calculations. I would even go so far as to say that this complexity necessitates a market, if "market" is broadly defined to mean institutionalized exchange between decision-units enjoying relative autonomy, "free" in this context, and founded on economic calculations (expressed in terms of "price"), at least in part. Of course, this definition is far removed from that implicit in the dominant ideology, which uses the term market to designate in fact a capitalist market, which is founded on a particular social structure (private ownership of the means of production), and operates in a hierarchical world system.

The confusion surrounding the subject of the market allows the advocacy of theses which, in my opinion, do not have scientific foundation and constitute the basis of what I call the ideology of market alienation and the utopia of a social order founded on the basis of the supposed logic of general equilibrium. The treatment of environmental issues within conventional economics could be critiqued against this background. Prevailing neoclassical economics conceives of society as the sum of individuals, and the market as the meeting of their desires in their capacities as consumers, workers, and owners/managers of the means of production. Those social relations that define the actual rules of the game and the actual margins of choice and possibility are, therefore, immediately eliminated from the range of questions asked of exclusively economic analyses. Neoclassical economics remains separate from other domains of social life. The social, cultural, and political status of the individual, reduced to being at times a consumer, at times a worker and/or owner, is not considered in conventional economics.

## 2. THE NEOCLASSICAL PARADIGM

In the prevailing neoclassical economic paradigm, the generalized "market" for goods and factors of production (labor, nature, capital) will produce optimal choices in decisions affecting matters of growth, technological choice, distribution of income, and the satisfaction of needs.

First Walras, then his student Maurice Allais, proposed formal and rigorous proofs of this general equilibrium theorem. These proofs have the clear advantage of stating the assumptions upon which their validity is based. They are the following:

(a) Consumers' choice is free and determines in the long run the structure of production;
(b) The market is perfectly competitive;
(c) All yields are characterized by increasing then diminishing returns;
(d) Economic agents discount the future, and this discounting is quantitatively measurable;
(e) A perfect market implies equal access for all to natural resources (land, air, water), and a price determined by the marginal product of the natural resource should be charged for this access.
(f) In economic life, workers are reduced to a single dimension, that of suppliers of labor.
(g) The operating space of the market is abstract, and real world spaces that constitute the national and world markets are only approximations of this abstract theoretical space.

Pure economic theory excludes, by definition, all other possible aspects of social reality from its own scope of research, and therefore opts for a rigorous separation between economic and non-economic life. Obviously, theorists do not deny that reality may be quite different from this model, but they pretend that one must come as close to it as possible, in the interest of the "individual."

Yet, as we shall see, a critique of each of these assumptions and of the conditions for the validity of the general equilibrium theory is essential for debate on the environment. We shall see that these axioms and conditions are not only unreal or insufficient for the analysis of real problems and choices that society faces, but also that the attempt to approximate the reality of the model can only have catastrophic results, especially with respect to the environment. It is, therefore, a dangerous utopia.

General equilibrium theory implies the determination (in the long run) of production by consumption. Obviously, given the general structure of the model, all the variables are inter-

dependent. The intelligent defenders of the model even recognize that the structure of consumption depends equally on givens outside the realm of economics such as the distribution of property, and history, and that political intervention to modify these (e.g., agrarian reform) will modify in turn the structure of consumption through the structure of production. Based on this observation, they would defend these interventions in some cases, or even a critique of the principle of property itself, as we shall see. Nevertheless, by placing social relations outside the domain of economics, the theory of the market implies that, in a given situation, consumption determines production. Yet, by integrating social relations within the analysis we immediately realize that in capitalism the reverse is true: production determines consumption.

Let us translate this abstract formulation into a concrete example. Each year consumers are confronted with 200 models of automobiles, offered at given prices. In this situation, these consumers make choices which I shall accept — for the sake of argument — as rational (and therefore analyzable through neoclassical consumer theory). But let us suppose that another production system had offered only 20 models, but at reduced prices through the reduction of the costs associated with product differentiation. Who is to say that consumers would not prefer choosing among 20 less expensive models than the 200 models that arise in our present system? The choice is not even available to them. Why then is society seemingly forced to offer 200 models? The answer is obvious: because competition between car manufacturers leads to this product proliferation (useless and costly even in the eyes of consumers, if they were ever asked). The structure of production (profit-seeking through competition and the insatiable accumulation of profits, etc.) determines consumption, in the sense that it determines the real framework within which choices are made. For consumption to determine production — which would be desirable — it would be necessary for the production system to be organized upon different foundations than those that define capitalism.[1]

Neoclassical consumer choice theory should therefore be seen for what it is: an intellectual game that does not enlighten us to the functioning of the real system in which we live. I stress here that my critique is directed at the essence of the neoclassical model, and not on those factors that would modify the model, such as, for example, advertising and sales costs that modify demand. Is that to say that consumer theory should be thrown away? I do not think so: on the contrary, I believe that it could be useful in the future, which is to say in another social system, when the conditions shall have been created to make consumption the starting point of economic decisions. In that sense, we would need a post-capitalist, but not post-market, consumer theory. This post-capitalist consumer theory would define individual and social needs, which would in turn define the structure of production.

Even more seriously, with respect to the environment, if the danger to the biosphere is as real as is maintained by ecologists (and I believe it so), it becomes vital to ensure that the pursuit of progress does not lead to unrestrained growth in the consumption of energy and other resources. Talking about sustainable development is nonsense unless we accept that the social system should be reorganized in such a way as to effectively base production decisions on needs defined prior to production, rather than basing needs on production decisions. Under the present system, we can hold all the discussions we want on the dangers of development to the future of the planet, but there is no way of slowing the destructive folly.

The second and third hypotheses of the neoclassical model (perfect competition and diminishing returns) are simply distortions of empirical reality. Even more serious, the real trend in the evolution of capitalism is not to approximate the ideal model, but on the contrary to distance us from it: the economy of monopolies is not even one of imperfect competition. In addition, the necessary abandonment of the artificial hypothesis of diminishing returns deprives the model of any chance of operation.[2]

The practice of discounting the future [general equilibrium assumption (d)] appears to be an obvious psychological law. However, one cannot extend such discounting to society at large, in any sphere. A discount rate of whatever amount, low (1%) or high (15%), immediately reduces the range of calculations to the strictly short-term: 5–30 years maximum. Because with a rate of only 4% over 30 years, any value is reduced to two-thirds of its initial value, leaving a margin of almost absolute uncertainty about the validity of choices. But if 30 years can appear a respectable period in the scale of human life, what does it represent in the time frame of the history of nations and of humanity?

A large number of collective (social) and even individual decisions therefore necessarily avoid discounting the future. A first example is given by the (individualistic) behavior of the peasant land-owner. If he or she discounted the future, the land-owner would never have any incentive to maintain landed capital, and even less incentive to upgrade its potential in the long term so

that he or she could profit from the increased income derived from its gradual depletion. The land-owner does not behave in this way, and sees these advantages as illusory. Why? Because the land-owner wants to leave his or her children a means of making a living that is equal to or even better than the land-owner had.

A second example is furnished by national decisions concerning defense and military research. No government would accept a short-term constraint in this domain. Its decision will therefore be guided by the principle that — if not for eternity (a concept that has no political meaning) at least for the foreseeable future — the nation should be in a military position equal or superior to that of a presumed adversary. Based on this objective a government calculates the cost of its implementation in order to examine whether it is feasible. It consists therefore of a rationale different from the discounting of the future implied in economics.

These observations concerning discounting of the future are essential when we consider the realm of environmental problems. A number of the effects of modern economic activity occur in the long term and even in the very long term (exhaustion of natural resources, the greenhouse effect, depletion of the ozone layer, etc.). In this case, the economic method should be to incorporate absolute values, abandoning the concept of discounting the future. Yet conventional economics does not allow us this choice. The futile distinction, between the economic and noneconomic (for there is still a social choice to be made), explains the impasse in which neoclassical economics has embroiled itself.

Can access to natural resources [condition (e) of the model] be based on prices determined by their marginal product? My reply is negative. First and fundamentally the concept of the marginal product of factors of production is tautological, with apparent productivity itself being determined by social relations that determine the distribution of income among labor, capital and ownership.[3] In fact, in all societies, this access is regulated by laws and social conventions whose nature and effects it is important to understand. Suppose, for instance, that the economist is capable of calculating the marginal product of a particular factor of production. For this calculation to have meaning agents must effectively behave in a way that is consistent with this calculation. However, this requires a modification of the social laws governing access to natural resources.

In our society, access to some resources is sometimes taken as essential and leads to private (or public) ownership of these resources (land, mines, sometimes water) whereas access to others is free and unregulated (air, and sometimes water). Owners charging for access do so at prices that are direct consequences of traditionally formed social relations, and not at the equivalent of the supposed marginal product of the appropriated resource. This private management sometimes has positive effects from an environmental point of view. For example, in the previously cited instance, the peasant was careful to maintain the productive value of the land for future generations. But in most cases, it has variable and negative effects: the management of urban land by a municipality could be different (and itself variable as a result of social interests that the municipality represents) from that of speculators. Private ownership (or public ownership as it is presently practiced) of land is itself at the origin of a certain type of management of resources that, in general, does not guarantee rational management in the long term.

On all these issues, neoclassical economics clearly excludes the articulation of national/world systems perspectives from the debate. We shall now turn to those questions that are essential to the management of the planet's resources, the fundamental basis of environmental problems.

I am particularly concerned with those problems ignored by conventional economics, the underlying assumptions of which extol the virtues of the market in general without taking into account the fact that the world is distorted by the absence of a world labor market. Even before the Stockholm Conference (1972) when these points of view were expressed (without being properly heard) I demonstrated that the structure of agricultural export prices prevented African peasants from properly maintaining their land. In fact, the Western consumer benefited from this transfer to the detriment of the African people. The tragedy of millions of Africans condemned to famine — the biggest ecological catastrophe that we have known to date — is the direct, logical result of capitalist expansion. I have also shown that while mineral resources in the developed countries were managed as national resources, those of the Third World were treated as "common human property," to the exclusive benefit, of course, of Western consumers and firms (mineral rents reflect here unequal international social relations). Finally, I discussed how the statute of land ownership in the "reserve" economies (South Africa and several other colonies) had as a goal the creation of a cheap labor market for the benefit of the colonies of "white" population. Each of these extremely serious environmental problems cannot be re-

solved without a revision of international political relations.

The contrast between national and international markets — superbly ignored by pure economics — directly poses the problems of the rights of the common man or woman, who is neither principally a consumer nor supplier of labor, but simultaneously a citizen of a country occupying a given place in the world order. Even if historically formed national markets tend to properly integrate their three logical dimensions (markets for goods, labor and capital), the world market remains a stunted market, limited to the exchange of goods and capital to the exclusion of labor (which is to a large extent limited to within national borders). The theory of general equilibrium is therefore, in this way, a veritable fraud. This essential point completes the critique of labor relations. Conventional economics analyzes labor laws in a manner that constitutes *par excellence* the expression of alienation in the bourgeois ideology. This point about labor markets is, in my opinion, Marx's fundamental critique of bourgeois ideology, and I shall not return to it.

## 3. THE SOCIALIST ALTERNATIVE

A radical critique of bourgeois economic assumptions includes: (a) their reduction of society into the sum of individuals, and of the individual into an economic man; (b) the construction of an economic science separated from the social science (and the false problems of interdisciplinarity that it has created); (c) the demonstration that the concept of general equilibrium is misleading for the understanding of the real functioning of society and that, additionally, it is based on unrealistic or tautological hypotheses; (d) the illustration of the limits of rational calculations of agents operating in this framework; and (e) the illustration of the limits of rational economic calculations as they relate to the natural terms of production. These critiques of bourgeois economics are not original discoveries as environmentalists often believe.

Marx defined capitalism as a social system determined by the dynamics of the accumulation of capital. He concluded that it would find its historical limit in the fact that it would erode the two sources of human wealth: the worker (treated as labor) and nature (treated as inexhaustible). Environmentalists have, therefore, innocently rediscovered half of Marx's conclusion, a century later, just as a few years ago the critics of modernity rediscovered the Marxist critique of alienation, the other half of the conclusion. For Marx, the critique of economics was primarily of its separation from the proper context of historical materialism (which is the expression of the economistic alienation of bourgeois ideology and culture). Contrary to popular opinion, Marxism does not reduce social reality to economic determinism. In fact the economic reductionism of contemporary thought is expressed in the everyday (naive) language of governments, every time that they formulate economic constraints as a "laws of nature"! It is true that vulgar Marxism — of which the Soviet formulation was an extreme example — concurred at this level with the economic culture of the bourgeoisie. Poor Marx should not be held responsible and condemned to oblivion for this.

Karl Polanyi took up this tradition in 1944 to demonstrate the dangers of market utopia, leading to the double ravaging of humankind and of nature. Polanyi specifically refers to "the devastation of the environment, deforestation, the pollution of rivers, the degradation of labor."[4] In his critique of interwar liberals (such as Hayek and other spiritual fathers of the liberalism that is prevalent today, even among the "environmentalists" at the World Bank), Polanyi wrote: "expecting a society to remain indifferent to the scourge of unemployment, to the changes of industries and trades with their processions of moral and psychological torture, simply because in the long-run their economic effects will be negligible, is to suppose the absurd."[5] General equilibrium is therefore inherently utopian and this is why its applicability is always arrested by realistic and self-defensive society, something which continues to escape liberal dogma. "One could search in vain in all of the liberal literature for an explanation of these facts. A flood of insults against peoples, governments . . . presumed responsible for non-liberal policies . . . a piece of political theology . . ."[6]

At the same time Shigeto Tsuru was attempting to dissipate the illusion of unconstrained growth, by calling to attention the fact that high rates of growth are based on the destruction of nature.

My own contributions follow in this tradition. I believed it important to advance the analysis by examining the global dimension of the effects of the accumulation of capital (the accentuation of center-periphery contrasts), a dimension that was seriously underestimated by Marx and ignored by Polanyi. This dimension is essential for an analysis of sustainable development.

The proper treatment of environmental problems requires an end to the "totalitarianism of economics" and work toward the practical and theoretical reconstruction of the unity of politics

and economics. Conventional thought has not gone down this road; and conventional political forces have not taken any action in this direction. The debate surrounding the environment remains, under these conditions, the powerless expression of wishful thinking.

The critique of general equilibrium theory, in its pure formulation, has the advantage of delimiting the scope of economic logic. In addition, the Cartesian rationalists (Walras, Allais) have dared to draw logical conclusions from their theory: i.e., that a self-equilibrating and perfectly integrated market implies the abolition of private property, to be substituted by the state ownership of capital and of nature (land and access to the environment). In place of the imperfect managerial systems that private ownership implies, they propose a state that will auction access to capital and nature (at prices equal to the marginal products of these factors, which they assume are possible to calculate). Individuals would have a choice between supplying their labor and being managers of the factors of production (entrepreneurs). This proposition is intellectually courageous, but I believe it to be naive. It is amusing to note that the proposals of the Soviet reformers — Kruschev and Gorbachev — called for a system exactly conforming to the illusion that I have named "capitalism without capitalists." If the reformers have been overtaken, it is because their conceptions (sometimes called "technocratic" without adequate justification — their philosophy, like that of pure Walrasian economists, is derived from the tradition of Saint Simon and of "scientific government") do not incorporate that which is essential: social relations.

The most current defense of general equilibrium theory — and the proposition that the environment could be integrated in both economic calculations and the decision-making process — is certainly not that of Walrasian rationalists and their Novossibirsk students. The pragmatism that characterizes North American culture is content with sweetening expressions, accepting "imperfections" in private management and limited to conceiving of ways to reduce the negative impacts of these imperfections. The results are poor: a lot of economics (without much criticism), a little politics (in the superficial sense of the term). These do not constitute ideas for action![7]

The management of the market and economic calculations are not in and of themselves the basis for a superior rationality; they are only instruments and their rationality is in the service of the social order in which they operate. In order to be really able to respond to the challenges of environmental degradation, the social order should satisfy three conditions:

(a) base production decisions on needs and therefore lay out a mechanism for the identification and expression of these needs; conceive this mechanism in such a way as to integrate nature in the process of identifying these needs.
(b) recognize that human beings are multidimensional, and no longer reduce them to a single dimension of labor supply.
(c) Operation on the basis of a system integrated into the world at large.

Taken together, the first two conditions define a concept of democracy that exceeds the concept — and practice — of democracy[8] with which we are familiar. The current concept has been reduced to regulations regarding the management of electoral regulations and political pluralism. While existing cost/benefit methods are limited by their submission to the unilateral logic of the accumulation of capital, what is needed are criteria for rationality in the calculations of economic efficiency that we could define in the framework of a social system that responds to conditions (a) and (b) above. These conditions are infinitely more ample and complex than those proposed by conventional analyses.

I know of no social system corresponding to these three criteria other than socialism on a world scale. Even if the question of its construction is not the talk of the moment, this does not constitute a reason for eliminating this perspective, if we wish to avoid the barbarism that, among other things, the destruction of the environment implies.

The problem of detailing the economics (the organization of the system guaranteeing more or less that it is coherent with a system of rational calculation) of a social system founded on the above three principles constitutes one of the real intellectual challenges of our times. It requires an economics that is not post-market (since the market conserves its role and validity as an institution in the proposed social system) but is post-capitalist. One of the fundamental dimensions of this challenge concerns the status of the worker, who must be viewed as inseparable from the citizen. In the reality of capitalist society, these two facets are strictly separated: the rule of capital, expressed as the maximization of profit (the heart of cost-benefit analysis) implies the reduction of the worker to the status of seller of labor, while the rights of the citizen, exercised exclusively in the context of the political management of society, do not concern economic management.

The other fundamental aspect of the challenge

concerns the treatment of nature in the making of economic choices. This problem can be divided into a series of specific but varied questions about (a) renewable resources; (b) exhaustible resources; (c) minor pollution; and (d) questions concerning the very future of the planet.

The cost of using a natural resource should include, in principle, the cost of its maintenance (the regeneration of forest or maintenance of agricultural land), which forcefully implies that calculations should not include any discounting of the future, which is unacceptable in the scale of history. It is much more difficult to establish economic policy when the resource is nonrenewable. The goal here should be the investment necessary to substitute the resource nearing exhaustion with the creation of another resource having an equal use value. For example, the price of gasoline should include the cost of the set-up of an equivalent source of energy (search for oil fields, development of solar/nuclear energy alternatives, etc.). Of course, the calculation of this replacement cost will always remain uncertain since future scientific discoveries and technological progress are not known. This simply means that one has to set the replacement costs very high, with the understanding that these costs will fall with technological progress. The challenge is even more serious if dangers such as the greenhouse effect or ozone depletion threaten the life of the planet. If our scientific knowledge allows us to discern with a reasonable degree of certitude the causes of these phenomena, an authoritarian decision to fix absolute ceilings for harmful production and consumption constitutes the only efficient answer to the challenge. All the problems and the conflicts that rationing is associated with will be found here, and cannot be avoided by any taye of calculation trick.

The social order in which we live, at both the national level and the level of world organization, is incapable of facing up to the three conditions listed above because of the fragmentation[9] of decision-making power (private ownership, competition between producers) and inequality between nations. It is, at most, capable only of solving the problems that I have categorized as minor pollution: that of a river by a particular plant, traffic noise, etc. In these cases, one can effectively imagine compensation that is easy to calculate and impose (soundproofing neighboring housing, or transferring the residents elsewhere), or even *ad hoc* administrative measures. However, there are no simple solutions for major environmental problems. Although we may adopt methods of calculation based on the principles stated above, their implementation would still come into direct conflict with the logic of private accumulation and the logic underlying the international order. We can see that the three conditions stated above are inextricably linked.

The incorporation of the environmental dimension in the regulation of economic choices is only possible in the context of a democracy with social content. I mean by this a democracy operating beyond the restricted field of political management in the field of economic management. It is only under this assumption that individualism can be reconciled with humanism, whereas separating the fields of politics and economics brings, through the alienation and utilitarianism that it implies, the triumph of individualism at the expense of humanism. This is why, in the current systems of democracy, which are restricted and alienating even in the best of cases, the "electoral majorities" remain deaf — even beyond all the manipulations to which they are victim — to the demands for solutions to the serious problems of the environment. The average voter — because he or she is alienated — discounts the future. This is also why the idea of "capitalism without capitalists," from the extreme limit of pure economic rationality as conceived by Walras or by the Novossibirsk reformers, is illusory and naive.

Does extended democracy guarantee rational choices that correctly integrate the dimension of environmental challenges? Asking the question in these terms is, in effect, going beyond the realm of social science and transforming the debate into an eschatalogical one. Can humanity accept, or maybe even desire, collective suicide? Disalienated democracy would find its limit here. The distinction that I propose between economic alienation, individual and social, and anthropological alienation, more generally, is based exactly on this concern for defining the limits of the realm of social knowledge and for, at the same time, avoiding the skid into the unknown realm of eschatology.

Despite the eschatological question concerning the destiny of the human race, disalienated (from economism) democracy operates in a reality that need not be uncertain. I call attention to this point: economic calculations will always remain imperfect, because the future, even in the limited field of scientific knowledge, is only predictable in the short term. The arrogance of the prevailing alienated culture is that it is incapable of accepting this reality. "Eliminate the uncertainty or calculate the effects" only has a relative and limited reach in a time that is not historically adventurous.

Finally, and obviously, disalienated democracy only makes sense if it operates on a world scale.

If, as it seems, the threats to the planet already enumerated require a form of rationing, is it acceptable that this rationing rigidify the unbearable hierarchies in the modern world? Why should people who, by their negligible consumption, only have minor responsibility for the disaster, accept an order which only allows the perpetuation of monstrous waste by the rich minority of the planet? The debate on the environment, if this question is not raised, will remain a hypocritical one. A disalienated democracy operating in a real world situation of peoples treated unequally would transfer the law of the jungle of alienated individualism into a conflict between peoples and nations.

In all of its dimensions, the important issues concerning the environment put the dilemma up front: socialism or barbarism.

## NOTES

1. Of course, competition is not confined to product differentiation, and price competition should remain in a post-capitalist market mechanism. Nevertheless conventional theory ignores the devastating effects of the artificial multiplicity of goods, for which it has no explanation but a naive attribution to the psychology of consumers.

2. This is not the place to repeat standard criticisms of conventional economics: that the abandonment of the assumption of perfect competition does not affect the fundamentals of neoclassical reasoning; that the hypothesis of decreasing returns is logically necessary to establish points of equilibrium between demand and supply, etc.

3. Fundamental critiques of the concept of factor productivity have been made innumerable times elsewhere.

4. Polanyi (1944), p. 182.

5. Polanyi (1944), p. 280.

6. Polanyi (1944), p. 276.

7. One could always, in theory, internalize external factors by using appropriate shadow prices. This is the essential point of the reformers. But, in order for the calculation founded on these shadow prices to constitute an effective system of incentives, one must multiply the subsidies, taxes, etc., and differentiate them to infinity. Development planners in the Third World have not done anything else. The resulting systems of national prices have been delinked from those the world market through exchange control, capital flows, etc. These practices are, as we know, violently attacked and their dismantlement is proposed in the name of rationalizing markets, without shadow prices!

8. I refer the reader to the fundamental critique of political democracy, as distinct from social democracy in Amin (1991).

9. The critique here of the fragmentation of power monopolized by a minority of decision makers under capitalism (heads of companies) does not argue for the centralization of power under a socialist system (along the Soviet model), but a real decentralization among collectives of workers (self-management) accompanied by collective negotiations allowing coherence on a national and world scale.

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