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Redefining Progress in Light of the Ecological Crisis

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Redefining Progress in Light of the Ecological Crisis

Dominique Méda

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Though they do not like being dependent on the hypotheses or results of research in the natural sciences, the humanities and social sciences now face the challenge of addressing the radical changes that the former have revealed to us: first, to understand how human beings turned themselves into veritable geological agents capable of destroying the planet's habitable character; second, to measure the extent to which we can trust traditional disciplines to define the contours of the world in which we aspire to live; and finally, to shed light on possible solutions to what we can now see is far greater than a mere crisis. Dominique Méda examines here the reasons why production has become the primary context in which expression occurs in modern society and why gross domestic product has become main criterion for measuring achievement, before reflecting on what the stakes are of developing new ways of representing "what matters."



Working Papers Series

Redefining Progress in Light of the Ecological Crisis

Dominique Méda

Décembre 2012

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The text

This text is drawn from a talk given on October 2 on the occasion of the inauguration of the chair in “Ecological Reconversion, Work, Employment and Social Policy” at the Collège d'Études Mondiales, in collaboration with the University of Paris-Dauphine. It is the first draft of a text that will be published as a book in the first trimester of 2013. The author wishes to thank Michel Wieviorka, the members of the Forum Pour d'Autres Indicateurs de Richesse (FAIR), the seminar on “sustainable policies for prosperity,” and the Veblen Institute, which realised the translation into English of this text. This text is also published as a note by the Institut Veblen in both languages.

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Abstract

This paper presents the main arguments from the inaugural lecture delivered at the opening of the chair «Ecological Reconversion, Work, Employment and Social Policies», established at the Collège d'Etudes Mondiales set up by the Fondation Maison des Sciences de l'Homme, Paris, in cooperation with the University Paris-Dauphine. Though they do not like being dependent on the hypotheses or results of research in the natural sciences, the humanities and social sciences now face the challenge of addressing the radical changes that the former have revealed to us: first, to understand how human beings turned themselves into veritable geological agents capable of destroying the planet's habitable character; second, to measure the extent to which we can trust traditional disciplines to define the contours of the world in which we aspire to live; and finally, to shed light on possible solutions to what we can now see is far greater than a mere crisis. Dominique Méda examines here the reasons why production has become the primary context in which expression occurs in modern society and why gross domestic product has become main criterion for measuring achievement, before reflecting on what the stakes are of developing new ways of representing "what matters."

Keywords

ecology ; environmental accounting ; Gross Domestic product ; progress ; wealth

Redéfinir le progrès à la lumière de la crise écologique

Résumé

Le texte constitue un extrait de la conférence inaugurale de la Chaire « Reconversion écologique, travail, emploi, politiques sociales » du Collège d'études mondiales, mise en place par la Fondation Maison des sciences de l'homme en coopération avec l'Université Paris Dauphine. Même si elles n'aiment pas dépendre des hypothèses ou des résultats de recherche des sciences de la Nature, les sciences humaines et sociales sont aujourd'hui mises au défi de penser les transformations radicales que nous révèlent celles-ci : d'abord pour comprendre comment l'homme a pu se muer en véritable agent géologique capable de détruire le caractère habitable de la planète, ensuite pour savoir dans quelle mesure nous pouvons faire confiance aux disciplines traditionnelles pour dessiner les contours du monde que nous voulons, enfin pour éclairer les voies de résolution de ce qui est bien plus qu'une crise. Le texte revient sur les raisons qui ont fait de la production le principal lieu d'expression de nos sociétés et du Produit Intérieur Brut leur principal critère de performance avant de s'interroger sur les enjeux du développement d'autres manières de représenter « ce qui compte ».

Mots-clés

écologie ; comptabilité environnementale ; Produit intérieur brut ; progrès ; richesse

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In mid-2012, Mitt Romney, the Republican candidate for president, placed the distinction between helping the planet and helping people at the heart of his campaign: “President Obama promised to slow the rise of the oceans and to heal the planet. My promise is to help you and your family.” At the very same moment, the journal *Nature* published an article signed by twenty-two scientists entitled: “Approaching a State Shift in Earth’s Biosphere.” In the article, the authors remind us that human beings now dominate the earth and are changing it in ways that threaten its ability to support us—us, as well as the other species. They emphasize that critical transitions linked to threshold effects can trigger state shifts, and that humans are now forcing such transitions to occur, which may transform the earth quickly and irreversibly, ushering in a situation that humanity has yet to experience. Two recommendations arise from the article: the need for understanding the deep causes of this all-encompassing change that humans have brought about and the urgent necessity of adopting measures to ensure the resilience of our society and, in particular, its ecosystems.

Though they do not like being dependent on the hypotheses or findings of the natural sciences, the humanities and social sciences now face the challenge of coming to terms with the radical changes that the former have revealed to us: first, to understand how human beings have turned themselves into veritable geological agents capable of destroying the planet’s habitable character; second, to measure the extent to which we can trust traditional disciplines to define the contours of the world in which we aspire to live; and finally, to shed light on possible solutions to what we can now see is far greater than a mere crisis.

Let me remind you of the main facts that scientists, notably the IPCC, have discovered: the primary threat is global warming and the accumulation in the atmosphere of several greenhouse gases that must be reduced by 50 to 85%. Global warming above 2° C is likely to trigger dramatic climate change, including tropical storms, the desertification of much of the earth, soil erosion, the acidification of the oceans, and loss of biodiversity. To this must be added the (more or less related) phenomena of air and groundwater pollution, the growing scarcity of available drinkable water, the depletion of non-renewable natural resources (coal, oil, and gas), and diminishing

mineral stocks. Everything seems to suggest that humanity finds itself on the brink of catastrophe if nothing is done within a very narrow window of time.

My goal today is to *take seriously* this highly credible data and to make it the starting point of my reflection.

Focus on Production

This information requires us, in the first place, to undertake a new reading and critical reinterpretation of our past: it is as if, as Ulrich Beck argued some time ago in his book *Risk Society*, the past two centuries, which we have tended to consider as centuries of progress, due to the fact that they radically changed the conditions in which human beings (at least some of them) live on earth and the fact that economic growth (at least in the West) reached hitherto unprecedented levels, can no longer be described in these terms. True, the “average worker” could, in the late twentieth century, buy six times as many goods as at the end of the previous century and human living conditions have improved considerably, notably in terms of health. Yet the fact remains that the current and coming environmental degradations, of which we are now becoming conscious, seem to be the immediate consequence of the past two centuries. Though they were invisible until recently, they can nonetheless be attributed to past human actions.

In 1986, Beck wrote that we were discovering that the production of wealth often produces problems. Indeed, beginning with the Industrial Revolution, the achievements of the vast forces that were mobilized to shape nature for human use were systematically counted and represented as a “plus”—as *progress*—while the damages inflicted on preexisting equilibriums, nature, and for a long time on human beings themselves were never specifically considered or taken into account. These are the two processes the dynamics of which we must grasp: the concentration of all human energy on production, on the one hand, and the occultation of its negative effects, on the other. If we do not analyze them, we will deprive ourselves of the means to overcome the resistance that is preventing us from taking new path.

Why this emphasis, beginning in the eighteenth century, on production? Why such an overabundance of energy devoted to shaping the world? This obsession was determined not merely by a

desire for the comfort such changes were likely to bring: the point was not, as Descartes suggested, simply to live longer and in good health. This relentless outflow of energy, this immoderate expenditure of work and natural resources can only be explained by deeper causes. It required, as many authors have emphasized, a genuine intellectual revolution and the establishment of a “system” in which everyone saw at as their *interest*—or felt *required*—to participate in the growth dynamic.

Among the explanations that have been offered of the “staggering upheaval” that began in the eighteenth century, I will mention those that strike me as the most determinant, notably because they continue, in many cases, to shape our social dynamics and thus obviously contribute to resistance to change.

The first explanation for the passion with which the West threw itself into production, to the point that it has often been described as having a “religious” character, is offered by Max Weber: the passion for enrichment resulted from a *conversion* of spiritual energies towards the material world. If the rational reordering of the world was undertaken with such seriousness, it is because it raised the question of salvation. Historians such as Lynn White maintain that the effects of this theological matrix continue to be felt today.

The second explanation is that the emphasis on production solved a question that haunted the eighteenth century: how to find a way to establish and preserve social bonds in the wake of the assault on geocentrism, the collapse of *universitas*, the rise of the individual, and the discovery that society is a human convention? At the time, two “solutions” competed with one another to explain why individuals should get along and regulate their interactions peaceably: the “Rousseau solution,” which saw collective deliberation occurring in a citizen’s assembly and political bonds as the source of social order—a discursive and negotiated order—and the “Smith solution,” which, wary of the human ability to agree verbally, maintained that a spontaneously regulated order was the best means to compel individuals to participate in social life, with no expectation that they like or even talk to one another. The modern (and latter) solution triumphed: production became the basis for social bonds and growth ensured that it would be preserved.

Through the value it placed on work, the nineteenth century promoted humanity as a force that could transform the world. One sees this, in France, in Saint-Simon’s defense of industry and, in Germany, in the preeminent place Fichte gave to “man the legislator.” First Hegel, then Marx argued that it is humanity’s vocation to destroy the natural world and to remake the world in its own image.

The last two “explanations,” however, call attention more than the others to the “irrepressible” character of production’s growth and its transformation into “productivism.” The reason lies, on the one hand, in the way that our imagination and love for distinction ensnare us, as Smith argues in *A Theory of Moral Sentiments*, in the pursuit of a “bad infinity,” and, on the other, in the unrelenting desire for profitability that, according to Marx, Weber, and Sombart, characterizes capitalism.

In the nineteenth century, the economy was integral to humanity’s establishment of itself as the font of all values, as it renounced any connection to nature—its materiality, its resistance, its finitude. Production was seen as providing evidence for this truth. Sociology, at its inception, was careful to explain social facts by other social facts and was obsessed with the threat of social dissolution represented by the Industrial Revolution; consequently, it made social cohesion its primary concern. The human and social sciences were complicit in downplaying the damage inflicted on workers and nature entailed in the rapid reshaping of the world by describing the various degradations resulting from industrialization as the inevitable price of progress. The problems tied to the “labor factor” were overshadowed by the possibility of offering consumers cheap and abundant goods: “The rights of the people,” wrote F. W. Taylor, “are therefore greater than those of either employer or employee.”

In the twentieth century, GDP became the most developed expression of the absolute priority given to production and the necessity for growth. While the size of national income had, since the seventeenth century, been central to international competition, as Vanoli has shown, the development and implementation of national accounting in the mid-twentieth century provides dramatic confirmation both of the equation of progress and wealth with increased production alone, as

well as of the process whereby the latter's social and environmental costs were rendered invisible.

GDP as *the* Indicator of Progress

Like all formal and accounting procedures, national accounting is a convention, and thus the result of choices and various operations of inclusion and exclusion. Fourquet's work on French national accounting has revealed the strong ideological preferences that shaped its conception: GDP is not a tool that describes reality in a neutral way, but one that extracts, from reality as a whole, the factors that are most important to a country's well-being. Thus Kuznets, the man who is seen as the founder national accounting, emphasized the extent to which he drew on value judgments when attempting to estimate the United States' national income.

GDP corresponds to the monetary value of commercial and non-commercial production. The activity that generates this production is work in all its legal forms: independent work and salaried work. Excluded from this definition (i.e., "what counts") one finds, if one focuses on human activity, what accountants call "non-commercial household production," which corresponds to all the activity carried out within the household and which could be traded with the outside (in other words, domestic labor), as well as all activity that is not aimed at production—that is, which does not seek to shape an object for human use. Because this indicator has become the main criterion by which we gauge a society's success, non-work activity counts for nothing, though we would be more industrious if, for example, all non-commercial household production could be turned into commercial production. One easily recognizes the philosophical choice made by the eighteenth century, which is built into the indicator: what GDP primarily counts is production, which values exchange between society's members.

Other characteristics of GDP must also be recalled: it counts positively and at their exchange value all production, whether useful or useless. Neither inequalities arising from participation in the production process nor inequalities in consumption have any bearing on it. Finally, it only records positive flows and, unlike business accounting, it does not use a balance sheet that, in

addition to increases in added value, incorporates losses other than the depreciation of technical capital. By losses, I mean decreases in the stock of renewable and non-renewable natural resources, health problems related to production (caused by work or pollution), the declining quality of air, water, soil, beauty, social relations, the climate, and everything else that has no price and cannot be appropriated on a unit-by-unit basis but nevertheless belongs to the shared heritage upon which life depends. GDP neglects these factors, placing exclusive emphasis on added value and, ultimately, the amount of overall income that is distributed.

GDP has become our society's primary indicator of progress. Every day, we hear the media tell us that unless GDP grows, incomes will not increase and unemployment will not decline. And yet this indicator is able to reveal neither the dangers that we face nor the factors or resources that contribute to making our society sustainable over the long term. Worse still, it blinds us and deceives us. One person who recognizes that GDP is a dead-end is Joseph Stiglitz, a classic economist who is also critical of his field. He was a co-reporter of the Commission on the Measurement of Economic Performance and Social Progress that was set up in 2008 by the French president. At present we still accept to live in a society that is completely structured around an indicator that is incapable of steering us in the "right" direction. But if the GDP is a poor indicator—if the data that it gives us is, as Passet writes, truncated, to the point that it could lead us to a disaster without a single alarm bell being sounded—this means that the categories we are using to interpret the world and guide our actions are no longer appropriate, and that we have no choice but to change. We need, in short, new indicators.

What does this statement mean? It means that we must invent new categories that provide us with a better account of reality and that are better able to guide our individual and collective actions. Yet such an endeavor raises many questions: how should such retooling occur? Who should be allowed to participate? Who can legitimately do so? On what principles should it rest? What should be represented: should we remain within the preexisting paradigm and improve the way in which we represent production, i.e., the way human beings create useful goods? Or should we, to the contrary, focus on the interactions between

human beings and nature in order to highlight how different human actions modify natural balances? What language and what grammar should we draw on to construct a new form of accounting and to sketch a desirable world? Should one employ today's universal language of economics and monetary policy, or turn our attention to energy and material flows? In the latter case, how can we create connections and build bridges between these different representations? How can we translate one into the other?

At present, a real race is underway to propose new wealth indicators that would complement or replace GDP. As Florence Jany-Catrice and Jean Gadrey have shown, this market is booming: dozens of new indicators—some synthetic, some monetary—have been proposed by those who are now aware of GDP's inadequacy as a tool for guiding and evaluating human action. Make no mistake: this competition is critical. The stakes of this competition are the frameworks we will use to interpret the world and the norms that will guide our actions for decades to come. This competition will determine the principles shaping public and private policies, the stakes of which are the legitimization of certain forms of behavior at the expense of others. Evidence of the importance of these stakes can be found in the fact that OECD has devoted impressive resources to this concern (in a project tellingly entitled *Measuring Progress*); that France's former president wanted (to the surprise of those who follow these questions) to create a commission, the task of which was nothing less than acknowledging the limitations of GDP and to propose different indicators; and that the European Commission has committed itself to publishing new indicators in the near future.

This competition, however, obeys rules that are far from clear and occurs between experts in terms that make it difficult for the broader public to understand the stakes or participate in the discussions. No public forum has been organized to address the question and to allow citizens to seize upon it. The meeting of the Stiglitz Committee is a significant example: while its goal was to think about "what counts" in modern society, it consisted of a gathering of experts, with no representatives of civil society or national parliaments and composed almost exclusively of economists—and mainly men, to boot—working behind closed doors—as the Forum for Other

Wealth Indicators (Forum pour d'autres indicateurs de richesse, or FAIR) immediately pointed out.

Our attention should also be drawn to the content of the committee's reflection, as it helps us understand why the stakes of this rebuilding are essential. The committee's report made three major proposals: to find better ways to integrate income inequality and to measure quality of life and sustainability. Relating to this point, the committee proposed a genuine shift by recommending the need "to take into account wealth as well as income and consumption." It proposed that, like companies, the economy as a whole must have a balance sheet, giving us a complete statistical record of its assets. This complete change in thinking traces its origins, in part, to the World Bank's 2006 report *Where is the Wealth of the Nations?*, which proposed a new definition of wealth, the so-called "theory of inclusive wealth." By taking into consideration the totality of this "capital"—productive capital, human capital, as well as natural capital—it is possible to compare annual variations in total capital thanks to the conception of net adjusted savings. The latter is calculated by taking a country's net savings and subtracting the value of the depletion of natural resources while adding the value of investments in human capital. Even if the latest version of the report of the Committee on Measuring Economic Performance and Social Progress devotes in-depth analysis to the limitations of this indicator and largely takes into consideration the critiques in its midterm report (notably by FAIR), it does not completely break with GDP, as it proposes "focusing the monetary aggregation on items for which reasonable valuation techniques exist, such as physical capital, human capital, and natural resources traded on markets."

In What Language should we describe the Future World?

Yet the consequences of this new representation of wealth are enormous: on the one hand, they attribute a monetary value to items that are neither commercial nor intended to be exchanged on a market and count them as "exchange values"; on the other, they consider the three forms of capital to be mutually substitutable, that is, replaceable by one another. The truth of a representation that at first glance may seem appealing can

thus be explained as follows: there will always be enough human and technical capital—in other words, enough human intelligence to create the technical progress that will make the equivalent of natural capital. That the latter is destroyed is not terribly important, as human beings are smart enough to build the artificial capital—this is the heart of the matter—that will generate a flow of utilities equivalent to that which is currently generated by natural capital.

The utilitarianism of this concept of “weak” sustainability is self-evident: that which must be preserved above all and passed on to future generations is an “x,” a noumenon capable of generating the same flow of utilities that we manage to generate at present. If environmental economics currently attributes any role to nature, it is thus as a kind of capital reserve of utilities and service flows. Contingent valuations, cost-benefit analyses, and estimates, all of which use money as their common idiom, justify their ascent on the grounds that natural resources are being pillaged because they have no value. It follows that they must be given value, a process that depends on the fiction of a market that ultimately exists to determine the price of the various services that nature provides human beings. It is also recommended that we think in terms of total economic value, defined as the sum of use values and non-use values. Contingent valuations are used to approximate these values and peoples are asked about their willingness to pay. In this vision, nature is simply humanity’s “utilities reserve” and “man is the measure.”

These trends help us to understand the emergence, when confronted with such anthropocentrism, not only of “deep ecology,” but more generally of a corpus of economic and non-economic work that seeks, on the one hand, to deny human beings the right to systematically exploit nature, and, on the other, to acknowledge that nature has a value independent of human beings, which is, most importantly, not reducible to economic value. The American philosopher Baird Callicot, who was introduced in France by the philosopher Catherine Larrère, has defended the claim that nature has inherent value in order to fight this very utilitarianism. The theory of inherent or intrinsic value makes it possible to escape utilitarianism and the “reduction to cost-benefit analyses[,] in which valued natural aesthetic, religious, and epistemic experiences are shadow priced and

weighed against the usually overwhelming material and economic benefits of development and exploitation.”

In what idiom must we write about and describe our future world, the “new development model” to which we must transition? The Stiglitz Commission, even as it aspired to take multiple disciplines into consideration, addressed it in primarily economic terms, using the postulates of standard economics and a conception of value drawn from environmental economics. The same year, Juan Martinez Alier, one of the leading ecological economists, asked: “Are ecological values only valid if they are translated into financial terms, or are they valid in themselves with their units of biomass and biodiversity? Is it valid to argue directly in terms of human health, subsistence and welfare, or do we have to translate them into money? ... Who has the social and political power to simplify complexity and impose a particular language of valuation?”

How are we to overcome the many linguistic and value conflicts that emerge as soon as we try to say what matters? Since the early 1980s, philosophy, sociology, and economics have more or less radically reconsidered their purposes. All three disciplines took into account the discoveries of the 1970s: that natural resources are finite and that certain human actions are destructive. All three developed sub-disciplines: environmental ethics, environmental and ecological economics, and environmental sociology, all of which are on the rise. In all three cases, these disciplines significantly revised their foundational paradigms, renouncing their anthropocentrism and grappling with the interdependence of human beings and nature. Yet all three disciplines continue to do so in their own language and according to their own epistemological frameworks, even if revisions are underway.

There is no good reason for maintaining that the language and concept of value we should use to describe the world of the future should be drawn from economics. On the contrary, we can already conclude from the fact that definitions of value are strategic, plural, and multiple, that all the sciences—the human, social, and natural sciences—must cooperate to choose or construct the language that is ultimately needed to describe this world, with the help of citizens, who must necessarily be involved in determining “what matters” for everyone.

Moreover, what superior principle, transcending all disciplinary boundaries, could guide the entire process? The maxim that Hans Jonas decreed in his *The Imperative of Responsibility* offers a minimal basis upon which we could agree to work for the representation of a desirable world: “Act in such a way that the consequences of your acts are compatible with the permanence of a true human life on Earth.” From this maxim we can deduce several concepts that might serve as foundations for the various sciences that must strive to imagine the future world: strong sustainability; the obligation to act as nature’s usufructuary rather than proprietor; and the duty to pass onto future generations the patrimony we have inherited and that will allow them, in turn, to have a decent life. We must preserve it and pass it on to the next generation, regarding it as a common good that must be managed as respectfully as possible and that can only be used according to collectively defined rules.

Everything leads back to the patrimony that each generation must preserve and pass on. All disciplines can agree on the importance of bequeath assets and not merely flows. But of what exactly does this patrimony consist? How are we to describe its constitutive components? In 1968, Bertrand de Jouvenel wrote that progress is “consecutive growth in social patrimony, to an extent that each active generation bequeaths to the next richer tangible and intangible assets.” What does this social patrimony cover? What method should be adopted to identify its parameters and count its components? Imagining society’s possible demise and, to the contrary, what is necessary to ensure that it lasts over time allows us to identify at least two possible elements: a natural element and a social element. A society can die because of the disappearance or extreme dilapidation of its natural capital, but also as a result of social balkanization and its reduction to its constitutive elements—unorganized aggregates of individuals.

This patrimonial conception of wealth thus requires a precise inventory of the quantity and quality of the patrimonies and situations that we believe should be passed on. Work has already begun on biodiversity, minerals, non-renewable resources, forest, groundwater, and fish stock. The work relating to “social patrimony” is no less difficult. Approaches based on the idea of “social health” have been developed notably in several

French and North American regions: elaborated through citizens’ conferences, these initiatives, as Florence Jany-Catrice has shown, determined that what matters the most is the quality and distribution of work, working conditions, and income inequality.

If progress is no longer measured in terms of GDP growth rates or net adjusted savings, but in terms of the evolution of our natural and social patrimony, is such a representation sufficient to guide us? Is it dynamic enough? In other words, how are we to connect this representation with our current system of accounting, which is expressed in terms of production and income? How can we shift from one to the other to guide the transition process? I propose that we consider this patrimonial representation as an indicator that allows us both to describe the world desired and as a rule that production must respect—that is, as a totality of numerated constraints defining the norms governing production. This indicator’s parameters must be determined by collective choices made in conjunction with scientists belonging to all relevant disciplines. It must thus be the point upon which we must fix our gazes—the indicator destined to shape our public and private behavior.

Imagining the Ecological Transition

The concrete implementation of such a process raises, moreover, numerous theoretical and practical questions.

The first concerns the steering of the transition process. There are two opposing positions on this question: the first, in the tradition of Hans Jonas, is skeptical about the capacity of democratic governments, which are always under pressure to be reelected, to take the required measures and maintains that only a “benevolent and well-informed tyranny, driven by a proper understanding of things,” can succeed; the second holds, to the contrary, that greater democratization will make the process more acceptable. More concretely, one of the primary questions consists of understanding how to incentivize—or compel—private actors to participate in such a process.

The second question concerns the role of trade unions and social movements in grappling with the ecological question. If the first two years of the crisis in which the world is still mired led to greater awareness of the global economy’s

dysfunctions and encouraged the creation of coalitions between the ecological movement and unions—witness the drawing up, at the European level, of a Green Agenda—the deepening of the crisis had rendered the situation far more complicated: the Green Agenda has disappeared from official speeches, coalitions like the Spring Alliance have lost momentum, and the contradiction between resolving the social question—which requires more and immediate growth—and the ecological question—which requires radical change and a complete paradigm shift, but which is postponed indefinitely—is once again absolute. The advocates of a joint solution to the ecological question and employment are very isolated in Europe, where nationalism and short-term interests once again have the upper hand. And the temptation is great to reemphasize the commercial perspective on the world in the name of life, growth, and employment, in direct contradiction with an approach that seeks to spare the world from predatory attitudes towards natural resources. In recent years, there have been increasingly intense debates about global public goods and common goods. The work of Elinore Ostrom and its influence on social movements like the World Social Forum in Bélem have opened new perspective and raised questions that have now become urgent: what should be the status of natural and human common goods? How can they be protected from commercialization? Which goods and rights should be held in common by the human race and which should belong to specific communities? What kind of process is required to attribute such a status? Which communities can legitimately initiate such a process? What rules will it obey and who will determine them? What form of management will result from this process?

The third question concerns the re-conceptualization and revision of the traditional hierarchy of activities to which we are led once we take the ecological threat seriously. Whether or not we agree with the predictions of those who believe that investments in renewable energy, insulated buildings, and the reorganization of a number of industries on ecological principles will not suffice and that we must resign ourselves to a drastic reduction in the size of our economies (some studies suggest that this goal can only be achieved if GDP declines 3% annually, i.e., 77% between 2007 and 2050), we must in any case give a priority to actions that take care of the environment.

To what extent will this rehabilitation, in addition to activities that will shape it for usage and monetary exchange, lead to a reconsideration of how these various activities are remunerated, the creation of a guaranteed income, or the invention of specific currencies? How can our social policy adapt to this goal? To what extent must we renounce systematic improvements in productivity, which would place the quality of labor back at the heart of our concerns? Might we be witnessing the birth of a movement that simultaneously seeks to rehabilitate product quality and labor and promotes coalitions between consumer advocacy groups and social movements? All of these intersecting questions must be pursued.

The fourth and in my view most decisive question concerns the concepts, language, and disciplines that must be mobilized to represent, participate in, and support the transition. It consists of several sub-questions, the first of which is monetization. Should we, in order to accelerate the transition and render its necessity even more apparent, adopt a new indicator that could impose limits on production, the development of which would continue to be measured by existing accounting systems (both national and corporate), or must we drastically revise these systems, requiring for instance that financial accounting include depreciations resulting from the degradation of natural and human capital and count them as a cost that must be subtracted from profits, as a number of “alternative” accountants now propose?

More generally, can we, in conceptualizing the ecological transition, trust academic disciplines, in their current specialized form? Is it possible and adequate to organize real cooperation between them? Or must we found a new science, transcending narrow disciplinary boundaries, and rehabilitate, contra Durkheim, interest in a synthetic, non-specialized vision?

I would like to give the last word on this question to the mathematician Nicolas Bouleau, who recently called for a new approach to science—a science that, unlike the kind promoted by Bacon, would take care of the object of its study. Bouleau writes: “I am dumbfounded that there are still those who dare to reflect on the environment by thinking about humanity’s role on the planet as that of a company with internal and external goods, governed by the function of production, a little parametric equation [...] like those used in microeconomics to determine a company’s

balance sheet. This is still done at the highest levels of academia [...]. It is an imposture. Economic logic is fundamentally incapable of conceiving its own limits [...]. When economics appeals to neoclassical arguments, it demands allegiance. It proposes a conceptual framework that must be trusted. But due to the unwarranted profits and the widely acknowledged damage to which it has led, it has been discredited and its capital of trust has collapsed [...]. If one must be wary of one thing, it is humanity's bold and domineering temperament. To the contrary, we must develop a form of scientific knowledge that contributes to and takes care of natural equilibriums and takes into consideration the knowledge of affected social groups. In short, we need higher quality knowledge. What would this involve? Knowledge in which we would have greater trust, given the current human, social, and geopolitical situation, without giving a blank check to specialists enamored of their specialization."

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